

**Perspectives on effectiveness: What works in a juvenile fire
awareness and intervention program?**

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Abstract

Deliberate lighting of fires by juveniles is both a public health concern and a community issue. This collaborative multiagency project aimed to establish best practice guidelines for child and youth firesetter programs in Australia. The study proceeded in two parts. Firstly, the practices and perceived effectiveness of the Victorian Juvenile Fire Awareness and Intervention Program (JFAIP) were investigated and contrasted with other Australian and overseas programs (US, Canada and NZ). Reviewing the literature, extensive interviewing, comparative analysis of approaches and site visits enabled the development of criteria associated with juvenile firesetter programs that were well designed, well implemented, and appeared to provide effective interventions. Secondly, pre and post fire-specific and psychosocial risk factors were investigated with a sample of 29 firesetter boys (7-13 years) referred to the JFAIP using the firesetting risk interview (FRI) and children's firesetting interview (CFI). Children's recidivism was also prospectively followed-up for 12 months. Pre and post findings on the FRI suggested that all JFAIP clients benefited from the intervention. From the parent's perspective, lower fire-specific risk factors were reported after the intervention, but as expected psychosocial risks remained unchanged. From the child's perspective on the CFI, some fire-specific risk variables had improved. Of the 29 children in the sample, nine participants were identified as recidivists. Thus a third of the sample, although receiving an intervention, continued to light fires. Recidivist and non-recidivist children were also compared on FRI and CFI and significant differences were found in both fire-specific and psychosocial risk factors. The study highlighted that high risk and low risk clients participate in fire safety education programs in Australia. Low risk clients benefited from a fire safety intervention emphasising education. Thus, fire safety education programs may be appropriate as a sole intervention with some firesetters under certain conditions. However, about a third of the JFAIP clients were recidivists and would

benefit from additional interventions. It is recommended that juvenile firesetting programs follow best practice guidelines.

Declaration

“I, Kathryn McDonald, declare that the PhD thesis entitled Perspectives on effectiveness: What works in a juvenile fire awareness and intervention program? is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work”

_____ Date _____

Dedication

I would like to dedicate this work to my family who supported and encouraged me throughout this PhD thesis. During this time I have also been completing my Masters in Clinical Psychology. In particular, I need to express gratitude to my Mother Sandra, Aunt Heather and Uncle Peter. I need to acknowledge my friend and mentor Connie Wilbanks-King and dedicate Chapter Five to her. I also dedicate this thesis to the families whom may benefit from this research.

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This thesis was not a sole effort and I would like to acknowledge others who have helped me complete this research investigation.

I wish to thank Heather Forward who dedicated hours of her time to assist and encourage me. Connie Wilbanks-King who also dedicated her time, inspired me and also for her friendship. Both Heather and Connie spent hours reading this thesis line-by-line with me: challenging me, brainstorming ideas, editing, reworking and reshaping. I cannot thank them enough. I would also like to thank Marleena Forward.

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Background and purpose of the study

Australian bushfire conditions

Australia is the driest continent on Earth, but also has many temperate forested areas that are subjected to very long, hot, dry summers, often against a background of consecutive years of drought. Given the dry landscape, fuel loads and extreme weather conditions in the summer, bushfires pose a great threat to the communities located in the fire-prone zones of the Australian continent. In addition to the considerable threat posed by natural conditions, there is also the risk posed by human activity, which includes the possibility of both accidental and deliberate fire initiation.

The Black Saturday fires that occurred in Victoria in February 2009 were collectively the worst disaster witnessed in recorded history in Australia. The official death toll was 173 fatalities and more than 100 people suffered severe burns, 2,000 homes destroyed and 7,500 people displaced. The costs, in terms of human lives and injury, live stock and wildlife, natural resources (i.e., forest, crops) and property destruction, have been enormous (Moloney, 2009).

It must be acknowledged that bushfires are, regrettably, part of Australian life. On Black Saturday, weather conditions were catastrophic, with record temperatures of over 46 degrees centigrade, hot dry winds and low humidity. The extreme weather conditions and forest fuel loads were thought to be the major factors contributing to the intensity of fire storm, but some evidence has suggested that the tragedy was also linked to the work of arsonists, who took advantage of these conditions to spread destruction. Investigations after Black Saturday have led to a number of different sites where fires were initiated and these have been

designated as crime scenes, and a number of known and as yet unknown suspects have been investigated. Marysville is a small town that was almost completely destroyed by the fires, with 34 people killed and many more non-fatally injured. It is strongly suspected that the fire that destroyed Marysville was deliberately lit. Similarly, the Churchill fire, which killed 21 people, has also been linked to an arsonist.

The fire in Maiden Gully, near Bendigo, on Black Saturday was thought to be deliberately lit by juveniles. Two teenage boys, aged 14 and 15, were recently charged with: arson causing death, deliberately lighting a bushfire, lighting a fire on a Total Fire Ban day, lighting a fire in a Country area during extreme weather conditions. This fire destroyed 354 hectares of land, 61 houses and 125 sheds. The fire also caused one death and was responsible for \$ 24 million in property damage (ABC News, 2010; Hunter, 2010).

Arson ignites anger and outrage in the community and often leads to a call for increasingly harsh punishments for arsonists and firesetters. Since Black Saturday, the Government of Victoria has carried out a revision of the laws surrounding the charge of arson causing death. If a suspect is convicted of this charge, the revised maximum penalty is a 25-year gaol term. These legislative and punitive responses may be a knee-jerk reaction to appease community outrage, but may have little effect in curbing arson because most firesetters do not expect to get caught (Australian Institute of Criminology, 2009). Therefore, these legal initiatives are unlikely to have any effect on reducing the deliberate initiation of fire. Antisocial behaviours are difficult to change once they are established in adolescents and adults (Dadds & Fraser, 2006). It may be that community money and effort might be better directed to preventing or modifying children's preoccupations with fire before it becomes more permanently established and therefore very difficult to extinguish.

It should be noted that little is known about the link between firesetting and arson because there are no longitudinal studies that have documented the developmental pathway of an arsonist (Kolko, 2002b). However, there is some evidence that childhood interest in fire may predict adult involvement with fire (Rice & Harris, 1991). Not all children who light fires develop a pathological preoccupation with fire; in fact, some researchers suggest that 60% of firesetters are driven by curiosity (Gaynor, 2000; Gaynor & Hatcher, 1987; Schwartzman, 2002). However, there is a group who are more pathologically focused on firesetting and who are unlikely to stop without external intervention; Chapters Three and Four of the thesis examine risk factors and Chapters Five and Six focuses on treatment options for this group. These children frequently exhibit multiple psychological/psychiatric problems, including some or all of the following: an intense preoccupation with fire, an extensive fire history across multiple settings, multiple psychiatric diagnoses, externalised behavioural problems, and parental and family dysfunction. Children who light fires in Australia are rarely convicted if apprehended, and the few who do appear in court are usually mandated by a court order or community conference agreement to participate in a juvenile Fire Safety Education program, which is offered in all jurisdictions in Australia (Muller & Stebbins, 2007). This diversionary action is considered more appropriate for children than more severe incarceration penalties.

Given that there is more chance of successful intervention and of changing the behaviours of children than older adolescents and adults; interventions that target children's inappropriate use of fire are widely considered most appropriate. Fire Safety Education (FSE) programs target children who have shown firesetting tendencies because it is believed that early interventions rather than incarceration are more effective with juvenile firesetters. Chapters

Five and Six discuss intervention approaches to the juvenile firesetting problem and provide guidelines for best practices for Australia.

Currently, the treatment for firesetters in Australia is Fire Safety Education (FSE); mental health tends to treat collateral problems but not the firesetting problem directly. The Victorian Juvenile Fire Awareness and Intervention Program (JFAIP) was the first fire safety educational program that was established in Australia and due to this, many FSE programs in Australia use this model (Muller & Stebbins, 2007). The overall effectiveness of juvenile firesetting treatment in Australia has been examined and evaluated in this thesis.

Fire service fire safety educational (FSE) strategies are appropriate for all juvenile firesetting clients. However, higher risk clients require a more comprehensive mental health intervention that will complement fire safety educational programs. Evidence has suggested that FSE strategies, when combined with mental health approaches, augment treatment effects (Barreto, Boekamp, Armstrong, & Gillen, 2004). Best practice guidelines provided in this thesis endorse early interventional efforts thought to be consistent with the developmental approach to crime prevention.

Aims of the study

The broad aims of this thesis are:

- to evaluate national and international approaches to juvenile firesetting
- to establish best practice guidelines and evaluate both the JFAIP and state programs in Australia against these guidelines.
- to describe the JFAIP clients both broadly (through JFAIP database)

- to evaluate the risk factors of a selection of JFAIP clients pre- and post-intervention and to determine rate of recidivism by following them for one year post-intervention
- to determine if there were any differences in risk factors between recidivist and non-recidivists.

Thesis organisation

This thesis has been organised into the following Chapters:

Chapter One: Background

- Literature review, including the statistics and historical research on the juvenile firesetting problem, child development and fire, and conceptual models of firesetting behaviour.

Chapter Two: Juvenile Fire Awareness and Intervention Program (JFAIP)

- Description of program components and organisation JFAIP and description of clients.

Chapter Three: Review of fire-specific and general behavioural risk factors

- Literature review of fire-specific, general behavioural risk factors, components of Kolko and Kazdin (1986) risk model and recidivism.

Chapter Four: Evaluation of individual, fire-specific, and general behavioural risk factors

- This evaluation uses Kolko and Kazdin (1989a; 1989b) Firesetting Risk Interview (FRI), Child Firesetting Interview (CFI) and Fire History Screen (FHS) with a selection of JFAIP client's pre- and post-intervention.

Chapter Five: Proactive evaluation and best practice guidelines

- A proactive evaluation and review and synthesis of what is known about treatment and intervention with juvenile firesetters in the United States and Canada and

establishment of best practice guidelines, in reference to the TAPP-C and Oregon programs.

Chapter Six: Evaluation of Australian approaches against the guidelines

- Clarificative evaluation of practices, theory and approaches of juvenile firesetting intervention and FSE programs in Australia, with comparative critique against the set guidelines.

Chapter Seven: Recommendations

- Recommendations of how these discrepancies can be actioned within the context of Australian treatment and intervention with juvenile firesetters.

CHAPTER ONE: Background – developmental theories, conceptual models and prevalence of juvenile firesetting behaviours

Statistics and prevalence data

The gathering of statistical information is paramount to providing accurate prevalence rates and also in determining the effectiveness of firesetting programs. Fineman (1980) has argued that an important way of measuring the success of the nation's juvenile firesetting programs should be reflected by a declining number of cases in juvenile firesetting and lower rates of arson. Statistical data on the prevalence and impact of children and adolescents who misuse fire are often unreliable and underestimate the extent of the problem because many factors obscure juvenile firesetting. Firstly, there is the lack of reporting of statistics worldwide and in Australia, where there are no formal national databases or reporting systems available. In the United States and the United Kingdom, the collection, compilation and reporting of data on child firesetting appears to be more reliable as this became a priority in the 1970s. A second major factor that obscures the problem of firesetting is the parents' underreporting of children's firesetting incidents. Thirdly, children's firesetting behaviour is generally infrequent and covert, and often remains undetected for some time. Finally, juvenile firesetting behaviour remains under-researched both nationally and internationally, and our understanding of the problem remains relatively poor (Fineman, 1980; Kolko, 2002b; Stadolnik, 2000).

1.1 Prevalence and impact of juvenile firesetting behaviour

In Australia, statistics on juvenile firesetting are likely to be underestimated and unreliable because there has been no concerted effort to record data. However, on request, the

Metropolitan Fire Brigade (MFB) in Victoria was able to provide some statistics regarding fire incidents and data on reoffending. These included JFAIP client involvement in fire incidents, injuries and fatalities; offender statistics and some ignition information. However, these statistics were not readily available because there is no central or shared database for gathering national statistics on juvenile firesetting. The data gathered from 2003–2006 (as presented below) had to be compiled manually. To give some context to these statistics, the total population of Victoria as recorded by the Australian Bureau of Statistics was reported as 4,962,970 in 2004 and 5,022,346 in 2005 (Australian Bureau of Statistics, 2005a).

From 2003 to 2006 there were 6,616 residential fires in Victoria. The major origin of these residential fires was the kitchen (60%) and then sleeping areas (13%). Electrical equipment was the most common form of heat ignition (33%) and the most frequent ignition factors were mechanical failure of electrical equipment (28%). Only a small percentage of residential fires were confirmed to have been deliberately set (0.4%), with 11% under suspicious circumstances. The number of children and juveniles (<16 years) who were involved in fire ignition over the three-year period were reported as 166 (3%). Fifty percent of these children were reported to be between the ages of 13 and 16 years, 24% were fewer than five years old, and 27% were six to 12 years old. The number of injuries in residential fires over the three-year period (2003–2006) was reported as 378 (6%) and the number of fatalities was 35 (less than 1%). The estimated cost of residential fires for the three-year period was \$262 million in damages.

International data has been reported and surveys have been undertaken with normative samples in the United States to determine a more accurate account of prevalence rates of children playing with fire in the broader community. In the non-referred population, the rate

of fireplay has been estimated to be as high as 40% (Kolko & Kazdin, 1988a). Kafry (1980) examined the frequency of firesetting behaviour in a “normal” child population and also concluded that fire interest was almost universal for young boys. Kafry reported an incidence of fireplay as 45% in a sample of 99 boys. Interestingly, only 9% of the fires set by young children were reported, while 36% of the cases have not been accounted for, may not enter into official fire statistics and are unlikely to be referred for evaluation.

Further large-scale community studies in the United States also support the view that fire interest is normal and fireplay common for most children. In a community sample of 770 children aged between six and 14 years, 38% were reported to have ever played with fire, with a higher percentage of older children over the past six months, and over 50% of children were reported to have played with fire by the time they were out of elementary school (Grolnick, Cole, Laurenitis, & Schwartzman, 1990). However, in contrast, an Australian study reported a 5% prevalence rate of matchplay and firesetting in a community sample of 1,359 children aged four to nine years recruited from 21 primary schools in Brisbane (Dadds & Fraser, 2006).

The clinical population studies in the United States have indicated that prevalence rates of firesetters are approximately 20% of outpatients (Heath, Hardesty, Goldfine, & Walker, 1983), with even higher rates (approximately 35%) found among inpatients and delinquent populations. Matchplay in clinical populations can be higher, with reported statistics of 24% and 52% for outpatients and inpatients respectively (Kolko & Kazdin, 1988a).

The prevalence rate of firesetting and matchplay in Dadds and Fraser’s (2006) Australian study appears low in comparison to other community studies undertaken overseas that have

reported rates as high as 38–45% for boys in a normative sample (Grolnick et al., 1990; Kafry, 1980). Perhaps the lower prevalence rate could be due to the inclusion of the four to nine years age group, when the reported mean age of a firesetter is typically 10 years old (Kolko, 1985a; Showers & Pickrell, 1987). Boys and girls were included in the Australian study, whereas most prevalence studies focus on boys due to the well-documented 9:1 ratio of boys to girls that engage in firesetting (Kolko, 1985a). Furthermore, in this Australian study the measure used was the fire history screen, which is based on parents' reporting fireplay or firesetting that had occurred within the past six months. However, other studies have asked parents the question "Has your child ever played with or misused fire?" Life-time prevalence rates may be a more accurate measure of firesetting because antisocial behaviours such as firesetting are typically low in frequency with unstable persistence over time (Stickle & Blechman, 2002).

A comprehensive study undertaken to gain insight into the prevalence rate of general behavioural problems in non-referred children using the Child Behaviour Checklist (Achenbach & Edelbrock, 1981) was more consistent with the Australian findings. In this study, 1,300 caregivers responded to the Child Behaviour Checklist (CBCL) and firesetting was evaluated by measuring responses against item number 72 on the checklist, which related to "none, occasional or frequent firesetting". A 3% prevalence rate was found in this normal population, which is lower than that reported in the Australian study by Dadds and Fraser (2006). The diversity of prevalence rates reported in firesetting literature is highly variable, making it difficult to determine any reliable estimation of this dangerous behavioural problem.

Youth firesetting is a social, economic and major life-threatening problem that has implications for children, families, and communities. In the United States, the most recent available data from 2002 suggested that children were responsible for an estimated 13,900 reported structural fires, resulting in 1,460 deaths and injuries and over \$300 million in property damage (Hall, 2005). In Australia, arson statistics estimate that the cost to the community is \$180 million annually, inclusive of both bushfire and residential arson data (Drabsch, 2003). In the United Kingdom, data from 2001 suggested that fire and rescue services were called to over 123,000 malicious fires, with the Home Office (2002) reporting that in 2001–2002 around 52,800 incidents of arson were reported to the police. Eight percent of the reported incidents resulted in a formal caution or prosecution, and roughly 50% of these fires involved a juvenile. The cost of arson is high, both financially and in terms of human life and injury. In the year 2000, the financial cost of arson in England and Wales was £2.2 billion. Most of the figures reported do not include any incidental, personal or social costs, thought to be four times the amount usually quoted. The hidden costs can include: maintaining and developing infrastructure of emergency services, responding to the fire, loss of income or temporary housing costs (Drabsch, 2003; Willis, 2004). The personal costs of arson in England and Wales for the early 1990s indicate that firesetting acts led to 32,000 injuries and 1,200 deaths, an average of 55 injuries and two deaths per week (Palmer, Caulfield, & Hollin, 2005).

Costs in terms of injury and death from fire can be high with statistics both in the United States and Australia revealing that younger children are most vulnerable. United States data has indicated that fireplay is the leading cause of fire deaths in preschool-aged children and accounts for more than 66% of overall preschool deaths (Schwartzman, 2002).

Once infancy is past, injury emerges as the leading cause of death in Australia. The Australian Bureau of Statistic (ABS) figures in 1994 suggested that 13% of child (aged between birth and 14 years) deaths were caused by accidents. This was ranked third, with perinatal conditions and congenital anomalies ranked first and second, respectively. Almost half (48%) of these accidental child deaths were young children aged from birth to four years and the majority of them were boys (61%). The most common causes of accidental deaths were motor vehicle accidents (44%), drowning (29%) and 9% of accidents caused by fire and flames (Australian Bureau of Statistics, 1996). In 2005, ABS data reported an overall decline in the number of injury deaths of children aged one to 14 years over the past two decades – a decline from 553 deaths in 1983 to 231 deaths in 2003. They suggested that better preventative and educational efforts were responsible for this decline. In relation to fire deaths, in the period from 1999–2003 child deaths caused by smoke, fire and flames had declined to 3% and was ranked eighth in injury-causing-death data (Australian Bureau of Statistics, 2005b).

In Australia, approximately 20% of fires are thought to be set by juveniles (Dadds & Fraser, 2006). However, this is an approximate figure because there is no uniform statistical reporting on who sets fires. This figure is low compared with overseas data from the United States that has reported that half of all deliberately lit fires (approximately 100,000 annually) are started by juveniles (Klein, Mondozi, & Andrews, 2008). In Australia, New South Wales compiles data and reports their statistical findings on fires caused by children (<16 years). The figures indicate that children were responsible for 21% of all fires from 1987–1994, and that 71% of fires lit by children were bush or grass fires. The financial cost of these fires was \$24 million in NSW between 1987 and 1994 (Nicolopoulos, 1996).

The offending figures also provided by the MFB indicated that many fires lit by children do not result in formal action in the criminal justice system. Victoria Police processed a total of 155,766 alleged offenders (both adult and juveniles) in 2005. This was an increase of 0.5% compared with the 154,968 processed in 2004. In 2005, there were 125,693 adults and 29,152 juveniles processed for crimes by Victoria Police. Of these crimes, 4,821 were assault related and 18,830 were property related, while 2% of property crimes were arson. Although the arson figure is comparatively small, the figures for juveniles processed for arson-related crimes have risen 55% from 2004 to 2005.

1.2 Factors that obscure accurate and reliable statistics of juvenile firesetting prevalence

Several factors obscure accuracy and reliability regarding juvenile firesetting in Australia. The literature highlights a lack of research into juvenile firesetting and coordination between organisations, which contributes to poorer reporting, documentation and understanding. Secretive firesetting and the lack of parental reporting have also been cited as an explanation for underestimating the problem. Finally, scarce resources remain a fundamental issue when addressing juvenile firesetting behaviour; currently, there is no centralised system in Australia that records this data. Collating data from parents and agencies working with these juveniles and families is meaningless if there is no central repository where information can be gathered, compiled and evaluated (Fineman, 1980).

Fineman (1980) indicated that the broader success of juvenile firesetting programs can be measured by the decline in juvenile firesetting and arson rates. However, without local- and national-level statistics, these figures and the prevalence rates remain largely unknown. Fire departments in most jurisdictions in Australia have their own databases that record

information about their clients but as there is no centralised system in place that aggregate national data, government bodies and concerned stakeholders are not fully informed of the seriousness, cost or severity of the problem or the impact of intervention efforts.

Agencies that intervene with juvenile firesetters may not be treating the juveniles' firesetting behaviour directly or documenting this as a clinical problem because frequently the behaviour is not viewed as the primary clinical diagnosis, but rather as a symptom or secondary problem (Jacobson, 1985b; Kolko, 1985a; Slavkin & Fineman, 2000; Stadolnik, 2000; Winget & Whitman, 1973). The overall lack of literature in the area suggests that juvenile firesetting is unrecognised, poorly understood and under-researched as a major life-threatening social problem. One of the factors contributing to the pervasive lack of knowledge in the mental health field on juvenile firesetting is the inadequate body of systematic and well-controlled studies in the research area. Published articles have been reported as few as 300 in this research area (Stadolnik, 2000), which is scant by comparison with research in developmental disorders, delinquency or conduct disorder. Some suggest this is because firesetting is a much less frequent phenomenon (Jacobson, 1985a) and as a result there is not enough known about the behaviour because resources have not been devoted to studying it in a systematic way. However, the situation is shifting as more mental health practitioners in the field are investigating the problem. Furthermore, in the United States, the emergence of statistics has drawn more attention to the severity, prevalence and consequences of the behaviour.

The percentage of children involved in firesetting is thought to be underestimated, with only approximately one third of fires lit by children brought to the attention of authorities (Hardesty & Gayton, 2002; Kafry, 1980; Stadolnik, 2000). Reasons for this underestimation

could be due to the concealed nature of firesetting or inadequate parental response to the act, as well as the relatively low frequency of fire-related behaviours (Del Bove, Caprara, Pastorelli, & Paciello, 2008). Also, children often set fires in places that are not easily detected such as in the backyard, closet or under the bed (Kafry, 1980).

Parents may also be contributing to underestimation because they may be reluctant to report their child's firesetting acts. Reasons for this can include issues such as chaotic households and other family problems, or parental anxieties around mental health interventions. Some parents may also believe that the firesetting problem is driven by curiosity and not malicious intent and will be something that their child will outgrow (Block, Block, & Folkman, 1976). Parents are often hesitant to seek help for their children, some preferring to handle the problem themselves; others may have an attitude of minimising the problem (Webb, Sakheim, Towns-Miranda, & Wagner, 1990).

1.3 Understanding the problem of juvenile firesetting

In the 18th century, the term pyromania was used to describe someone who had a chronic impulse to set fires for no apparent reason (Stadolnik, 2000; Vreeland & Levin, 1980). This chronic irresistible impulse to set fires was thought to be based on sexual gratification, arousal and excitement caused by lighting and watching fires. Anyone fitting that description was classified as insane and was considered incurable. For most of the 1800s there was a continual medical and legal debate over whether arson was a mental disorder or criminal behaviour (Gellar, 1992). From the early 1900s to the 1960s, juvenile firesetting was conceptualised within the theoretical framework of psychoanalysis, with the earliest research about firesetting coming from individual case study reports (Kolko, 1985a). Many of these studies concluded that there was a strong link between sexual dysfunction and firesetting (Freud, 1932).

Studies started to emerge in the 1950s that attempted to isolate commonalities of symptoms amongst firesetters in clinic, hospital or treatment centre populations (Fine & Louie, 1979; Gruber, Heck, & Mintzer, 1981; Kaufman, Heins, & Reiser, 1961; Lewis & Yarnell, 1951; Nurcombe, 1964; Yarnell, 1940). Extensive research was conducted from 1950 to the 1970s to describe the personality characteristics of firesetters in an effort to develop a profile. The limitation of these studies were that few of these correlational studies used control groups of non-firesetters, thus not permitting conclusions specific to firesetters (Sakheim & Osborn, 1999).

It was not until the 1980s that studies emerged with control groups, which aimed to examine group differences between non-firesetters and firesetters in an attempt to specifically profile juvenile firesetters (Kuhnley, Hendren, & Quinlan, 1982). Although firesetters were considered a heterogeneous group, some researchers thought that there were different subsets of firesetters with commonalities. Investigations of differences were also carried out to examine and profile children who appeared to be confined to a more benign matchplayer group (Jacobson, 1985b; Kolko & Kazdin, 1990) as distinct from higher risk firesetters (Sakheim & Osborn, 1991). At the same time, investigations with “normal” children were also undertaken with a few large community samples, as initiated by Kafry’s (1980) study. The few studies that included community samples provided new understandings of prevalence rates and the developmental changes in non-clinical samples of children who were interested in and played with fire (Grolnick et al., 1990).

From the late 1980s to 1990s, theoretical and conceptual ways of thinking about the problem also shifted to multifaceted risk-factor models, including individual, familial and environmental factors (Fineman, 1995; Kolko & Kazdin, 1986). Research also had started to

conceptualise firesetting in terms of where it was placed along the developmental pathway of serious antisocial behaviour (Forehand, Wierson, Frame, Kemptom, & Armistead, 1991; Kelso & Stewart, 1986; Sakheim & Osborn, 1991, 1999). Researchers at the time also focused on predictions of risk of recidivism in juvenile firesetters, and the newly developed screening tools and assessment tools also reflected this change in thinking. These tools were commonly designed to evaluate the juveniles' risk of firesetting recidivism by categorising them into high and low risk categories for recidivism (Kolko & Kazdin, 1989a, 1989b; Sakheim & Osborn, 1991, 1994).

There were also significant changes in the way firesetters were treated as new insights generated through research began to emerge. In the 1960s there were some shifts in treatment from predominately psychoanalytic case studies to a focus on individual treatment programs using several modalities such as psychodynamic, cognitive-emotion, behavioural, and family therapy (Kolko, 1985a). The next shift was in the 1980s, where practitioners began to conceptualise firesetting more within the context of behavioural disturbances and conduct disorders. This shift led to the development of multicomponent treatments that often incorporated satiation techniques, social skill development, parental skills, and cognitive and behavioural strategies. Research also shifted focus to the evaluation of juvenile firesetting treatments and interventions. Various treatment conditions and approaches were evaluated for their effectiveness using Randomised Control Trials (RCT), considered the gold standard in measuring effectiveness. The outcomes of this evaluative research have been used to inform evidence-based practices and have underpinned the development of multidisciplinary teams that address the juvenile firesetting problem in a holistic and comprehensive way (Hardesty & Gayton, 2002; Kolko, 1985a).

In light of this clinical research, it became clear that firesetting was a community problem. In the past, firesetting was a problem within the domain of the fire services, with agencies generally working independently of each other. In the 1990s, coalitions and multidisciplinary approaches were established to develop community-based intervention strategies for juvenile firesetters. This was a significant advancement in the movement to treat and evaluate child firesetting (Gaynor & Hatcher, 1985). Researchers have also investigated mental health practitioners' perspectives of juvenile firesetting and factors that enhance the adoption of multidisciplinary approaches in an effort to close the gap between research and practice (Henderson, Mackay, & Peterson-Baddali, 2006).

1.4 Developmental tasks, competencies, limitations and trends in firesetting through childhood and adolescent stages

The field of developmental psychology has provided insight into child psychopathology and provides an important framework for understanding and treating juvenile firesetting behaviours. Developmental psychopathology assumes that there is a complex interplay of multiple factors, such as biological, psychological and social factors, that contribute to the child's overall behavioural or psychological dysfunction (Wilmshurst, 2005). For the behaviour/clinical problem of firesetting, the attraction to fire and involvement with fire will be different for all ages and may be directly related to the conflicts of that particular developmental stage (Slavkin & Fineman, 2000). For instance, what draws a four-year old to fireplay will be very different for a 15-year-old adolescent who misuses fire. In addition, there are often developmental differences in the characteristics of the fire incidents with older children, who, for example, set more fires in the community (Pinsonneault, 2002a; Slavkin & Fineman, 2000; Yarnell, 1940). The developmental phases of preschoolers (three

to six years), childhood (seven to 12 years) and adolescents (12–18 years) will be discussed. The key developmental stages and challenges of each phase will be addressed in relation to firesetting behaviours.

1.4.1 Preschool stage (three to six years)

The preschool years are a period of rapid growth physically, cognitively, emotionally and socially. This section focuses on cognitive, moral and social development and the developmental perspective of a child's interest in fire and fireplay.

In the preschool years, the child is moving from the sensorimotor phase of cognitive development into a preoperational stage of development. Preschool children are no longer limited to immediate sensory and motor experiences, but can now mentally problem solve with the emergence of symbolic thought. Infants who were also predominately non-verbal are now more verbal in the preschool years with a vocabulary of approximately 8,000 to 14,000 words (Berger, 1991).

Socially, preschool children are still very enmeshed with their families and have limited opportunities for external social engagement. They develop socially through engaging in play and quite frequently their parent is their first playmate. At this level, attachment is at the core of social development. Attachment refers to the bond between mother/carer and developing infant/preschooler, fundamental to the early development of the child, and forms the foundation for other interpersonal relationships throughout life. It has been found that a close and trusting relationship with at least one adult is considered one of the strongest protective factors against developmental and psychological difficulties through childhood and adolescence (Harrison, 2003; Kelly & Barnard, 2003).

Preschool children typically obey rules to avoid punishment or gain rewards. At this stage, the anticipation of blame and praise are effective reinforcers and the power of disapproval is magnified as one of the many unpleasant external consequences of action to be avoided (Kohlberg, 1963).

Cognitively, preschool children are concrete thinkers and generally can only imagine life from a very limited egocentric perspective; they can only conceive what they have experienced or seen. The main sensory mode for a child is visual and therefore “show me” has more of an impact than “tell me” (Pinsonneault, 2002a).

Preschool children also have difficulty in understanding cause and effect, partly because they focus on one aspect of the problem rather than the relationship between events. According to Piaget’s theory of conservation, preoperational children do not have the ability to predict and explain logically cause-and-effect relationships until they reach school age. The limitation of conservation is particularly relevant when assessing risk and safe and unsafe situations in the environment (Coppens, 1986).

When Coppen (1986) compared the understanding of causal reasoning and cognitive styles (impulsive versus reflective) of older (six- to eight-year-olds) versus younger (three- to five-year-olds) in a study of 112 children, he found that younger children were more impulsive and older children had a greater understanding of safety, prevention and causal relationships. Younger children were less likely to process and understand unsafe environments, increasing their vulnerability to accidents, injury and death. With limited experience and intellectual capacity, younger children were developing cognitive schemas that would later help them understand the world and their experiences in predictable ways.

Preschool children and their relationship with fire

For a young child, fire can represent fascination, temptation and interest. Children are usually stimulated by the visual colour, the flicker and the movement of flame. Young children learn through play and experience and are naturally curious. These factors, along with the taboo of playing with fire, can be very tempting for a young child who is intrigued and wants to know what happens when you put a piece of paper into the flame.

Piaget's theory of the preoperational child's limitation in conservation and reversibility is particularly relevant to children and their experiences with fire. This limitation suggests that preschool children cannot distinguish bigger from smaller things and may explain why they cannot conceptualise that a small fire can grow into a bigger fire (Berger, 1991). Due to this, children of this age frequently have an unrealistic sense of their ability to control a small fire. This is especially true if a young child has played with fire a few times and nothing bad has happened. This success consolidates their confidence that they can keep a fire small (Pinsonneault, 2002a).

Generally, young children are classified as "curiosity firesetters" who do not intend harm and are playing with fire because they are developmentally curious about it. Fireplay for a preschooler is commonly thought to be experimental and accidental. Researchers have indicated that children's interest in fire is a normal phase of childhood (Block et al., 1976; Schwartzman, 2002). Several others have indicated that fire interest and play, particularly with very young children, is benign rather than psychopathological behaviour (Grolnick et al., 1990; Kafry, 1980; Schwartzman, 2002). By contrast, some researchers believe that it is wrong to assume that playing with fire is natural (Hanson, Mackay, Atkinson, Staley, & Pignatiello, 1995; Pinsonneault, 2002a; Yarnell, 1940). Hanson et al. (1995) investigated

preschool children's firesetting behaviours and unique clinical issues through case vignettes and they concluded that firesetting in preschoolers can be associated with serious child and/or family psychopathology.

Play is important to the preschool child and their growing fire interest may be revealed in their play. This could include the incorporation of fire themes into symbolic play. For example, a child at this stage may pretend to be a firefighter, or may play with fire trucks and enact scenes of coming to the rescue to put out imagined fires. Other ways a child may express fire interest is by asking questions about it such as "What makes it burn?" or by requesting permission to be involved in fire-related acts such as lighting candles or the barbeque. The intensity of the child's preoccupation with fire and fire interest is important to determine at this crucial stage of development because fire interest can lead to either fire-safe or fire-risk behaviour (Gaynor & Hatcher, 1985).

1.4.2 Middle childhood

In middle childhood between the ages of seven and 12 years, children have greater cognitive capacity, social opportunities, moral awareness and reasoning skills. They are in the operational stage of cognitive development and therefore understand cause-and-effect relationships (Berger, 1991). In middle childhood they no longer have to play to learn; they can read about it, imagine it, and think about it (Pinsonneault, 2002a).

At this stage, the child's social world expands, initiated by going to school. Family relationships are still central to the child, but are beginning to loosen to accommodate new relationships. As the capacity to know and understand the world increases, so does the awareness of self. School-age children are also less egocentric, are more socially aware, and

are able to sympathise with others or recognise that people have opinions that are different from their own (Waddell, 2002).

Children's moral development is influenced by cultural norms, family socialisation and peer group interaction. They now understand right and wrong and mutual respect. They will generally obey authority based on gaining a reward or minimising punishment, with more of an emphasis on social rules, such as seeking the approval of others and being a law-abiding citizen (Kohlberg, 1963).

Reinforcement strategies and modeling of behaviours take on more power at this stage of development because children are able to remember, understand and predict the relationship between cause and effect. With these new skills, children are able to attend to the model, remember what they saw or heard, reproduce the memory of the model's behaviour during imitation and receive reinforcement for accurately enacting the behaviour (Bandura, 1965, 1977).

School-aged children have more skills in information processing, memory, knowledge and cognitive strategies than younger children. In middle childhood the child can conserve, manipulate and transform objects. They are more logical and can predict consequences from their actions. However, despite these advances in cognitive and reasoning skills, children in the middle childhood range are still limited in their understanding of abstract concepts. Thus, if they have not experienced something, they may have trouble understanding consequences (Berger, 1991). However, these children, with a more reflective and mature cognitive style, are generally more skilled in processing information about their environment and therefore better equipped to understand unsafe situations (Coppens, 1986).

Middle childhood stage of development and the relationship with fire

The younger school-age child may still fall into the category of curiosity firesetting, but as the child ages they are becoming more accountable for their actions. In this stage of development, the child is more intrigued by process than by the colour and movement of the flame. For example, they will wonder why the piece of paper disappears into the flame. Curious children are frequently interested in what fire does and the reinforcement for this behaviour comes with observing the changes and watching what things do when they get burnt up (Pinsonneault, 2002a).

In middle childhood, the common characteristics of firesetting and fireplay have been described as accidental, unintentional, non-pathological, and experimental. They generally light fires close to the home and are mainly experimenting with materials such as paper and candles. Yarnell's (1940) study of 60 firesetters found that younger children (six- to eight-year-olds) accumulated fireplay materials such as matches, candles and paper, lit fires in their own homes, and then called for help, while adolescents more commonly set fires in the community (Yarnell, 1940).

In her study, Yarnell (1940) found that many younger firesetters were equally disturbed and shared with older children commonalities of revenge fantasy, comorbid antisocial behaviour, learning disabilities, social difficulties, symptoms of acute anxiety, sexual conflicts and emotional problems. She concluded that these children set fires for symbolic reasons, for example to gain power over adults or situations. Specifically, the behaviour was directed to family members who may have withheld love or other persons who may have been competing with them for parental attention. In a later study of middle school boys, Jacobson

(1985a) also found that middle childhood firesetters could be equally aggressive and disturbed as adolescents.

Grolnick et al. (1990) community study assessed children's (aged six to 14 years) knowledge, understanding and sense of omnipotence in relation to fire. In this study, two variables were assessed: understanding of the destructiveness of fire and the child's sense of control over fire. Children were asked: "Which of these things (paper, clothing or house) could get all burnt up by one match?" Children responded affirmatively with 95% (paper), 84% (clothing, toys, and furniture) and 66% (house). Most of the children understood that one match could burn up a piece of paper. However, when asked about clothing, toys, furniture and houses, the younger children of the group were not so sure. Knowledge and the variable of house was significantly correlated to older age, where 55% of primary, 66% of elementary (middle school) and 80% of junior high school children believed that one match could burn down a house.

In an assessment of sense of control over fire, Grolnick et al. (1990) and found that 78% of children said that they could put out a small fire, while 5% felt that they could put out a large fire. However, similarly to preschool children, school-aged children generally do not have the skills to manage and contain a fire should it get out of hand, and tend to overestimate their ability to control the situation.

Kafry (1980) concluded in her study that school-aged children aged five to nine were aware of the risks and consequences of their fire; they also understood that it was forbidden. However, despite this understanding, middle childhood is the age where children most commonly engage in fireplay or firesetting (Kolko, 1985a).

1.4.3 Adolescent developmental years

Adolescence is regarded as a crucial period in which fundamental aspects of the personality become shaped and organised into a coherent and stable sense of self. The stage is marked by a major developmental transition, laden with conflict and turmoil. The onset of puberty and sexual development marks the rising levels of sexual and growth hormones, fuelling much conflict, confusion, and sexual and aggressive impulses in these years. The physical, psychological and emotional challenges of adolescence are a complex adjustment and the resolution of these conflicts can be highly variable. Adolescents with a stable background, upbringing and developmental history are thought to resolve these challenges with less turmoil and upheaval. There may, however, be factors that place adolescents at greater risk of a more troubled transition during this developmental phase (Waddell, 2002).

In puberty, rapid physical changes coincide with psychological upheaval including identity conflicts, fragile sense of self and struggles for independence. Sexual and aggressive impulses intensify at this stage of development with the release of hormones and emotional change.

The frontal lobe, responsible for executive functioning, decision making, inhibition, judgement, emotional and behavioural regulation, higher-level cognitive capacities (such as self-awareness and perspective-taking), does not reach full development till around the age of 25 years. Its relative immaturity at this stage is believed to influence adolescent risk-taking behaviours, which tend to be amplified (Blakemore & Choudhury, 2006).

Cognitively, adolescents are moving into the last stage of Piaget's cognitive development called "formal operations", usually attained by 15 years of age. At this stage, adolescents

can hypothesise and think abstractly and imagine their futures (Berger, 1991). An important aspect of formal operational thought and cognitive maturity is the development of moral reasoning. As the child matures they become increasingly accountable for their actions and may try to apply moral standards to their behaviour. In adolescence, moral reasoning is more salient than at any other stage in the life span; this may be due to cognitive maturation that has enabled the adolescent to think more abstractly and to question morality and ethics in an effort to develop their own moral codes. Kohlberg (1963) suggests that adolescents will have attained stage three or four of moral reasoning, which is based on taking into account the perspective of other people or on moral justice and being law-abiding citizens. Adolescent delinquents, on the other hand, were more motivated to avoid punishment or to gain rewards for their actions.

For the adolescent, the social world and peer group are of supreme importance, while the family becomes less influential. Social life starts to extend and broaden. Caught between the world of no longer being a child but not quite being an adult, adolescents struggle with their newly found independence and what their futures might be. Emotional containment and regulation may be problematic for the developing adolescent, resulting in explosive expression and intense power struggles with authority figures such as parents or teachers (Waddell, 2002).

Adolescents may experience a heightened sense of self-censure, be susceptible to depression, isolation and may have a desperate need to fit in with their peer group. During this time, adolescents explore their identity through frequently changing their styles of dress, taste in music, and many other things (Waddell, 2002). This is one of the key developmental challenges of this phase, where adolescents strive for sense of self and a greater commitment

to self-selected goals. However, at such a time of emotional upheaval one's sense of identity can be difficult to achieve.

Poorer negotiation of this developmental task can result in what Erickson described as identity confusion or identity diffusion (Berger, 1991; Mooney, 2000). This vulnerability, confusion, apathy and fragile sense of self can place adolescents at risk of destructive behaviours and attitudes during periods of boredom or confusion. Then, they may engage in delinquent acts, such as destroying property or experimenting with alcohol. At these times, adolescents may not be in control or care about consequences, putting themselves and others at risk.

Confusion and conflict is at the core of the adolescent experience. In excess this stress can propel the adolescent into disturbing emotional and behavioural states. Normal manifestations of disruption can be difficult to discriminate because there can be a fine line between pathological behaviour and normal adolescent processes. Delinquent behaviour generally peaks at the age of 14 years and is a way of rebelling and testing the boundaries of external authority. At this time, adolescents are detaching from parents, rejecting the containment of home life and structure and may be defying authority figures (Waddell, 2002).

Adolescent stage of development and the relationship with fire

In the adolescent years the growing importance of peer acceptance, independence and defiance of authority figures is closely related to firesetting behaviour (Stadolnik, 2000). Kolko and Kazdin (1991a; 1994) found that adolescent firesetters exhibit higher levels of aggression and hostility as compared with those who set fires at other ages. Adolescents are

thought to use fire more instrumentally as a weapon because they are angry, frustrated, bored, seeking revenge or counterattack (Kolko & Kazdin, 1986; Showers & Pickrell, 1987; Slavkin & Fineman, 2000; Yarnell, 1940).

Firesetting in adolescence is frequently viewed as serious delinquency and is thought to be a part of a larger collection of antisocial acts or conduct problems. This is why adolescent firesetting is frequently associated with delinquent motivated firesetting, which is thought to be a combination of negative peer influence, a wish to fit in and belong, poor decision making and antisocial tendencies (Slavkin & Fineman, 2000). Typically, the fires that delinquents set will be away from home, may include significant property destruction and generally involve two or more people (Yarnell, 1940).

Adolescent firesetting may stem from maladaptive psychosocial deficits and identity problems. Adolescents who are struggling to fit in and find an identity in their peer group may be motivated to light fires due to peer pressure. These adolescents may be involved in a one-off situational or transient firesetting incident because they have been led astray, are bored, have fallen in with the wrong peer group and want to gain their acceptance. At the other end of the spectrum is the more chronic delinquent firesetter who disregards other people's property and safety, and may lack empathy and remorse due to more ingrained behavioural disturbances (such as conduct disorder) or personality problems (emerging antisocial personality disorder). These more risky antisocial adolescents at the extreme end of firesetting may be more appropriately placed and treated in a residential treatment setting (Sakheim & Osborn, 1991).

The literature frequently distinguishes between child and adolescent firesetting in terms of motive, firesetting behaviours and clinical problems (Yarnell, 1940). Older children are more likely to engage in repeat firesetting and may be in contact with juvenile authorities. These older firesetters often plan their fires, seek out materials, set fires in pairs away from home, and cause more damage (Kolko & Kazdin, 1994; Lewis & Yarnell, 1951; Stewart & Culver, 1982; Strachan, 1981; Wolfe, 1984). Yarnell (1940) also found that adolescent boys were more sensation-seeking than girls because they appeared excited by the flames and watched the fire, enjoying its noise and destructiveness. Heightened sensory reinforcement from firesetting is more frequently associated with pathological firesetters.

1.5 Conceptual models of juvenile firesetting behaviours

Conceptual models are required to organise the emerging theoretical, clinical and research information. Firesetting models organise the literature into five theoretical frameworks: psychoanalytic, social learning, dynamic behavioural, antisocial and motivational models (Gaynor & Hatcher, 1987).

1.5.1 Psychoanalytic conceptualisation of firesetting

The earliest account of arson was by a medical practitioner in 1837 who wrote of a sexually aroused young female patient who, “overheated” from a dance, returned to her house and set fire to her room (Wooden & Berkey, 1984). During the 1800s through to the 1960s, firesetting was conceptualised mainly from a psychodynamic theoretical perspective and sexual conflict was frequently associated with the act of firesetting (Freud, 1932). Firesetting was thought to excite and sexually arouse the individual (Kaufman et al., 1961). It has been linked to sexual dysfunction in older adolescents and adults (Heath, Gayton, & Hardesty, 1976; Sakheim, Vigdor, Gordon, & Helprin, 1985) and enuresis with varying

prevalence rates of between 20% (Vandersall & Wiener, 1970; Yarnell, 1940) and 50 % (Kaufman et al., 1961).

Lewis and Yarnell's (1951) landmark study was the first to include a large sample of over 1,300 cases that challenged the prevailing view that firesetting behaviour was linked to dysfunctional sexual drives. They concluded that firesetting was multidetermined and more influenced by aggressive drives. In this sense, sexual problems were not seen as primary, whereas aggressive and externalising behaviour problems were more salient (Heath et al., 1983).

Lewis and Yarnell (1951) were responsible for introducing the concept of ego manifestations to the firesetting literature. In a later study, Vandersall and Wiener (1970) also examined ego strengths when they examined the inner conflict of 20 firesetters and found that setting fires represented a temporary breakdown of controls in the child. The work of Kaufman et al. (1961) supported Lewis and Yarnell's formulation but introduced the idea that firesetters were fixated at the oral phase (psychotic) as opposed to the more advanced phallic-urethral stage (neurotic), because they were more primitive and disorganised in their anxiety. Macht and Mach (1968) disputed this finding, suggesting that the act of firesetting was a highly-determined behaviour complex or syndrome that had important instinctual, defensive and adaptive aspects. They proposed this because the act involved planning and timing, such as organising the materials, the location, lighting the fire, turning in the alarm, waiting for the firemen to arrive, and watching and assisting the firemen extinguish the flames.

Despite the diversity of psychoanalytic perspectives in the early to mid 1900s, there were consistent findings that the children in the research studies were from disrupted and

disturbed families and that they had experienced deprivation of love and security. More contemporary analytic theorists tended to conceptualise the firesetter in terms of ego operations, but also acknowledged that the child or adolescent will show a history of sexual dysfunction, enuresis, and significant disturbances of object relations. Some evidence has challenged the assumption that sexual conflict is a uniquely underlying motive of firesetting because it is also related to a range of pathological behaviours. It has been suggested that the evidence is not conclusive enough to attribute any causal effects. A similar argument applies to enuresis, whereby there is a much higher rate of enuresis occurring in the general population as compared to the population of firesetters (Vreeland & Waller, 1979).

1.5.2 Social learning theory and firesetting behaviours

Aggressive behaviours and disorders of conduct in children are frequently linked to parenting practices (DeGarmo, Patterson, & Forgatch, 2004). It is well known that aggressive children come from families where at least one family member displays aggressive behaviour. This is because children frequently learn vicariously by exposure to models that can teach and reinforce aggressive behaviours (Bandura, 1986; Gaynor & Hatcher, 1987).

Social learning theory emphasises that behaviour is evaluated within the context of the situation in which it occurs and is not singularly attributed to one individual factor. Many contemporary writers stress the role of firesetting within the framework of learning theory. They propose that firesetting is a learnt behaviour that has been “taught” from an early age, either vicariously by modelling another’s behaviour or through social reinforcement (Fineman, 1980, 1995).

Modelling theorists argue that complex social behaviours, language, aggression and other social skills are first observed, stored in memory and then enacted (Bandura, 1977; Patterson, 1982). Social learning develops through selective action of consequences in the natural environment, thus a child learns that some responses are rewarded, while others are not, or are even punished. The consequences of behaviour do not have to be directly experienced for learning to take place but can have an influence on children, particularly if the person modelling the behaviour is considered important or powerful (Bandura, 1977). Macht and Mack (1968) discuss the child's identification and modelling of their father's firesetting behaviour. In this study, most of the fathers had some significant involvement with fire as their employment (fireman, gas burner repairman, furnace stoker). They indicated that the children in their sample learnt both vicariously and directly by example of their fathers and this may have contributed to their firesetting. Kolko and Kadzin (1986) also support the view that exposure to early modelling of misusing fire can influence the emergence of firesetting behaviours.

Social learning theory attempts to explain why fire is chosen as one of the maladaptive behaviours seen in child firesetters. Theorists suggest that firesetting offers immediate rewarding consequences for the individual and control over the environment without the need for interpersonal resolution of conflict. Social learning theory hypothesises that the firesetter has experienced a number of social and interpersonal failures and has generally been ineffective in obtaining rewards from his environment (Fineman, 1980; Vreeland & Levin, 1980).

For the first explanation, sensory rewards and stimulation can include receiving extra attention from parents; the thrill of hearing the sirens, seeing the fire engine, the crowds, the

commotion and drama; or the approval of peers for daring to light a fire. This drawing of attention and recognition can be rewarding for a child who normally perceives the environment as unrewarding (Vreeland & Levin, 1980). The juvenile who gains attention, personal satisfaction and pleasure from the activity but no adverse consequences learns that fireplay is acceptable. Under these conditions there is greater likelihood that that the child will become a repeat offender and that the act of firesetting will become part of the child's repertoire of coping with problems or for gaining the responses they want (Fineman, 1980). The second explanation relates to coping with problems in socially acceptable ways. Vreeland and Levin (1980) hypothesised that firesetting reflects a difficulty with or fear of direct expression of aggression. A child firesetter is generally not a social aggressor because they do not directly attack or confront people, preferring covert and less confrontational aggressive action. Thus, the act of firesetting allows the child or adolescent to have an impact on their victim in passive-aggressive ways and this may reflect an underlying deficiency in self-control and general social skills. The firesetter generally feels powerless and helpless and is unable to satisfy their needs through socially acceptable methods, such as talking through their frustrations or confronting someone directly. Firesetting may offer power, mastery and control over a hostile and unrewarding environment without the need for interpersonal resolution of conflict (Jackson, Glass, & Hope, 1987).

Studies on arsonists found that their firesetting was motivated by misplaced aggressive expression due to failure in social, interpersonal interactions and a tendency to view themselves as victims of society. They generally fear direct confrontation with their victim and cope with conflict in passive-aggressive ways, such as committing crimes against property to release their aggression. It is thought that these deficits in social skills may be

associated with low self-esteem, fewer coping strategies and limitations in an ability to connect with others (Jackson et al., 1987; Rice & Harris, 1991; Wolford, 1972).

1.5.3 Firesetting, antisocial behaviours and problems with impulse control

In the 1980s, researchers had started to conceptualise firesetting in terms of where it was placed along the developmental pathway of serious antisocial behaviour (Gruber et al., 1981; Kolko & Kazdin, 1991b; Kuhnley et al., 1982; G. Martin, Bergen, Richardson, Roeger, & Allison, 2004; Stewart & Culver, 1982; Stickle & Blechman, 2002). Both early and contemporary studies of firesetters have reported that firesetting was not an isolated antisocial behaviour. Lewis and Yarnell (1951) reported that half of their subjects had been in trouble with authorities for other delinquent behaviour. Yarnell (1940), and Vandersall and Wiener (1970) reported that most of the children had been referred for problems other than firesetting, such as poor impulse control and general behavioural disturbance.

Different practitioners working in the field recognise that firesetting behaviour is a marker for potentially more severe or graduated antisocial acts (Oregon Youth Authority – S. D., personal communication, 11 June 2007). For example, many police departments, psychologists and court authorities view firesetting as the first clue to a child's delinquent behaviour and, left unchecked, can lead to future criminal behaviours (Gaynor, 1991). The marker of firesetting may provide an opportunity by early intervention to reduce a pattern of serious aggression and persistent antisocial behaviours, future crime and violence. This is consistent with the developmental approach to crime prevention, which emphasises early intervention and identification (Stickle & Blechman, 2002), because once these extreme behaviours have been established, treatment is difficult, expensive to implement and has limited effectiveness (Dadds & Fraser, 2006).

In the current Diagnostic Statistical Manual (DSM- IV-TR), firesetting is included as a criterion for the diagnoses of conduct disorder and pyromania, with firesetting being one of the 15 symptoms required for the diagnosis of conduct disorder (APA, 1994). Heath, Hardesty, Goldfine and Walker (1985) and Kuhnley et al. (1982) have all associated conduct disorder with firesetting (Kolko & Kazdin, 1986). The prevalence rates of the comorbidity of firesetting and conduct disorder is high, with some studies reporting this association to be as high as 71% (Sakheim & Obsorn, 1999) and 66% (Heath et al., 1985) in clinical samples. Due to the strong relationship between conduct disorder and firesetting, research studies have been designed to control for conduct disorder by separating it out of the data analysis. This is so the diagnosis of conduct disorder does not contribute to the group differences, diagnosis and firesetting status (Kolko, Kazdin, & Meyer, 1985b; Mackay et al., 2006). Since the 1980s, firesetting research has focused on clinically investigating the differences between firesetter and non-firesetter and conduct-disordered children (Jacobson, 1985b).

There is debate as to whether firesetting is embedded in the clinical diagnosis of conduct disorder, whether it represents an isolated syndrome, or an advanced level of antisocial behaviour. Some argue that no single behaviour (such as firesetting) can lead to the diagnosis of conduct disorder because there has to be a presence of three (or more) symptoms over the duration of 12 months, with at least one symptom (criteria) being present in the past six months. The symptoms of conduct disorder cluster under the four behavioural themes that are thought to violate the basic rights of others, including aggression towards people and animals, destruction of property, deceitfulness or theft and serious violation of rules. Thus, the total clinical picture has to be taken into account with persistent and

repeated patterns in behaviour in which the rights of others or other major age-appropriate societal norms or rules are violated (Heath et al., 1985).

The diagnosis of pyromania, along with kleptomania and intermittent explosive disorder, comprise the DSM-IV-TR category of impulse control disorders not elsewhere classified. The diagnosis for pyromania is considered rare with prevalence rates of 0–8% (APA, 1994). Sakheim and Osborn (1999) reported that over a period of 16 years of counselling only four “pyromaniacs” have been diagnosed from 250 referred patients.

1.5.4 Dynamic-behavioural model and multifaceted risk-factor models

Kolko and Kazdin (1986) and Fineman (1980; 1995) conceptualised juvenile firesetting in terms of dynamic-behavioural models and multifaceted risk-factor models. Briefly, the model conceptualises firesetting as multidetermined and includes the risk factors in the domains of individual, family, and social and environmental conditions.

Fineman (1980) describes his theory as a broad-based psychosocial conceptual framework designed to explain firesetting behaviour. His model is theoretically similar to Kolko and Kazdin (1986); however, it is more comprehensive and complex because it incorporates more variables. These include physical (demographic, physical, emotional, motivational and psychiatric); family and social circumstances; and immediate environmental conditions (events occurring immediately prior, during and after firesetting). Furthermore, the model differs from Kolko and Kazdin because it explores the antecedents and consequences of firesetting behaviour and emphasises the dynamic nature between the individual and their environment. Fineman has provided a clinical formula ($FS = G1 + G2 + E$) for firesetting (FS) whereby the variables are thought to interact to produce firesetting, or increase the risk for firesetting. This conceptual framework allows the firesetting behaviour to be

operationalised and measured. Similar to Kolko and Kazdin, an assessment protocol was developed that categorises the juvenile into little, moderate or extreme risk for firesetting.

Fineman's clinical formula is psychosocial, taking into account both predisposing (G1) and reinforcing (G2) historical factors that place the child at risk for firesetting and using fire in maladaptive ways. Predisposing factors include dysfunction in areas of family, peers, academics, personality, health and other behavioural disturbances. Inappropriate modelling and discipline, lack of supervision, firesetting history, and fire curiosity act as behavioural reinforcers. The immediate environmental contingencies (E) includes the characteristics of the firesetting incident; the degree of distorted thoughts or feelings of the firesetter (cognitive errors, justifications and thoughts preceding, during and after the firesetting act); and internal (sensory satisfaction or excitement) and external (e.g. monetary or reinforcement from peers) reinforcement.

Kolko's (1986) risk-factor model is another example of a dynamic-behavioural model. Its derivative questionnaires of the Firesetting Risk Interview (FRI) and Children Firesetting Interview (CFI) were used in the current thesis to evaluate risk factors pre- and post-JFAIP intervention. This model is more fully described in Chapter Three.

1.5.5 Motivational models

Motivational typology can be used to explain firesetting with a variety of motives thought to elicit firesetting behaviour. Typologies of firesetters have been created to help categorise and describe the firesetting behaviour or predict the firesetter's risk for future firesetting. The four most common motivational categories reported in the literature are curiosity, cry-for-help, delinquent and severely disturbed firesetters (Wooden & Berkey, 1984). The most prominent category is thought to be the curiosity firesetter, at 60% of the firesetter

population (Gaynor, 2000; Gaynor & Hatcher, 1987). Others have categorised firesetters into corresponding risk levels of little, definite, and extreme risk (Fineman, 1995). The little risk category corresponds with the curiosity firesetter at 60%, while 30–40% fall into the definite risk and less than 1% in the extreme risk category (Schwartzman, 2002). Another common way to describe the motives of juvenile firesetters is either intentional or unintentional (accidental) firesetting acts. Intentional firesetting is thought to be more planned, deliberate and malicious in intent, whereas unintentional is unplanned, impulsive and not malicious in intent (Gaynor, 1991).

Briefly, children driven by curiosity frequently start fires accidentally by experimenting and playing with matches or lighters. These fires are generally lit by younger children (five to 10 years of age). This was explained further in section 1.4.2.

“Cry-for-help” firesetting may be more instrumental because there are often underlying psychological issues and perhaps family conflicts that need attention. The act of firesetting is thought to be symbolic or motivated by inner difficulties, underlying anger or frustration. These firesetters may present with acting out, externalising behaviours, anger and frustration. This category of firesetter is thought to be treatable if the cry for help is answered (i.e., if the underlying source of stress or conflict is dealt with, or if conflicts in the family are resolved; Fineman, 1980).

The delinquent firesetter is typically an adolescent who may engage in firesetting with others repetitively or to gain acceptance from peers (section 1.4.3). The severely disturbed firesetter is described as more pathological than the other categories because of the internal reinforcement gained from the act. Severely disturbed firesetters appear to be more

treatment-resistant because they engage in firesetting to gain sensory gratification, a sense of power and excitement from the act (Fineman, 1980).

The categorisation typology that came out of the Massachusetts program and Fineman's model has some utility in screening children, but lacks empirical support (Stadolnik, 2000). It attempts to place the children into diagnostic "categories" but has generally proved unsuccessful, owing to overlapping of categories (Showers & Pickrell, 1987). Recent insights and the development of expertise in this area in the United States have led to revised thinking of the utility of these categories, which are now considered redundant because they are not exclusive and the firesetter often has multiple motives for his/her behaviour.

"It is a nice place to hang a hat and divides up kids. But they have moved away from this form of categorisation because it was found that youths could not fit neatly into the typologies and in fact they often had presented with numerous features across the diverse typologies ... a youth is often delinquent but they are also in a crisis. Flexible categories are proving to be more useful. It is a progressive behaviour and often can't go back." (Oregon Youth Authority – S. D., personal communication, 11 June, 2007)

There is now empirical support for the classification of juvenile firesetting that is motivated by high levels of curiosity and high levels of anger (Kolko & Kazdin, 1991a; 1991b; Kuhnley et al., 1982; Mackay et al., 2006; Sakheim & Osborn, 1991). These two variables are discussed further in Chapter Three. In brief, rather than categorising the population into discrete categories, researchers are considering the motives of anger and heightened curiosity to be more salient factors when trying to understand firesetting behaviour.

CHAPTER TWO: Juvenile Fire Awareness and Intervention Program (JFAIP) and description of clients: Victoria, Australia

Introduction

The aim of this chapter is to provide an overview of the JFAIP and the clients who participated in the program from 2003 to 2005.

General Methodology

Program documentation, retrospective case file notes, general research observations (attending meetings and training of JFAIP practitioners) and some data from both formal and informal interviews was used to inform the program background section. The JFAIP database of 2003 to 2005 was used to describe JFAIP clients and a detailed methodology is provided in section 2.4.1.

2.1 Program background, history and origins

The JFAIP was established by the Metropolitan Fire Brigade (MFB) in 1988 in response to concerns about the number of fires attributed to child firesetting in Victoria. In 1994 the Country Fire Authority (CFA) joined the program. The program development was influenced by the FSE program in Phoenix, United States, and a psychiatrist at the Royal Children's Hospital, Professor Robert Adler. At the time of its inception, a study called the Secondary Prevention of Childhood Firesetting (1994) was conducted to determine its effectiveness.

Adler, Nunn, Northam, Lebnan and Ross (1994) conceived the JFAIP program. This study evaluated the firefighter intervention, during which the firesetter and their parent(s) attended three to four visits focused on fire safety education, behavioural modification using satiation

techniques, graphing techniques, and parental training in positive and negative reinforcement. Of these techniques, fire safety education is the only component remaining in the current program. Satiation technique was withdrawn due to its requirement for its continual commitment from parents and because it was seen as controversial. The graphing technique was also withdrawn due to its complexity. Parental training was replaced with positive reinforcement approach only.

2.1.1 Program Sites

The JFAIP is a state-wide program delivered to metropolitan Melbourne by the MFB and to 20 regional and rural areas within Victoria by the CFA (see map, Appendix 1).

2.1.2 Stakeholders

There are currently 68 active firefighter practitioners who deliver the program to juvenile firesetters and their families throughout the state of Victoria. JFAIP also includes CFA and MFB Managers and a Program Psychologist.

2.1.3 Budget

The CFA and MFB jointly contribute financially to the JFAIP. The CFA allocates \$80,000 to the program annually. This funds firefighter practitioner overtime rates (\$40,000), travel costs (\$10,000), training (\$10,000) and resources (\$20,000) such as stationary and printing. The cost to deliver a case is roughly \$400. This contribution does not include manager's salaries. The MFB was unable to provide figures of their financial contribution because they do not have a budget line for the JFAIP. However, their financial contribution to the program is less than the CFA because the program is delivered in Metropolitan Melbourne and incurs less expenditure. Managers of this program do not work full-time on the JFAIP and have other responsibilities in community education. For instance, the JFAIP state coordinator spends 60% of his work time on activities related to the JFAIP.

2.1.4 Training

JFAIP training of new practitioners is generally conducted every three years and is offered over four days. The content includes education on firesetting, intervention skills, home fire safety, and also a mental health component. The program offers ongoing training and there is compulsory attendance of at least two training meetings per year. This is delivered by the state-coordinator of the program, experienced practitioners, the program psychologist and external agencies (as required). Its mode of delivery is both interactive (such as role plays and active discussions) and lecture format.

2.2 Aim and program theory

The program documentation states that the aim of the JFAIP is to reduce the frequency and severity of firesetting by young people. The objectives of the program are to stop children from firesetting. There is no program theory specified in the documentation. After interviews with MFB and CFA Managers, here is my summary of the current JFAIP program theory.

- FSE is based on the assumption that education about fire and fire safety leads to behavioural change.
- The program needs to be delivered by career firefighters because they have expertise, authority and credibility. They firmly believe that this factor leads to behaviour change in the juvenile firesetter.
- Because the program is skill-based (incorporating both behavioural training, some basic behavioural modification strategies, and basic parenting training), the fire safety messages are more likely to be retained by the parent(s) and children and lead to behavioural change.

2.3 Program components of JFAIP

The JFAIP program documentation has the following three components: trust building, syllabus, and positive reinforcement and rewards. The content of the program includes a family interview, a fire safety audit of the home, an assessment of the child's knowledge of fire and fire safety (Questionnaires A, B and C; flammable liquids and gases) an educational component, activities and homework exercises.

2.3.1 JFAIP program protocols

The JFAIP program protocols are addressed below:

Intake procedure

1. Brief interview intake form at the initial enquiry. This form gathers details on the firesetting incident and the family (at Appendix 2).

Interview

1. A family interview designed to gather basic data on the family and post-intervention form (Appendix 3).

Assessment of the child's fire knowledge and fire safety awareness

1. Questionnaires A (5–7 year olds), B (8–11 year olds) and C (>12 years). These provide direction for the practitioner in formulating the intervention (Appendix 4).

Curriculum content

The JFAIP curriculum content does not include separate age-appropriate protocols for the different developmental levels. The content includes:

1. Understanding the nature of fire (e.g., the speed of fire and how quickly it spreads).
2. Teaching of personal fire safety strategies (e.g., practice and instruction of fire safety skills such as “Stop, drop, cover, and roll”, “Get down low and go, go, go” and the “Home fire escape plan” that are generally used with younger children).
3. Taking responsibility for safe fire behaviour (e.g., a child being appointed the junior fire safety officer for the family).
4. Consequences of unsafe fire use (e.g., personal and financial costs).
5. Building knowledge of fire (e.g., through the questionnaires of A, B and C and discussion with the firefighter).
6. Understanding of fire hazards (e.g., home safety audit). This is aimed to increase parental and child awareness about the potential hazards (such as flammables, faulty appliances, smoking and smoke alarms) within the home.
7. The curriculum is targeted to firesetting misbehaviour (e.g., making bombs, rockets or using aerosols is different from burning leaves in the backyard and requires a different focus).

The details of the JFAIP curriculum are found at Appendix 5.

Contracts and Reward System

1. Firesetting agreements include contracts for adolescents and star charts for younger children (Appendix 6)
2. Rewarding the child for participation in the program and for demonstrating fire-safe behaviour at three months (younger children) and six months (adolescents)

2.3.2 Interview and screening protocols

An interview is undertaken with the family which is not a formalised screening. There is no current screening tool in practice that helps the firefighter make an objective decision as to

whether the child needs further psychological assessment and intervention. A standard interview found at Appendix 4 that gathers information on the firesetting incident(s), the child and family is used instead.

2.3.3 JFAIP delivery and strategies to engage families

Approximately 200 to 300 clients are referred to the JFAIP annually. It is a voluntary program that targets four- to 17-year-olds who have engaged in firesetting, or who have a fascination with fire. Delivery of the program to younger children is not undertaken due to evidence that suggests that intervention with children below four years enhances their fascination and experimentation with fire (Adler, 1993). The MFB and CFA have another program called Early Fire Safe that targets parents and carers of children under the age of four years who set fires. The JFAIP program also intervenes with Aboriginal families and culturally and linguistically different (CALD) clients, but no specific materials have been developed for these groups, with all juveniles receiving the same standard intervention. The program is also delivered to involuntary clients (approximately 5% of total clients) who are mandated by a court order or community conference agreement to participate in a juvenile FSE program.

Trained career firefighters deliver the home-based JFAIP fire safety intervention program. Home visits provide an outreach service to clients and also allow firefighter practitioners to assess the fire risks within the home.

2.3.4 How is the JFAIP delivered?

There is a basic standard program in place; however, the practitioner will diverge from the program and adjust it to the needs of the child and family, and will also target the juvenile's specific fire misbehaviour.

Timely intervention

According to program documentation, the JFAIP standard delivery guidelines specify that all interventions must be conducted within 10 days of the intake interview.

Behavioural training and experiential learning of FSE

Children learn best by doing, and activities such as creating a fire escape plan for the home or becoming the Junior Fire Safety Officer (JFSO) and role plays (stop, drop, cover and roll) are used to engage the child and to help reinforce the fire safety educational message. The home fire escape plan, for example, is generally undertaken as a family exercise, where the practitioner provides the family with a sketched outline of the house and then stresses the importance of having two exits, and the family works on the plan together.

Resources

The firefighter practitioners are provided with a kit, which includes DVDs, books, visual charts, interview forms and questionnaires (Appendix 7). The practitioner selects the resources to be used in the intervention according to the age and developmental level of the target client.

Parental involvement

Parent participation and involvement is required so that the fire safety messages are understood by the whole family and are continued after the JFAIP concludes.

Basic behavioural modification strategies

Positive reinforcement strategies used by firefighter practitioners include star charts, rewards, and social reinforcers (such as praise for being fire safe). The child is rewarded at the end of their contract for remaining fire-safe and for demonstrating fire safety behaviours.

Building rapport and engaging with families

Trust and rapport is emphasised in the JFAIP, the style of interaction is not punitive, but engaging, with the aim of creating an alliance between practitioner and client. In most instances, the practitioner will clearly explain to both the parent and child why they are there, the purpose of the program and what to expect. The practitioner will frequently tell the child that they are “not in trouble” and they are asked to tell the truth about all firesetting incidents they have been involved in. Most practitioners will seek to make a verbal agreement with the juvenile not to play with fire again by directly asking them to promise not to light fires in the future.

The practitioner’s own experience as a firefighter

Firefighter practitioners have a wealth of experience about fire and how it behaves and they will often draw on their own personal experiences of fighting fires to bring the intervention to life so that the fire message is delivered strongly and appropriately. Firefighter practitioners use their knowledge, experience and credibility to convey important fire safety messages.

Safety audit of the house

Safety strategies are taught to the family through discussion with the firefighter. For instance, in the case of a house fire, the practitioner may advise the family to check the door

for heat and explain that a shut door protects someone for approximately half an hour. The firefighter would then advise the child to stay in the room, block the gaps rather than open the door to flames and wait for the fire truck that will arrive in around 10 minutes. Other practical information discussed with families are the dangers of deadlocks, how to call the fire department on 000, crawling low in smoke, having a meeting place so that people can locate you, the importance of not returning into the house and that no one in the family is expected to put the fire out.

The firefighter practitioners often use their own firefighting experience and knowledge to educate the child or adolescent about the potential consequences of their actions. For example, a case file discussed a situation in which boys were placing grass into rabbit burrows and attempting to smoke out the rabbits when surrounding grass caught fire. With insight into climatic conditions the firefighter can convey how quickly grass and bush fires can get out of control, for example how the wind is an unpredictable element that can quickly whip up a fire. In many instances, juveniles will recognise the firefighter as the most credible source of information about the nature of fire. This recognition can help reinforce the fire safety message and deter the juvenile from future firesetting.

2.3.5 What is delivered – the JFAIP curriculum

Dosage

An analysis of the database indicated that on average JFAIP clients received between two and three interventions ($M = 2.8$) in the period from 2003 to 2005. Dosage is discussed in detail in Chapter Six.

Curriculum content

For description of JFAIP curriculum content refer to section 2.3.1.

Complex cases

Some cases referred to the JFAIP are more dysfunctional or complex. While there is no screening tool available to determine their complexity, anecdotally some clients do present with greater dysfunction. These families receive the standard intervention with some modifications that are contingent on the firefighter practitioner's skill and experience. The following vignettes of cases from the 2003 to 2005 database are provided to help illustrate some complex cases referred to the JFAIP.

Adolescents who have been charged with arson are also referred to the program as a part of a community conference agreement (that could involve police, fire service, case workers, and juvenile justice) or as a diversion from juvenile court. Some practitioners have dealt with difficult adolescent clients. An example of this is presented in Vignette One.

Vignette one

Some adolescents believe that they can control fires and demonstrate serious repetitive firesetting:

The practitioner case notes described the case of Client R as challenging. Client R lived on a dairy farm and was involved in serious firesetting behaviour with his siblings. Client R (the target child in the intervention) had been diagnosed with an unknown genetic disorder. The most recent incident involved throwing firelighters around the kitchen with the other siblings, and as a result there were burn marks on the kitchen floor. Client R and his younger brothers also had been involved in lighting a petrol trail that got out of hand and had caught the hose from the fuel tank on fire. Fortunately, the children's mother was able to smother the flames. Client R spoke freely about other fires he had lit and how he thought that petrol was an important part of lighting these fires. The practitioner noted that he had a dangerous firesetting history of using petrol on fires, putting pressure cans on fires, juggling heat beads, putting lighters into fires or onto stoves. The practitioner also stated that Client R had no fear of being hurt and that he believed nothing bad would happen to him. The practitioner talked about the agreement to stop firesetting, and Client R was adamant that he would not promise he wouldn't play with fire and petrol. The practitioner then showed the DVD of a boy being engulfed in flames. In this session, Client R asked the practitioner to rewind the footage and stated that "hardly any fuel was used and that he used bucket loads and that it wouldn't happen to him". The

practitioner did manage to form an agreement with Client R to stop lighting fires in fire danger periods. The practitioner noted on the file that when he followed up with Client R two weeks after the intervention, he was still lighting fires. The parent stated that he had stopped lighting petrol fires but had lit some grass fires using hay and that one of these almost spread to the hay shed. The parent commented that Client R still had no fear of playing with fire and thought that he could control it, despite the practitioner showing him a video of the burn victims.

Vignette two

Engaging a child who is not taking on fire safety messages:

The firefighter practitioner describes Client K's firesetting incidents as lighter flicking (putting lighter fluid on his hands and lighting it), building rockets in the backyard, burning his sister's doll and scraping sparklers into a jar and lighting them. The intervention included the DVD *It can't happen to me*. Client K stated that it wouldn't happen to him. The practitioner worked on this consistently, but client K insisted that nothing could happen to him, that he knew what he was doing and everything was fine. The practitioner wasn't sure if he had gotten through to him, although he worked hard to send the message.

Both Client R and K are complex cases and out of the domain of the firefighter practitioner's experience. FSE is still relevant for these cases but a more complementary mental health intervention is required. Client R is involved in serious firesetting that could be potentially fatal (use of petrol and lighting fires near petrol tanks) and has thinking errors and assumptions that he is omnipotent and cannot be harmed. Client R also appears to have severe mental health issues and is involved in group firesetting with his brothers. Client K has demonstrated versatility in his firesetting involvement (from misusing fireworks and aerosols) and has engaged in dangerous self-harm (lighting his hand using an aerosol). He also may be motivated by anger or revenge because he has targeted his sister's doll. These issues cannot be resolved by FSE alone.

2.3.6 Monitoring, data collection and JFAIP database

The JFAIP does not monitor client or programmatic data. The program collects demographic and fire incident data through the organisation's database.

The JFAIP client database

As a part of any intervention, a standard interview and post-intervention form is undertaken by a JFAIP practitioner with the client family (Appendix 3). This information is then compiled onto the JFAIP client database. Paper copies of all cases are also securely kept on the premises of the MFB offices. The JFAIP coordinator, who updates this database, is the only person with access to these confidential files, aside from research purposes.

This database generates basic descriptive statistics about the clients, such as demographic factors, some motivational factors, counselling factors, police contact, and details of the fire incident. This information is primarily descriptive data that may inform and guide the development of the JFAIP at a minimal level.

2.3.7 Evaluation of JFAIP

The JFAIP only collects descriptive data, but does not include the collection of data that measures outcomes. This program has not been previously evaluated.

2.3.8 Collaboration with other agencies

From 2003 to 2006 the main referral sources to the JFAIP were the fire department (24%), self-referral (22%), and the Department of Human Services (16%).

2.4 Description of JFAIP clients

An analysis of the current database and an investigation of practitioners' retrospective case notes was undertaken to gain a more detailed picture of the JFAIP clients and intervention approaches.

2.4.1 Methodology

Participants

A de-identified database of all JFAIP clients was provided from the period January 2003 – December 2004. There were 448 participants and of these, 15 were no action (i.e., the case did not proceed).

Procedure

Access to a de-identified database and paper copy files of all relevant cases from the period January 2003 – December 2004 was given. Any missing data on the database was due to the information not being present on the interview form. As much as possible, attempts to enter missing data were made by checking against the paper file copy of the case.

Data Analysis

The database was recorded on Microsoft Access and this was converted from Access, Excel and then to Statistical Packages for the Social Sciences (SPSS) for analysis.

2.4.2 Results

JFAIP clients

The JFAIP database was examined between the two-year period of 2003 to 2005 and during that time 443 juveniles had participated in the program. There were significantly more boys (91%) than girls (9%) and the mean age was 9.6 years old. In terms of family structure, 37% of participants lived with their natural mother and father, 34% with their natural mother only, 45% of families were married or de facto, 35% were divorced or separated, and 15% had been placed in foster care either past or current. In 68% of JFAIP families, at least one smoker lived in the home. There were 129 families in the metropolitan region and 306 families outside of metropolitan areas.

In the United States, previous counselling is viewed by practitioners of the Oregon Juvenile Firesetter Intervention Program (Oregon JFIN) as a “red-flag” indicator of more pathological firesetting and psychological disturbance (Oregon JFIN– C. B., personal communication, 11 June 2007). In the JFAIP sample, 44% of clients had received past counselling or were receiving current counselling (32%). ADHD or other comorbid diagnoses are not routinely recorded on the JFAIP database. Of the 443 clients, 27% had a recorded diagnosis of ADHD; however, as these diagnoses were not systematically recorded, the data is not considered fully reliable.

Police contact and court involvement was routinely recorded and 22% of clients had past police contact with the major reasons cited as firesetting (34%), theft (27%), property damage (14%), violence or assault (4%) and arson (3%).

Reoffending was not recorded on the database because follow-up with clients was not part of standardised practice for the JFAIP. There was some recording of recidivism but this should be interpreted with caution as without a standardised protocol of follow-up, this data is likely to be unreliable. Of those recorded, 77% did not reoffend, 9% reoffended during the intervention and 5% were reoffenders who were required to repeat the program.

Firesetting behaviour

The group data indicates that 29% of families had other children in the family (such as siblings) who were also involved in firesetting. Almost half of the families (40%) allowed their children some responsibility and directly supervised experiences with lighting fires (such as allowing the child to light the barbeque under supervision). The majority of ignition sources used by children were lighters (59%) and matches (24%). These ignition

sources are generally easily gathered in the home, emphasising the need to educate parents about the safe storage of ignition sources.

The juvenile's firesetting behaviours included mostly (40%) igniting objects and items such as paper, leaves, hay, grass, sticks and twigs, shrubs, rubbish, dried flowers, straw, plastic, toilet paper, tissues and cotton buds; 8% of children reported that they were involved in fireplay with aerosols and flammables; 7% were involved in matchplay; and 8% were involved in lighting household items and furnishings such as curtains or carpet. Almost half of the children (47%) lit fires in the home with the majority in the child's bedroom (15%). The immediate locations cited outside the home were places such as the backyard (22%), in the community (26%) and of these 10% occurred at school and 4% in open paddocks.

When asked if the child had deliberately lit the fire, 84% of the children stated that they did not deliberately light the fire, whereas 9% intended to light the fire. This data is based on the reflection of children, who perhaps thought they may get in trouble for admitting to committing a destructive act, so may not be fully accurate. The frequency of fires was recorded on the database for each child and the mean of the total number of fires that caused damage in the last 12 months (N = 400) was six. The mean of the total number of fires that caused no damage in the last 12 months (N = 403) was 11. Thus, on average children and juveniles are reporting six fires that have caused damage and 11 fires that have not caused damage, indicating that there may be a high proportion of repeat firesetters who are referred to the program.

CHAPTER THREE: Review of fire-specific and general behavioural dysfunction risk-factors that contribute to the onset and continuation of firesetting

Organisation of Chapter Three

Chapter Three includes:

- review of two domains: (1) individual, familial, social and environmental (general dysfunction and behavioural risk factors) and (2) fire-specific risk factors associated with juvenile firesetting
- Kolko and Kazdin (1986) dynamic risk-factor model including the Fire Risk Interview (FRI), Children's Firesetting Interview (CFI) and Fire History Screen (FHS) measures
- terminology
- the prevalence and risk factors associated with firesetting recidivism.

Background: Risk factors as defined by the dynamic behaviour risk -factor models

As Kolko and Kazdin (1986) and Fineman (1980) proposed, firesetting is multidetermined and complex, suggesting that many factors contribute to the onset or continuation of the behaviour. Kolko and Kazdin's model is based on the assumptions of dynamic behavioural theory that takes into consideration variables of individual characteristics, family and social circumstances, and immediate environmental conditions.

3.1 Kolko and Kazdin's (1986) risk-factor model

In Kolko and Kazdin's dynamic behaviour risk-factor model, they broadly include the two domains of (1) general dysfunction and behavioural issues and (2) fire-specific risk factors that are thought to be associated with the onset and continuation of juvenile firesetting. The three components under the domains include learning experiences and cues, personal repertoire, and parental and family influences and stressors. Each component is associated both with fire-specific and general behavioural risk factors, as indicated in Table 1. The content of these domains was derived from a review of both controlled studies and clinical cases in mental health and fire services literature, and an adaptation of the Federal Emergency Management Agency's (FEMA) existing method for classifying a child's risk of firesetting.

Table 1: Proposed domains of fireplay and firesetting (Kolko and Kazdin, 1986)

1. Learning experiences and cues
 - a. Early modelling experiences
 - b. Early interest and direct experiences
 - c. Availability of adult models and incendiary materials
2. Personal repertoire
 - a. Cognitive components
 - (1) Limited fire awareness and fire safety skills
 - b. Behaviour components
 - (1) Interpersonal ineffectiveness/skills deficits
 - (2) Covert antisocial behaviour excesses **
 - c. Motivational components
3. Parent and family influences and stressors
 - a. Limited supervision and monitoring
 - b. Parental distance and uninvolved involvement
 - c. Parental pathology and limitation **
 - d. Stressful external events **

** Not assessed on the Firesetting Risk Interview (FRI) or the Child Firesetting Interview (CFI) due to existing measures

Individual factors of the child include those specific to fire and those more related to behavioural dysfunction. Family and social factors include family dysfunction, parental

pathology, and interpersonal and social deficits. Environmental factors include predisposing, precipitating, and maintaining (reinforcing) influences that may impact on the firesetting behaviour.

3.1.1 The Fire Risk Interview (FRI) and Child Firesetting Interview (CFI)

In later studies, (Kolko & Kazdin, 1989a; 1989b) the Fire Risk Interview (FRI) and Child Firesetting Interview (CFI) measures were developed to operationalise the several domains of the risk-factor model. However, due to existing clinical tools, the two measures do not include the components of covert antisocial behaviour excesses, parental pathology and limitation, and stressful external events.

The FRI and CFI are self-report measures for parents and children respectively. The measure of the FRI has two domains that are (1) specific to fire; and (2) non-specific-to-fire. The CFI is the child's measure that is equivalent to the parent's fire-specific variables found on the FRI. Both of these measures assess aspects of the child's firesetting experiences and interest, along with the child's behavioural profile, family and peer relations.

The FRI and CFI questionnaires have been used as objective measures in this study and are more fully described in sections 4.3.4 and 4.3.5, respectively.

3.2 Terminology

A child's firesetting status can be poorly defined because most studies fail to adequately describe what constitutes firesetting in their sample (Kolko, 1985a; 2002b). There is no single universal definition used to describe a child's fire involvement, thus it is important to apply a definition for each study so that the parameters are clear and meaningful

comparisons can be made across studies. The firesetting definition for this study can be found in section 4.3.2.

3.2.1 Firesetting versus fireplay

The definition of firesetting clarifies the behaviour under investigation. Firesetting has been described in studies by its function or purpose, motive, damage, frequency or consequence. Some authors have concluded that matchplay is not the same as firesetting and that a history of only playing with matches is not considered to be firesetting behaviour (Kolko & Kazdin, 1989a, 1989b; Ritvo, Shanok, & Lewis, 1983).

Some of the literature indicates that the pattern of fire behaviour and a psychological profile will determine a firesetter from a matchplayer or firesetting from fireplay. Firesetting is generally described in the literature as more planned, intentional and destructive than fireplay, which is thought to be more curiosity-driven, experimental and unplanned. According to Gaynor (1991), there are five behavioural factors that can be used to distinguish fireplay from firesetting including: history of the firestart, method of firestart, ignition source, target of the firestart, and behaviours occurring immediately following the firestart.

Briefly, the history of the firestart refers to whether or not the incident is a single episode (fireplay) or recurrent (firesetting). Generally, a single unplanned episode of igniting available materials such as paper and rubbish and where the child reacts by either putting it out or calling for help is considered to be a fireplay incident. In contrast, recurrent, planned incidents that involve flammable or combustible materials that are targeted towards another person, property or animal and where the child reacts by watching the fire burn or running away are considered firesetting.

3.2.2 Matchplayers versus firesetters

There have been some noted differences between the psychological profile of the matchplayer and the firesetter. Sakheim and Osborn (1991) compared minor firesetters with severe firesetters and found that minor firesetters had more anxiety problems (separation anxiety or obsessive-compulsive traits) and had more mature superego development due to the presence of more feelings of guilt or remorse for their firesetting acts. Kolko and Kazdin (1990) also explored the differences between matchplayers, firesetters and non-firesetters and found that matchplayers were more similar to firesetters than to non-firesetters.

Clarification on what distinguishes a firesetter from a matchplayer can be unreliable and misleading, mostly because fire does not discriminate between burning a piece of paper and burning an entire house. It can be argued that a matchplayer can be equally considered a firesetter if the fire were to get out of control and burn property and if the criterion for classification was the damage caused.

3.2.3 The Fire History Screen (FHS)

The Fire History Screen (FHS) is a screening tool questionnaire administered to the parent and child separately. This tool was developed to clarify the child's firesetting status in the Kolko and Kazdin (1989a; 1989b) studies.

3.3 Demographic, individual, familial, social and environmental (general dysfunction and behaviour) risk factors

The Kolko and Kazdin (1986) dynamic risk-factor model has been described by the authors as tentative, indicating that there may be some future revision of the model. The domain of general dysfunction and behavioural risk of the two-factor model includes social ineffectiveness and dysfunction (relevant to social difficulties, interpersonal relationship

problems and some behavioural disturbances). However, it does not include the comorbid psychiatric diagnoses of conduct disorder, Attention Deficit Hyperactivity Disorder (ADHD) or depression that firesetters frequently present with. Family factors such as parenting, discipline and punishment are included but specific factors such as abuse, maltreatment or neglect are not included. Other individual factors such as academic difficulties and demographic factors such as age, gender, and socioeconomic status are not included in the model. These factors are discussed in this section because they are associated with juvenile firesetting behaviours.

3.3.1 Demographic factors associated with firesetting

Age, gender and socioeconomic status are demographic factors associated with juvenile firesetting.

Age

Age of onset is particularly relevant when tracing the developmental history of a disorder. The developmental patterns of onset, either early or late onset, are important in the course and outcome of some childhood disorders (APA, 1994). Firesetters have been described as having a relatively earlier onset of firesetting behaviour when compared with the onset of antisocial behaviours in non-firesetting children (Jacobson, 1985a; Root, Mackay, Henderson, Del Bove, & Warling, 2008; Stickle & Blechman, 2002). It has been reported that interest in fire begins at an earlier age than is assumed, with increasing salience for children between the ages of three and six years. The age of a child's interest in fire and fireplay have been reported to be as low as two (Nurcombe, 1964) and three years (Kafry, 1980). Most commonly, the age that children engage in firesetting has been reported as 10 years (Kolko, 1985a).

The age distribution of firesetting can vary; however, an average of approximately 10 years of age has been reported in a meta-analysis of 22 studies (Kolko, 1985a). Several large-scale studies have reported that more than 70% of their samples were fewer than 10 years of age (Kolko, 1985a). One study has reported a bimodal age distribution that differentiated firesetters from non-firesetters. The age distribution of the firesetter group was aged eight with a secondary peak at age 13. This contrasted with the non-firesetting group that had a unimodal age distribution of conduct disorder that peaked at 13 years (Jacobson, 1985a). This bimodal distribution indicates that firesetting can emerge or re-emerge in middle childhood and then adolescence. There are also noted behavioural and clinical differences between younger and older firesetters (Gaynor, 1991) and this was clarified in sections 1.4.2 and 1.4.3.

Some researchers have interpreted an earlier onset of firesetting and conduct disturbance as indicative of a more severe course, pattern and outcome of childhood behavioural disturbance that may lead to heightened aggression, early arrests and chronic offending. Jacobsen (1985a) and Stickle and Blechman (2002) concluded that early starting firesetters were a marker for serious antisocial behaviour that may lead to persistent criminality.

Gender

Most studies have indicated that firesetting behaviour is mainly associated with boys (Showers & Pickrell, 1987). A meta-analysis of 22 descriptive studies on firesetters found that, on average, 82% of firesetters were male (Kolko, 1985a). Most studies in this area have investigated boys with a few exceptions that have included girls (Saunders & Awad, 1991; Showers & Pickrell, 1987).

One explanation for the gender bias is that boys are more prone to externalising problems than girls. Boys have a tendency to act out emotions aggressively instead of containing or talking about them. Externalising aggression through destructive fireplay may be rewarding and provide immediate gratification. Block et al. (1976) investigated normal children's interest in, anxieties about, attitude towards and reactions to fire. They found that females were more fearful of fire, less interested and tended to withdraw from situations in which fire materials were involved. In contrast, boys were more interested in and had more fantasies about fire and were therefore more involved in fireplay.

Studies that have reported on female firesetters (Showers & Pickrell, 1987) suggest that a girl's pattern of firesetting is qualitatively different from boys', is quite rare and has a different profile from boys. Mostly, female firesetters are in adolescence and are characterised by antisocial behaviours and psychotic disorders. Similar to boys, they tend to be neglected and come from unstable home environments that are aggressive and violent. However, many of the female firesetters have also been subjected to sexual abuse and tend to light fires to express anger and vengeance against their perpetrator (Saunders & Awad, 1991).

In an Australian study that used a normative sample to investigate children's interest in fire, it was found that boys' firesetting was associated with increasing age, parental stress, antisocial behaviour, hyperactivity, cruelty to animals and thrill-seeking temperament (Dadds, 2006). Another study confirmed that boys were more likely to set multiple fires, destroy property and be motivated by the excitement of the act (Showers & Pickrell, 1987). Female firesetting was specifically related to higher levels of parental stress, both positive

and negative parenting, antisocial behaviour and problems with anxiety and depression (Dadds, 2006).

Socioeconomic status

Socioeconomic disadvantage has been associated with child firesetters and their families. Studies that have investigated this association have concluded that there is a relationship between lower socioeconomic status and child firesetter families (Kolko, 1986).

Kolko and Kazdin (1990) used the Hollingshead and Redlich indexes of social class and concluded that 60% of the 288 families involved in their study fell into the two lower socioeconomic classes and a further 181 (38%) were receiving public assistance. The Kolko and Kazdin (1994) study of 95 non-patient, inpatient, and outpatient firesetters found they were lower in socioeconomic status, with the majority (60%) falling into the lower socioeconomic classes and 47% receiving public assistance. Consistent with this finding, another sample of 133 non-patient, outpatient and inpatient firesetters' families found a large proportion fall into the lower two of the five socioeconomic classes as measured by the Hollingshead scale (Kolko & Kazdin, 1991b). Strachan (1981) categorised 70 families into the five socioeconomic classes and found that 70% fell into the lowest class, while only 2% fell into the upper two classes. Other large-scale studies (Gruber et al., 1981; Heath et al., 1983) and case studies (Kolko, 1983; Madanes, 1991) have reported a predominance of families with firesetting children falling into the lower socioeconomic range.

3.3.2 Individual factors associated with firesetting

The individual factors associated with firesetting are comorbidity with other psychiatric disorders. These can include ADHD, disruptive behaviours, conduct disorders, mood disorders, academic problems and learning disorders.

Child firesetting and comorbidity with other psychiatric disorders

Firesetting occurs among both normal children and children with multiple behaviour problems (Kolko, 1985a). However, clinical experience has indicated that firesetting rarely occurs as an isolated symptom (Kaufman et al., 1961), but rather is aligned with a variety of other behavioural and clinical problems. Clinical disorders such as ADHD, conduct disorder, Oppositional Defiant Disorder (ODD) and disruptive behaviour disorder are significantly over-represented in the population of firesetting children and adolescents (Stadolnik, 2000).

Firesetters can fall on both extreme ends of a continuum, ranging from normally curious (60%) (Schwartzman, 2002) to severely disturbed and psychotic children. For instance, Kaufman et al. (1961) examined the clinical records of 30 firesetter boys from three state hospitals and found they were severely disturbed with eight having a diagnosis of conduct disorder, 11 borderline personality, and 11 with psychotic disorders.

A major distinguishing factor of firesetters can be the multiple problems they present with, such as aggression, externalising problems and a lack of impulse control (Vandersall and Wiener, 1970). Mackay et al. (2006) reported that of the 191 children aged 6–17 years referred to the TAPP-C program, 48% scored in the clinical range ($T > 69$) on the CBCL externalising scale. In Kuhnley et al. (1982) study, 31 of 47 children (65%) with conduct disorder also had a developmental disorder.

Sakheim et al. (1985) study compared the psychological profiles of emotionally disturbed firesetting and non-firesetting children in a residential setting and found that many

experienced strong feelings of maternal rejection, sexual conflict, conduct disorder and had sociopathic tendencies.

The Kolko and Kazdin (1986) risk-factor model also includes both covert antisocial behaviour and social behavioural problems as identified risk factors for the onset and continuation of firesetting. The FRI and CFI questionnaires measure some of these general behavioural factors, such as externalising behaviours (the expression of negative behaviours, such as hurting others, threatening, screaming and destroying property) and prosocial behaviours (such as the expression of positive behaviours).

ADHD and firesetting

Inappropriate involvement with fires has been associated with an undercontrol of impulses and lack of ego control (Kafry, 1980; Kolko and Kazdin, 1985a). Block et al. (1976) indicated that fireplay was associated with impulsive behaviour, an inability to delay gratification and more risk-taking behaviour, characteristic of impulse-control disorders such as ADHD. There are few studies that have explored the association between ADHD and firesetting, but some studies have noted ADHD comorbidity with the juvenile firesetter population (Kolko, Bridge, Day, & Kazdin, 2001b; Kolko & Kazdin, 1989b). For instance, in Kolko and Kazdin's (1989b) study, of the 519 inpatients, outpatients and non-patients, they found that the most common diagnosis was conduct disorder (n = 58), with ADHD coming second (n = 34).

Disruptive behavioural and clinical correlates

Firesetters frequently present with behavioural disturbances and, most commonly, disorders of heightened externalising behaviours. The behavioural correlates of firesetting typically

include conduct disorder, ODD, and disruptive behaviours not otherwise specified (Heath et al., 1985; Jacobson, 1985a; Kolko & Kazdin, 1991a; Kolko et al., 1985b). Parents frequently describe their children as out of control. Nishi-Strattner's (2005) review of the 247 families who participated in the Washington County Fire Academy Program found that 46% of parents felt like they had no control over their children, 56% said their child had a history of lying, and 37% reported that their child was physically aggressive or hurt others. A further 36% of children were so disruptive at school that it led to expulsion or suspension.

Relationship between firesetting and conduct disorder

The relationship between conduct disorder and firesetting has been well established, with some studies reporting a relationship as high as 71% (Sakheim & Osborn, 1999). Firesetting is an antisocial behaviour and forms part of the diagnostic criteria for conduct disorder. One study found firesetting to be the fourth most discriminating behaviour for the diagnosis of conduct disorder out of a possible 14 (Kelso & Stewart, 1986) and thus the link between conduct disorder and firesetting has been explored in many studies (Forehand et al., 1991; Kolko, 1985a; Kolko et al., 1985b).

In clinical samples, juvenile firesetters are generally considered more pathological than non-firesetter controls (Moore, Thompson-Pope, & Whited, 1996) and at the more extreme end of conduct disorder (Forehand et al., 1991; Kolko et al., 1985b; Patterson, 1982; Vreeland & Levin, 1980). Kolko et al. (1985b) found that firesetters engaged in more delinquent acts, had fewer social skills and a broader range of aggressive and more extreme antisocial behaviours than non-firesetters. Moore et al. (1996) found that the adolescent MMPI-A profiles of psychiatric inpatient firesetter boys (aged between 14 and 17 years) were more pathological than non-firesetters. Firesetters' profiles featured significantly elevated scores

on clinical and content scales such as mania, schizophrenia and depression. Furthermore, firesetters were more likely to have been in outpatient and inpatient treatment, suffered sexual abuse, been cruel to animals, and to have engaged in self-harming than the non-firesetter group. Based on clinical evidence, they concluded that firesetting was a manifestation of both anxiety and anger and a more complex level of antisocial behaviour than mere conduct disorder (Moore et al., 1996).

Hanson, Mackay-Soroka, Staley, & Poulton (1994) found that there was no difference in the clinical profiles of firesetters and non-firesetters and the only differentiating factor was that the firesetter group had a high proportion of recidivism. They concluded that the matchplay had progressed to involvement in more serious acts of firesetting, whereas the non-firesetting group had progressed to other antisocial crimes.

Stickle and Blechman (2002) explored whether firesetter offenders showed evidence of a different overall pattern, pathway and structure of antisocial behaviour than non-firesetting offenders. They found that firesetters differed significantly in their frequency and versatility of aggressive acts (non-aggressive and aggressive) and had an earlier onset.

Firesetting is described as covert antisocial behaviour because, like stealing and lying, it is frequently committed with victims absent or under conditions of limited supervision and monitoring. Kolko and Kazdin (1991a) found that covert antisocial behaviour was the strongest predictor of firesetting in a discriminant analysis. In personal communication with Kolko, he has concluded throughout his extensive body of work with juvenile firesetters that covert antisocial behaviour was most strongly associated with juvenile firesetting behaviour (D. K., personal communication, 8 June 2007).

Mood disorders or emotional difficulties

Internalised problems in children tend to manifest as anxiety and neurotic symptoms, whereas externalised problems manifest as out-of-control and acting-out behaviours.

Juvenile firesetters generally externalise problems (Jacobson, 1985a) and this may account for not including internalising factors in risk-factor models. Jacobson found that in 104 clinically referred firesetters, 74% had conduct disorder while only 8% presented with adjustment disorders and 2% with neurotic or emotional disorders.

Firesetting is not typically associated with depressive or anxiety disorder or guilt feelings (Fineman, 1980; Kolko & Kazdin, 1994). However, some research has highlighted some cases of depression related to parental loss or separation (Nurcombe, 1964).

Heath et al. (1983) found that a combination of low internalising and high externalising scores on the CBCL measure, along with lower socioeconomic status, significantly predicated firesetting. In general, most antisocial children have both externalising and internalising scores in the clinical range, so it was interesting that the Heath et al. study found that lower internalising scores differentiated firesetters from non-firesetters. This finding was consistent with other studies that have found that firesetters are generally less guilty and remorseful about their negative behaviours and the consequences of their actions than other antisocial youths (Sakheim & Osborn, 1991).

Academic problems

Kolko and Kazdin (1986) did not include academic problems as a risk factor for the onset and continuation of juvenile firesetting. One reason that this factor has not been included in the dynamic risk-factor model could be that there is no evidence that substantiates the link

between firesetting and low academic performance and that there are no intellectual differences between firesetters and non-firesetters (Heath, et al., 1983; Kolko et al., 1985b; Kuhnley et al., 1982). Some studies have confirmed that child firesetters have lower intelligence as measured by lower IQ scores (Lewis and Yarnell, 1951; Nurcombe, 1964) but most firesetters have been described as underachievers at school (Kaufman et al., 1961; Vandersall & Wiener, 1970; Wooden & Berkey, 1984) or have learning disabilities (Gaynor, 1991; Nishi-Strattner, 2005). It appears that many child firesetter have academic problems, but not necessarily intellectual deficiencies.

3.3.3 Social and environmental risk factors associated with juvenile firesetting

Many juvenile firesetters have social deficits and have been exposed to stressful life events.

Social difficulties

Child firesetters tend to experience interpersonal and social failures and have inadequate skills in social settings. They have poor relationships with their peers, inadequate social skills and are generally unable to form close relationships (Wooden & Berkey, 1984) because they tend to be emotionally immature (Kolko, 1999).

Kafry (1980) found that child firesetters experienced more rejection and less support from their peers compared to those who did not engage in fireplay. Vandersall and Wiener (1970) reported that the children in his study conveyed a sense of exclusion, inadequacy and loneliness, and suffered low self-esteem. He also found that many of the boys had inadequate age-appropriate relationships with other children, frequently having older, more delinquent friends. They frequently were teased, seemed isolated, and did not participate in any group activity. Many of them felt they were “not good in sports” or were “picked last all the time”. Data from the Washington County (Oregon) Fire Academy of 247 firesetter

children and their families referred to the program also supports this with 51% of parents indicating that their child was picked on, 55% had friends who were a bad influence and 37% stated that their child had few friends and was physically aggressive or hurt others, thus interfering with their ability to make or maintain friendships (Nishi-Strattner, 2005).

Kolko and Kazdin (1986) include social dysfunction and interpersonal difficulties as part of their dynamic risk-factor model. The FRI (fire-specific and non-fire specific) questionnaire measures the parents' perceptions of the child's social difficulties and the expression of prosocial behaviour.

Exposure to stressful life events and multiple stressors

A predisposing risk factor for children who misuse fire may be exposure to stressful events (Kolko & Kazdin, 1992). These events could include a recent divorce, or an arrival of a new sibling or step-parent (Jacobson, 1985a). Stressful environmental factors are incorporated into both Fineman's (1980) and Kolko and Kazdin's (1986) dynamic risk-factor models. However, this factor is not measured by the CFI and FRI questionnaire due to already existing measures in clinical practice.

Stress affects a developing child differently from an adult; children are not as developmentally able to cope with the demands of stress as adults. Family stress can be disruptive and can lead to an increase in child antisocial behaviour. Moreover, multiple stressors can have a cumulative effect and can increase the child's likelihood of psychiatric problems (Mackay et al., 2006; Patterson, 1982). Fineman (1995) also acknowledged stress as a powerful antecedent that may trigger a firesetting act.

3.3.4 Familial and parental factors associated with juvenile firesetting

There are family and parenting factors associated with juvenile firesetting including parental psychopathology, emotional deprivation and neglect, poor relationships and parental deficits in skills (i.e., disciplinary and punishment skills).

Parental psychopathology

Studies on firesetters' parents and families have reported considerable parental psychopathology. Clinical diagnoses of schizophrenia, psychotic disorders, depression, alcoholism, abusive behaviour and criminality, personality and antisocial disorders have been associated with parents of firesetters (Bumpass, Fagelman, & Brix, 1983; Fine & Louie, 1979; Lewis & Yarnell, 1951; Stewart & Culver, 1982). Fine and Louie (1979) found that of the 11 court-referred cases, six of them had parents with severe psychopathology including attempted suicide, homicide, psychoses and alcoholism. Parental psychopathology and limitation is included in Kolko and Kazdin (1986) risk-factor model. The factor of "parental psychopathology" is not measured by the FRI and CFI questionnaires due to already existing measures in clinical practice.

Specific parental and marital characteristics have been found to delineate the families of firesetters and non-firesetters. Additional to greater psychopathology, parents of firesetters have reported marital conflict and dysfunction. Kazdin and Kolko's (1986) study investigated parental psychopathology, dyadic adjustment and family environment in a sample of hospitalised children aged six to 12 years. The findings concluded that parents of firesetters reported greater dysfunction in terms of psychiatric symptoms and higher levels of depression. In their marital relationships they reported lower levels of affectional

expression, consensus with their partner, and overall lower adjustment in their relationships than non-firesetter parents.

In a later, more extended study that compared inpatients, outpatients, and non-patients in a population of firesetters, matchplayers and non-firesetters, the families of firesetters were reported as more dysfunctional. They reported greater psychological distress, marital disagreement, and exposure to stressful life events and less child acceptance, involvement, monitoring and discipline than non-firesetters. Child firesetters also characterised their parents' child-rearing practices as being more lax, less likely to enforce discipline and consequences, and more prone to instilling anxiety than that of non-firesetting children. The matchplayer children's responses fell between the two groups of firesetters and non-firesetters (Kolko & Kazdin, 1990).

Family factors

Studies of family background have found family discord has been associated with the onset and continuation of firesetting (Kolko & Kazdin, 1992) with many coming from dysfunctional, unstable and disturbed homes (Vandersall, 1970), predisposing them to antisocial behaviours (Fineman, 1980).

The family factors included in the Kolko and Kazdin (1986) dynamic risk-factor model are parenting practices (disciplinary strategies, supervision and monitoring) and parental distance and uninvolvement (relational issues) and these factors are discussed in this section. The CFI and FRI questionnaires measure some parenting practices, including the frequency and efficacy of harsh and mild punishment, supervision and monitoring.

Emotional atmosphere and neglect

Among the family variables associated with juvenile firesetting are poorer parenting practices, abuse, harsh punishment and poor parent–child relationships (Kazdin & Kolko, 1986; Kolko, 1985a; Kolko & Kazdin, 1990). Firesetting can be symptomatic of a family crisis and many child firesetters have been maltreated, neglected and victims of physical or sexual abuse (Nishi-Strattner, 2005; Ritvo et al., 1982; Wooden & Berkey, 1984).

Child firesetters generally come from homes where the parents are hostile, rejecting and have a low acceptance of them. Studies have reported neglect, deprivation of the basic needs for love and security. Nurcombe (1964) found parents to be indifferent, unresponsive, rejecting, aggressive, and overpunitive. He found that only nine parents out of the 21 families provided adequate emotional care and in only one family was the male and female partnership considered adequate.

There is also evidence that abuse is a risk factor for child firesetting (Nishi-Strattner, 2005; Root et al., 2008). The role of maltreatment in juvenile firesetting was investigated with a sample of 205 youths aged four to 17 years who were referred to TAPP-C. This study compared maltreated children with non-maltreated youth within a firesetting population. In the sample, 48% had a history of maltreatment as reported by their caregiver, and of these 26% had experienced more than one type of maltreatment. A further 60% of these children had been previously involved in some way with child welfare (Root et al., 2008).

Root et al. (2008) also found that many firesetting children had been maltreated and concluded that this was a risk factor for a more severe course of firesetting, defined as an earlier onset of fire involvement, more frequent and varied firesetting, higher recidivism

rates, and greater emotional and behavioural problems. This severe course of firesetting is associated with poorer outcomes for children in terms of pathology, treatment and prognosis. In the longer term, and without successful treatment, adult consequences can include interpersonal, psychiatric, and legal difficulties. Root et al. also found that the relationship of firesetting and maltreatment was an indirect link, where heightened emotion resulting from this maltreatment lead to acting out behaviours, such as firesetting.

Quality of parent–child relationships

Quality of the parent–child relationship has been associated with juvenile firesetters with many studies focusing on the child’s relationship with the mother (Sakheim & Osborn, 1986; Sakheim et al., 1985). Sakheim et al. (1985) and Sakheim and Osborn (1986) found that child firesetters experienced strong and enduring feelings of anger and resentment over maternal rejection, neglect, abuse or emotional deprivation. In a later study, Sakheim & Osborn (1991) also found that severe firesetters were chronically angry with their mothers. The relationship with the father has also been reported as dysfunctional or abusive, with a high proportion of deserting fathers who were either completely absent, or, if present, emotionally and physically unavailable for their children (Vandersall, 1970). Macht and Mach (1968) found in their study many mothers were overprotective, while many fathers were absent, and the adolescent, looking for a substitute father figure, lit fires to befriend the fireman, buffering the suffocating relationship they were experiencing with their mother.

Parenting practices

Numerous researchers suggest that parents of firesetters have poor parenting practices and disciplinary strategies, react inappropriately to the child’s firesetting and have limited skills in enforcing rules, monitoring and supervising their child (Gruber et al., 1981; Kazdin &

Kolko, 1986; Kolko, 1985a; Kolko & Kazdin, 1986, 1990; Ritvo et al., 1983; Sakheim et al., 1985; Vandersall & Wiener, 1970).

Harsh discipline and punishment

Patterson (1982) found that parents of antisocial children generally punish their children more frequently, and parents of firesetters are inappropriate in their disciplinary practices and more punitive than non-firesetter parents (Kafry, 1980; Kolko & Kazdin, 1986). This style of parenting encourages the expression of aggression and coercive interactions (Patterson, 1982).

Parental reaction to firesetting

According to various studies, children who anticipate discipline from their parents are more likely to refrain from firesetting (Gaynor & Hatcher, 1987; Kafry, 1980). If the juvenile does not expect to be punished then they are more likely to set fires. The Grolnick et al. (1990) community study of 700 children confirmed this and found that 77% of children expecting no response from their parents reported fireplay, whereas only 12% of those expecting some response reported such activity. Kolko and Kazdin (1994) found that half of the juveniles acknowledged neutral or even positive reactions from their parents for firesetting in their sample of 95 juveniles aged six to 13 years.

Researchers have reported that some parents react in extreme ways such as harsh physical punishment, while others have reported that parents have dismissed or ignored the firesetting incident. In one study, one fourth of the children stated that their parents were either unaware of the incident or had no reaction to it. This absence of consequences or disciplinary action is likely to increase the firesetting behaviour. This study indicated that

juveniles whose parents did not show any response or were not aware of the firesetting incident were more likely to report matchplay at the two-year follow-up (Kolko and Kazdin, 1994).

Some parents, at the other extreme, punish their children severely. In the Ritvo et al. (1983) study of incarcerated adolescent delinquents, they found that adolescent firesetters had a significantly greater history of severe burns than non-firesetters and that the majority of the burns were inflicted by parents as punishment for lighting fires. To the adolescent, this may have conveyed a message that the misuse of fire is an acceptable mode of retaliation. Other studies have reported similar findings, where the parents had burnt the child to punish them for firesetting (Madanes, 1991). This severe punishment does not match the misbehaviour and sends contradictory messages to the child. Evidence has indicated that this type of disciplinary action will not stop these juveniles from lighting more fires (Ritvo et al., 1983).

Another study found that the most common parental strategy and response to their child's firesetting was applying scare tactics or physical punishment, and that professional referral to a mental health professional was the last option (Kolko, 1988). Patterson (1982) suggests that in the absence of rules and boundaries, parents frequently resort to physical punishment to control their child's behaviour.

Lack of household rules

Child firesetters generally come from families that set few limits and rules, do not enforce discipline, and lack supervision and monitoring. Household rules that state the expectations of what is and is not acceptable behaviour in family life are generally absent in families with antisocial children (Patterson, 1982).

Poor monitoring and supervision

Prolonged disruptions in parental monitoring and the failure to adequately punish antisocial acts are associated with both the onset and continuation of antisocial behaviours. Parents of antisocial children have been generally described as “unmotivated” in their role as parent. Patterson (1982) concluded they did not want to monitor the child’s behaviour or confront the child’s antisocial behaviour. Antisocial children do not grow out of their behaviours on their own and unless they are taught otherwise they will continue behaving in antisocial ways. Fine & Louie (1979) and Block et al. (1979) also noted that firesetters were frequently involved in accidents, perhaps reflecting a lack of supervision in the home.

3.3.5 Summary

Firesetting is a possible sign of an at-risk young person and may be symptomatic of a deeper problem, such as family issues or mental health problems. Firesetting is often associated with and embedded in a variety of problems ranging from psychosocial, family dysfunction, behavioural and clinical problems.

It has been suggested that there is a variety of explanations for firesetting behaviours and that firesetters are heterogeneous group presenting with diverse problems. There are many ways to conceptualise the problem and researchers have concluded that there appears to be no specific profile of the juvenile firesetter and that the symptom of firesetting is multidetermined (Kuhnley et al., 1982). However, some commonalities of the juvenile firesetter have emerged in the literature. Research has suggested that the range of characteristics associated with firesetting in children include both individual and family variables. These characteristics can include both general behavioural dysfunction and fire-specific factors that place the juvenile at risk of onset or continuation of firesetting behaviours.

3.4 Fire-specific risk factors associated with juvenile firesetting

Fire-specific factors are associated with juvenile firesetting and they include: curiosity, attraction/preoccupation and fire interest; early experiences with fire, involvement and fire history; access to fire materials and exposure to models that misuse fire; and fire safety knowledge and skills. These variables, assessed on the CFI and FRI questionnaire, are discussed in detail.

3.4.1 Curiosity, attraction, preoccupation and fire interest

FSE operates under the assumption that by educating and raising awareness of fire and fire safety the child's curiosity and misuse of fire will be channelled into more fire-safe and responsible behaviours (Gaynor & Hatcher, 1987). Curiosity, defined as the desire to know, is the most common reason reported for firesetting behaviour (Stadolnik, 2000). It is commonly accepted amongst adults that a child's curiosity about fire, especially at certain developmental stages, is natural and normal (Bumpass et al., 1983; Grolnick et al., 1990). Studies that have explored the prevalence of firesetting in "normal" populations anticipate that 60% (Gaynor, 2000; Gaynor and Hatcher, 1987; Schwartzman, 2002;) of child-set fires are initiated by "curiosity firesetters" and that fire interest and fireplay in children can emerge as early as two or three (Kafry, 1980; Nurcombe, 1964). Curiosity, fireplay and attraction at an early age may determine later involvement in firesetting.

A curious firesetter is generally a younger child (between the ages of five and 10 years), who may be involved in an isolated "accidental" act or simple experiment with fire use (i.e., wanting to see what would happen). It is reported that these children also tend to be from stable backgrounds, generally do not have any psychological problems and may be involved in only one fire incident. They are frequently described as benign and normal because they

do not developmentally understand the consequences of their actions (Grolnick et al., 1990). However, some researchers have discovered that curiosity is not as benign as previously thought and can be a more enduring motive for repetitive firesetting (Kolko & Kazdin, 1991b; Mackay et al., 2006) or disturbance (Hanson et al., 1995; Jacobson, 1985a; Pinsonneault, 2002a; Yarnell, 1940). Curiosity is frequently synonymous with attraction to fire, which may represent a more maladaptive preoccupation. Natural curiosity and attraction at an early age may not progress to fire-risk behaviours, but data has suggested that of those children expressing an interest in fire, 50% will actually participate in fireplay (Kafry, 1980; Block et al., 1979).

In one study, it was found that children who self-identified as highly curious about fire may be more emotionally disturbed and more physically involved with fire than children who report low curiosity (Kolko & Kazdin, 1991b). Clinical opinion suggests that there may be a point where curiosity becomes too high and progresses to a preoccupation with fire. Kolko suggests that curiosity is a transient state and fascination is an enduring trait that may be more pathological and lead to a preoccupation with fire. So those who are fascinated have more of a relationship and connection to fire and have also been described as having an atypical curiosity about fire. The CFI and FRI questionnaires do measure curiosity and may assess some elements of preoccupation and fascination by asking questions like, “How special or magical is fire to you?” or by observing how excited or fascinated the juvenile becomes when fires are mentioned in everyday conversation. However, neither of the two constructs has been distinguished in the literature, nor have they been empirically validated (D. K, personal communication, June 8 2007).

Anger and curiosity are viewed as two of the most common motives for firesetting (Kolko and Kazdin, 1994; Kolko and Kazdin, 1991b; Root et al., 2008). Sakheim and Osborn (1991, 1999) demonstrated that higher levels of anger and fire interest differentiated “high-risk” or severe firesetters from those deemed to be “low-risk” or non-severe firesetters.

In the Kolko and Kazdin (1991b) study, children were categorised as either high- or low-curiosity, or high- or low-anger and these motives were compared. The objective of the study was to examine whether these two motives were associated with different patterns of child psychopathology, firesetting risk factors, involvement in fire-related behaviours, and firesetting incident parameters (e.g., characteristics, correlates, and consequences). The unanticipated finding was that heightened behavioural dysfunction was more associated with high-curiosity children, but not angry children. This was surprising given that curiosity firesetters are generally depicted as “normal” and benign, in contrast with those whose motives involve anger and revenge and tend to be portrayed as more malicious and intended. It was suggested that curiosity and interest represented a more enduring motive than anger, sustaining a more continual and prolonged involvement with fire and other deviant activities. They concluded that high fire interest was associated with greater overall behavioural dysfunction, firesetting risk, and fire involvement.

Mackay et al. (2006) found that after controlling for conduct disorder, heightened fire interest was a significant predictor of both the frequency and versatility of a child’s fire involvement and recidivism during the 18-month follow-up period. Externalising behaviours were thought to trigger the initial onset of firesetting; however, once this pattern was established the sustained and heightened interest in fire continued to fuel the behaviour. This study demonstrated that heightened interest may increase a child’s repetitive firesetting

once already engaged in the behaviour. The study also supported theoretical models of juvenile firesetter risk factors that combine fire-specific as well as more generic (non-fire-specific) mental health/criminogenic factors when assessing juveniles. Furthermore, it supported Kolko and Kazdin (1991b) argument that curiosity and interest should not be cast as a benign characteristic and that the widely used label “curiosity firesetter”, which is used to convey low-risk, should be re-evaluated.

The Kolko, Hershell and Scharf study (2006) found that FSE intervention was not effective in reducing curiosity about or attraction to fire. Kafry’s (1980) study also found that fire attraction was independent of fire competence and fire avoidance. These findings have suggested that it is not possible to solve the child’s fire problem by focusing only on preventative measures or education about fire safety while ignoring the curiosity and fascination attached to fire. Clinical opinion indicates that fascination with fire is more dangerous and less amenable to intervention, whereas curiosity with fire is easier to change (D. K., personal communication, June 8 2007). This indicates that fascination with fire may require more intensive intervention or psychological interventions that directly target pathological interest in fire.

3.4.2 Early experiences with fire, fire history and involvement

The prevalence and impact of fire interest has been investigated in several community and clinical studies and is important in understanding firesetting behaviour because fire interest can emerge early and commonly leads to fireplay/firesetting (Kafry, 1980; Kolko, 2001a; Mackay et al., 2006). Most children’s interest in fire will be particularly salient around the ages of three to six years, but will often become a passing phase once the child matures (Nurcombe, 1964).

Some researchers have suggested that matchplay leads to firesetting and then more graduated acts, especially if there is no intervention or consequences (Patterson, 1982). Kennedy Vale, Kahn & McAnaney (2006) found that past involvement with fire was the best single predictor of recidivism.

Some researchers have concluded that children should be exposed to everyday tasks concerning fire, such as helping light the BBQ, to satiate fire fascination, enhance fire safety skills and the responsible use of fire (Kafry, 1980). Gaynor and Hatcher (1987) also supported this and suggested that children who learn to use fire materials in a controlled, supervised setting can demonstrate fire competence and fire-safe behaviours. However, other research has found that children who were more involved in these activities under supervision were significantly more involved in fireplay (Grolnick et al., 1990). Whether or not the child should be allowed to use matches and be empowered with fire responsibilities under supervision is debatable. With more mature children and non-pathological firesetters this may be effective. However, Block et al. (1979) found that some children may construe permission to light a fire in the parent's presence as blanket permission for unsupervised use of matches. Furthermore, they assessed parental attitude toward supervised fire use. Some mothers indicated that they refused to let their children use matches even under supervision because they were fearful of fire. However, forbidding children may be less effective and may even encourage the curious child who likes to test the rules to experience the forbidden.

The FRI's assessment of juvenile fire involvement includes only three questions relating to fire involvement behaviours. These are: seeking out ignition sources, burn marks on items in the home, and complaints from others in the community about the juvenile firesetting.

The CFI asks the juvenile four questions relating to fire involvement centred around setting

off false fire alarms, hiding ignition sources, leaving burn marks in the home, and complaints from others in the community about their firesetting behaviour. Community complaints about the child's firesetting behaviour are used by the CFI and FRI questionnaire to verify that their involvement with fire has become a community problem and that other people (i.e., neighbours) are aware of it. This may indicate that the juvenile's involvement with fire has become more frequent, severe and versatile (i.e., the juvenile has used different ignition sources or has tried to ignite a variety of different targets). However, the FRI or CFI do not specifically include versatility, severity or onset in their measure of firesetting involvement.

Both the FRI and CFI assess the juvenile's early experiences with fire by asking the parent about (1) the child's exposure to models who misuse fire more than a year ago (i.e., smokers living in the home or family members who misused fire more than a year ago), and (2) the child's misuse or special interest in fire (more than a year ago). However, neither the CFI nor the FRI question parent or child about the age of onset of the firesetting behaviour or the frequency of fire involvement. Age of onset is particularly relevant in the severity, course and outcome of firesetting behaviour, with some researchers predicting a more severe course for earlier onset (Root et al., 2008).

The TAPP-C program assesses the youth's fire involvement using the "Fire Involvement Interview" (Henderson et al., 2006). This interview includes questions about (1) when the fire involvement began (age of onset); (2) the total number of episodes of fire involvement (frequency); (3) the types of ignition sources used; (4) the types of targets ignited, and the locations where the involvement occurred (versatility); and (5) the accomplices involved in the firesetting, and the damages that occurred. This interview yields a youth involvement score. Typically, a juvenile who has an early onset of the behaviour, has been responsible

for greater damages, and is more frequently involved and more versatile with fire will receive a higher score on this interview. This high score generally indicates that the youth is a more severe firesetter, is pathological and may have a more severe trajectory of firesetting and conduct problems (Mackay et al., 2006). This interview is more comprehensive than Kolko and Kazdin's (1989a, 1989b) determination of fire involvement as assessed by the CFI and FRI because it includes the variables of fire severity, frequency, versatility and age of onset when assessing the youth's involvement with fire.

3.4.3 Exposure or modelling and parental responsibilities

Exposure has been associated with juvenile firesetting and this can include: the availability of ignition sources, influence of parents and other significant models, smoking in the household, injury from fire, influence of peers and siblings who may misuse fire, and the surrounding neighbourhood. Availability of matches and lighters and models who misuse fire are significant environmental risk factors (Grolnick et al., 1990).

The home environment is the most common place where matches and lighters are found. Research has indicated that 90% of fires started by children use matches and lighters as their ignition source (Hall, 2005). In Grolnick's et al. (1990) community study, 770 children aged six to 14 years completed a survey that assessed their attitudes towards and experiences of fire. Access to ignition materials was assessed by two questions: "Could you get matches if you wanted to without asking?" and "Could you get a lighter without asking?" Overall, 40% reported access to matches, and 33% reported access to lighters, whereas 29.4% had access to both. In Nishi-Strattner's (2005) review of the Washington County Fire Academy Program, 42% of parents from the 247 families referred to the program over a four-year period acknowledged that their children had easy access to lighters and matches.

Children frequently light fires because they have access to ignition sources and are not being monitored or supervised (Holland, 1969; Stawar, 1976). Researchers have emphasised simple practical solutions to parents of children who set fires (Humphreys, Kopet, & Lajoy, 1994; Wilcox, 2006). Humphreys et al. (1994) have several practical suggestions for parents to help them monitor, instruct and manage their firesetting children (e.g., remove matches and set firm rules about fireplay, monitor TV habits, discuss consequences in advance, forbid fireplay and inform firesetting children that routine searches of rooms and belongings will occur). Parents generally have more control over the home environment than children so the significance they place on fire safety is a critical factor. Restricting access to fire sources, combined with adequate supervision, is perhaps the most realistic and effective procedure for preventing future firesetting (TAPP-C – S. M., personal communication, 1 June 2007).

Appropriate modelling

From a social learning theory perspective, firesetting is thought of as a learned aggression and this behaviour continues to be reinforced by inappropriate modelling. So if the adult role models are consistently careful with fire and model appropriate fire safety this can lead to fire-safe behaviours. Appropriate modelling can include the manner in which parents use fire, the significance they place on fire safety, the level of appropriate concern, and the consistency in which they deliver these fire safety messages (Fineman, 1980; Gaynor & Hatcher, 1987).

Inappropriate modelling

Inappropriate modelling occurs when the child receives positive reinforcement for fireplay or observes inappropriate firesetting modelled by parents or others. Kolko and Kazdin

(1994) found in slightly more than half of their sample of 95 juveniles aged six to 13 years that fires were set in the presence of another person, mostly friends. In Nishi-Strattner's (2005) study, 25% of the parents reported that others in the family home also set fires. The group JFAIP data from Chapter Two indicated that 29% of families involved in the JFAIP over a two-year period had other children in the family who were also involved in firesetting. Family modelling and peer pressure powerfully influence juvenile firesetting and these studies suggest that approximately 25–50% of children who are lighting fires do so in pairs.

Firesetting behaviour can gain the attention and admiration of peers, but also has negative outcomes such as property loss, injury and punishment. It is expected that children who have seen or experienced the negative effects of fire would be less likely to play with it. However, Ritvo et al. (1983) found that some juveniles who had experienced painful burns had not stopped firesetting. They also found that these children were frequently burnt by their parents as punishment for firesetting, thus sending a message that fire is acceptable retaliation.

Smoking in the household has been identified as one of the correlates of child fire involvement (Putnam & Kirkpatrick, 2005). Cigarette smoking of parents can provide both a model of adult “fireplay” and easier access to ignition sources (Adler et al., 1994). The fire exposure variable as found in the FRI includes smoking as one of the number of situations in which children were exposed to the involvement of fire-related activities. The fire-specific variable of exposure differentiated firesetters from non-firesetters (Kolko and Kazdin, 1989a; 1989b).

3.4.4 Knowledge and fire safety skills

The aim of most FSE programs is to increase fire safety knowledge, skills and awareness. FSE teaches skills and knowledge in personal safety strategies (e.g., stop, drop, cover and roll), the nature of fire (e.g., what burns, the power of one match, and how quickly fire spreads), what firefighters do, building of fire knowledge (e.g., the fire triangle and hazards), taking responsibility for safe-fire behaviour, and the consequences of misusing fire. FSE also targets parents by encouraging them to have a safe home environment, such as no fire hazards and safe storage of ignition sources (Cole et al., 2006; Kolko, 1996, 1999; Kolko et al., 2006; Schwartzman, 2002).

It is important to keep in mind when interpreting the pre- and post-results of knowledge and skills that the CFI and FRI measures may not have captured all aspects of knowledge and skills taught in the JFAIP as explained in section 4.3.4 and 4.3.5 of materials.

The JFAIP and most FSE programs teach children about what burns and does not burn through fire knowledge questionnaires and conversations with the firefighter. This is an important component of the curriculum because Grolnick et al. (1990) found that children lack basic awareness and knowledge of what burns and what does not burn. In his study, he found that about half of the boys could not assign plastic, rubber, chalk, and aluminium items correctly to burnable or non-burnable materials.

The nature of fire is also frequently taught in the JFAIP intervention, typically by using DVD footage such as the Bradford fire video, and footage of lounge room and bedroom fires. These DVDs are shown to children because they frequently do not understand how quickly fire can get out of control and often assume that they can keep a fire small. For

instance, Grolnick's et al. (1990) study found that children who believed that they could control fire were more likely to play with fire. They also concluded that children who understood the destructiveness of fire were no more likely to stop firesetting. This finding is similar to that of Kafry (1980) who also found that children continued to play with fire even though they knew that it was wrong and forbidden.

In terms of fire safety skills, the JFAIP and most FSE programs are skill-based and incorporate behavioural training and instruction on personal fire safety strategies through rehearsal and role plays (Cole et al., 2006). A skill-based FSE program is particularly relevant as Grolnick et al. (1990) found that many children did not know the correct response to various fire situations (such as clothes catching fire, or smoke in the room).

The Block et al. (1979) study found that 42% of children were reasonably competent in handling and lighting matches correctly and that competence increased with age for children who were allowed to light matches under supervision and for those who were involved in fireplay (Kafry, 1980).

Researchers have debated whether children should be taught fire responsibilities under supervision (see section 3.4.2; Block et al., 1979; Gaynor & Hatcher, 1987; Grolnick et al.; 1990; Kafry, 1980). Gaynor and Hatcher (1987) argued that learning fire safety behaviours is part of the child developmental skills repertoire and is comparable to learning how to cross the street safely. Despite this, one study found that, in general, parents were particularly lax in teaching their children about the use of fire in comparison with other safety life skills such as avoiding street accidents, drowning, burns and ingesting poisonous substances (Block et al., 1979).

The Grolnick et al. (1990) study confirmed that assigned responsibilities were strongly associated with fireplay. Programs such as the JFAIP do not directly teach fire-safe behaviours such as the correct way to light stoves or strike matches. There is evidence of some programs that practice this, such as the “Smokey the Bear” program, and the authors have concluded that this was an effective strategy (DeSalvatore & Horstein, 1991). There appears to be conflicting evidence as to whether or not children should be empowered and assigned with supervised fire responsibilities to teach them appropriate fire use. Certain less pathologically driven firesetters may benefit from this type of teaching.

Evaluations of children’s short-term knowledge and skills have been conducted mainly in primary prevention programs (R. T. Jones, Kazdin, & Haney, 1981b; McConnell, Leeming, & Dwyer, 1996; Satyen, Barnett, & Sosa, 2004) but not in secondary intervention programs that target juvenile firesetters. Jones et al. concluded that you can teach children fire safety skills, but long-term retention may require more continual and repetitive training (Satyen, et al., 2004).

A study that evaluated children’s retention of fire safety knowledge after exposure to the MFB Fire Education Primary Prevention Program found that at three weeks follow-up, the children displayed a significant gain in knowledge as compared to the controls that were not exposed to the program. At five week follow-up, Satyen et al. (2004) found that there was a significant decline in the children’s retention of knowledge from week three to five, recalling 81% of information compared with 69% respectively. This decline could be consistent with cognitive development theories that maintain that children are a difficult group to reach in terms of training because their age limits their ability to understand and remember what they

are taught. This study supports the claim that children need continual, repetitive and periodic training in fire safety messages if they are to retain them over time.

Improvements in knowledge have been found in other studies (Kolko, Watson, & Faust, 1991). However, Kolko (1996) found no evidence to suggest that increased knowledge is causally related to the outcome of less interest and involvement in fire and concluded that education does not necessarily result in behavioural change. Kafry (1980) also found that fireplay was not related to fire knowledge, and the Grolnick et al. (1990) study was consistent with Kafry. These studies indicated that discussion of the dangers of fire had limited impact on safety behaviour and that increasing understanding about fire was not the sure route to decreasing the prevalence of fireplay and firesetting.

3.4.5 Summary of fire-specific risk-factors associated with juvenile firesetting

Juvenile firesetters present with both fire-specific and general behavioural risk factors. Thus, practitioners need to assess for both risk factors. What is most interesting is the variable of curiosity, commonly thought as benign and normal. The recent evidence has concluded that this motive is dangerous and can be a marker of preoccupation, recidivism and clinical or behavioural problems. The difference between curiosity and fascination still needs to be verified through research. However, there is fairly compelling evidence that young firesetters can present with preoccupation, which is associated with an ongoing relationship to fire and is difficult to treat. Certainly, this is important for FSE programs who have assumed that they can satiate a child's interest and curiosity with fire by educating them.

Age of onset also is particularly relevant in understanding, assessing and treating juvenile firesetters. Research suggests that the earlier the onset the more severe the course of

firesetting. It may be particularly useful for practitioners to take an in-depth fire history of the youth. The TAPP-C risk evaluator does this and asks questions to both the child and the parent about when the firesetting started. Firesetting time-lines can be constructed to assist the child in this process of the assessment.

Another aspect of TAPP-C's assessment that could provide valuable information to the clinician is the assessment of the child's fire involvement. This assessment not only looks at age of onset, but also looks at frequency, severity (damages caused), versatility (what was the ignition source, where the fire was lit and what was ignited), and who was involved (any accomplices).

Fire knowledge and fire safety skills are generally targeted by most FSE programs that are skilled based. Research has found that children lack fire safety knowledge and skills. One study that evaluated a prevention program offered by the MFB found that there was significant improvement on knowledge 3-weeks after the completion of the program; however at 5-weeks this knowledge was significantly reduced. Children are a difficult group to reach in terms of training because their age limits their ability to understand and remember what they are taught, thus may need longer and more repetitive exposure to these programs.

3.5 Prevalence and factors associated with recidivism

Juveniles with a firmly established pattern of firesetting can have a destructive impact on themselves, family and community. Presently there is little work that has investigated recidivism prospectively and evaluated the factors with which it is associated (Brett, 2004; Kolko & Kazdin, 1992). However, there is some evidence that firesetting is a behaviour that

juveniles may engage in repetitively, and that one in every four firesetters may be a recidivist (Kolko, 1985a).

The rate of recidivism can vary across studies due to the differences in the populations (patients versus community samples), the ages of the samples (young children versus adolescents), methods of assessment (parent versus child reports), and definitions of firesetting, recidivism and treatment effects (Kolko & Kazdin, 1992). Some studies have reported high recidivism rates of 50–65% (Kolko and Kazdin, 1988a), while other have reported rates as low as 9% (Stratchan, 1981), and even lower (0–6%) after receiving intervention (Adler et al., 1994; Kolko, 1999).

In clinical samples, the prevalence rate of firesetting and recidivism may be higher. For instance, Kolko and Kazdin (1988a) found recidivism rates as high as 52% and 72% for outpatients and inpatients respectively over a 12-month follow-up period. Combined samples of patients and non-patients have found similar results. For example, in a prospective longitudinal study of children's involvement with fire over a two-year follow-up period, 50% and 59% of firesetters in a nonpatient and patient sample, respectively, become recidivists (Kolko et al., 2001b). In another prospective study, Kolko and Kazdin (1992) found that 21 out of 60 firesetters (35%) had set multiple fires in a one-year follow-up period.

There is diverse evidence as to the correlates of firesetting recidivism. Broadly, the evidence points to fire-related variables, general behavioural or family dysfunction, or a combination of these factors that are highly related to the onset and continuation of firesetting. Studies that looked at both the fire-specific factors and overall behavioural dysfunction have

concluded that both factors contribute to recidivism (Kolko and Kazdin, 1986, 1994; Kolko et al., 2001b; Nishi-Strattner, 2005; Mackay et al., 2006).

3.5.1 Fire-specific factors and recidivism

The fire-specific factor of fire involvement has been reported as a salient predictor in several studies (Kennedy et al., 2006; Kolko et al., 2001b; Kolko & Kazdin, 1992). A recent systematic review of six studies and two dissertation abstracts found that previous involvement in firesetting behaviour was the best single predictor of recidivism (Kennedy et al., 2006). In the Kolko and Kazdin (1992) study, child recidivists acknowledged greater attraction to fire and greater involvement than non-recidivists at one year follow-up. Rice and Harris (1991) had consistent results with a family report of the childhood interest in fire as the most robust predictor of adult arson. Several other studies have found that previous involvement in firesetting behaviour predicted recidivism (Kennedy et al., 2006; Kolko et al., 2006); this is consistent with the notion that past behaviour predicts future behaviour (Root et al., 2008).

3.5.2 Recidivism and general behavioural and family dysfunction

Recidivists are characterised by heightened externalising behavioural problems and general behavioural dysfunction (Kolko et al., 2006). Adler et al. (1994) found that child psychopathology was the only significant correlate of firesetting recidivism at 12 month follow-up. Root et al. (2008) found that externalising factors as measured on the CBCL predicted the child's continual involvement with fire. They found that for every unit increase in externalising behaviour on the CBCL, the risk of recidivism increased by 10%. This is an important finding because it was calculated using odds ratios of continuous predictors that are cumulative in nature. Thus, a five point difference in a child's CBCL externalising score (e.g., a t-score increase from 64 to 69) would be associated with a 50%

increase in a child's risk of recidivism. The externalising scores on the CBCL cannot be understated in predicting child firesetting recidivism. Moreover, these scores reflect significant mental health needs that should be addressed within the context of a comprehensive treatment plan.

Other psychosocial variables such as child maltreatment can predict recidivism and are linked to a more severe trajectory course of firesetting. It was found that children with a history of maltreatment demonstrated more frequent fire involvement, and more versatility regarding ignition sources and targets. Maltreated children were more likely to react to family stressors and become involved with fire out of anger (Root et al., 2008). Other family factors correlated with recidivism include lax discipline, family conflict and hostility, less affiliation, disorganisation and exposure to stressful events. Parental mental health problems and parental-child relational problems were also more linked to recidivist children than non-recidivists (Kolko & Kazdin, 1992).

3.5.3 Combination of fire-specific and general behavioural dysfunction and recidivism

Research has acknowledged the contribution of factors that place children at risk of recidivism. These include both fire-specific and more general behavioural dysfunctional risk factors. Kolko et al. (2006) found that greater involvement, curiosity, firesetting history and externalising behaviours were predictors of recidivism. Kolko and Kazdin (1994) found that children who had set multiple fires differed in both clinical features (engaged in more covert and externalising behaviours) and were more curious about fire than single incident firesetters. Kolko et al. (2001b) found that involvement in fire-related acts and covert antisocial behaviour predicted recidivism for inpatients and outpatients.

Nishi-Strattner (2005) also investigated the difference between first-time firesetters and repeat offenders who participated in the Washington County Fire Academy Program. She found that repeat offenders set more fires within the home, were fascinated with fire, showed more versatility in firesetting acts (i.e., fireworks and explosives), set fires with their peers, did not call for help once the fire was set, used a lighter as an ignition source, and continued lighting fires. Repeat firesetters were also behaviourally different as they were more likely to destroy their own possessions, fought with their caregivers more often and frequently lied. These repeat firesetters had been exposed to more traumatic experiences in the past one-year period and were educationally more disadvantaged (with 48% having special educational needs) than single firesetters as reported by their parents.

3.5.4 Intervention and recidivism

In general, children who receive therapy or intervention are much better off than those who do not as these reduce recidivism rates (Kazdin & Nock, 2003). In community programs, the prevalence of firesetting has been reported to be lower after intervention, but this may also be due to fewer dysfunctional clients. A community sample of 29 national FEMA and Firehawk programs that included over 2,000 participating families found that the program served mostly males (90%) between the ages of seven and 12 years (50%). Prior to intervention, 50% of these boys were repeat firesetters. After receiving the intervention, the recidivism rates were reported by the program managers to be between 1–6% (Kolko, 1988). However, it was noted that not all programs follow up their clients in a standardised way, with only 40% of these programs having a follow-up protocol in-built in their programs. Legal professionals also have found intervention vitally important. In the state of Massachusetts, repeat firesetting is at approximately 80% without intervention, a figure that is reduced to approximately 5% after intervention (Massachusetts State Police – P. Z, personal communication, 30 May 2007).

CHAPTER FOUR: Analysis of risk factors for firesetting, considered before and after participation in the JFAIP

The evidence of Chapter Three suggests that there are a range of general behavioural and fire-specific factors associated with both the onset and continuation of firesetting behaviours. The evidence also indicates that interventions do have an impact on recidivism rates. This study explores both general behavioural and fire-specific risk factors pre-and post-JFAIP intervention.

Chapter Four includes:

- study design and rationale
- aims and hypotheses
- methodology
- evaluation of individual, fire-specific and general behavioural risk factors and one-year recidivism findings pre- and post-JFAIP intervention
- qualitative descriptions
- comparison of recidivists and non-recidivist risk factors
- general discussion.

4.1 Study design and rationale

4.1.1 Rationale

It is widely accepted that part of the problem in evaluating and assessing children who light fires is the unavailability of sufficient measures and assessment tools. In particular, there is a lack of standardised measures that permit evaluation of fire safety educational interventions (Kolko et al., 1991).

Kolko and Kazdin's (1989a, 1989b) study on the CFI and FRI measure demonstrated the scales that can reliably assess aspects of the firesetting model and predict firesetting risk. Reliability of the FRI and CFI measures are discussed further in psychometric properties in sections 4.3.4 and 4.3.5, respectively. After controlling for conduct disorder, Kolko and Kazdin concluded that the FRI and CFI were reliable measures of the risk-factor model because they could discriminate firesetters from non-firesetters on certain risk factors. These measures remained stable even though the sample might have varied across child pathology and demographics. Due to their reliability and objectivity the pre-and post-CFI, FRI and FHS measures were used in this study on JFAIP clients. Other studies have also used these measures as the risk assessment tool (Kolko & Kazdin, 1992, 1994; Kolko, 1996, 1999; Kolko et al., 2001; Kolko, 2006).

Validation of the FRI

Kolko and Kazdin (1989a) validated the FRI in a sample of 343 firesetters (114) and non-firesetters (229) who were aged six to 13 years from three separate samples of non-patients, inpatients and outpatients. The parents were administered the FRI, the interview for antisocial behaviour and demographic questionnaires. Conduct disorder was a common diagnosis and was controlled for.

The FRI study revealed that firesetters were different to non-firesetters on five of the eight fire-specific variables. Firesetters:

- were more curious about fire
- were more involved in fire-related activities
- had more early experiences with fire
- received more complaints regarding firesetting behaviour

- had greater exposure to ignition sources and peers or family members who were interested in fire.

There were no significant differences between firesetters and non-firesetters on the variables of fire knowledge, safety skill and parental awareness. For general behavioural dysfunctional risk factors (“non-specific-to-fire” variables), firesetters were significantly different from non-firesetters because their parent(s) reported:

- greater expression of negative behaviours
- greater frequency of harsh punishment
- less responsiveness to administration of mild punishment
- and a tendency to be less responsive to the administration of harsh punishment (“a trend”).

There were no differences between firesetters and non-firesetters in the expression of positive behaviour.

Discriminant analysis was undertaken to classify the firesetter and non-firesetter groups. The discriminant function correctly classified 68.1% of firesetters and 88.7% of non-firesetters for an overall classification accuracy of 81.5%, indicating that the scale could accurately predict and correctly classify a significant number of children by their firesetting status. Four dimensions contributed to this significant function, including involvement with fire, curiosity about fire, complaints about fire behaviour and expressions of negative behaviour.

Validation of the CFI

The CFI was administered to 519 children (343 males and 176 females, aged six to 13 years) with a sample from non-patient (n = 251), outpatient (n = 154), and inpatient (n = 114) populations. All children were assessed using the CFI, FHS, Fire Safety Knowledge Questionnaire, and Interview for Antisocial Behaviour (IAB). The most common diagnosis was conduct disorder and this was controlled for.

The results indicated that firesetters received significantly higher scores than non-firesetters on the variables of “curiosity”, “involvement” and “exposure to models”. Unexpectedly, firesetters were found to be significantly more knowledgeable than non-firesetters about combustible materials, contradicting Kolko and Kazdin’s original hypothesis. One possible reason for this is that knowledge does not necessarily suggest that they are more competent in responding to an actual fire (i.e., skills). Firesetters did receive lower scores on “supervision/discipline” and “fire skills” variables, but these scores only approached significance, which also contradicted prior predictions.

Discriminant analysis function also correctly classified 61.6% of the firesetters and 76.6% of the non-firesetters, for an overall classification accuracy of 71%. This satisfactory classification suggested that the proposed risk-factor model could accurately predict and correctly classify a significant number of children by their firesetting status.

4.1.2 Study Design

The design of this study was pre- and post-research, where the CFI, FRI and FHS measures were administered at both pre-JFAIP intervention and post-three months of JFAIP intervention. The design also prospectively followed up families for 12 months to determine if the juveniles remained fire-safe at three monthly intervals. Three post-intervention phone

calls were made. Children who continued firesetting in either the intervention or follow-up time were identified as recidivists (Table 5 recruitment and administration procedures).

Similar to Kolko and Kazdin's (1989a, 1989b) research design, the data was analysed using Multivariate Analysis of Variance (MANOVAS). However, because this study was a pre-and post-design, repeated measures MANOVAs were used. The study also followed up MANOVAs with discriminant analysis to determine whether the child's firesetting status of recidivist and non-recidivist could be correctly classified.

Pre-and-post design

This part of the study is based on a pre-and-post intervention design where each participant is their own control. This is a pragmatic design that is used when a control group cannot be employed. A randomised control trial is considered the most effective way of evaluating treatment efficacy. However, a randomised control trial requires another reasonably effective treatment option for the participants involved in the study (i.e. a control group; APA, 2002). A control group was not considered a viable option for this study as firesetters and their families represent a vulnerable group that need services and treatment. The JFAIP is currently the only intervention available for firesetters, thus in a real-life setting it is unethical to deny juveniles access to an intervention without any suitable substitute.

Interviewing children

Previous research has highlighted the importance of assessing the activities related to a child's involvement with fire by asking them directly (Grolnick et al., 1990; Kolko, 1999; Kolko & Kazdin, 1994). The CFI was used in the study to gain the child's perspective because it demonstrated that it could reliably capture the child's firesetting risk. In addition,

the firesetting act is usually covert in nature, thus multiple perspectives from diverse sources are required, inclusive of the child. The Kolko and Kazdin (1994) study found that children were reliable informants of their firesetting and that the child's reporting on the details and parameters of their firesetting incidents (inclusive of situational context, precipitants, motives, consequences) could predict future firesetting acts.

Sample

The sample represents those firesetters that come to the attention of authorities. As indicated in section 2.3.3 approximately 200 to 300 clients are referred to the JFAIP annually. This study included 29 families which is representative of firesetters that come to the attention of authorities. Thus, the families who are not accessing services for this problem may be underrepresented. The families were randomly selected through the state coordinator of the JFAIP and were self-selected. It is also possible that the sample underrepresents some firesetters because of self-selection.

The sample also only included boys and thus not inclusive of female firesetters, who are known to be qualitatively different from boys (Block et al., 1976; Dadds & Fraser, 2006; Kolko & Kazdin, 1994). Previous research has also consistently highlighted the prevalence of boys in firesetting populations (Kolko, 1985a). Exploration of the JFAIP database from 2003 to 2005 was also consistent with previous research, finding a ratio of 9:1 of boys to girls. Due to the greater prevalence of boys, this study only examined JFAIP families with boys.

Age range (six to 13 years old)

The age range parameter of six to 13 years was chosen for this study because the JFAIP does not deliver to younger clients and older (adolescent) clients may represent a different, more pathological sub-set of firesetters. The average age of children involved in the program was nine years and eight months; a decision was made to incorporate roughly three years either side of this range.

Mechanisms of change in juvenile firesetting intervention

The mechanisms of change are the processes that lead to and cause therapeutic change. According to Kazdin and Nock (2003), mechanisms for change explain why and how an intervention works through mediators and moderators. A mediator explains why the intervention worked and what caused the behavioural change. Understanding this mechanism enables program designers or clinicians to maximise improvements in clients. In contrast, moderators explain how the therapy works in terms of what variables can influence the outcome of the intervention, such as characteristics of the child (e.g., age of onset, severity of dysfunction), the practitioner (e.g., experience, style, and personality), family (e.g., dysfunction) and social context (e.g., neighbourhood, safe home environment or socioeconomic status). Moderators tend to influence the outcome of the intervention and whether or not they nurture and support behavioural change. Kazdin and Nock argue that it is important to understand why and how the intervention works because it may optimise therapeutic change, help in the development of treatment manuals and ensure that the right intervention is targeted most appropriately to the client group.

Kazdin and Nock (2003) suggest that mediators of the intervention are difficult to determine even in research designs such as “the gold standard randomised control trials”. The

methodology employed in this current study is a pre-post design that does not have a control group. Therefore, causal relationships and the mechanisms for change cannot be identified. However, what could potentially be identified are possible moderators of the intervention that could be assessed in a follow-on study. Such a study may add to the firesetting knowledge and understanding of how different client characteristics may influence the outcome of an intervention.

4.2 Aims and hypothesis

A broad aim of the current study is to examine whether or not the parents perceive a change in their child's fire-specific and general behavioural characteristics after the conclusion of fire safety educational intervention at three months and prospectively for 12 months. A further aim is to examine whether there is change in pre-and post-intervention fire-specific and general behavioural risk factors from the child perspective. Change in this case denotes improvement, and this will vary depending on the nature of the variables. The JFAIP aims to improve fire safety awareness, knowledge and skills. It is expected that JFAIP clients would improve after participation in the intervention because of a reduction in the risk factors associated with repeated firesetting.

4.2.1 Pre- and post-FRI and CFI risk variables

The hypothesis for pre- and post-FRI and CFI variables are reported below.

FRI specific-to-fire domain

In this study, the first hypothesis was that parents would report significant changes and this would be reflected in all pre-and-post scores of the FRI (fire-specific). Specifically, parents would report that after the intervention their child would:

- be less curious about fire

- be less involved in fire-related activities
- have less exposure to peers or family models (people who may be misusing fire) than before the intervention
- have greater fire safety skills
- have greater fire knowledge
- receive fewer complaints by people in the community about their firesetting behaviour.

CFI specific-to-fire domain

The CFI was also administered to children to gain the child's perspective of their risk factors. It was expected that the children would report changes between pre- and post-intervention on all CFI measures and that this difference would reflect improvement on fire-specific measures. Specifically, children would report that after completion of the JFAIP they:

- are less curious about fire
- are less involved
- are less exposed to models who misuse fire
- have greater fire knowledge
- have greater fire safety skill after the completion of the JFAIP intervention.

FRI non-specific-to-fire domain (general behavioural dysfunctional risk factors)

The FRI measure as previously outlined also has a non-specific-to-fire domain that captures the general behaviour of children. The pre-and post-intervention variables of "positive behaviour" "negative behaviour", "supervision", "frequency of harsh and mild punishment", and "effectiveness of harsh and mild punishment" were evaluated using MANOVA.

The third hypothesis of the study is that there would be no changes in the non-specific-to-fire variables because these behaviours are not specifically targeted by the JFAIP intervention.

4.2.2 Recidivists and non-recidivists

A second broad aim of the study was to determine if the child remained fire-safe during and after the intervention and over a one-year follow-up period. The CFI and FRI pre-post comparisons were supplemented with one-year follow-up data in the form of calls with parents. This enabled classification of children as either recidivists or non-recidivists. The overall aim was to determine whether or not one group changed more significantly than the other. Another aim was to determine if recidivists and non-recidivists had significantly different risk factors.

Recidivist and non-recidivist pre- and post-FRI (fire-specific)

The literature indicates that recidivists are more involved with fire and have a greater attraction to it (Kolko et al., 2001; Kennedy et al., 2006; Kolko et al., 2006; Nishi-Strattner, 2005). Firesetters in general have fewer fire safety skills and are more exposed to ignition sources and models that misuse fire (Kolko, 1989a, 1989b). While some of the findings indicated that firesetters had more fire knowledge than non-firesetters, the literature has indicated that firesetters perform lower academically, thus may gain less from educational intervention efforts.

It was hypothesised that there would be differences for recidivist and non-recidivists on the FRI fire-specific variables of “curiosity”, “involvement”, “complaints”, “exposure”, “fire safety knowledge” and “fire safety skills”. The hypothesis was that the parents of recidivists

would report less improvement than non-recidivist parents between pre- and post-intervention on these fire-specific dependent measures.

The parents of recidivists would report significantly different scores than parents of non-recidivists. It was hypothesised that parents of recidivists would report that the child would:

- be more curious
- be more involved in fire-related activities
- receive more complaints from people in the community about their firesetting behaviour
- be more exposed to inappropriate modelling of fire behaviour
- be less knowledgeable about fire
- be less knowledgeable about fire safety.

The change in recidivist scores from pre- to post-intervention will reflect that they have gained significantly less than the non-recidivist group after the intervention and that they have significantly greater risk factors that are associated with the onset and continuation of firesetting.

Recidivist and non-recidivist pre- and post-CFI

The child's perspective on the CFI was also evaluated to examine the differences between recidivist and non-recidivist groups on the pre- and post-intervention CFI scores. It was anticipated that there would be group differences for recidivists and non-recidivists.

It was hypothesised that child recidivists would:

- be more curiosity about fire
- be more involvement with fire
- less knowledgeable about fire

- more exposed to models that misuse fire
- receive less discipline and supervision from people in authority
- and be less knowledgeable of fire safety skills

It is expected that those children who are categorised as recidivists will report significantly less change and improvement between pre- and post-intervention on the CFI variables than non-recidivists.

Recidivist and non-recidivist differences on non-specific-to-fire FRI variables

Comparison of the non-specific-to-fire pre- and post-intervention scores for both recidivist and non-recidivist groups was also undertaken in this study. Although the JFAIP is not designed to specifically target general behavioural dysfunction or individual and environmental characteristics that are not fire-specific, research has indicated that recidivists are considered more pathological and dysfunctional than non-recidivist children. Thus, there is expected to be differences between recidivist and non-recidivist groups on FRI non-specific-to-fire pre- and post-intervention scores. Previous research has indicated that recidivist firesetters have greater behavioural dysfunction, externalising behaviours and social difficulties. It was hypothesised that parents of recidivists would report: (1) employment of harsher and milder punishments and (2) less effective employment of both harsh and mild punishment. It was also anticipated that parents of recidivists would report that their child would express fewer positive and more negative behaviours.

Selected individual post-items on the FRI scale

The individual items on the FRI scales of “exposure” and “negative behaviour” were evaluated because previous research has indicated that they are associated with recidivism.

Firesetters tend to be more exposed to models who misuse fire and have greater access to ignition sources (Kolko, 1989a, 1989b). The variable of “exposure” was assessed by the FRI and is made up of exposure to ignition sources and models. These items have been assessed individually because during interview process it became evident that many of the children were exposed to models who had misused fire. This is further explained in the fire modelling section of 4.9.1. Thus, it was hypothesised that there would be significant differences between recidivists and non-recidivists, and recidivists would: (1) have greater access to matches and lighters in the home and (2) have greater exposure to family members who have an interest or fascination with fire or misuse fire.

Nishi-Strattner (2005) found that recidivist firesetters were different from single-incident firesetters because they destroyed their own items. This hypothesis was tested in the study by evaluating the item on the negative behaviour scale of “destroying own items”. It was hypothesised that recidivist firesetters would destroy their own items and property significantly more often than non-recidivists. It has also been suggested that recidivists have more aggressive tendencies than non-recidivists; thus, it was hypothesised that recidivists would demonstrate more aggressiveness by hitting and hurting others.

Fire behaviour variables (age of onset of fire interest and frequency of fires)

Two additional fire behaviour variables of “age of onset of fire interest” and “fire history (no damage)” (i.e., number of incidences [frequency] of fires set) were also investigated using independent tests because they are associated with more severe firesetting and conduct disturbances (Root et al., 2008). Pathological and repetitive firesetting has been associated with earlier onset, longer duration, and greater frequency of firesetting behaviour. It was hypothesised that recidivists would be significantly different from non-recidivists and have:

(1) a significantly earlier onset of fire interest and/or fireplay than non-recidivist firesetters and (2) greater fire history (i.e., frequency of fires that have caused no damage).

4.3 Methodology

This section discusses participants, terminology of firesetting and fireplay, and recruitment procedure and description of questionnaires used. It also provides a description of the JFAIP clients and their families and their firesetting incidence(s).

4.3.1 Participants

There were 36 participants who were administered the pre-FRI, CFI and FHS questionnaires, and the JFAIP intervention. However, due to attrition, 29 children (aged seven to 13 years) and 21 families were involved in pre- and post-intervention questionnaires and the JFAIP intervention. Of these, 12 were self-referred; four were referred from the DHS, three from the police, and 10 from the fire brigade. Refer to Table 2: Demographic data; Table 3: Brief description of JFAIP client, family characteristics and firesetting incidents; and Table 4: Referral incident and firesetting history of JFAIP clients (N = 29).

Table 2: Demographic characteristics of the children and families involved in the study

Sample characteristics	Result
Mean age	9.7 years
Family size (mode)	5 people
Family structure	24% biological mother only 48% biological parents 15% biological mother and stepfather 7% biological father only 3% biological father and stepmother 3% foster mother and father
% exposed to smokers	97% stated there was some exposure in the home (45% of these stated that their children were not exposed on a regular basis to smokers in the home, i.e., either they concealed it, or they had

Sample characteristics	Result
	friends/relatives who would come to the house irregularly and smoke)
% with mental health diagnosis	41%
% with ADHD	38%
Other MH diagnosis	7% conduct disorder (2) 3% intellectual disability (2) 7% developmentally delayed 7% depression (2) 7% engaging in self-harming (2) 3% dysthymic disorder (1)
Mean age first interested in fire	7.6 years

4.3.2 Definition of firesetting for the current study

Kolko and Kazdin (1989a; 1989b) provide parameters to distinguish fireplayers from firesetters. They defined firesetting as the child's involvement in burning or setting fire to property and non-firesetting as either matchplaying or no misuse of fire within a one-year period. For instance, firesetters were categorised as such if they had burnt objects, whereas those children whose fireplay was limited to matchplay only (e.g., playing with candles, or striking matches) were classified as non-firesetter. This was verified by obtaining collateral reports from both the child and parent in separate interviews. Matchplayers were classified as non-firesetters if they denied any firesetting within the past year.

This current study is similar to Kolko and Kazdin's in most aspects but deviated because it relied on parent report only between the periods of three and 12 months post-intervention. For the purposes of this study, a child was a recidivist if they reoffended within a one-year period and that was inclusive of both matchplay and firesetting. This decision was based on JFAIP policy and guidelines that conclude that a child has to remain fire-safe under all circumstances because any situation can be life-threatening.

Table 3: Brief qualitative description of JFAIP client and family characteristics and firesetting incidents

JFAIP client and family	Child's age and ID	Family structure and other information	Referral	Diagnosis and any other issues	Qualitative description of firesetting incident(s)
Family 1	6012 – 9	Biological mother only	Police	Father had died recently (12 months ago)	This child was witnessed at the scene of a serious fire incident where the kitchen of a vacant house was destroyed. This child claimed that although present, he was not involved and his friend initiated the firesetting act. He says that he has no firesetting history.
Family 2	6023 – 9	Biological mother and stepfather	Self	ODD ADHD Dysthymic Disorder Depression Self-harming behaviours	The most recent incident was lighting a mattress on the front lawn. Other incidents include lighting his clothes while in them, lighting fires on his bed, and lighting bed clothes. He appears to be motivated by anger and sets fires when he is frustrated and angry. Two of his most influential role models (his father and stepfather) have been incarcerated due to arson-related crimes.
Family 3	Child 1 – 6051 – 7 Child 2 – 6052 – 8	Biological mother and stepfather Mother has advised that she has had to send Child 1 to live with his father due to both boys' behavioural problems.		Child 1 ADHD Child 2 ADHD Behavioural problems Aggression Intellectual disability Unmanageable behaviour	Both boys are lighting fires together. The incidents include smoking cigarettes, lighting papers on the stove, and lighting mattresses.
Family 4	6077 – 9	Biological mother Only		NIL Recent divorce	There were two firesetting incidents recorded. Eighteen months prior to the intervention, the child took matches and lit sticks in a paddock. The most

JFAIP client and family	Child's age and ID	Family structure and other information	Referral	Diagnosis and any other issues	Qualitative description of firesetting incident(s)
					recent incident occurred on a family holiday and this included lighting toilet rolls in the toilet block at the caravan park. His mother believes he was seeking attention from his father, whom she had recently separated from. The child's father is a firefighter.
Family 5	Child 1 – 6058 – 9 Child 2 – 6059 – 10	Biological mother and father		Child 1- ADHD Child 2- ADHD	There was one firesetting incident recorded where both boys got up early in the morning (4am) and were lighting pieces of paper with the stove lighter. There is also a history of people misusing fire in the family. A cousin had previously set another cousin alight and the grandmother was killed in a deliberately lit house fire.
Family 6	6083 –10	Biological mother	Police	NIL Mother has had substance abuse problems and history of domestic violence	Previous incidents included playing with lighters and burning his bedhead. The most recent incident included lighting a fire with a boy from school. The friend lit dry leaves and then coerced the child to light a fire (said he was going to “bash” him). The child then lit a fire under a gum tree and was caught by a teacher at school.
Family 7	6082 – 10	Biological mother and stepfather		NIL	This child has been involved in three firesetting incidents. Two years ago he lit newspapers in the backyard. In the last 12 months he has been involved in two other incidents. The most recent was a shrub fire in which the fire brigade attended to put it out.
Family 8	6094 – 8	Biological mother only	Police	NIL	This child was witness to a house fire. He was with a girl much older than him (13–15 years old) who lit a house fire. This occurred late on a Saturday night and it was quite a distance from where the child lives. This child stayed to watch the fire and told a man to

JFAIP client and family	Child's age and ID	Family structure and other information	Referral	Diagnosis and any other issues	Qualitative description of firesetting incident(s)
					call 000. The child has had one incident prior to this where he lit paper in the house.
Family 9	Child 1 – 60101 – 8 Child 2 – 60102 – 7	Biological father only		NIL Father has had substance abuse problems (heroin) and had to re-enter drug rehabilitation while on the program	The boys have been involved in approximately six incidents in the past 12 months that have included mainly playing with the stove and burning papers. In the past, approximately one year ago, they were involved in a fire that caused damage to their cubby house. The children's mother, who has no involvement with the children, has been in jail due to a fire incident. She set fire to a semitrailer and three other trucks.
Family 10	60103 – 13	Biological mother only		Is currently seeing a psychiatrist with a suspected diagnosis of ODD	This child was involved in a fire incident at the age of four years where he put paper into a kerosene heater resulting in a fire that burnt the entire back room of the house. He completed the JFAIP in 1997. He was also thought to be involved in grass fires at school with a group of children two years ago. The JFAIP was also called to attend and they gave a general lecture to the year level. In the last 12 months the child has been involved in approximately three other fire incidents and they have mainly been misuse of fire with aerosols. The child has been filming this firefighting with his mobile phone and showing it to his friends. This is how he got caught. The child's uncle has been burnt by fire and has sustained serious burns to his face, resulting in scarring.
Family 11	06104 – 7	Biological mother and father		ADHD Mild learning disability	This child has been involved in two fires in the past that have been serious enough for the fire brigade to attend. They have involved burning grass. Other

JFAIP client and family	Child's age and ID	Family structure and other information	Referral	Diagnosis and any other issues	Qualitative description of firesetting incident(s)
				Neurofibromatosis	incidents have included approximately six fires in the last 12 months that have not resulted in damage. Some of these incidents include burning his sister's bed clothes and lighting papers. His mother says that he hides and hoards matches in his toy box, under his bed and in his sister's room.
Family 12	06113 – 11	Biological father and stepmother	RCH	ADHD Self-harming behaviour History of sexual abuse	In the past this child has lit approximately 15 fires that have not caused any damage or injury. In the past 12 months he has lit two fires. The most recent incident was on a camp and this involved using a can of hairspray as a flame thrower.
Family 13	06121 – 9	Biological mother only		NIL	This child has been involved in playing with matches both at school and at home.
Family 14	06126 – 10	Biological mother only	Self	NIL	This child has been involved in one fire incident that has not caused damage. This incident was burning papers (his homework) on the stove.
Family 15	06130 – 13	Biological mother and father	MFB	NIL	This child has been involved in one fire over the last 12 months that has not caused any damage. The incident included lighting aerosol cans with friends.
Family 16	06134 – 10	Biological mother and father		ADHD	The child has been involved in approximately five firesetting incidents. The most recent incident occurred in the bedroom, in which he was alone lighting paper. Other incidents include lighting grass in the backyard and matchplay.
Family 17	Child 1 – 06140 – 9 Child 2 –	Biological mother and father		Child 1 ADHD	Child 1 appears to be more interested in fire than his brother Child 2. Child 1 was involved in an incident, lighting paper in his room that prompted the referral to the program. Child 1 has also been involved in lighting rubbish in the backyard and playing with

JFAIP client and family	Child's age and ID	Family structure and other information	Referral	Diagnosis and any other issues	Qualitative description of firesetting incident(s)
	06171 – 12				lighters a few times. Child 1 and 2 don't generally engage in firesetting together. Child 2 has played with a lighter.
Family 18	06144 Child 1 – 12 Child 2 – 12 Child 3 – 9	Biological mother and father (Child 1 and 2), foster parent (Child 3)		NIL Child 3 is a foster child of the family. He has been in 32 foster homes in his lifetime.	Child 3 (the foster child) was the instigator of the firelighting according to the foster parent. The other two boys were involved because they were there at the time. The incident involved lighting a footy card on the basketball court. Child 3 has had a history of firesetting and has lit leaves and sticks.
Family 19	06155 – 9	Biological mother and stepfather		ADHD Developmental delay	There were two brothers involved in the firesetting incident. The most recent incident involved lighting a mop in the backyard. Both boys were arguing about who was at fault when interviewed. The argument was so inflamed that one of the children refused to participate in the study. The children have been involved in numerous fires both around the home.
Family 20	Child 1 – 06177 – 11 Child 2 – 06175 – 9	Biological mother and father		Child 1 ADHD	Child 1 and 2 were both lighting fires together with a group of children from school. Over the past 12 months they have been involved in approximately 15 fires. These incidents have occurred mainly at the creek and on the way to and from school. The latest incident was a small shrub fire that got out of control and the fire brigade was called to suppress it.
Family 21	Child 1 – 07059 – 12 Child 2 –	Biological mother and father	Self		Child 1 and 2 engaged in firesetting together and separately. Child 1 mainly followed Child 2's lead. Child 2 appeared to be more interested in and fascinated with fire. He was interested in lighting

JFAIP client and family	Child's age and ID	Family structure and other information	Referral	Diagnosis and any other issues	Qualitative description of firesetting incident(s)
	07060 – 10				<p>chemicals, spray paint, lubricants, and putting flammables into jars. Child 2 told me that he has lit around 60 fires in the past six months. He called himself a “firebug” and seemed proud of it. He talked to me like he knew it all, like he was an authority on the subject of fire. He tells me how he made a castle out of sticks a couple of weeks ago, put a toy car under it, doused it in flammables and then lit it. He thinks that fires are sacred and notes the connection to the Aboriginals (he is of Aboriginal descent). Child 1 stated that he likes to light bark and sticks. He also likes to play with his cap gun and he likes the sound it makes. He tells me that he doesn't light fires in the house, but does in the shed or digs a hole in the backyard.</p>

Table 4: Referral incident and firesetting history of JFAIP clients (N = 29)

Characteristics	Frequencies (all categories are mutually exclusive)
Social context	10% set fires alone 14% set fires with friends 31% set fires alone and with friends 21% set fires with sibling 14% observer 10% set fires with friends and siblings
History of firesetters in the family of origin	41% no other firesetters in family 45% one 10% two 4% three
Frequency of incidents	31% single incident in last 12 months 69% multiple incidents in last 12 months
Severity of firesetting	7% matchplay only 38% burning twigs and paper 24% minor fire 7% severe fire 14% aerosols 10% observers
Location of fires	43% in the community 24% outside the home (i.e., backyard) 33% inside the ho
Ignition source	28% matches 52% lighters 17% stove 3% unknown
Damage	17% no damage 55% item only 7% part of a house 7% minimal burn mark 7% tree 7% carpet

4.3.3 Recruitment

Once ethics approval was gained from the Victoria University Ethics Committee, all families who adhered to the criteria were invited to be involved in the research, and were recruited by the JFAIP program coordinator. The criteria for eligibility included male children (seven to

13 years) and their families. Research families were limited to metropolitan Melbourne (MFB areas) and the CFA areas of: Melton (area 14), Lilydale (area 13), Dandenong (area 8), Ballarat (area 15), Bendigo (area 2) and Geelong (area 7).

The program coordinator explained the research to the client, as per the protocol, and asked if they would be willing to join the research group. Once verbal consent was given over the phone, the client's details (phone number, address, and case details) were provided.

Recruitment of participants occurred over the 18 month period of April 2006 to September 2007. In this time, approximately 200 clients participated in the JFAIP program, and of these, 36 were recruited into the study. Of the 36 families who participated in the initial pre-assessment of the FRI, CFI and FHS, 29 families only received the post-assessment. Seven families withdrew from the study for various reasons:

- One family with four firesetters in the family did not receive an intervention due to numerous mental health and other problems within the family. Coordinating an intervention for this family was difficult as it took almost eight months to agree to a date. Ultimately, the family withdrew from the program due to court proceeding around child protection issues.
- A second family, with one child, withdrew from the study because the mother stated that she was too busy and was moving home.
- Another family withdrew because the child had moved from living with his mother to living with his father, due to behavioural issues. The mother did not re-contact, despite attempts to interview the child at his father's home.
- A further family could not be re-contacted due to the disconnection of their phone.

4.3.4 The FRI questionnaire

The FRI is composed of 15 variables with two domains, including those that are (1) specific to fire, and (2) not specific to fire (Appendix 8).

FRI variables specific-to-fire

The Firesetting Risk Interview “specific-to-fire” questionnaire was administered to the parent and consists of eight content factors. “Specific-to-fire variables” are those that are related to the act of firesetting:

- **Curiosity** – has seven items and asks the parent how attracted the child is to fire, and how much the child wants to play with it and talk about it. It can also indicate how invested the child is in fire and what fire represents to the child. Scores range from seven to 35.
- **Knowledge** – has five items and asks the parent questions about the child’s fire knowledge, assessing whether the parent thinks the child understands consequence of misusing fire, their knowledge of what burns and what does not burn, and how safely the child can light matches or use a lighter. Scores range from five to 25.
- **Fire Skill** – has five items that evaluate the parents’ perception of their child’s skills in relation to fire (e.g., to what extent does the parent think their child could handle a fire that is out of control). Scores range from five to 25.
- **Complaints or concerns about fire behaviour** – has three items and serves as another indicator of how prevalent, frequent and severe the child’s firesetting behaviour is. For instance, complaints and concerns suggest that the firesetting behaviour has extended beyond the boundaries of the child’s home and that others in the community have made observations about the child’s firesetting behaviour and are making complaints. Scores range from three to 15.

- **Exposure to peers and/or family models** – has six items and is related to the child’s exposure to individuals who are involved with fire (e.g., exposure to smokers or exposure to models who misuse fire) and materials that are used in fire-related activities (e.g., availability of fire-starting materials in the house). Scores range from six to 30.
- **Parental fire preparation** – has eight items scored in a dichotomous (yes = 1 and no = 0) way. This variable assesses how prepared the parent is should a fire occur. This variable is not only associated with the parent’s being prepared if a fire should arise, but also with modelling fire safety awareness and appropriate fire safety concern in the home (e.g., whether there is a smoke alarm in the home). Scores range from zero to eight.
- **Involvement in fire-related acts** – has three items and captures the level or extent of the child’s fire misbehaviour (e.g., hiding matches or lighters). The scores can range from three to 15 on this scale.
- **Early experiences with fire** – has five items scored in a dichotomous (yes = 1 and no = 0) way. This variable relates to the child’s fire history and gives insight into the duration of the behaviour by asking if the child had been involved with firesetting more than a year ago. Scores range from zero to five.

FRI non-specific-to-fire

The second domain that the FRI evaluates is those “not specific to fire”. This questionnaire assesses seven content areas that are related to the child’s general dysfunction and behavioural issues. The dimension includes the following factors:

- **Expression of positive behaviour** – has five items and captures behaviours that are prosocial (e.g., how often the child express himself by making pleasant conversation). Scores range from five to 25.
- **Expression of negative behaviour** – has 10 items and captures the child’s antisocial behaviours (e.g., how often the child expresses himself by hitting or hurting others, destroying items, or being cruel to animals). Scores range from 10 to 50.
- **Frequency of mild punishment** – has five items and is related to parental discipline using milder forms of punishment (e.g., time outs, taking away priviledges and discussion of behaviour). This question asks the parent to rate the frequency of their use of mild punishment methods. The scores range from five to 25.
- **Effectiveness of mild punishment** – has five items and asks the parent to rate how effective the mild punishment strategies are in disciplining their child. The scores range from five to 25.
- **Frequency of harsh punishment** – has five items and is related to parental discipline using harsher forms of punishment (e.g., physical punishment, yelling or threatening). The scores range from five to 25.
- **Effectiveness of harsh punishment** – has five items and asks the parent to rate how effective the harsh punishment strategies are in disciplining their child. The scores range from five to 25.

Scoring of the FRI

Most of the items are based on multiple choice items rated on Likert scales (five points) reflecting the quality (e.g., 1 = not at all, 3 = somewhat, 5 = very much), quantity or frequency of the behaviour (e.g., 1 = not at all, 3 = some of the time, 5 = almost always).

Other items are rated on a dichotomous (yes/no) basis.

The psychometric properties of the FRI

Kolko and Kazdin (1989a) assessed both the internal reliability and test-retest reliability. The Cronbach's alphas coefficients were computed to examine the internal consistency of each scale of the FRI questionnaires. Ideally, the Cronbach alpha coefficient should be above .7 (Pallant, 2007). On the FRI, the alphas were moderate to high (range = .43–.85), with the highest and lowest alphas found for "curiosity" (alpha = .85) and exposure to supervision/discipline (alpha = .43) respectively, with an overall mean alpha for the 15 dimensions at .66.

Test-retest reliability was evaluated using Pearson correlations between the scores on the 15 dimensions from two separate assessment periods. All of the individual test-retest correlations were statistically significant. The overall mean correlation, based on Fisher's z transformation, was .69 (range: .34 and .87; Kolko & Kazdin, 1989a).

Construct validity of the FRI was demonstrated because the measure could successfully distinguish firesetters from non-firesetters (see section 4.1).

4.3.5 The Child Firesetting Interview (CFI)

This is a semi-structured questionnaire that is designed to elicit information from the child regarding several dimensions that may help to describe and predict firesetting behaviour more effectively (Appendix 9). It consists of 46 questions reflecting six dimensions of firesetting risk. The variables included in the CFI are:

- **Curiosity** – has ten items and asks the child questions related to how curious (or attracted) they are to fire (e.g., how much do you want to play with fire? How much do you think about fire?). Curiosity questions included those scored on a Likert scale

and open-ended questions with pre-assigned risk responses (see below in scoring for description). The scores range from 10 to 50.

- **Involvement in fire-related activities** – has four items and asks the child how involved they are with fire (i.e., setting off false fire alarms and hiding matches). The scores range from five to 25.
- **Fire knowledge** – has ten items and assesses the child’s knowledge of combustibles (i.e., “what burns” and “what does not burn”). The child is asked to respond to questions with a “yes” or “no” (e.g., does chalk burn? Does a piece of wood burn?). The scores range from zero to 10.
- **Fire safety skills** – has eight items and asks the child questions related to fire safety. Most questions have pre-assigned responses scaled from lesser to greater knowledge of fire safety (e.g., are there any dangers to playing with fire? Responses ranged from: 1 = do not know; 2 = general problem, get in trouble; 3 = burn things; 4 = burn self or others; 5 = burn things and people). The variable also includes a role play where the child has to demonstrate what he would do if he saw a fire in a neighbour’s house by using a telephone prop to call the Fire Brigade. Scores range from eight to 47.
- **Exposure to models who misuse fire** – has six items that ask the child if they are exposed to others (family or peers) who misuse fire or if they are permitted to use matches/lighters at home (e.g., how many friends have you seen playing with matches or lighters, or setting fires? Responses are scored as: 1 = none, 2 = one, 3 = two, 4 = three–five, 5 = six or more). Scores range from five to 30.
- **Exposure to discipline/supervision** – asks the child how often they are disciplined both by parents and others (people in the community) and if they are supervised

when at a friend's home (e.g., how often do you get into trouble at home?). Scores range from five to 15.

Scoring

Most items were measured on a five-point Likert scale reflecting the quantity of the behaviour (e.g., 1 = not at all, 3 = somewhat, 5 = very much), while other items were measured on the five-point scales reflecting specific categories of behavioural frequencies (e.g., 1 = none, 3 = two or three, 5 = seven or more) or qualitative aspects of severity (e.g., 1 = nothing, 3 = burn objects, 5 = burn people/ buildings). There were some open-ended questions such as: What do you like most about fire? These open-ended questions have pre-assigned responses that were rated on risk (1 = nothing, 2 = heat/cooking/light, 3 = observing fire, firefighters or some contact with fire, 4 = fireplay or 5 = use of fire to burn, hurt, control or influence. There were also three role-play items that were scored on the basis of the total number of correct responses. Finally, 24 items surveyed the child's knowledge of things that burn and this was measured in a dichotomous format (yes/no).

Changes to the questionnaire

In the current study, a question on the "fire safety skill" variable of the CFI was changed because it contravened JFAIP practice. This question required that the child role-played lighting a match in front of the examiner. The practitioners and the families expressed concern that it was giving the child mixed messages because JFAIP policy insists that they must not handle matches and must remain fire safe. Permission was granted by one of the authors of the measure (Kolko) to change the question in the CFI. It was replaced with the question: "Suppose you were to find a box of matches or a lighter, tell me what you would do?" with the choice of response:

- take it/use it
- take it and hide it
- leave it there or throw it away
- pick it up and give it to a parent straight away
- take the parent to where the matches are.

The scoring of this was from one (less fire safe) to five (most fire-safe response). The child was awarded points based on their response.

Limitation of the CFI questionnaire

On the variable of “knowledge” the CFI assesses what burns and what doesn’t burn. It does not assess the child’s understanding of the nature of fire, what firefighters do, responsible fire behaviours, consequences of misuse of fire or knowledge of hazards that are also taught by JFAIP fire practitioners.

The psychometric properties of the CFI

Kolko and Kazdin (1989b) assessed psychometric properties when they developed this measure. They assessed the internal reliability, test-retest reliability and validity.

Cronbach’s alphas coefficients were computed to examine the internal consistency of each scale and four of them were in moderate range (range = .39 to .74), with the highest and lowest alphas found for the variables of “knowledge” (alpha = .74) and “supervision/discipline” (alpha = .39). The overall mean alpha for the six dimensions was .68 for the CFI.

Test-retest reliability was evaluated using Pearson correlations between the scores of the six dimensions from the two assessment periods. All but one of the correlations was statistically significant. The overall mean correlation, based on Fisher's z transformation, was .56 ($p < .001$). The scale-remainder correlations were low but statistically significant for all the dimensions, except supervision/discipline.

Intercorrelations between scales were also examined to determine the magnitude. The low magnitude of these intercorrelations suggests little shared variance or redundancy and therefore the individual dimensions were not combined.

Concurrent validity was measured for only two of the CFI scales of knowledge and skills due to the unavailability of additional measures. The Fire Safety Knowledge Questionnaire (R. T. Jones et al., 1981b) was used as the concurrent validity measure on knowledge of things that burn and Fire Safety Skills. It was found that Knowledge ($r = .26, p < .001$) and Fire Safety Skills ($r = .40, p < .001$) was significantly correlated with the Fire Safety Knowledge Questionnaire (Kolko & Kazdin, 1986).

Validity of the CFI was demonstrated because differences between firesetters and non-firesetters would suggest that the scale had adequate construct validity (see section 4.1).

4.3.6 The Fire History Screen (FHS)

The FHS (Appendix 10) has been used in numerous studies to survey the child's interest in fire, frequency of matchplay, frequency of firesetting, and the nature of damages and items burned in each incident within the past year and more than one year ago (Dadds & Fraser,

2006; Kolko and Kazdin, 1989a, 1989b, 1992). This screen was administered pre-intervention and at post-intervention follow-up (three months after the intervention).

The FHS questionnaire is administered to both parent and child to evaluate the frequency of matchplay and firesetting, severity of the fire, and interest in fire. The child's firesetting status is also based on whether or not the child had engaged in firesetting within the past year. Parent-child agreement has been assessed in two former studies (Kolko & Kazdin, 1992; Kolko et al., 2001) and has shown to have moderate agreement of firesetting status between the parent-child sources, as well as adequate test-retest reliability (Kolko and Kazdin, 1992).

4.3.7 Procedure

The administration of the questionnaires was undertaken with families at pre-intervention and at three months post-intervention. This entailed making contact with the client to re-state the purpose of the research, to set up mutually convenient times to do the interview, and to answer any questions the client had. Families were mostly interviewed in their own home except for one post-intervention interview that was conducted at a community backyard. I conducted 28 out of the 29 interviews, and a trained research assistant conducted one interview. I mainly interviewed the families solely; however, on five occasions I took a trained research assistant because there was more than one child in the family to interview.

At the family home, adhering to the principles of data collection, participants were provided with:

- a plain language invitation statement that explained the purpose of the study, emphasised confidentiality and freedom to withdraw from the study with no

consequences for their non- participation (for parents and children, Appendix 11 and 12, respectively)

- informed consent form (for parents and children, Appendix 13, 14 and 15, respectively)
- assurance that they would not be identified in the report
- a point of contact should any distress occur throughout the interview process.

Families were interviewed prior to the JFAIP intervention using the CFI, FRI, and FHS, after which they received intervention, usually a week later. In the some instances, due to time constraints and families in need of intervention, administration of the pre-FRI and CFI questionnaires coincided with the practitioner's first visit. There were six occasions where this occurred, and I scheduled to visit the family one hour prior to the practitioner's arrival. On these occasions, there was often some crossover, and I was able to observe some of the initial practitioner intervention, in particular the rapport building between the child and the practitioner.

All children except for one consented to be involved in the study. The child who refused to participate in the study was from a family where two brothers had been involved in the incident and there was an ongoing disagreement about who had started the fire. This child did not want to participate in the study and was not forced to do so.

The children were interviewed first using the FHS and CFI questionnaire in a standardised way. The FHS was administered first and then the CFI questionnaire. Where possible, children were interviewed separately, but were still visible to their parent. The questions on the CFI are presented in different formats, for example, multiple choice options, choice of

response from one to five, “yes” and “no” responses, open-ended questions or role-plays. A prompt card was used in the administration of the CFI and the answers to questions were numbered from one (low risk) to five (high risk). The prompt card was explained to children to clarify how they could respond to questions. Responses could be made in a number of ways, for example, verbally (e.g., by saying the response “very little” or saying the correct number), or by pointing to the correct response. Once I was satisfied that the child fully understood the process, I commenced administration of the CFI. If the child responded with “I don’t know” on some of the answers, I prompted the child by asking, “Are you sure?” If the child failed to respond then a second prompt was used: “Think about it for a second and then tell me.” If these prompts failed, a response of “don’t know” was recorded. The CFI took approximately 15 to 20 minutes to administer.

The parent was then asked to confirm the details of the child’s firesetting history using the FHS. At the pre-intervention assessment, questions on the FRI were administered to reflect the child’s firesetting history in two time periods, the current year (last 12 months) and prior years (more than 12 months ago).

The FRI, which took approximately 30 minutes, was then administered to the parent(s). I clarified the response format of the FRI by explaining to the parent that they needed to select the best response that described their child on a one to five scale: 1 (not at all true), 2 (very little), 3 (somewhat), 4 (a lot) and 5 (very much true). Other questions included some yes or no responses. Once the parent understood what was required, the FRI was administered to the parent.

The families were then re-contacted at the three-month fire-safe period to set up a mutually convenient time to re-administer the FRI, CFI and FHS to both the parent and the child. Initially this contact over the phone involved asking the parent: (1) “Is the child still fire-safe?” and (2) “Has the child received their reward?” On the occasions that the child had reoffended, I offered the parent the option of re-referral to the program. In some cases, asking the question about the reward appeared to influence the child’s receiving a reward, as this served as a reminder call. The standard practice of the JFAIP is that the parent and not the firefighter practitioner will make contact at three months to receive the child’s negotiated reward for being fire safe. One problem with the program is that the parent often forgets to call back to obtain the reward.

The administration of the questionnaire at post-intervention adhered to the procedure above. The post-intervention questionnaires were worded slightly differently by adding “since the intervention ...” to the questions. The FHS was also administered slightly differently. For example, instead of asking if the child had been involved in a fire in the current year (last 12 months) and prior years (more than 12 months ago), the participants were asked whether firesetting or matchplay had occurred since the intervention (i.e., within three months of the designated fire safety period).

After the pre- and post-intervention questionnaires were administered, families were followed up for a year, mostly at three monthly intervals, by a telephone call. This call involved asking the parent whether the child had been fire-safe or not. Direct follow-up with the child did not occur beyond three months. Interviewing the parent only in this phase of the research was deemed reliable because prior research has suggested that parents and children have shown reasonable agreement in reporting the child’s past and current

firesetting (Kolko & Kazdin, 1988b). In some instances, the child had reoffended, and again, the parent was offered the option of being contacted either by the practitioner or the program coordinator. In all cases the families declined the offer of any further follow-up by the JFAIP. Table 6 shows the reoffending data.

JFAIP intervention conditions were implemented using standard operating procedures (explained in Chapter Two) and most families received between two and four interventions (inclusive of the practitioner interview). The practitioners, some experienced and some newly trained, were randomly assigned to cases.

Follow-up checking for recidivism

Participants were followed for one year to determine whether or not they were fire-safe (see Table 5).

Table 5: Timeline of the procedural sequence of recruitment and test administration of the FRI, CFI and FHS

Time	Firesetting event and referral taken by JFAIP coordinator	Administration of FRI, CFI, FHS to parent and child N = 36	Intervention received N = 32	Re-administration of the FRI, CFI and FHS to parent and child N = 29	Post follow-up phone call 1 N = 29	Post follow-up phone call 2 N = 29	Post follow-up phone call 3 N = 29
Week 1	█						
Week 2		█					
Week 2, 3, or 4			█				
Week 13, 14				█			
6 months					█		
9 months						█	
12 months							█

4.4 Data Analysis

The data was analysed using 2 x 2 mixed design MANOVA, non-parametric and parametric tests and discriminant analysis.

4.4.1 MANOVA analysis of FRI and CFI

Mixed design 2 x 2 repeated measures MANOVA were used to (1) investigate differences between the FRI and CFI variables from pre- and post-intervention and (2) determine the differences between recidivist and non-recidivists on both pre-and post-intervention FRI and CFI variables. The “early experience” variable was removed from the FRI MANOVA analysis because it is a historical variable measuring the child’s fire history and not expected to change between pre- and post-intervention.

4.4.2 Non-parametric tests and analysis for FRI and CFI

Some variables were also analysed using non-parametric tests because they violated assumptions (see also section 4.5.2 for explanation).

FRI variables analysed using non-parametric tests

Variables analysed using non-parametric tests included:

- involvement (both for the CFI and FRI fire-specific; they were highly skewed with outliers because most children had not reset fires post-intervention)
- parental fire preparation (due to outliers)
- exposure (due to outliers).

These variables were analysed using Mann-Whitney non-parametric U tests.

4.4.3 Individual item analysis

Individual items on the FRI were evaluated to determine differences between recidivists and non-recidivists. This is because previous research has highlighted that these selected items, such as exposure to models that misuse fire, aggressiveness, and the fire behaviour variables of age of the onset of interest in fire and firesetting history were associated with recidivism and a more severe course of firesetting. The individual items on the FRI that were evaluated included:

- How available are the matches or lighters in the home?
- How many family members have a fascination with fire?
- How many family members has the child observed misusing fire?
- How often does the child express himself by destroying items?
- How often does he express himself by hurting others?

These items were examined with Mann-Whitney tests to compare recidivists and non-recidivists. Two further fire behaviour variables – (1) age of onset of fire interest and (2) frequency of fires lit with no damage – were also examined using independent t.tests to compare recidivists and non-recidivists.

4.5 Results (initial analysis)

The initial analysis of results includes – (1) the identification of recidivists and non-recidivists and (2) MANOVA assumptions.

4.5.1 Recidivists and non-recidivists

Recidivists were identified as those children in the study who had lit a subsequent fire from the time of the first referral to within the one-year period in which they were followed. Non-recidivists did not misuse fire from the time of first referral and over the follow-up period.

Nine out of 29 participants reoffended during 12 month follow-up time (see Table 6).

Overall, the incidence of firesetting had been reduced as 20 out of 29 participants did not reoffend. Amongst the nine participants who did reoffend, their firesetting acts were less severe and were reduced to matchplay or fireplay in eight out of nine instances.

Table 6: Recidivism and non-recidivism over the duration of a year (N = 29)

Child	Date of Intervention	During intervention	3 M	6 M	12 M	Recidivist
06012	19 April 06	✓	✓	✓	✓	NO
06023	24 April 06	X	X	X	✓	YES
06051	16 May 06	X	✓	✓	✓	YES
06052	16 May 06	X	✓	✓	✓	YES
06077	8 June 06	✓	✓	✓	✓	NO
06058	19 June 06	✓	✓	✓	✓	NO
06059	19 June 06	✓	✓	✓	✓	NO
06083	19 June 06	✓	✓	✓	✓	NO
06082	21 June 06	✓	✓	✓	✓	NO
06094	3 July 06	✓	✓	✓	✓	NO
06101	14 July 06	✓	✓	✓	X	YES
06102	14 July 06	✓	✓	✓	X	YES
06103	20 July 06	✓	✓	✓	✓	NO
06104	25 July 06	✓	✓	✓	✓	NO
06113	12 Aug 06	✓	✓	✓	✓	NO
06121	23 Aug 06	✓	✓	✓	✓	NO
06126	1 Sept 06	✓	✓	✓	✓	NO
06130	11 Sept 06	X	X	✓	✓	YES
06134	12 Sept 06	✓	X	✓	✓	YES
06140	4 Oct 06	✓	✓	✓	✓	NO
06171	4 Oct 06	✓	✓	✓	✓	NO
06144	10 Oct 06	✓	✓	✓	✓	NO
06144	10 Oct 06	✓	✓	✓	✓	NO
06144	10 Oct 06	✓	✓	✓	✓	NO
06155	1 Nov 06	✓	✓	✓	X	YES
06177	20 Nov 06	✓	✓	✓	✓	NO
06175	20 Nov 06	✓	✓	✓	✓	NO
07060	21 Mar 07	✓	✓	✓	✓	NO
07059	21 Mar 07	✓	✓	✓	X	YES

4.5.2 Assumption testing for CFI and FRI (fire and non-fire specific) variables

Prior to analysis, assumptions of variables were examined through SPSS for normality, linearity, outliers and multi-collinearity.

Sample size

The sample size of 29 for MANOVA analysis was considered moderate and less susceptible to violations (Tabachnick and Fidell, 2007). However, the sample size was unequal for analysis of non-recidivists and recidivists, with recidivists (N = 9) and non-recidivists (N = 20), therefore not as robust to violations. Tabachnick and Fidell (2007) suggest that with smaller samples there must be a minimum of five participants for every dependent variable, which this study adhered to.

Normality

Assessing normality was undertaken by exploring histograms to investigate skew and kurtosis values. Hair, Anderson, Tatham and Black (1998) suggest nominating a critical statistical value (z) for skew and kurtosis that corresponds with the significance value that is desired. For instance, a calculated value exceeding ± 2.58 indicates that the assumption of probability of distribution is rejected at the 0.01 probability level. The critical value of ± 2.58 was used as criteria for normality of distributions.

Some dependent measures moderately violated this assumption (Appendix 16). However, according to Tabachnick and Fidell (2007), MANOVA is robust to violations of normality, especially with sample sizes above 20, unless caused by outliers (Hair et al., 1998). There were no outliers; therefore, all dependent variables were retained in the MANOVA.

The sample size comparing recidivists and non-recidivists was unequal and there were some violations of this assumption found in Appendix 16. Some of these variables were moderately above the ± 2.58 critical values (i.e., “pre-recidivist CFI curiosity”, “non-recidivist fire safety skills”, “pre-non-recidivist exposure”, and “post-non-recidivist knowledge”). However, other variables such as post-FRI recidivist and non-recidivist “involvement” seriously violated the assumption. The post-intervention variable of “involvement” was highly skewed with a very large kurtosis of 20. This is because most of the children (20) were not involved with fire at post-intervention. This variable was analysed using Mann-Whitney non-parametric U tests.

Outliers

Outliers were assessed through the procedure of histograms and box plots. Examination of the dependent variables indicated that there were some outliers in the data set. Extreme outliers were identified through box plots and are those that extend more than three box-lengths from the edge of the box (Pallant, 2007). There were no outliers for the FRI (specific to fire and non-specific-to-fire) and CFI variables, therefore all variables were retained in the analysis. However, the recidivist and non-recidivists variables had several extreme outliers, including FRI variables of “exposure”, “parental fire preparation” and “involvement”. These variables were retained in the analysis, but were subject to further analysis using Mann-Whitney non-parametric U tests.

Outliers were identified for the CFI variables. In the two variables of post-intervention “knowledge” and pre-intervention “fire safety skills”, the extreme outlier(s) values were changed so that the case no longer had as much of an impact, a practice endorsed by

Tabanich and Fidell (2007). The variable of both pre-and post-intervention “knowledge” had two extreme outliers that scored below seven. This was due to some children having intellectual disabilities; therefore, the extreme low score of seven was amended to a score of 10. The pre-intervention variable “fire safety skills” had one extreme low score (18) and one extreme high score (35). These scores were amended to 21 and 35 respectively to ensure that the assumption was met. Outliers are found at Appendix 16.

Multicollinearity

Multicollinearity between the dependent variables was assessed by checking for correlations across the dependent variables of both the FRI and CFI. Most of the variables were moderately correlated (approximately .3–.7). There were some dependent variables that did not have a relationship, and this lack of correlation may be due to smaller sample sizes. These established measures were found to be conceptually related and correlated moderately in Kolko (1989a, 1989b) studies, therefore retained in the analysis.

Linearity

Linearity of the dependent variables was assessed by scatterplots and the variables included in the analysis met this assumption.

4.6 Results – mixed design MANOVA, non-parametric and parametric tests

This section includes results for:

- Main effects for pre-and post-intervention on the FRI and CFI
- Main effects for recidivists and non-recidivists on the FRI and CFI
- non-parametric tests for selected FRI and CFI variables

- analysis of selected individual variables of interest.

4.6.1 Results of mixed design pre- and post-intervention FRI variables

A repeated measures mixed design MANOVA was used to explore these hypotheses: (1) whether or not there was a difference between parents' perceptions of their child's risk from pre- and post-intervention; and (2) if there were differences in recidivists and non-recidivists on pre- and post-intervention FRI risk variables.

Main effect for differences between pre-and post-intervention FRI variables

There was no interaction effect between time and recidivism, $F(7, 21) = 1.17, p = .359$, partial eta square = .38, thus only main effects were interpreted. All dependent variables on the FRI, with the exception of "early experiences", were included in the repeated measures MANOVA. There was a significant main effect of time on the combined dependent variable, $F(7, 21) = 8.36, p < .001$, partial eta squared = .74.

Analysis of each individual dependent variable showed that significant changes between pre- and post-intervention on the FRI fire-specific dependent variables (Table 7 for Means and Standard Deviations). In the "curiosity" variable, $F(7, 21) = 18.95, p = .001$, partial eta squared = .41, there were significant difference. This indicated that parents perceived their children to be significantly less curious at post-intervention time than pre-intervention time. The "fire safety skill" variable, $F(7, 21) = 27.56, p = .001$, partial eta squared = .51, was also significant, indicating that the parents perceived their children to be more skilled in fire safety after they had received the intervention. There was significant difference between pre- and post-intervention on the "complaints" variable, $F(7, 21) = 6.73, p = .02$, partial eta squared = .20, indicating parents were receiving fewer complaints in the community about their child's firesetting behaviour after the JFAIP. In the "exposure to models" variable, F

(7, 21) = 5.88, $p = .022$, partial eta squared = .18, the significant difference indicated that parents believed that the access to ignition sources and opportunities for fireplay had been reduced since the intervention. The significant difference on the “fire knowledge” variable, $F(7, 21) = 11.11$, $p = .003$, partial eta squared = .29, suggested that parents perceived that their children had more knowledge after the fire safety intervention. In the “parent preparedness in fire safety” variable, $F(7, 21) = 7.42$, $p = .01$, partial eta squared = .22, there were differences. The increase in means suggested that parents were more safety-aware at post-intervention compared with pre-intervention. In the “involvement” variable, $F(7, 21) = 38.61$, $p = .001$, partial eta square = .59, the significant difference indicated that parents perceived that their children were less involved with fire at post-intervention compared with pre-intervention.

Main effect for recidivists and non-recidivists for the FRI variables

The multivariate MANOVA main effect of recidivist was not significant, $F(7, 21) = 1.59$, $p = .193$, partial eta square = .35 – thus univariate analysis of individual dependent variables was not undertaken. The variables of “exposure”, “involvement” and “parental fire preparedness” were also analysed using Mann-Whitney non-parametric U tests (section 4.6.4).

Table 7: Means and standard deviations for pre- and post-intervention FRI fire-specific variables

Dimensions specific to fire	PRE		POST		F	p	Kolko's Fire	Kolko's No Fire
	<i>M</i>	<i>(SD)</i>	<i>M (SD)</i>	<i>(M)</i>			<i>(M)</i>	
Curiosity	17.58	(6.65)	12.21	(4.09)	18.95	.001	15.7*	10.2
Early experiences **	2.55	(1.49)					2.5*	1.7
Involvement	5.37	(1.88)	3.45	(1.09)	38.61	.001	1.3*	0.3
Peer/family exposure	20.34	(5.85)	18.45	(4.07)	5.88	.022	28.6*	24.7
Complaints/concerns	6.62	(2.74)	5.14	(1.96)	6.73	.02	6.5*	4.1
Fire knowledge	17.38	(4.38)	19.97	(2.90)	11.11	.003	18.6	19.2
Fire skill/competence	12.10	(3.77)	15.45	(3.79)	27.56	.001	13.8	14.5
Parent fire prepare	4.72	(1.49)	5.52	(1.12)	7.42	.01	Data not available	Data not available

Kolko and Kadzin's (1989) means for Fire and No Fire taken from *Assessment of Dimensions of Childhood Firesetting Among Patients and Nonpatients: the Firesetting Risk Interview*.

* Significant at .05 level.

***Means for early experience were not reported at post-intervention as they are a re-test item and anticipated to be exactly the same

4.6.2 Results of mixed design pre- and post-intervention CFI variables

A repeated measures mixed design MANOVA was used to explore the hypotheses of (1) whether or not there was a difference between children's pre- and post-intervention scores on the CFI, and (2) if there were differences in recidivists and non-recidivists on pre- and post-intervention CFI risk variables.

The main effect for pre- and-post intervention CFI variables

There was no interaction effect between time and recidivism, $F(6, 22) = .92$, $p = .50$, partial eta squared = .20, therefore only main effects were interpreted. All dependent variables on the CFI were included in the repeated measures MANOVA. Multivariate tests indicated a significant effect of time on the combined dependent variable, $F(6, 22) = 6.31$, $p = .001$, partial eta squared = .63. Analysis of each individual dependent variable showed significant changes for children between pre- and post-intervention on all fire-specific dependent variables.

Investigation of means (Table 8) indicated that there was improvement between the following pre- and post-intervention variables. In the "curiosity" variable, $F(6, 22) = 14.23$, $p = .001$, partial eta squared = .35, this difference suggested that after the intervention the children claimed that they were less curious about fire and this signified an improvement. In the "fire safety skill" variable, $F(6, 22) = 12.13$, $p = .002$, partial eta squared = .31, the difference indicated that at post-intervention children were more skilled compared with before the intervention. In the "exposure to models" variable, $F(6, 22) = 9.14$, $p = .005$, partial eta squared = .25, children perceived that they were less exposed to models and ignition materials at post-intervention compared with pre-intervention. In the "involvement" variable, $F(6, 22) = 20.07$, $p = .001$, partial eta squared = .43, the significant difference

suggested that after the intervention children reported that they were less involved with fire. There was no significant difference between pre-and-post intervention “knowledge”, $F(6, 22) = .04$, $p = .20$, partial eta squared = .06 indicating that the children’s knowledge had not changed between pre-and-post time. The variable of “supervision” was also not significant, $F(6, 22) = 3.66$, $p = .07$, partial eta squared = .12. Although this suggests that significance was approached, this result does indicate that the children’s perception of being supervised by their parents had not changed from pre-and-post intervention time.

Main effect for recidivists and non-recidivists on the CFI

The main effect of recidivism was significant, $F(6, 22) = 5.52$, $p = .001$, partial eta squared = .601, suggesting that there were significant differences between the recidivist and non-recidivist groups. Univariate ANOVAS reveal a significant difference between the groups of non-recidivists and recidivist on some pre- and post-intervention variables. The mean differences are presented in Table 9. In the “curiosity” variable, $F(6, 22) = 4.38$, $p = .05$, partial eta squared = .14, the means suggested that scores were significantly higher for recidivists for both pre- and post-intervention curiosity, as compared with non-recidivists, who scored significantly lower on both pre- and post-intervention curiosity. The “supervision/discipline” variable, $F(6, 22) = 4.58$, $p = .04$, partial eta squared = .15, was also significant. The means suggested that scores were significantly higher for recidivists for both pre- and post-intervention “supervision/discipline”, as compared with non-recidivists who scored significantly lower on both pre- and post-intervention supervision/discipline. In the “fire safety skills” variable, $F(6, 22) = 6.79$, $p = .01$, partial eta squared = .20, recidivists had significantly lower scores on fire safety skills at both pre- and post-intervention than non-recidivists. Variables of “knowledge”, “involvement” and “exposure” were not significant. “Involvement” was analysed using Mann-Whitney Tests (section 4.6.5).

Table 8: Means and standard deviations comparing the pre- and post-intervention CFI variables

Dimensions specific to fire	PRE		POST		F	P	Kolko's Fire	Kolko's No Fire
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>			<i>(M)</i>	<i>(M)</i>
Curiosity	22.79	(5.68)	18.75	(5.19)	14.23	.001	20.3	18.3
Involvement	6.21	(2.01)	4.21	(0.62)	20.07	.001	5.5	4.5
Knowledge	12.79	(2.23)	12.93	(2.31)	1.74	.20	12.5	12.0
Peer/family exposure	12.45	(3.50)	10.72	(2.25)	9.14	.005	22.9	23.9
Supervision	10.83	(1.79)	10.34	(1.61)	3.66	.06	11.3	10.2
Fire safety skills	27.34	(3.93)	31.55	(5.65)	12.13	.002	22.9	23.9

Kolko and Kadzin's (1989) means for Fire and No Fire taken from *The Children's Firesetting Interview with Psychiatrically Referred and Non-Referred Children*.

Table 9: Means and standard deviations for the pre- and post-intervention CFI variables

Dimensions specific to fire	Time	Recidivists		Non-recidivists		F	P
		<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>		
Curiosity	Pre	24.78	(5.21)	21.90	(5.77)	4.38	.05
	Post	22.11	(6.07)	17.25	(4.06)		
Exposure	Pre	13.33	(5.31)	12.05	(2.37)	2.54	.12
	Post	12.11	(3.66)	10.10	(0.72)		
Knowledge	Pre	13.11	(2.09)	12.65	(2.32)	.23	.88
	Post	12.45	(1.74)	13.45	(1.76)		
Fire safety skills	Pre	24.89	(2.71)	28.45	(3.18)	6.79	.02
	Post	28.89	(7.28)	32.75	(4.46)		
Supervision	Pre	12.11	(1.62)	10.25	(1.58)	4.58	.04
	Post	10.45	(1.38)	10.30	(1.38)		
Involvement	Pre	5.89	(1.83)	6.35	(2.11)	0.02	.90
	Post	4.44	(0.88)	4.10	(0.45)		

4.6.3 Results of mixed design pre- and post-intervention FRI (non-specific-to-fire)

A repeated measure MANOVA was used to investigate the hypotheses that (1) FRI variables non-specific-to-fire would not change pre- and post-intervention; and (2) certain FRI non-specific-to-fire variables would be significantly higher for recidivists (see section 4.2.2).

Main effect for pre- and post-intervention FRI non-specific-to-fire variables

There was no interaction effect between time and recidivism, $F(7, 21) = .36, p = .91$, partial eta square $.108$, indicating that intervention effects were consistent across both groups. Due to no interaction effect only main effects were interpreted. Multivariate tests indicated a significant effect of time (pre- and post-intervention) on the combined dependent variable fire-specific, $F(7, 21) = 2.39, p = .05$, partial eta squared $= .44$. Analysis of each individual dependent variable showed significant differences between pre- and post-intervention on the “frequency of harsh punishment” variable, $F(7, 21) = 5.85, p = .02$, partial eta squared $= .18$. The means (Table 10) indicating that parents perceived that they were punishing their children less after the JFAIP intervention. There were no significant differences for FRI non-specific-to-fire variables of “positive behaviour”, “negative behaviour”, “supervision”, “frequency of mild punishment”, and “effectiveness of harsh and mild punishment”.

Main effect for pre-and post-intervention recidivists and non-recidivists FRI non-specific-to-fire variables

The main effect of recidivism was significant, $F(7, 21) = 6.83, p = .001$, partial eta squared $= .70$. This suggested that there were differences between recidivist and non-recidivist scores on the pre- and post-intervention FRI non-specific-to-fire variables.

Univariate ANOVAs indicated that there were significant differences between the variables. Table 11 presents mean differences between pre- and post-intervention non-specific-to-fire variables. In the “positive behaviour” variable, $F(7, 21) = 4.30$, $p = .05$, partial eta squared = .14, the mean difference indicated that parents of recidivist children perceived that their child displayed fewer positive behaviours, compared with non-recidivists’ parents, who viewed their child’s behaviour more positively. The “negative behaviours” variable, $F(7, 21) = 14.28$, $p = .001$, partial eta squared = .35, was significant. This indicated that parents of recidivist children perceived their child to be more negatively behaved than non-recidivist parents. The variables “effectiveness of mild punishment”, $F(7, 21) = 4.19$, $p = .05$, partial eta squared = .13; “frequency of harsh punishment” variable, $F(7, 21) = 6.47$, $p = .017$, partial eta squared = .19; and “effectiveness of harsh punishment” variable, $F(7, 21) = 5.47$, $p = .027$, partial eta squared = .17; were all significant. This suggested that parents of recidivists were more frequently harshly punishing their children and that this was not effective as reported by parents of non-recidivists. In addition, mild punishment strategies were reported by parents of recidivists as less effective than parents of non-recidivists.

Table 10: Means and standard deviations for difference between pre- and post-intervention FRI non-fire-specific variables

Dimension Non-specific-to-fire	Pre		Post		F	p	Kolko's and Kazdin Fire (<i>M</i>)	Kolko's and Kazdin No Fire (<i>M</i>)
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)				
Positive behaviour	19.03	(4.09)	19.27	(3.54)	.17	.69	16.8	18.5
Negative behaviour	26.41	(8.05)	25.62	(9.09)	.76	.39	27.7	21.9
Supervision	25.62	(2.69)	24.34	(2.27)	3.13	.09	24.0	23.7
Mild punishment (frequency)	15.41	(2.65)	14.93	(2.22)	.70	.41	8.8	7.6
Mild punishment (effectiveness)	14.34	(4.81)	15.48	(4.66)	2.96	.10	17.3	17.2
Harsh punishment (frequency)	7.76	(2.03)	6.97	(2.51)	6.03	.02	5.8	6.6
Harsh punishment (effectiveness)	5.90	(2.44)	5.79	(2.69)	.05	.83	14.1	16.6

Kolko and Kazdin's (1989) means for Fire and No Fire taken from *Assessment of Dimensions of Childhood Firesetting Among Patients and Nonpatient: The Firesetting Risk Interview*.

Table 11: Means and standard for differences between recidivist and non-recidivists on the pre- and post-intervention for FRI non-specific-to-fire variables

Dimension Non-specific-to-fire	Time	Recidivists		Non-recidivists		F	p
		<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>		
Positive behaviour	Pre	17.33	5.00	19.80	3.47	4.30	.05
	Post	17.22	3.92	22.20	3.93		
Negative behaviour	Pre	33.11	7.30	23.40	6.50	14.28	.001
	Post	33.11	10.20	22.25	6.29		
Supervision	Pre	25.89	2.37	24.75	2.81	2.85	.10
	Post	25.56	2.96	23.80	1.70		
Mild punishment (frequency)	Pre	15.22	2.28	15.50	2.86	.41	.53
	Post	14.44	1.74	15.15	2.41		
Mild punishment (effectiveness)	Pre	11.78	5.09	15.50	4.32	4.19	.05
	Post	13.33	5.48	16.45	4.03		
Harsh punishment (frequency)	Pre	9.20	1.39	7.10	1.94	6.47	.02
	Post	8.22	1.92	6.40	2.58		
Harsh punishment (effectiveness)	Pre	4.44	1.93	6.55	2.39	5.47	.03
	Post	4.55	1.01	6.35	3.03		

4.6.4 Non-parametric tests comparing recidivists and non-recidivists on the FRI and CFI

Certain variables were also evaluated using non-parametric tests because they violated the assumptions of MANOVA. These variables are discussed below.

Analysis of “involvement”, “parental fire preparedness” and “exposure” variables

There was no main effect for differences between recidivists and non-recidivists on the FRI (fire-specific) measure. The variables of “involvement”, “parental fire preparedness” and “exposure” were analysed using Mann-Whitney non-parametric U tests because non-parametric tests are less sensitive to violations of assumptions (Pallant, 2007; Tabachnick & Fidell, 2007). These tests revealed no significant difference between recidivists and non-recidivist pre-and post-intervention on these variables.

Analysis of individual items on “exposure” variable

Some of the individual items on the variable of “exposure” on the FRI measure were explored for differences between recidivists and non-recidivists. It was expected that recidivists would be (1) more exposed to models who misuse fire, and (2) that ignition sources would be more readily available in their homes (i.e., “availability of ignition sources”, “exposed to models with fire fascination” and “exposed to models who misuse fire”).

Mann-Whitney tests were used to explore the differences of these variables and found recidivists were significantly different from non-recidivists in certain variables. In the “exposure to models with a fire fascination (post)” variable ($U = 44.5$, $N1 = 20$, $N2 = 9$, $p = .03$, one tailed), the significant difference indicated that recidivists were more exposed to

models with a fascination of fire than non-recidivists at post-intervention. The variable of pre-intervention “exposure to models who misused fire” was not significant ($U = 51.5$, $N^1 = 20$, $N^2 = 9$, $p = .07$, one tailed), but this was a “trend”, and recidivists were more significantly exposed to models who misused fire. There was no significant difference between recidivists and non-recidivists on post-intervention “availability of ignition sources”.

Table 12: Mean ranks of pre- and post-intervention individual exposure items on the FRI

Exposure items	Recidivist (N = 9) Mean rank	Non-recidivist (N = 20) Mean rank	p value
Post availability of ignition sources	12.89	15.95	.40
Post exposure to models with fire fascination	20.06	12.73	.03
Pre exposure to models that misuse fire	19.28	13.08	.07

Analysis of “involvement” CFI variable

The CFI variable of “involvement” in fire-related acts was analysed using Mann-Whitney non-parametric U tests and was not significant.

4.6.5 Analysis of additional individual variables of interest

Selected pre- and post-intervention items from “negative behaviour” and fire behaviour variables (i.e., “age of onset of fire interest” and “fire history”) were also investigated.

Fire Behaviour variables (age of onset of fire interest and fire history)

“Age of onset of fire interest” and “fire history” (frequency of firesetting) is associated with recidivism and a severe course of firesetting behaviour (Root et al., 2008).

It was hypothesised that recidivists would have a significantly earlier onset of fire interest and/or fireplay than non-recidivist firesetters. Independent t.test results found a significant difference between recidivists and non-recidivists ($t = 3.07$, $df = 27$, $p = .005$, one tailed).

It was hypothesised that recidivists would have a greater fire history (frequency of fires set that had caused no damage) than non-recidivists. There was a significant difference between recidivists and non-recidivists ($t = 2.67$, $df = 27$, $p = .020$, one tailed).

Table 13: Mean differences and standard deviations of fire behaviour variables

Fire behaviour variable	Recidivist (N = 9)		Non-recidivist (N = 20)		p value
	M	SD	M	SD	
Age of onset	5.8	2.54	8.9	2.63	.005
Fire history	15.11	11.22	4.56	5.78	.020

Negative behaviour

Nishi-Strattner (2005) found that recidivist firesetters were different from single incident firesetters because they destroyed their own items and were generally more aggressive. The two individual items on the FRI measure of (1) destroying items and (2) hurting and hitting others were explored to evaluate if there were differences between recidivists and non-recidivists. It was hypothesised that recidivist firesetters would be more aggressive (hitting and hurting others) and would destroy property and their own items significantly more than non-recidivists. This was confirmed by Mann-Whitney tests, for example: “hurting and hitting others” ($U = 32$, $N^1 = 20$, $N^2 = 9$, $p = .005$, one tailed) and by “destroying items or property” ($U = 45$, $N^1 = 20$, $N^2 = 9$, $p = .03$, one tailed).

Table 14: Mean ranks of individual post-intervention negative behaviour items on the FRI

Negative behaviour	Recidivist (N = 9)	Non-recidivist (N = 20)	P value
	Mean ranks	Mean ranks	
Post destroying items	20.06	12.73	.03
Post hurting or hitting others	21.44	12.10	.005

4.7 Summary of MANOVA and non-parametric results

A summary of statistically significant results for mixed design MANOVA (FRI and CFI), non-parametric and parametric tests is provided.

4.7.1 FRI (specific-to-fire) MANOVA and non-parametric tests

Comparison of pre-and-post intervention FRI variables

The hypothesis that all parents in the study will report significant changes on all pre- and post-intervention FRI variables was confirmed. The results were consistent with the hypothesis that after the intervention parents perceived that their children were less curious about fire, were less involved with fire, were less exposed to peers or family models who may be misusing than before the intervention, and they received fewer complaints about their children's firesetting behaviour by people in the community. Furthermore, parents perceived that their children were more knowledgeable about fire safety after the intervention. The parents themselves were also more fire safety aware after the intervention.

Comparison of recidivists and non-recidivists on the FRI (specific-to-fire) variables

There was no main effect on the FRI for differences between recidivists and non-recidivists. This refuted the hypothesis that parents of recidivist would receive more complaints about their child's firesetting, would report their child as being more curious and involved with

fire, having more exposure to fire models, being less knowledgeable about fire safety and being less skilled, than would parents of non-recidivist children.

4.7.2 CFI MANOVA and non-parametric tests

Comparison of CFI pre-and-post intervention variables

The hypothesis that children would report significant changes between pre- and post-intervention on the CFI variables was confirmed for most variables. Children reported significant changes in the variables “curiosity”, “fire skill”, with less “involvement with fire” and “exposure to models”. However, there were no significant changes in “knowledge” and perceived “discipline/supervision” from pre- to post-intervention.

Comparison of recidivists and non-recidivists on the CFI, parametric and non-parametric tests

The hypothesis that there would be group differences between recidivists and non-recidivists was confirmed for the variables of “curiosity”, “discipline/supervision” and “fire safety skills”. There were no group differences for the variables of “exposure” and “knowledge”. According to Mann-Whitney tests, there were no difference for the variable of “involvement” between recidivists and non-recidivists.

Thus, as anticipated, after the intervention, recidivists were significantly more curious about fire and had fewer fire safety skills than non-recidivists. An unanticipated finding was that recidivists perceived that they received more discipline and supervision than non-recidivists. The findings also did not support the hypothesis that recidivists would be more exposed to models who misuse fire or ignition sources and less knowledgeable about fire than non-recidivists. However, individual item analysis of the “exposure” variable (section 4.7.4) did find some differences between recidivists and non-recidivists.

4.7.3 FRI (non-specific-to-fire) MANOVA

Comparison of FRI (non-specific-to-fire) pre-and-post intervention variables

The results, according to the perception of parents, indicated that they were administering significantly less harsh punishment at post-intervention compared with pre-intervention.

This refuted the hypothesis that there would be no changes in parental discipline from pre- to post-intervention of recidivists and non-recidivists. All other variables were not significant, confirming the hypothesis.

Comparison of recidivists and non-recidivists on the FRI (non-specific-to-fire) variables

The hypothesis that there would be differences between the parents' perceptions of their child's general behaviours for recidivists and non-recidivists was confirmed. Parents of recidivists reported that their children expressed significantly more "negative behaviour" and "less positive behaviour" than did parents of non-recidivists. These parents also responded that they used "harsher punishment" than non-recidivist parents, but that neither harsh nor mild punishment was particularly effective. There were no differences on parental response for the variable of "frequency of mild punishment".

4.7.4 Non-parametric tests comparing recidivists and non-recidivists (FRI variables)

There was no main effect for the FRI MANOVA. However, individual item analysis of the variable "exposure" found that recidivists were more exposed to family members who have a fascination with fire at post-intervention than non-recidivists. There was also a trend ($p = .07$) that recidivists would be more exposed to models who misuse fire.

Individual item analysis was undertaken with the FRI non fire-specific variables of "hitting and hurting others" and "destroying items". It was found that recidivist firesetters were

more aggressive and destroyed property and their own items significantly more than non-recidivists.

4.7.5 Fire behaviour variables

The two fire behaviour variables of “age of onset of fire interest” and “fire history” were explored. As anticipated, the following hypotheses were confirmed. Firstly, recidivists had a significantly earlier onset of fire interest, at five years and eight months, as compared with non-recidivists at eight years and nine months. Secondly, independent t.tests indicated that recidivists had a greater fire history and a higher number of fires set (frequency) that had caused more damage at an average of 15 fires as opposed to non-recidivists with an average of five fires (three time greater).

Table 15: Summary of results, direction of hypothesis and changes for pre- and post-intervention scores on all MANOVA analyses

Test	Hypotheses	Prediction at post	Results at post
Pre and post FRI main effect	Parents will report significant changes on all pre and post scores on the FRI and this will reflect improvement	<ul style="list-style-type: none"> ↓ curiosity ↓ involvement ↓ exposure ↓ complaints ↑ knowledge ↑ fire safety skills ↑ parent fire preparedness 	<ul style="list-style-type: none"> ↓ curiosity ↓ involvement ↓ exposure ↓ complaints ↑ knowledge ↑ fire safety skills ↑ parent fire preparedness
Pre and post CFI main effect	Children will report significant changes on all pre and post scores on the CFI and this will reflect improvement	<ul style="list-style-type: none"> ↓ curiosity ↓ involvement ↓ exposure ↑ fire safety skills ↑ knowledge ↑ supervision/discipline 	<ul style="list-style-type: none"> ↓ curiosity ↓ involvement ↓ exposure ↑ fire safety skills knowledge = no change supervision/discipline = no change
Pre and post FRI (non-specific-to-fire) main effect	Parents will not report any significant pre and post changes on the FRI non-specific-to-fire variables	<ul style="list-style-type: none"> positive behaviour = no change negative behaviour = no change discipline/supervision = no change frequency of mild punishment = no change effectiveness of mild punishment = no change frequency of harsh punishment = no change effectiveness of harsh punishment = no change 	<ul style="list-style-type: none"> positive behaviour = no change negative behaviour = no change discipline/supervision = no change frequency of mild punishment = no change effectiveness of mild punishment = no change ↓ frequency of harsh punishment effectiveness of harsh punishment = no change
Recidivist and non-recidivist FRI main effect	Non-recidivist and recidivist parents will report significantly different FRI scores	<p>Recidivist parents will report that their children have the following:</p> <ul style="list-style-type: none"> ↑ curiosity ↑ involvement ↑ complaints ↑ exposure ↓ fire safety knowledge ↓ fire safety skills 	There was no main effect on the multivariate MANOVA

Test	Hypotheses	Prediction at post	Results at post
Recidivist and non-recidivist CFI main effect	Non-recidivist children will report significantly different scores on the CFI than recidivist children.	Specifically, recidivists will report: ↑ curiosity ↑ involvement ↑ exposure ↓ fire safety knowledge ↓ fire safety skills ↓ supervision	There was a main effect on the multivariate MANOVA and univariate ANOVAS revealed recidivist were significantly different from non-recidivists on the following pre and post variable of the CFI measure: ↑ curiosity ↓ supervision/discipline ↓ fire safety skills
Mixed design non-specific-to-fire pre and post recidivist and non-recidivist MANOVA	There will be no difference on the non-specific-to-fire pre and post scores for parents of non-recidivist children and recidivist children.	It is expected that recidivists' parents will report: ↓ positive behaviour ↑ negative behaviour ↓ supervision/discipline frequency of mild punishment = no change ↓ effectiveness of mild punishment ↑ frequency of harsh punishment ↓ effectiveness of harsh punishment	Recidivist parents reported significantly different scores than non-recidivist parents on the following non-fire-specific variables on the FRI measure. The recidivist group reported: ↓ positive behaviour ↓ effectiveness of mild punishment ↓ effectiveness of harsh punishment ↑ negative behaviour ↑ frequency of harsh punishment

4.8 Discriminant Analysis Results

It is conventional practice to follow up MANOVA with discriminant function analysis to determine group membership (Tabachnick & Fidell, 2007). Discriminant analysis was used to classify children into the two firesetting status groups of recidivist and non-recidivists. The variables used in the analysis were restricted to those that were significant in MANOVA. The FRI (specific to fire) variables were not included in this analysis because there was no main effect. A combination of pre- and post-intervention CFI variables and the child's fire history were used in discriminant analysis (Table 16). Pre-intervention FRI non-specific-to-fire variables were used in the second discriminant analysis (Table 17). Thirdly, post-intervention FRI non-fire-specific variables were used in the final analysis (Table 18).

4.8.1 Assumptions of discriminant analysis

The key assumptions for discriminant analysis are, according to MANOVA, identified as: multicollinearity between dependent variables, multivariate and univariate normality of the distribution, outliers, and equal covariance matrices.

The assumption of univariate normality of the distribution was taken into account by checking the kurtosis and skewed values. The criterion of the critical value of ± 2.58 was used to determine normality of the distribution. Assumption for normality of the distribution was not met for some dependent variables. However, according to Francis (2001) discriminant analysis is not particularly sensitive to violations of the normality assumption unless caused by outliers. Histograms were examined for each predictor and there were no outliers.

The assumptions for multi-collinearity between the predictor variables were checked with regression statistical analysis. This analysis revealed no strong correlations above 0.9; therefore, the assumption of multi-collinearity was not violated (Pallant, 2007).

4.8.2 Classification of the discriminant function

Discriminant analysis was used to determine if groups could be correctly classified into their firesetting status of either recidivist or non-recidivist. Three discriminant analyses were undertaken using the “enter” method. This method was used because the “stepwise” method of analysis requires a bigger sample size, which we did not have. The classification of groups assumed unequal group sizes with the probability of being a recidivist of .30 (9 out of 29) and not the default assumption that all groups were equal (i.e., equal probabilities). This assumed that there was a 30:70 chance of being a recidivist rather than a 50:50 chance. This decision was based on past research that suggested that roughly one in four children was likely to be a recidivist, as opposed to one in two children. Overall, the literature does not support that there is a 50% chance that the child would be a recidivist (Kolko, 1985a).

The classification accuracy was raised to 87.5 % in this study. This was due to the unequal sample sizes (with a ratio of 70:30) and also because the classification should be at least one fourth greater than that achieved by chance. So for these results, classification accuracy should be one fourth higher than 70%, (i.e., higher than 87.5%) for the percentage of correct classifications to be significantly large enough than to be expected by chance.

4.8.3 Results for discriminant analysis of pre- and post-intervention CFI

variables

A discriminant analysis was performed with recidivism as the dependent variable and pre-and post-intervention predictor variables of “curiosity”, “fire safety skills”, and “supervision” because they were significant in the MANOVA. Variables of the “child’s fire history (no damage)” and the “onset of fire interest” were also included as predictor variables because independent t.tests revealed that recidivists were significantly different from non-recidivists. Furthermore, empirical evidence has suggested that a child’s fire history and age of onset (fire interest, firesetting) are strongly related to recidivism (Fineman, 1980, Kafry, 1980; Kolko & Kazdin, 1992).

Univariate ANOVAS revealed that the recidivists and non-recidivists differed significantly on the predictor variables of “child fire history (no damage)”, “early onset of fire interest”, “post-intervention curiosity”, “pre-intervention fire safety skills” and “pre-intervention discipline/supervision”. The value of this function was significantly different for recidivists and non-recidivists (Chi square = 20.70, df = 8, p < .008).

Table 16: Results of discriminant function analysis of pre- and post-intervention CFI variables

Predictor variables	Correlations of predictor variable with discriminant functions	Univariate F (1,8)	P
Fire history (no damage)	.525*	11.36	.002
Onset of fire interest	-.479	9.44	.005
Pre child discipline/supervision	.453	8.46	.007
Pre fire safety skills	-.453	6.01	.020
Post curiosity	.397	6.51	.020

* Denotes largest absolute correlation between each variable and any discriminant function

The correlation between predictor variables and the discriminant function suggested that the predictor variables listed above were the best predictors of reoffending within 12 months of receiving the JFAIP intervention.

The discriminant analysis found the following significant predictors of recidivism. The predictor “fire history (no damage)” was the strongest positive correlation with the discriminant function, indicating that the more fires lit by children, the more likely they were to reoffend within 12 months of receiving the JFAIP intervention. The “onset of fire interest” predictor was the second strongest variable negatively correlated with the discriminant function, suggesting that children who had an early onset of interest were more likely to reoffend within 12 months of receiving the JFAIP intervention. The pre-intervention “fire safety skills” predictor was negatively correlated with the discriminant function value, suggesting that children with fewer fire safety skills prior to the intervention were more likely to reoffend. Both post-intervention “curiosity” and pre-intervention “supervision/discipline” were positively correlated with the discriminant function. This indicated that children (1) with higher curiosity (after the intervention) and (2) who perceived that they were more closely supervised and getting into trouble more (prior to the intervention) were more likely to be recidivists.

The discriminate function correctly classified 95% who did not reoffend and 78% for the children who did reoffend within the 12 months of receiving the intervention, with an overall classification of 90% accuracy. This classification accuracy is meaningful because it is above 89.7 %; which is large enough to be greater than expected by chance.

4.8.4 Results for discriminant analysis for pre-intervention non-specific-to-fire FRI variables

A discriminant analysis was performed with recidivism as the dependent variable and pre-intervention predictor variables of “positive behaviour”, “effectiveness of mild punishment”, “effectiveness of harsh punishment”, “frequency of harsh punishment”, and “negative behaviour”. Pre-and-post variables were not combined in this analysis, as with the CFI variables, because there were too many significant variables that needed to be included. In addition, the variables included needed to be smaller in number than the cell sizes (i.e., no larger than nine variables in this case) so that assumptions were not violated.

Univariate ANOVAS revealed that the recidivists and non-recidivists differed significantly on the pre-intervention predictor variables of “effectiveness of mild punishment”, “effectiveness of harsh punishment”, “frequency of harsh punishment”, and “negative behaviour”. The value of this function was significantly different for recidivists and non-recidivists (Chi square = 16.94, df = 5, $p < .005$).

Table 17: Results of discriminant function analysis of pre-intervention FRI (non-specific-to-fire) variables

Predictor variables	Correlations of predictor variable with discriminant functions	Univariate F (1,27)	P
Negative behaviour	.69 *	12.85	.00
Freq. harsh punish	.57	8.64	.01
Eff. harsh punish	-.45	5.34	.03
Eff. mild punish	-.39	4.13	.05

* Denotes largest absolute correlation between each variable and any discriminant function

The correlation between predictor variables and the discriminant function suggested that “negative behaviour”, “frequency of harsh punishment”, “effectiveness of harsh punishment” and “effectiveness of mild punishment” were the best predictors of

reoffending within 12 months of receiving the JFAIP intervention. The parents' negative perception of their child's behaviour (negative behaviour) was positively correlated most strongly with the discriminant function. "Frequency of harsh punishment" was also positively correlated with the discriminant function value, suggesting that recidivist parents perceived that they were punishing their children more harshly before the intervention. "Effectiveness of harsh and mild punishment" was negatively correlated, suggesting that parents who perceived that their discipline efforts were less effective were those of recidivist children.

Overall, the discriminate function successfully predicted outcomes for 83% of cases, with accurate predictions being made for 85% of children who did not reoffend and 78% accuracy for the children who did reoffend within the 12 months of receiving the intervention. This classification accuracy is reasonable; however, it does not reach above 87.5% as indicated in section 4.8.2.

4.8.5 Results for discriminant analysis for post-intervention non-specific-to-fire FRI variables

A discriminant analysis was performed with recidivism as the dependent variable and predictors of post-intervention – "positive behaviour", "effectiveness of mild punishment", "effectiveness of harsh punishment", "frequency of harsh punishment", and "negative behaviour" – as predictor variables.

Univariate ANOVAS revealed that the recidivists and non-recidivists differed significantly on the predictor variables of post-intervention "negative behaviour" and "positive behaviour". The value of this function was significantly different for recidivists and non-recidivists (Chi square = 21.44, df = 5, $p < .001$).

Table 18: Results of discriminant function analysis of post-intervention FRI (non-specific-to-fire) variables

Predictor variables	Correlations of predictor variable with discriminant functions	Univariate F (1,27)	P
Negative behaviour	.58*	12.48	.00
Positive behaviour	-.37	5.15	.03

* Denotes largest absolute correlation between each variable and any discriminant function

The strongest predictors of reoffending with 12 months of receiving the JFAIP were “negative behaviour” and “positive behaviour”. The parents’ post-intervention “negative behaviour” score was positively correlated with the discriminant function, indicating that parental perception of more negative behaviours predicted recidivism. Conversely, “positive behaviour” was negatively correlated with the discriminant function, indicating that if parents perceived their child as behaving less positively at post-intervention it was more likely that their child would reoffend.

The discriminate function correctly classified 95% of children who did not reoffend in the 12 months after receiving the intervention and 78% of children who did reoffend within 12 months of receiving the intervention, with an overall classification of 90%. This classification accuracy is meaningful because it is above 87.5%, and large enough to be greater than expected by chance.

4.9 Discussion

4.9.1 Pre- and post-intervention FRI differences for 29 families

Kolko and Kazdin’s (1986) risk-factor model and the FRI and CFI questionnaires were used in this study to measure pre- and post-intervention JFAIP individual, social and familial risk factors in the two domains that are “specific to fire” and “non-specific-to-fire (general behavioural)”. This study included 29 families who were

administered the FRI, CFI and FHS in a pre- and post-intervention. The results indicated that, as expected, most fire-specific risk factors improved from the child's and parents' perspectives. Fewer non-fire-specific risk factors improved after the JFAIP intervention.

It was hypothesised that (1) the FRI fire-specific risk factors of curiosity, involvement in fire, exposure to ignition sources and to people who misuse fire, child knowledge and fire safety skills, and parent fire-preparedness would improve significantly after the JFAIP intervention; (2) non-fire-specific risk factors would not change significantly because FSE does not target psychosocial factors; and (3) the CFI fire-specific risk factors of curiosity, involvement, knowledge, fire safety skills, exposure and supervision/discipline would improve after the JFAIP intervention.

The significant difference on the pre- and post-intervention FRI suggested that from the parents' point of view, all JFAIP clients benefited from the intervention, with parents reporting significantly lower risk factors after participation in the JFAIP intervention. Parents (N = 29) reported that all fire-specific FRI variables had changed and improved after the JFAIP intervention.

Parents perceived that their children were significantly less curious about fire, less involved with fire, had less exposure to ignition sources and to models who misuse fire, had greater fire safety skills and knowledge after the JFAIP intervention, and parents received fewer complaints about fire involvement. The parents also self-reported that they were significantly more prepared, concerned and aware about fire safety and had implemented new fire safety strategies in their home environment.

As expected, there were no significant differences on non-specific-to-fire FRI variables of positive and negative behaviour, supervision, the frequency and effectiveness of mild punishment, and effectiveness of harsh punishment.

Unexpectedly, there was significant difference between pre- and post-intervention on the frequency of harsh punishment. After the intervention, parents reported that they were punishing their children less harshly and frequently. There are two ways to interpret this finding: firstly, that the JFAIP has had an impact on parenting styles, or that the family may have been in crisis at the time of pre-intervention, thus yielding higher pre-intervention harsh punishment scores. The second explanation is the more plausible, because at pre-intervention, the child was in trouble with the parent and perhaps the authorities, whereas at post-intervention (three months later) the crisis had dissipated and most of the children (20) had not been involved in further firesetting.

The significant difference reported on the CFI, indicated that from the child's perspective, they were significantly less curious, involved, exposed to ignition materials and models misusing fire, and had acquired greater fire safety skills after the intervention. There was no change in the fire risk variables of knowledge and supervision/discipline.

It is difficult to determine whether the JFAIP was responsible for the overall reduction in both parent and child risk factors because the intervention does not specifically target all risk dimensions and in the absence of a control group it is difficult to attribute an intervention effect. Thus, the results should be interpreted with some degree of caution. On several variables there was corresponding agreement with

parents and children that the child had changed and improved after the JFAIP intervention. These included less curiosity with fire, less involvement, less exposure to ignition sources and models who misuse fire, and greater safety skills. The parents concluded that their children were more knowledgeable after the intervention, but the children did not demonstrate pre-and post-intervention improvement on the CFI. Overall, parents and children reported no change in supervision and discipline.

Curiosity and fire interest

Children's curiosity and interest in fire are important in understanding firesetting behaviour because interest in fire frequently leads to actual fireplay (Kafry, 1980; Kolko, 2001a; Mackay et al., 2006) FSE does not directly target the child's curiosity with fire, but it aims to teach about fire and fire safety, believing that the child's curiosity and misuse of fire will be channelled into more fire-safe and responsible behaviours (Gaynor & Hatcher, 1987). In the overall sample, both the parents' and childrens' self-report indicated that there was a reduction in the childrens' curiosity about fire after participation in the JFAIP intervention.

Early experiences with fire, fire history, and involvement

Greater involvement in fire has been associated with triggering the onset (Kolko and Kazdin, 1989a; 1989b) and continuation of firesetting (Kennedy, et al., 2006). Some studies that have measured "involvement" have incorporated the components of age of onset, frequency, versatility and severity. However, "involvement" as assessed by the FRI in the current study and others (Kolko, 1989a) includes the seeking out of ignition sources, burn marks on items in the home, and complaints from other people (i.e., neighbours) in the community. The CFI measured "involvement" in the current

study by asking the juvenile four questions relating to setting off false fire alarms, hiding ignition sources, leaving burn marks in the home, and complaints from others in the community. Wilcoxon paired t-tests revealed that after participation in the JFAIP, both parents and children were in agreement that the child's involvement with fire was significantly lessened.

“Involvement” can include the amount of exposure the child has to home activities involving fire and assigned fire responsibilities. Whether or not the child should be assigned these fire responsibilities has been debated (see literature review section 3.4.4). Kafry (1980) and Gaynor and Hatcher (1987) argued that children should have more exposure whereas Grolnick indicates that given more responsibilities, the child may construe this as blanket permission to light fires when unsupervised.

The variable “complaints” from people in the community about the child's firesetting behaviour is used by the CFI and FRI questionnaire to verify that the firesetting involvement has become a community problem and that other people (i.e., neighbours) are aware of it. This variable may also indicate that the juvenile's involvement with fire has become more frequent, severe and versatile (i.e., using different ignition sources or trying to ignite a variety of different targets) and perhaps has moved out of sites around the home and into the community.

The TAPP-C program measures scores on a number of “involvement” factors to provide a score of the firesetter's level of severity, frequency and versatility. Additional information about the child's firesetting behaviour for this sample was collected in the standard interview that was conducted by JFAIP firefighter

practitioners (see Table 2 and 3). The TAPP-C protocol assesses the juvenile's level of fire involvement by including the: means age, ignition sources, targets ignited and location of fires, collaborators, and damage. The significant difference between pre- and post-intervention indicated that both parents and children perceived that the child was less involved with fire after the intervention.

Early experiences with fire

The developmental pattern of onset, either later or earlier, is relevant to the course and outcome of most childhood disorders (DSM IV, 1994). Early fire interest and greater fire history has been associated with a more severe course of firesetting and recidivism. Interest in fire and fireplay can start as early as two or three years of age (Kafry, 1980; Nurcombe, 1964). For instance, Kafry (1980) found that 18% of her sample of 99 normal children had an interest in fire before the age of three years and this was particularly prevalent in boys. Interest in fire can become a passing phase; however, in certain children this can lead to repeat fireplay or firesetting.

The "early experience with fire" variable was not measured pre-and post-intervention because it is a historical variable. Similar to most psychological problems, it has been concluded that the earlier the onset of firesetting, the more severe the course (Root et al., 2008). The mean average for early experiences with fire on the FRI measure was 2.55 out of a maximum score of five. However, this does not reveal anything meaningful. What was more meaningful in this study was the overall average age of onset of fire interest, which was reported as seven years and six months, two years younger than the average mean age (nine years and six months) of the children involved in the JFAIP program. Children have been generally described as curious,

attracted to and interested in fire, but this does not mean that they engage in the act of matchplay or firesetting. However, Kafry's study highlighted that of the 79% of the sample who reported interest in fire, 45% actually lit one. Thus, there is a high probability that interest in fire does actually translate into misuse of fire. Based on this data the children became interested in fire at approximately seven years of age but did not present to the JFAIP until roughly two years later. There can be several ways to interpret this:

- the children had been engaging in fireplay and firesetting over this time (repetitive firesetters)
- they had not been caught or the fireplay/firesetting had been ignored or dismissed
- they had received other unsuccessful interventions
- their interest had not led to fire involvement until they were two years older.

These four suggested hypotheses may indicate that these children are not receiving early intervention that may deter interest from becoming actual fireplay or firesetting. More community awareness, better screening processes in both mental health and fire services using reliable and valid tools that incorporate both fire-specific and general behavioural factors are essential for case formulation, treatment planning and monitoring processes.

Some researchers have also concluded that firesetters are early starters on the developmental pathway of crime. Age of fire interest and onset of firesetting is particularly relevant information because this can be a marker to more serious

antisocial behaviour and persistent crime. This information can also assist researchers who investigate the developmental pathways and trends of juvenile firesetters.

Exposure, modelling and parental responsibility

In the CFI and FRI questionnaire, the availability of ignition sources and exposure to models who misuse fire was assessed. Many contemporary social learning theorists stress that firesetting is a learned behaviour that is taught by models, either vicariously or through social reinforcement. These theorists stress the role of the family and environment in the development of maladaptive behaviours such as firesetting (Cole et al., 2006; Gaynor & Hatcher, 1987; Fineman, 1980; Kolko & Kazdin, 1986; Patterson, 1982).

Children frequently learn through observation and imitation of adult behaviours and firesetting can be influenced by inappropriate modelling (Cole et al., 2006; Gaynor & Hatcher, 1987; Fineman, 1980). Availability of matches and lighters and models who misuse fire are significant environmental risk factors (Grolnick et al., 1990). In the current study, according to both parents and children, unsafe modelling of misuse of fire and exposure to fire materials improved after the JFAIP intervention. This could suggest that the parents are modelling more appropriate fire-safe behaviours and storing ignition sources more safely as a result of the intervention, with some parents acknowledging that they were more concerned about fire safety and had changed their behaviour.

Siblings, peers and adult role models may also be modelling misuse of fire. The data suggested that more than 50% of the children in the sample lit fires with a peer. The

current study also provided qualitative description of the children's and families' firesetting histories (Table 3) and this indicated that some of the juveniles who participated in the study had witnessed or were aware of adult role models who had misused fire. What was striking in these interviews was that some of the children had been exposed to modelling of serious misuse of fire. For instance, in one family the child's two most significant role models, his father and stepfather, had been involved in arson and were incarcerated due to these crimes. Another family reported that a cousin had set another relative alight and that the grandmother was also killed in a deliberately lit house fire. A further family reported that their estranged mother had set fire to a semitrailer and three other trucks and had also been incarcerated for arson. A fourth family indicated that the child's uncle had been burnt by a fire and had sustained serious burns and scarring to his face. The serious implications of these acts had not deterred these children from firesetting, which is consistent with Ritvo et al. (1983) study that found that juveniles who had witnessed or experienced the negative effects of fire (painful burns) had not stopped firesetting.

Macht and Mack's (1968) study is one of the few that discusses the child's identification and modelling of their father's firesetting behaviour. In their study, most of the fathers had some significant involvement with fire as their employment (i.e., fireman, gas burner repairman, furnace stoker). They indicated that these children learnt both vicariously and directly by example from their fathers and this may have contributed to their firesetting. Kolko and Kadzin (1986) also supported this view and included this factor in their risk-factor model. While Macht and Mack's study related the impact of the father's career choice on the child's curiosity and

interest, there are no studies that discuss the impact of a role model's serious misuse of fire on juvenile firesetting behaviour.

Putnam and Kirkpatrick (2005) identified smoking in the household as one of the correlates of child fire involvement. Adler et al. (1994) noted that the cigarette smoking of parents was both a model of adult "fireplay" and provided easier access to ignition sources. Firesetters generally come from households where there is a smoker (Adler et al., 1994; Cole et al., 2006). In the current study, 97% of families stated there was some exposure in the home; however, 45% of these stated that their children were not exposed on a regular basis to smokers in the home (i.e., either the parents concealed their own smoking, or they had friends/relatives who smoked who would come to the house irregularly).

Availability of ignition sources

Grolnick et al. (1990) and Nishi-Strattner (2005) pointed out that easy access to ignition sources and inadequate supervision were important factors that may trigger the onset and continuation of firesetting. Parents may be unaware that safe storage of ignition sources is one of the most important strategies in preventing firesetting that they can control. Various studies and programs have emphasised that parental education in the safe storage of ignition sources is an effective strategy to reduce firesetting.

Monitoring and supervision of children may need to be addressed through parenting programs and not through FSE intervention. However, targeting risk factors for firesetting, specifically access to incendiary material, is an important strategy and is

widely practiced by TAPP-C with the rationale that most children are curious and impulsive firesetters and if given the opportunity will light fires.

Parental preparedness

Parents are more able to control the home environment and its safety than are children. If parents change their behaviours about home fire safety and hazards, then children are more likely to model responsible fire-safe behaviours (Cole et al., 2006; Gaynor & Hatcher, 1987). The parents in the study indicated that after intervention they were more prepared and concerned about fire safety, as was demonstrated by behaviour changes, such as ensuring smoke alarms were working or by purchasing a fire blanket.

Although FSE may have a positive impact on future behaviours, past serious misuse of fire cannot be undone. In these cases, effective psychological intervention needs to be implemented because there are still underlying issues for those children.

Fire safety skills and knowledge

It is important to keep in mind when interpreting the pre- and post-intervention results of knowledge and skills that the CFI and FRI measures may not have captured all aspects of knowledge and skills taught in the JFAIP.

Fire knowledge

Children generally lack knowledge in fire safety and do not understand basic personal fire safety strategies. The FSE aims to teach children this knowledge and this is the basis of the JFAIP. In the CFI questionnaire, the child is required to demonstrate their

knowledge of what burns and does not burn; however, the limitation of this questionnaire is that it only assess this one aspect of fire knowledge. The questionnaire did not assess the following components although they were taught in the FSE:

- the nature of fire (how quickly it spreads and gets out of control or how one match can burn down an entire house)
- what firefighters do
- responsible fire behaviours
- knowledge of the fire triangle
- consequences of misuse of fire
- knowledge of hazards.

The findings suggested that the children were not able to demonstrate a gain in knowledge of what burns from pre- and post-intervention. However, because the other types of knowledge were not assessed by the FRI or CFI it cannot be verified that these children did not gain knowledge in other areas taught by the JFAIP intervention.

Another reason why the children may not have demonstrated any knowledge gains after intervention is that the children may not have retained the taught knowledge. Satyen's et al. (2004) study indicated that children had recalled 81% of fire safety knowledge when assessed three weeks after receiving the MFB's primary prevention program. However, when the children were re-tested at week five (two weeks later) their knowledge retention had declined significantly to 61%. The children in the current study were retested on the CFI three months after the conclusion of the

intervention. It is very possible that these children had forgotten what they were taught. Satyen's et al. study indicated that children were a difficult group to educate because of their limited ability to understand and remember. This study illustrated that children need continual, repetitive and periodic teaching if they are to sustain learning. The JFAIP has, on average, two to three intervention sessions and the program relies on the parents to continually reinforce these messages. However, it is known that parents of firesetters are typically socially disorganised, preoccupied, challenged by day-to-day crises and possess ineffective parenting skills (Fine & Louie, 1979; Kazdin & Kolko, 1986; Sakheim et al., 1985; Vandersall & Wiener, 1970). In this type of home environment and atmosphere, continual reinforcement of fire safety may not be realistic because the parents may not have either the skills or the motivation to implement this.

Fire safety skills

The parents indicated that children's fire safety skills had increased after JFAIP intervention, and assessment of fire safety skills proved to be more comprehensive in general because they included: consequences of fire; how to correctly light and put out safe fire in a fireplace (under supervision); responsible action when finding matches or lighters and personal fire safety strategies.

In contrast to the assessment of "fire knowledge" which indicated no increase, the "fire safety skills" assessment demonstrated a much greater increase from pre-and post- intervention. Perhaps the reinforcement and behavioural training methods (i.e., role plays and rehearsal) were more effective than general discussion. There is some evidence that these methods are more effective with children than a didactic approach

to learning (Kolko et al., 1991). It is also consistent with evidence that suggests that children need to be actively involved in order to learn and retain information (R. T. Jones, Kazdin, & Haney, 1981a).

4.9.2 Recidivist versus non-recidivists

Interventions are necessary to reduce recidivism rates and the prevalence of firesetting has been reported as lower after intervention. The FEMA and Firehawk national programs reported one to six percent recidivism rate after intervention, but without intervention a 50% recidivism rate was reported (Kolko, 1988).

In the current study, 29 participants were followed up prospectively for one year to determine their firesetting status. Of the 29 children in the sample, nine participants had set a further fire and these were identified as recidivists. Thus, about a third of the sample continued to light fires. It must be noted that although the current study has a small sample, the recidivist rate of one third is consistent with international large-scale studies that have found around one quarter will reoffend (Kolko, 1985a). It is also important to note, however, that the subsequent fires lit by the recidivist group were restricted to matchplay incidents that were less frequent and severe.

In the overall sample of 29, the risk factors for all children lowered after the JFAIP intervention. However, when comparing the groups of recidivists and non-recidivists, recidivists had significantly greater risk on certain variables than non-recidivists.

There were no significant interactions between recidivists and time, suggesting that neither group improved more than the other because of the intervention. It might be that recidivists and non-recidivists are different and this has also been confirmed by other research (Kolko & Kazdin, 1992; 1994; Kolko et al., 2006; Nishi-Strattner,

2005; Root et al., 2008; Sakheim & Osborn; 1991, 1999). The recidivists may be a riskier group, whose risk factors before and after the intervention were higher than the non-recidivist group.

It was confirmed that recidivists had certain greater fire-specific and general behavioural risk factors than non-recidivists. The recidivists still remain at risk for continual firesetting because even after exposure to the JFAIP intervention they are still misusing fire, suggesting that they require a more intensive firesetting intervention that targets both fire-specific risk factors and general behavioural dysfunction. In some cases a mental health, family assessment and psychological intervention may be necessary.

There was no significant difference between recidivists and non-recidivists on fire-related risk factors from the parent's perspective as measured by the FRI. This disconfirmed the hypothesis that parents of recidivists would perceive that their children had greater curiosity, involvement, complaints and exposure than parents of non-recidivist children. There was also no difference between recidivists and non-recidivists in terms of fire safety skills and knowledge from the parents' perspective.

Individual FRI fire-specific items were explored using Mann-Whitney tests, which found there were some differences between non-recidivists and recidivists. For example, at post-intervention parents reported that their recidivist children were more "exposed to models who were fascinated with fire". There was also a trend that recidivists were "exposed to models that misused fire" at pre-intervention. There was no difference between recidivists and non-recidivists in terms of their "exposure to

matches and lighters in the home”. The fire behaviour variables of “onset of fire interest” and “fire history” (number of fires that had caused no damage) were also compared for recidivists and non-recidivists. Independent t.tests confirmed that recidivists had a significantly greater fire history and an earlier onset of fire interest than non-recidivists.

As expected, group differences were reported for non-fire-specific risk factors on the FRI. Parents of recidivists reported their children as engaging in significantly less “positive” and more “negative” behaviours, responding less to “mild” and “harsh” punishment, and had greater exposure to “harsh punishment” than non-recidivists. The individual variables of “destroying items” and “aggressiveness (hitting and hurting others)” were explored because Nishi-Strattner (2005) found these variables particularly salient to recidivists. Mann-Whitney tests confirmed that recidivists were more likely than non-recidivists to destroy items and behave aggressively by hitting and hurting others.

There were some significant group differences between recidivists and non-recidivist children on the CFI. In contrast to non-recidivist children, recidivists self-reported at three month follow-up that they were significantly more “curious”, frequently “disciplined and supervised”, and had acquired fewer “fire safety skills”.

A discriminant analysis was also employed to differentiate recidivists from non-recidivists. The predictors were restricted to certain variables (see section 4.8.3). A combination of pre- and post-intervention CFI variables and the child’s fire behaviour variables of firesetting history and age of onset were used in the first discriminant

analysis (Table 16). The variables of age of onset and firesetting history were included because independent t-tests (section 4.6.6) found a significant difference between recidivists and non-recidivists. Pre-intervention FRI non-specific-to-fire variables were used in the second discriminant analysis (Table 17) and, thirdly, post-intervention FRI non-fire-specific variables were used in the final analysis (Table 18).

The CFI variables that contributed significantly to the discriminant function were firesetting history (.53, number of fires causing no damage), age of fire interest onset (-.48), pre-intervention discipline/supervision (.45), pre-intervention fire safety skills (-.45) and post-intervention curiosity (.40). The discriminant analysis correctly classified 78% and 95% of the recidivist and non-recidivist groups respectively, with an overall classification rate of 90%.

The pre-intervention non-fire-specific FRI variables that contributed significantly to the discriminate function were expression of negative behaviour (.69), frequency of harsh punishment (.57), effectiveness of harsh punishment (-.45) and effectiveness of mild punishment (-.39). These risk factors were the best predictors of reoffending within 12 months of receiving the JFAIP intervention. The discriminant analysis correctly classified 78% and 85% of the recidivist and non-recidivist groups respectively, with an overall classification rate of 83%.

The post-intervention non-fire-specific FRI variables that contributed significantly to the discriminant function were negative behaviour (.58) and positive behaviour (-.37) and they were the best predictors of reoffending within 12 months of receiving the JFAIP intervention. The discriminant analysis correctly classified 78% and 95% of

the recidivist and non-recidivist groups respectively, with an overall classification rate of 90%.

Contemporary studies have indicated that some firesetters display a more severe trajectory of firesetting behaviour if they present with an earlier onset of fire involvement, more frequent and varied firesetting, higher recidivism rates, and greater emotional and behavioural problems (Root et al., 2008). Indeed, some of these patterns were found in the current study. The discriminant functional analysis revealed the most robust predictors of recidivism, including the parent reports of heightened negative behaviour and the fire behaviour variables of fire history (greater frequency of fires lit that had caused no damage) and early fire interest onset. The child's perception of being regularly disciplined was another robust predictor of recidivism.

These results are consistent with contemporary findings that a combination of fire-specific variables and general behavioural risk factors contribute to pathological and repetitive firesetting, and this indicates that FSE alone is not sufficient intervention for this recidivist group (Kolko and Kazdin, 1986, 1991c, 1994; Kolko et al., 2001b; Nishi-Strattner, 2005; Mackay et al., 2006).

4.9.3 CFI factors related to recidivism

Curiosity, attraction and preoccupation with fire and fire interest

The findings indicated that curiosity and interest in fire were significant variables that distinguished the group of recidivists from non-recidivists. Results of the CFI found that at post-intervention, recidivists had significantly higher curiosity and interest in fire than non-recidivists. This finding is consistent with the Kolko and Kazdin (1992)

study where child recidivists, at one year follow-up, acknowledged greater attraction to fire and interest than non-recidivists. It was also consistent with Nishi-Strattner's (2005) study that reported that recidivists were more fascinated and more involved with fire.

Curious firesetters, are described in the literature as benign, normal and unthreatening (Gaynor & Hatcher, 1987; Grolnick et al., 1990; Schwartzman, 2002). Researchers who now challenge this view have found that children who are self-identified with high levels of curiosity about fire indicated more preoccupation and fascination with fire than children who report low curiosity (Kolko & Kazdin, 1991b; Mackay et al., 2006).

Kolko has suggested that there may be a point where curiosity becomes too high and transitions to fascination and preoccupation with fire (section 3.4.1). Studies have found that heightened fire interest was a significant predictor of both the frequency and versatility of fire involvement and recidivism at 18 months follow-up (Mackay et al., 2006). Anger and curiosity were examined by Kolko and Kazdin (1991b) and they found that the variable of high curiosity was more associated with heightened behavioural dysfunction and sustained firesetting than anger. They concluded that curiosity may be a more enduring motive than anger. Other research has confirmed that externalising behaviours (i.e., anger) were the trigger for the initial onset of firesetting behaviour, and that once established, heightened fire interest continued to fuel the behaviour (Mackay et al., 2006).

In the current JFAIP study, it could be hypothesised that the recidivist children with heightened curiosity were more pathologically attracted to fire than those who did not reoffend. However, we cannot confirm this because the two constructs of “curiosity” and “fascination” were not measured or distinguished in the study. Future research into these constructs is worthy of investigation. Fascination and attraction to fire appears to be a red flag for pathological firesetting behaviours and this hypothesis needs to be validated through empirical research.

Fascination and heightened interest in fire has also been linked as a predictor of adult arson. Rice and Harris (1991) found that childhood interest in fire was the most robust predictor of adult arson. Given the social, financial and personal costs of arson, research of this nature is a priority, particularly since some of the Black Saturday bushfires in Victoria were thought to be deliberately lit by both adults and juveniles. The Royal Commission into the Black Saturday bushfires may suggest revision of laws and penalties. It may also be important that some effort and funding be directed towards programs that prevent or modify preoccupation with fire before it becomes well-established and difficult to change. Moreover, there are currently no mental health treatments in Australia that offer a targeted firesetting treatment (as further discussed in Chapters Five and Six).

FSE intervention on its own may not be as effective with children who have demonstrated a pathological interest in fire. Kolko et al. (2006) and Kafry (1980) found that a sole FSE intervention was not particularly effective in reducing curiosity about or attraction to fire. They concluded that fire fascination may require more

intensive training or alternative methods that more directly target reduced interest in fire.

Researchers have, in the past, endorsed satiation methods to extinguish fire interest; however, more contemporary approaches integrate FSE and CBT methods because this approach is evidence-based and thought to be more effective (Barreto et al., 2004; Gaynor, 1991; Henderson et al., 2006; Kolko, 2001a, 2002b; Mackay, Henderson, Root, Warling, & Johnstone, 2004; Sharp, Blaakman, Cole, & Cole, 2006).

This study also supports the re-evaluation of the term “curiosity” firesetter, frequently used to describe low-risk offenders who are benign (Kolko & Kazdin, 1991b; Mackay et al., 2006).

Early fire interest and fire history

Previous fire involvement has been reported as a salient predictor of ongoing firesetting in several studies (Kennedy et al., 2006; Kolko et al., 2001b; Kolko, 1992, 1994). A recent systematic review of six studies and two dissertation abstracts found that previous involvement in firesetting behaviour was the best single predictor of recidivism (Kennedy et al., 2006), consistent with the notion that past behaviour predicts future behaviour (Root et al., 2008).

In the current study, recidivists had three times greater fire history than non-recidivists, perhaps reinforcing the belief that they will never get caught. Furthermore, the recidivists had a significantly earlier fire interest onset at five years and eight months as compared with non-recidivists at eight years and nine months.

According to several researchers, earlier onset is indicative of a more severe course, pattern and outcome of behaviour disturbances that may lead to heightened aggression, early arrests and chronic offending (Jacobson, 1985a; Root et al., 2008; Stickle & Blechman, 2002). Jacobson (1985a) and Stickle and Blechman (2002) concluded that firesetting is a marker of serious antisocial behaviour that may lead to persistent criminality in later life.

Fire safety skills

Recidivists were found to have significantly less knowledge of fire safety skills before the intervention than non-recidivists and studies by Nishi-Strattner (2005) found that recidivists were educationally more disadvantaged (with 48% having special educational needs) than single incident firesetters. Nishi-Strattners views have been verified by other researchers (Heath et al., 1983; Kaufman et al., 1961; Kolko et al., 1985b; Kuhnley et al., 1982; Vandersall & Wiener, 1970; Wooden & Berkey, 1984). This suggests that recidivists may need a more comprehensive program with higher dosage and continual reinforcement so that knowledge is retained.

Research has found that an increase in fire safety knowledge does not always result in behavioural change (Kafry, 1980; Kolko et al., 2006, Kolko, 1996; Grolnick et al., 1990). In this study, the post-intervention discriminant analysis found that the variable of “fire safety skills” was not a significant predictor. Although recidivists demonstrated improved fire safety skills, this had not led to behavioural change, as they continued to light fires. More intensive intervention offered by a multidisciplinary team may be required.

Discipline and supervision (both fire-specific and general behavioural)

Recidivist children reported that they experienced significantly more discipline and supervision than non-recidivist children. This result was contrary to Kolko and Kazdin's (1990) findings that recidivist children perceived their parents' child-rearing practices as being more lax. However, the questions on the CFI asked the child "how often they got into trouble with parents and other people" and "how often they were supervised at a friend's house". The children identified as recidivists generally perceived that they were more frequently getting into trouble for their behaviours than non-recidivists. This is further reinforced by the parental FRI (non-specific-to-fire) results that suggested that recidivist children displayed more negative behaviours and the parents were less effective in their discipline strategies and therefore punished them more harshly.

4.9.4 FRI non-specific-to-fire factors related to recidivism

Although the overall main effect on the FRI MANOVA for recidivist and non-recidivists was not significant, some individual items on the "exposure" variable were examined for their importance because past research had indicated that they are implicated with recidivism.

Modelling and social learning

Firesetting literature has concluded that inappropriate modelling can lead to the onset and continuation of firesetting (Bandura, 1977; DeGarmo et al., 2004; Patterson, 1982).

In the current study, interviews with families indicate a pattern of parental and sibling misuse of fire. Separate Mann-Whitney tests were undertaken to determine whether

or not there were group differences between recidivists and non-recidivists on two items on the exposure scale. The two items investigated were (1) exposure to models with fire fascination, and (2) exposure to models who misuse fire.

In the current study, the recidivists had been more significantly exposed to models with a fascination with fire and there was a trend of inappropriate modelling of using fire as a weapon for revenge and resolution of conflict. The qualitative data also provided some insight into the parents' misuse of fire and revealed that some had committed serious acts of firesetting. This included parents taking revenge on people by burning down their houses and setting relatives on fire, teaching them to resolve interpersonal problems through violence or arson. Indeed, some of the parents of JFAIP clients had been convicted of arson and were in jail. In addition to this, there was a high proportion of firesetting that involved siblings (52%) who may be modelling inappropriate misuse of fire. Consistent with social learning theory, this evidence suggests that the firesetting behaviour of recidivists may have been taught by their role models and this may have been reinforced either vicariously or socially.

The child may light fires in an environment where firesetting is acceptable and rewarding because of the personal satisfaction derived from the activity and the lack of consequences. The literature has described firesetters' typical home environment as unrewarding, chaotic and disturbed. Firesetting may offer the child immediate rewards of sensory stimulation, gratification, attention, or recognition. There may be no punishment or consequences because the parents themselves have engaged in the behaviour. Delinquent firesetting could also emerge if the juvenile is gaining peer approval and acceptance for the act.

Practitioners in the field have recognised that firesetting is a marker and an early first clue to future criminal behaviours. Recidivist firesetters may be at more significant risk for future crime, particularly if their parent(s) have been convicted of arson also. Early intervention is paramount for these recidivists because once these behaviours are established, they are more difficult to treat and have limited effectiveness. Family pathology and disturbance of firesetting behaviour of this magnitude requires a more intensive psychological assessment and intervention than FSE alone. It may also be necessary to target individual and familial risk factors for firesetting, including the child's exposure to peer/family models (Kolko and Kazdin, 1989a, 1989b) through strategies and psychoeducation for parents to assist them in modelling appropriate behaviours. These family disturbances need to be treated within the context of a multidisciplinary team.

4.9.5 FRI (non-specific-to-fire) variables related to recidivism

In general, firesetters present with heightened externalising, social and aggressive problems (Heath et al., 1985; Jacobson, 1985a; Kolko & Kazdin, 1991a; Kolko et al., 1985b; Mackay et al., 2006). For instance, Mackay et al. study (2006) found almost half of the firesetter children referred to the TAPP-C program scored in the clinical range ($T > 69$) on the CBCL externalising scale. Researchers confirmed that firesetters have social deficits, are frequently bullied or bully others, and have limited skills in interacting with others (Kafry, 1980; Kolko, 1999; Vandersall & Wiener, 1970).

In the current study the parents of recidivists indicated that their child expressed significantly fewer positive prosocial and more negative antisocial behaviours than parents of non-recidivists children. This finding is consistent with other research that

found that recidivists were characterised by heightened externalising behavioural problems, clinical diagnoses and general behavioural dysfunction (Adler et al., 1994; Kolko, 1992, Kolko et al., 2006; Root et al., 2008). For instance, Root et al. (2008) found that for every unit increase in externalising behaviour on the CBCL, the risk of recidivism increased by 10%. Adler et al. (1994) also found that child psychopathology was the only significant correlate of firesetting recidivism at 12 month follow-up.

Results of Mann-Whitney U parametric tests confirm that the parents perceived that their children were more aggressive, hit other children and destroyed property. Nishi-Strattner's (2005) also found that recidivists were more aggressive than single offenders, fought with their caregivers and destroyed their possessions.

The FRI (non-specific-to-fire) MANOVA indicated that recidivist children showed significantly less prosocial behaviour on such things, as making pleasant conversation, being affectionate, complimenting and praising others, and using humour and jokes. This is consistent with previous work that suggests that firesetters have poor interpersonal and social skills (Kafry, 1980; Kolko, 1999; Vandersall & Wiener, 1970; Wooden & Berkey, 1984).

The qualitative data also revealed that some recidivists were bullied, whereas some were the aggressors and bullied others. Some children had experienced trauma, such as recent separation, sexual abuse, death, family substance abuse, divorce or domestic violence. Nishi-Strattner (2005) also found that repeat firesetters had been exposed to more traumatic experiences in the past one-year period than single firesetters as

reported by their parents. A chaotic and disturbed environment such as this can leave a child feeling powerless, predisposing them to crisis-, revenge-, power- or anger-motivated firesetting against parents who have been neglectful and abusive. The act of firesetting can be symbolic, instrumental and motivated to call attention to a family crisis and conflict (Kolko & Kazdin, 1986; Showers & Pickrell, 1987).

Studies have also found that many parents of firesetters are dysfunctional and can suffer from personality and clinical disorders, can be abusive or violent and frequently abuse substances (Bumpass et al., 1983; Fine & Louie, 1979; Lewis & Yarnell, 1951; Stewart & Culver, 1982). The qualitative data confirmed this with reported incidences of substance-abuse, depression, domestic violence and separation. Parental pathology, coercive parenting practices, family dysfunction, abuse, maltreatment and exposure to violence have been linked to the onset and continuation of juvenile firesetting (Kolko & Kazdin, 1986; Patterson, 1982; Ritvo et al., 1983; Root et al., 2008).

Children exposed to aggressive parental modelling are more likely to be aggressive (Bandura, 1965, 1977, 1986; Patterson, 1982). Parents of firesetters may also be unmotivated or unskilled to teach their children vital social skills and Patterson (1982) noted that antisocial children do not grow out of antisocial behaviours on their own unless they are taught otherwise.

Comorbid psychiatric diagnosis

Clinical experience (Kolko, 1985a) indicates that firesetting is rarely an isolated symptom, but viewed as comorbid with other problems such as conduct disorder,

ADHD and ODD. Of the current sample, 41% had a comorbid clinical diagnosis and 38% had ADHD, whereas 7% had a diagnosis of conduct disorder which has been identified as the most common clinical diagnosis associated with firesetting. A 7% prevalence rate from this study is quite low in comparison to other studies, with reports of up 60–70% conduct disorder prevalence in their samples (Sakheim & Osborn, 1999). Most of these studies have included a clinical sample of inpatients and outpatients, whereas this sample was derived solely from the fire service.

ADHD is the second-most common diagnosis after conduct disorder (Kolko and Kazdin, 1989b) and this is consistent with the current study that found a 38% prevalence rate.

In the current study, two of the children in the sample of 29 also had engaged in some self-harming behaviours (i.e., lighting their clothes while they were in them and cutting themselves).

Family factors: Parenting practices (harsh punishment and permissiveness)

Families of firesetters often demonstrate parent–child relational problems (Sakheim & Osborn, 1991), are abusive, substance dependent, and inadequate (Nurcombe, 1964). Parents of recidivist children employed harsher and less effective punishments than non-recidivist parents. Kolko, 1998 and Ritvo et al., 1983 also confirmed these findings. Nishi-Strattner's (2005) review of the Washington County Fire Academy Program found that most parents (46%) felt like they had no control of their children and 56% reported that their child had a history of lying. Many parents may need additional interventions to assist their children to develop alternative prosocial

behaviours. Parenting training can include using in-home contingencies where the skills of appropriate use of contingent positive- and negative-reinforcement strategies are learnt (Carstens, 1982; Kolko, 1983; Patterson, 1982). These strategies are outside the scope of a sole FSE program and beyond the skill-base and training of firefighter practitioners, and can only be provided by an appropriately trained multidisciplinary team.

Research indicates that some parents react in extreme ways (physical punishment) while others dismiss, ignore or are unaware of the incident. Physical punishment reinforces and increases the child's antisocial behaviour (Cox-Jones, Lubetsky, Fultz, & Kolko, 1990) as does absence of consequences, because it sends a message to the child that this behaviour is acceptable. No awareness of the firesetting act may indicate a lack of parental supervision (Grolnick et al., 1990; Kolko, 1992). This lack of response may reflect ambivalence in parents to discipline their child or the view that firesetting is normal and something the child will grow out of.

Poorer parental practices were observed when gathering the interview data on families, for example it was revealed that two children were observers to serious firesetting incidents. One child claimed that he was an observer to the firesetting incident where his friend lit a fire in a vacant house. This fire required a fire brigade response and caused extensive damage to the kitchen. The other case involved a young boy (eight years old) who was with a girl much older than him (approximately 13 to 15 years old) who lit a house fire. This occurred late on a Saturday night, some distance (a few suburbs) away from where the child lives. In both cases, these

children were not adequately supervised or monitored and the outcome was a serious fire that caused much damage and required suppression from the fire brigade.

At the other extreme, parents of firesetters can react harshly to their child's firesetting and punish them severely, even violently. Studies have reported on parents who have burnt their children for lighting fires. For instance, the Ritvo et al. (1983) study of incarcerated delinquents found that adolescent firesetters had significantly greater history of severe burns than non-firesetters and that the majority of the burns were inflicted by parents as punishment for lighting fires. Other studies have reported similar findings – that the parents burn the child to punish them for firesetting (Madanes, 1991). Root et al. (2008) found that many of the youths referred to the TAPP-C program had a history of maltreatment (48%), and that 26% of them had been exposed to more than one type of maltreatment. Additionally, a further 60% of children had been previously involved in some way with child welfare.

Exploration of maltreatment and abuse is an important factor to screen for when interviewing firesetting children because there is a link between maltreatment and a more severe course of firesetting (Root. et. al, 2008). Parental training by mental health professionals is also vital for dysfunctional families.

4.9.6 Combination of fire-specific and general behavioural dysfunction risk factors and recidivism

In the current study, the discriminant functional analysis revealed the most robust predictors of recidivism included the parent reports of heightened “negative behaviour” and the child's perception of greater “supervision or discipline”. The fire behaviour variables of a greater “fire history” and earlier onset of “fire interest” were also robust predictors of recidivism.

Other predictors of recidivism for the CFI were greater “post-intervention curiosity” and less “pre-intervention fire safety skills”. For the FRI (non-specific-to-fire) pre-intervention variables the following predictors were also salient, including: greater “frequency of harsh punishment”, and less “effectiveness of harsh punishment” and “effectiveness of mild punishment”. For the FRI (non-specific-to-fire) post-intervention variables, less “positive behaviour” was also a predictor of recidivism.

In previous literature, Kolko et al. (2006) found that greater involvement, curiosity, firesetting history and externalising behaviours were predictors of recidivism. Kolko and Kazdin (1994) found that recidivists were engaged in more covert and externalising behaviours and were more curious about fire than single incident firesetters. Kolko et al. (2001b) found that involvement in fire-related acts and covert antisocial behaviour predicted recidivism for inpatients and outpatients. Nishi-Strattner (2005) found that recidivists were more fascinated and more involved with fire, set fires with their peers, destroyed more of their possessions, fought more with their caregivers and lied more frequently.

The current findings and past evidence confirm that both fire-specific and general behaviour risk factors are linked to the onset and continuation of firesetting. It is recommended that screening tools incorporating both fire-specific and general behavioural factors are used and that methods of FSE and behavioural treatment therapies such as CBT are integrated so that both sets of problems are addressed.

4.9.7 Summary and Conclusion

This study supports the contemporary risk-factor models that suggest that firesetting is multidetermined and includes individual, familial, social and environmental factors.

These theoretical models (such as Kolko's and Fineman's) consider that juvenile firesetter risk factors are a combination of both fire-specific and general behavioural risk factors and this research supports these models.

The impact of the JFAIP cannot be fully ascertained because there was no control group to compare the findings against, therefore cause and effect attributions can not be made directly. A control group was not possible in the real-life setting of an established program of 20 years because it was unethical to deny juveniles access to an intervention without any suitable substitute. It can be concluded that after the JFAIP intervention, juveniles' firesetting incidents had either ceased or were less frequent and severe. There were 20 juveniles out of 29 who participated in the intervention who did not reoffend in the 12 month follow-up period. The nine participants who did reoffend committed less severe acts and this was limited to fireplay such as lighting matches, playing with the stove or lighting papers.

In the overall sample, parents perceived an improvement in the child's fire-specific risk factors from pre- to post-JFAIP intervention. The FRI fire-specific results indicated that from the parent's perspective children were less curious about fire, less involved with fire, less exposed to ignition sources and to models who misuse fire, had greater fire safety skills and knowledge, and parents had received fewer complaints about fire involvement after the JFAIP intervention. The parents also self-reported that they were significantly more prepared, concerned and aware about fire

safety and had implemented new fire safety strategies in their home environment. As expected, overall parents did not report pre- and post-intervention differences on the non-specific-to-fire risk factors of the FRI. The only exception was harsh punishment and this may be contextual because at pre-intervention the family was in crisis.

Overall, the child's perspective of change on the CFI firesetting risk factors from pre- to post-JFAIP intervention had largely improved. Curiosity about fire, involvement with fire, peer and family exposure and fire safety skills had changed and improved after the JFAIP intervention. Children reported that they were less curious about fire, less involved with fire, and less exposed to fire models after receiving the JFAIP intervention. Children also demonstrated greater fire safety skill at post-intervention. However, there were no significant changes on the variables of knowledge and discipline/supervision from pre- to post-intervention.

Recidivists and non-recidivists

The findings have highlighted that there are both high-risk and low-risk clients who are referred to FSE programs in Australia. Low-risk clients appeared to have benefited from a fire safety intervention emphasising education and did not reoffend at 12 month follow-up. Thus, FSE programs (e.g., JFAIP) may be appropriate as a sole intervention with some firesetters under certain conditions such as the child having: lower curiosity; less involvement with fire; a later onset of fire interest; lesser firesetting; parents who are supportive and model concern about firesetting; parents with better parenting skills and practices (punishment and discipline) and a family with a stable and intact home environment, and no reported parental or child clinical or behavioural disturbances.

However, about a third of the JFAIP clients were identified as recidivists and at risk because they demonstrated significantly greater fire-specific and general behavioural risk factors, thus could benefit from additional interventions. These salient risk factors included: greater externalising and behavioural disturbance; social deficits; family dysfunction (poorer parenting practices); an atypical curiosity (fascination) with fire; early onset of fire interest; greater fire history; less capacity to gain fire safety skills through FSE intervention; greater exposure to models who are fascinated with fire and parents who misuse fire and model inappropriate fire behaviour.

The JFAIP intervention worked for juveniles and their families under certain lower risk conditions and did not work for those at higher risk. The mechanism of change in the study could not be identified due to limitations of the study, such as no control group. However, the conditions identified for higher and lower risk clients could be explored as potential moderators of juvenile firesetting intervention in future studies.

FSE such as the JFAIP emphasise that this type of intervention may be appropriate for curiosity children but not those identified with an atypical curiosity (fascination). The two constructs of fascination and curiosity need further exploration and validation. However, what is clear is that FSE is not enough as a sole intervention with children preoccupied with fire. This preoccupation is a factor that needs attention as the recidivist children self-reported that they were significantly more curious about fire than non-recidivists. This is consistent with other work that found interest in fire and curiosity salient variables in the continuation of firesetting (Kafry, 1980; Kolko & Kazdin, 1991b, 1994; Mackay et al., 2006; Nishi-Strattner, 2005; Rice & Harris, 1991).

Kolko et al. (2006) and Kafry (1980) found that FSE was not effective in reducing curiosity about, or attraction to fire. In a previous study, it was found that attraction to fire was independent of fire competence and avoidance (Kafry, 1980). These findings suggest that solving the child fire problem by focusing only on preventative measures while ignoring the curiosity and fascination attached to fire is not effective. Kolko and Kazdin (1991b) and Mackay et al. (2006) also had similar findings, and suggested that recidivists have more of an atypical attraction to and preoccupation with fire. This intense curiosity factor has been also confirmed in the current study as a salient variable that contributes to recidivism in juvenile firesetting. It is recommended that interventions focus on interrupting children's intense preoccupation with and attraction to fire (Lowenstein, 1989).

The findings also support previous work that has concluded that fire knowledge and skill does not always lead to behaviour change (Grolnick et al., 1990; Kafry, 1980; Kolko et al., 1991). Fire safety skills distinguished the recidivists from non-recidivists at pre-intervention, but not at post-intervention. It suggests that recidivists may have gained some fire safety skills but this did not translate into behavioural changes as they continued to light fires.

The recidivist children had more significant behavioural disturbances (such as less positive and more negative behaviour) than non-recidivists. Other treatments, such as evidence-based CBT strategies that include increasing skills (prosocial skills), treating antisocial behaviours and other strategies found in sections 5.4.1, 5.4.2, and 5.4.3, may need to be incorporated alongside FSE to serve these clients and the community more effectively. In extreme cases the firesetter may need closed facility treatment

(section 5.4.5). Providing only knowledge and fire skills to pathological firesetters is not intensive enough and is unlikely to be as effective as a combined approach.

Recidivists were also exposed to more models that had serious firesetting pathology and misuse. Some of these models were parents who had committed acts of arson. Serious pathology of this magnitude requires a mental health or family intervention and assessment. Some effective therapies can be found in section 5.4.4.

Parents may also benefit from treatment interventions that include the development of positive parenting skills. The parents of recidivist children acknowledged that they used significantly harsher forms of punishment and that their disciplinary strategies were less effective than those employed by parents of non-recidivist children.

Parental training in reinforcement strategies and effective discipline may be appropriate for recidivist parents. Furthermore, screening families for maltreatment and abuse may be appropriate.

Practical implications and applications

Implications for the JFAIP are that red flag behaviours can now be identified and these can then be targeted more comprehensively in an intervention. This may inform the JFAIP about their client's firesetting risks before and after the intervention and help identify those children who may be at risk for setting additional fires. Questions that firefighter practitioners may wish to reflect on are: Does this child have poor fire safety skills? Do they perform badly when questioned by the practitioner and are undertaking the fire safety and knowledge questionnaires? Do they have the cognitive capacity to take in this information? Is this child frequently getting in trouble with his

parents and school? Does this child have too much preoccupation with fire? Do they have a greater fire history and at what age did the firesetting or interest in fire begin? Gaynor and Hatcher (1987) suggested that a fire history greater than five fires is indicative of a pattern. The recidivists in this study had set on average 15 fires in the six months prior to the JFAIP intervention, whereas the non-recidivists had set an average of five fires. The FRI non-fire-specific findings also indicated that recidivists had greater behavioural disturbances, externalising problems and the parents of these children had poor parenting practices. The children's perception of being regularly supervised or disciplined was also a strong predictor of recidivism.

The findings bear implications for understanding firesetting risk assessment measures, potential intervention targets, and predictors of firesetting recidivism among children. Specifically, for JFAIP it indicates the necessity for assessment to determine where resourcing may best be targeted to reduce the risk and respond to the needs of the families involved. This may guide the program in the future, giving direction in ways to be more effective in management and delivery.

One third of the children still remain at risk for continual firesetting after exposure to the JFAIP intervention and these children may require cognitive behavioural or supplementary treatments that promote prosocial skills, problem-solving strategies and the development of alternative behaviours (Bumpass et al., 1985; Carstens, 1982; Kolko, 1983; Kolko & Ammerman, 1988). The recidivist group are more pathologically focused on firesetting and are unlikely to stop without additional intensive and comprehensive intervention. Evidence-based analysis has concluded

that the most effective way to reduce recidivism and build skills in juvenile firesetters is within a multidisciplinary team (section 5.5).

The model

This study's findings were consistent with Fineman's (1980) dynamic-behavioural theory inclusive of predisposing, reinforcing and environmental factors that are used to explain firesetting behaviour. In the current study, similar to Fineman's model, identified variables such as inappropriate modelling, poor fire safety knowledge, firesetting history, child fire fascination, and parental factors differentiated non-recidivists from recidivists. This confirmed that the discriminant model in the study may be particularly salient for recidivists. These findings also support models that include both fire-specific and general behavioural dysfunction risk factors.

Kolko and Kazdin (1992) suggest that there is a strong need for theory development and model testing in the area of child firesetting research, due to the diverse array of variables thought to be associated with a child's involvement with fire. The FRI and CFI questionnaire is a valid and reliable measure of firesetting risk, but it is not specifically designed as a pre- and post-FSE intervention measure, thus some aspects taught in the program are not included. Some improvements in terms of the assessment of "knowledge" and "involvement" could be revised. In particular, the items on the "knowledge" variable only include the assessment "What burns and what does not burn?" and may require additional questions.

4.9.8 Limitations

The findings bear implications for risk assessment, prediction of recidivism, and the design of treatments and interventions for juvenile firesetters. However, these

findings should be interpreted in the context of the study's limitations. According to the findings of the current study, most juveniles improved after the intervention. However, one-third of the children in the sample were identified as recidivists and had significantly higher risk factors in both fire-specific and general behaviour domains. These findings were consistent with previous studies that had larger sample sizes (Kolko, 1985a). However, due to a small sample size and a lack of control group in this study, generalisations or conclusions made from it are more restricted.

Although significant findings were detected, this small sample may have limited the power to detect group differences. Furthermore, when the group was allotted to recidivist and non-recidivist, the sample was split unevenly to N = 9 and 20, respectively. The unequal group size could have reduced the power to detect group differences.

Pre- and post-JFAIP differences indicated that there was significant improvement on risk factors for the participants. In the absence of a control group, causality of these improvements and effectiveness of the JFAIP cannot be definitively attributed; it can only be provided as a possible explanation.

Furthermore, treatment conditions and certain client variables such as the implementation of JFAIP that was delivered by standard practice were not controlled for. Therefore, consistency of delivery of the program may have variations in quality. In addition, it bears mentioning that both groups may have been exposed to other extraneous (or unrelated) variables that may have impacted on their involvement in

fire over time, such as other interventions and use of medication. These unrelated variables were not controlled for in the study.

The pre- and post-intervention measures of the FRI and CFI have been used extensively in previous studies that have examined fire-specific and general behavioural risk factors. However, the FRI and CFI only examined certain risk factor variables related to firesetting. For instance, the instrument does not measure clinical risk factors such as individual personality, clinical or behavioural variables such as covert or overt antisocial behaviour, or academic problems that are also associated with the onset and continuation of juvenile firesetting. This study was limited to draw specific conclusions about some clinical and behavioural explanations because it did not measure them in a pre- and post-intervention way. Child behavioural variables and parenting practices were limited to those on the FRI and CFI and other variables such as externalising and internalising problems as measured by the CBCL may have also been relevant and contributed to the overall findings.

The FRI and CFI questionnaire also measured fire-specific risk factors, but was not specifically designed for the content of the JFAIP intervention, therefore the validity may not have been fully maximised. Improvements on the variables of knowledge and fire involvement are recommended to capture this domain more adequately.

The age range of the participants was limited to the ages of seven through to 13 years, thus the middle childhood stage of development. Research has indicated that older children (>12 years old) who set fires are more pathological than are those at earlier ages (Yarnell, 1940). Greater frequency and severity of firesetting and more psychological problems have been correlated with older age groups (Kolko and

Kazdin, 1994). Adolescents are considered developmentally more mature and beyond the age of being curious about fire, thus they are thought to use fire more instrumentally as a weapon because they are angry, frustrated, seeking revenge or counterattack (Showers & Pickrell, 1987; Yarnell, 1940). Older children above 13 years were not included in this study, thus this sample may not be reflective of the full range of possible JFAIP clients. An older sample may have revealed greater pathology, clinical disturbances, more severe firesetting behaviour, greater risk factors (on both dimensions) and greater recidivism.

The findings were also limited to the three informants: the parents, the child and the reports made by the firefighter who delivered the JFAIP. Multiple informants such as police, mental health workers and teachers may help verify the family and firefighter's reports of firesetting.

CHAPTER FIVE: International (United States and Canada) assessment and treatment approaches to the juvenile firesetting problem and best practices

Background and purpose of Chapter Five

Chapters Five and Six aim to establish best practice guidelines for juvenile firesetters in Australia. Chapter Five examines international treatment and exemplar models of practice in the United States and Canada to establish a best practice framework.

Chapter Five provides clarification on juvenile firesetting intervention and treatment in Australia. Chapter Six provides a comparative analysis of the current practices in Australia as measured against the established best practice guidelines.

Aims of Chapter Five:

- to review the literature on prevention, secondary and tertiary intervention programs in the United States and Canada that serve juvenile firesetters and their families
- to outline needs of juvenile firesetter and their families and the intervention practices most effective to serve this population
- to review exemplar models and practice in juvenile firesetting intervention programs
- to establish a criterion of best practice based on previous literature, International APA guidelines and identified exemplar programs that are well designed, well implemented and provide effective interventions.

Methodology

Chapters Five and Six are based on both a proactive and clarificative evaluation model (Owen, 2006). A proactive model is concerned with synthesising what is known in existing literature about the problem of juvenile firesetting and reviewing ways in which this has been addressed through programs and interventions implemented in the United States and Canada. The treatment approaches of primary, secondary, tertiary and multidisciplinary approaches will be reviewed and evaluated.

Using a proactive methodology, best practice guidelines will be established from the existing literature, and five site visits out of which I chose two exemplar programs that I considered were particularly well designed, well implemented and had evidence of effectiveness.

In Chapter Six, a clarification model was employed to determine the current practices and interventions with juvenile firesetters in Australia. In particular, current Australian FSE program theory and practices of Australian juvenile firesetting intervention were examined through interviews and three site visits.

In this chapter, a proactive evaluation methodology will also be used to develop best practice guidelines and this will then be used to compare against the interventions offered in Australia. This analysis will assist in the clarification of Australian juvenile firesetting intervention practices and provide program managers direction in the redevelopment and improvement of current practice in juvenile firesetting intervention.

5.1 International treatment approaches

Intervention for firesetters in the United States and Canada can fall into four main categories including: national programs, community or state programs, clinical interventions and or a combination of all three (Hardesty & Gayton, 2002; Kolko, 2002b).

Multidisciplinary approaches, theory and research of best practice are the focus of this chapter. Evidence from the literature and exemplar model multidisciplinary and collaborative programs, such as the Oregon Statewide Juvenile Firesetter Intervention Network (JFIN) and Toronto Arson Prevention Program for Children (TAPP-C), are drawn from to determine best practice in juvenile firesetting intervention. TAPP-C and the Oregon JFIN will be presented as exemplar models for best practices.

The types of juvenile firesetting intervention are primary, secondary, tertiary and multidisciplinary. Primary and secondary interventions with juveniles typically involve FSE. Primary prevention targets the general population predominately in school settings and aims to reduce the possibility of future fire experimentation. This approach operates under the assumption that fire interest and curiosity is common in young children. Secondary intervention occurs when a firesetter has been identified and this intervention is fire-specific, low level skill-based with a possibility of referral to mental health services. Typically, secondary intervention delivered by the fire service aims to educate and raise awareness about fire and the risks of firesetting, but does not aim to directly modify the child's behaviour. Tertiary education is aimed at firesetters identified as being at higher risk (recidivists and/or individuals with behavioural, familial or clinical issues) and requiring psychological assessment and

intervention (Webb et al., 1990). Multidisciplinary approaches target both fire-specific and general behavioural dysfunction risk factors, are best practice and are based on collaboration with several agencies that are concerned with and involved in the firesetting problem (Gaynor & Hatcher, 1987; Kolko, 2002; Webb et al., 1990)

Intervention models have evolved to serve juvenile firesetters, their families and the community more effectively and efficiently. Secondary intervention models have progressed from the brief firefighter home visit (FHV) to the more comprehensive FSE delivered by firefighter practitioners with a mental health services referral component. Best practice in intervention for juvenile firesetters recommends moving away from the FSE model that is delivered solely by the firefighter with option to refer because the current view is that firesetting is a multi-determined community problem that necessitates a multidisciplinary or collaborative approach (Gaynor, 1991, 2000; Okulitch & Pinsonneault, 2002; Sharp et al., 2006; Slavkin & Fineman, 2000).

5.2 Primary Intervention

Prevention programs offer FSE programs that are conducted worldwide generally with younger children with the intention of providing fire safety awareness and basic fire safety skills. Some well-known programs that have reported success are:

- Play Safe! Be Safe! program developed in Rochester New York, by Firesafe Children
- Project SAFE (Student Awareness of Fire Education) developed in Ohio
- Kidsafe developed by the Oklahoma Fire Department
- Learn Not to Burn developed by the National Fire Protection Association (NFPA).

These programs are similar in that they are preventative but some differ in their approach, materials and target audience. For instance, Play Safe! Be Safe! and Kidsafe have been developed for preschool-aged children (three- to five-year-olds), whereas Project SAFE and Learn not to Burn are programs delivered to children in preschool through to the eighth grade (Gaynor, 2000).

5.2.1 Curriculum content of Kidsafe and Play Safe! Be Safe!

The content of the Kidsafe program focuses on teaching children about hot and cold items, the use of matches and lighters, the proper procedure if clothing catches on fire, the difference between good fires and bad fires, the importance of smoke detectors, safe departure from a burning house, how to cool burns, and the role of the firefighter as a community helper (McConnell et al., 1996).

The “Play Safe! Be Safe!” program also targets three- to five-year-olds and has identified four skills that can be taught and understood by this age group, including crawling low under smoke, stop, drop, cover and roll, matches are adult tools/tell a grown up, and go to the firefighter. They also educate parents on creating a safe home environment by having such things as a working smoke alarm, creating and practicing home escape routes, modelling appropriate concern about fire, providing good supervision, recognising fire hazards, safely storing ignition sources, and creating clear rules rather than relying on vague warnings (Cole et al., 2006).

5.2.2 Effectiveness of primary prevention programs

Evaluations of primary prevention programs have been undertaken and have concluded that you can teach children fire safety skills and this will be retained at two-week follow-up (Jones et al., 1981a, McConnell et al., 1996). However, most of

these studies have only examined their efficacy in the short-term. Furthermore, because many of the studies were simulated role-plays, it is difficult to determine whether the skills learnt can be applied in real emergency situations (Satyen et al., 2004).

Jones et al. (1981a) trained children by methods of role-plays and cognitive rehearsal strategies to respond to nine home emergency fire situations. The children's ability to execute a sequence of fire safety behaviours was evaluated by trained firefighters two weeks post-education. Children in the study demonstrated improvement in fire safety behaviour at post-intervention and Jones et al. concluded that you can successfully teach children fire safety skills at two week follow-up.

Research on the Play Safe! Be Safe! program has concluded that the program was highly effective in teaching children aged three to five about important fire safety lessons. Children's knowledge was assessed at pre- and then post-intervention, three weeks later. The findings indicated that children in the treatment group showed significantly higher fire safety knowledge compared with the control group. The research found that 75% of the children who received the program knew to go to the firefighter, whereas only 10% of the children in the control group knew this. In the experimental group, 67% knew to crawl down low in smoke and could demonstrate this as compared to only 3% of the control group. In the experimental group, 75% knew when to stop, drop, cover and roll and could demonstrate this, compared with only 3% in the control group. In the last skill, matches are adult tools, 71% of the experiment children understood this as compared with 35% of the control group (Cole et al., 2006).

The Satyen et al. (2004) study found that children do not retain knowledge of fire safety skills over time. She suggested that periodic evaluation of intervention programs for children be implemented and that effectiveness be examined over longer intervals to ensure sustained knowledge gains. Furthermore, this suggests that educational programs need longer dosage so that this learning is reinforced and sustained.

5.3 Secondary Intervention: Fire Safety Educational Approaches

Secondary intervention is when a firesetter has been identified and this intervention is FSE.

5.3.1 Model one: Brief firefighter home visit (FHV) – content, dosage and delivery

FHV is a regionally common practice in the United States, and was considered the most convenient and cost-effective approach to address the problem. FHV has been described in Kolko et al. (2006) study as comprising two contact visits. In session one, the children receive information about the dangers of fire (to themselves and others), education about fire safety using a colouring book and are asked to follow a “no fire contract”. Parents receive a home safety handout relating to securing all incendiary materials. In the second follow-up session, the firefighter revisits the specific concepts of the first session and elaborates on key topics. Brief intervention can be effective in certain conditions where the content and delivery of the program is of high quality and the family is motivated and interested (Kolko, 1999). However, the findings in Kolko’s three large-scale studies have indicated that FHV intervention strategy is limited and has little effectiveness over the longer term (Kolko, 1996, 2001; Kolko et al., 2006). In the Kolko et al. (2006) study, they concluded a more

intensive, skill-based FSE program with higher dosage was more effective than FHV because the children had significantly lower recidivism rates and had less contact with fire-related materials and this was maintained for a longer duration.

5.3.2 Model two: Community FSE programs

FSE (model two) is typically delivered to parents and children by the fire service and includes roughly five to six sessions. This intervention has been designed to incorporate a basic skill-based approach that includes both behavioural training (instruction, rehearsal through role-plays, feedback and teaching of personal safety strategies) and some basic behavioural modification strategies to enhance children's learning and adoption of fire-safe behaviours and to help parents with some basic parenting strategies (Cole et al., 2006). This approach is considered more intensive and comprehensive both in content, dosage and delivery than FHV (Kolko et al., 2006).

Model two is most predominately practiced worldwide and there are wide variations in terms of content, dosage, curriculum, protocols, affiliations and delivery because there is no standardisation. For instance, in the United States the structure of the fire service is such that many neighbouring jurisdictions will have separate but parallel juvenile firesetter intervention programs. While these jurisdictions have similar firesetter problems, comparable demographics and may use similar materials/content, they are organised under differing program theories and are administered separately. For example, the Monroe County Fire Juvenile Firesetting Intervention Program (JFIP) uses assessment tools (Fineman's behavioural and dynamic protocol) and is affiliated with a private consultant psychologist who specialises in juvenile firesetting behaviours (F. R., personal communication, 5 June 2007). Some programs in the

United States emphasise FSE, graphing techniques and referrals to mental health services (Bumpass, Brix, & Preston, 1985) while other programs use the Oregon Screening Tool protocol, deliver firesetting intervention in a group setting and provide clinical services for those needing clinical intervention (Pittsburgh Safety Clinic – D. K, 8 June 2007).

5.3.3 Assumptions and effectiveness of FSE

FSE is based on the assumption that education about fire and fire safety leads to behavioural change as discussed in Chapters Three and Four. Anecdotally, FSE is most effective if delivered by firefighters, due to their expertise and credibility. Furthermore, an effective FSE program is skill-based, incorporating both behavioural training and some basic behavioural modification strategies (Cole et al., 2006). Unfortunately, there has been little research that has evaluated the effectiveness of FSE or verified these assumptions (Kolko, 2002b).

FSE's effectiveness in creating behavioural change and satiating curiosity

Literature has confirmed that knowledge has enhanced after FSE in the short term (Kolko et al., 1991). However, there is little evidence to support whether this knowledge translates to behavioural or attitude change in juvenile firesetters. Furthermore, it is unclear that FSE satiates an atypical curiosity or fascination with fire as confirmed by the findings in Chapter Four and previous research (Grolnick et al., 1990; Kafry, 1980; Kolko et al., 2006). However, Gaynor and Hatcher (1987) have asserted that if a curiosity firesetter receives immediate educational intervention then “the probability is virtually zero that they will become involved in future firesetting” (p.12). It is important to examine this point because 60% of child firesetters are thought to be curiosity-driven. However, other than anecdotal

reporting, little evaluation and research has been conducted that substantiates this theory. Furthermore, there is also a high percentage of firesetters who are not curiosity-driven but fascination-driven.

Firefighter delivered program

The assumption that firefighters are the most effective deliverers of FSE is anecdotal, with no evidence to substantiate the claim that their credibility or experience is responsible for behavioural change in juvenile firesetters. The impact of the relationship between the firefighter and juvenile has not been explored or established in literature. This could be due to the difficulties of verifying and measuring the dynamic and subjective relationship between two people. Numerous studies in adult counselling literature have tried to isolate which part of therapy works and leads to behavioural changes in the client, with several claiming that one of the most robust predictors of treatment outcome is the alliance created between client and practitioner (Carr, 2008; Florsheim, Shotorbani, Guest-Warnick, Barratt, & Hwang, 2000; Horvath & Symonds, 1991; Seligman, 1995). Assessment of counselling effectiveness and practitioner-client treatment alliance may not be fully reliable due to methodological flaws in studies (i.e., poor measurements, and sampling), variations in studies (i.e., therapy used, therapist styles and experience), diversity in clients (i.e., differing levels of pathology, motivation or insight, and psychosocial factors), the criteria used to assess “effectiveness”, and biases in self-reporting measures (Eysenck, 1992; Maguire, 1973). Furthermore, most research on therapeutic relationship variables in counselling are based on adults. Thus, these findings may not extrapolate to child and adolescent clients because they are not self-referred and are often difficult to engage (Diamond, Liddle, Hogue, & Dakof, 1999).

Effective dosage and rapport

The working alliance has been described as the collaborative relationship that develops between client and therapist, facilitating positive change (Florsheim et al., 2000; D. Martin, Garske, & Davis, 2000). The alliance is usually based on a relationship built between client and therapist over time, allowing for mutual trust, formulation of treatment goals and development of an affective bond (Florsheim et al., 2000). Carr (2008) suggests that adequate dosage of between 20 to 45 sessions and a good working alliance are required for effective treatment outcome in psychotherapy. Seligman's (1995) consumer report study found that longer-term treatment had better outcomes than short-term treatment.

Dosage of FSE

There is evidence to confirm that longer dosage intervention may be more effective. However, this is not to say that brief targeted interventions are not effective. Kolko (1999) found that brief intervention is effective when the program is of high quality and the client is motivated. In firesetting intervention, FHV and FSE have a reported dosage of between one and two, and six and eight sessions, respectively. Evidence has concluded that longer dosage interventions produce more improvement and behavioural change in the longer-term (Kolko, 1996, 2001; Kolko et al., 2006). Short-term dosage programs (i.e., FHV) may be effective and extinguish firesetting behaviour in some children under certain conditions. However, the dosage, content and the sole intervention of FSE programs may not be enough to change behaviour in recidivists who have a pathological interest in fire and may have other collateral behaviour such as social, familial or clinical problems (Gaynor, 1991).

Engagement strategies (FSE)

There is some evidence that behavioural training and experiential learning is more effective because children learn best and retain information more if they actively rehearse skills (Jones et al., 1981a). Fire-safe actions in the natural environment can be replicated through the use of experiential role-plays such as:

- asking children to role-play what they would do if they found matches or other incendiary materials (i.e., give them to an adult)
- demonstrating what they would do if their clothes caught on fire (i.e., stop, drop, roll)
- demonstrating what to do when there is smoke in the house (i.e., crawl down low)
- participating in active discussions (i.e., question and answer time).

Other experiential aids include:

- visual aids and props (i.e., pictures, puppets, and other objects)
- worksheets (i.e., testing knowledge and to demonstrate mastery)
- DVDs, books and charts.

These are used to stimulate and retain learning (Jones et al., 1981; Kolko et al., 2006)

There is also some evidence that a positive reinforcement approach works with some children and families because it is known that physical or verbal punishment strategies and threats are ineffective (Hawton, Salkovskis, Kirk, & Clarke, 2006; Kazdin, 2005; Patterson, 1982). Positive reinforcement strategies such as building self-esteem, giving praise and positive comments are usually found in FSE programs utilising best practice standards. Positive reinforcement motivates the child to refrain from firesetting and can build other prosocial skills. This approach also provides

modelling to parents and encourages them to consider more effective discipline and supportive parenting practices. However, there are limits to this approach and experts in this field indicate that a low level skill-based FSE approach is not sufficient for firesetters (Barreto et al., 2004; Cole, Grolnick, & Schwartzman, 1993; Kolko, 2001a, 2002a; Sharp et al., 2006).

Summary Secondary Intervention (Fire Safety Education)

Secondary intervention is a fire specific, low-level skill-based intervention that aims to educate and raise awareness about fire and the risks of firesetting. It does not aim to directly modify the child's behaviour because it may not satiate an atypical fire curiosity or fascination with fire or be sufficient for high-risk firesetters. Research has indicated that a skill-based FSE is effective, particularly if the dosage is around six to eight sessions. However, there are limits to this low-level skilled based approach with higher risk firesetters.

There is a debate regarding who is most effective to deliver the intervention. It is difficult to argue, due to a lack of evidence, difficulty in measuring the alliance between practitioner and child, that the firefighter practitioner is having a greater impact than other practitioners. Anecdotally firefighters are the considered most effective to deliver the intervention, other practitioners (i.e., social workers) can deliver this intervention. There is no evidence to substantiate the claim that their credibility or experience is responsible for behavioural change in juvenile firesetters.

5.3.4 Effectiveness of FSE versus other treatments (FHV or CBT)

Several studies have evaluated FSE against other modalities such as CBT or psychosocial treatment (PT). Three studies compared whether psychological

treatment or FSE was more effective than FHV programs (Kolko, 1996; 2001a) and Kolko et al. (2006). These randomised control studies confirmed that all treatments reduced juvenile firesetting, but found that CBT or PT was more effective and had longer-term effects in terms of both psychological and fire-specific improvements than FHV (Kolko, 1996; Kolko et al., 2006). FHV appears to be less effective in the long-term than the other two modalities. In one study there was controversy as to whether PT or FSE proved the most effective in the treatment of juvenile firesetters (Kolko, 2001a). The limitation of the three studies was that they did not evaluate an evidence-based juvenile firesetting intervention that combines the modalities FSE and psychological treatment, known to be best practice and most effective with juvenile firesetters.

5.3.5 International guidelines standardised FSE curriculum

An FSE component is recommended for all juvenile firesetters regardless of age, pathology or motive because most firesetting is thought to be learnt behaviour. An effective FSE component of a juvenile firesetting program will: have trained practitioners (to screen and deliver the intervention), be delivered in the home or in a group setting and be age appropriate. These components are discussed more fully below.

Trained practitioners who screen and deliver the intervention.

Where possible, it is recommended that the practitioner who delivers the FSE intervention be a trained firefighter. However, it is not necessary for the practitioner to be a firefighter but someone who can engage with children and is trained in fire-safety awareness and education. Some programs, such as those in the Oregon Networks and the Monroe County JFIP, employ other practitioners such as social

workers to deliver the FSE component of the program (Oregon JFIN – C. B., personal communication, 11 June 2007). The TAPP-C program has firefighter practitioners who deliver the fire safety educational component to children and their family (S. M., personal communication, 1 June 2007).

Home versus group setting

Many programs in the United States deliver firesetting intervention in a group setting that are commonly referred to as “Fire Schools” and has been reported as effective because it encourages peer interaction, a sense of belonging and learning from others’ experiences (Kolko et al., 1991). Other programs are delivered in the home.

Schwartzman (2002) has noted the advantages of a home intervention as providing the interventionist with the opportunity to assess the physical environment (resolving safety hazards in the home immediately) and observing the family interactions in their natural environment. However, the disadvantage is that the interventionist sacrifices an element of control in the family home and sometimes children and families are held more accountable in an “official” location. Furthermore, the firefighter visit may be rewarding and reinforcing the child’s negative behaviour (firesetting) by coming to the home and spending time with the child because they have misbehaved.

General Curriculum content

Content for each developmental stage generally includes:

- assessment of the child fire safety knowledge and awareness
- a home safety audit
- understanding the nature of fire
- consequences of unsafe fire use

- teaching of appropriate fire use
- education of personal fire safety strategies
- taking responsibility for safe-fire behaviour.

Each of these components will have a different emphasis depending on the age/development of the child (Gaynor, 2000; Kolko, 1996, 2001a; Kolko et al., 2006; Kolko et al., 1991; Pinsonneault, 2002b; Schwartzman, 2002).

Age appropriate curriculum with developmentally appropriate content

The FSE curriculum should address the levels of preschool, childhood and adolescent phases. Educational programs need to take into account the developmental tasks, competencies, cognitive capacities, skills and limitations, and the trends in firesetting of each age level (noted in Chapter one). In each developmental phase, the child or adolescent's relationship to fire will also be different. For example, a child lighting candles at home necessitates a far different content than an adolescent setting a school fire. A best practice curriculum protocol would have a different intervention for each age level of preschool, childhood and adolescence that is formally presented in a manual of processes and procedures (Cole et al., 2006; Slavkin & Fineman, 2000).

Curriculum content: Preschool children

Some researchers have concluded that it is better to target the parents because they can have an impact on the environment than children (Pittsburgh Safety Clinic – D. K., personal communication, 8 June 2007) while others indicate that preschoolers require a targeted intervention because they are a more vulnerable group and would benefit from direct intervention. Parental psychoeducation about the safe storage of

and access to ignition sources are common targets of FSE at this developmental age group. Some primary prevention programs such as Kid Safe and Play Safe! Be Safe! directly target the preschool child's misuse of fire and this could also be used at the secondary intervention level.

Curriculum content: Early and middle childhood

Schwartzmann (2002) has provided some guidelines and objectives for a developmentally appropriate FSE curriculum targeted to children. Objectives and lessons for five- to eight-year-olds can include: the power of a single match, how quickly a fire spreads, false sense of control and what burns.

For the ages of nine to 11, some key objectives and content should include: false sense of control, responsibility and fire, consequences of misuse, personal vulnerability and peer pressure.

Many FSE's targeted to children also include assessment of children's knowledge of fire, positive decision making, beliefs, risk evaluation, personal "no fire" contracts, and peer group discussions.

The consequences and impact of misusing fire can be introduced to older children within this age group. For instance, the child may take responsibility for their own and the family's personal fire safety by becoming the "Junior Fire Safety Officer". This may include promising to the firefighter practitioner that they will not play with matches or lighters again by drawing up a personal no fire contract and also by being responsible for keeping the home fire-safe by doing tasks such as checking the smoke

detector and telling the parent when they see matches or lighters. Scare tactics are not endorsed, but the child can be educated about some of the consequences of their actions, such as damage, financial costs, burn injuries and death as potential outcomes of their behaviour. Older children of this age group can also engage in firesetting due to peer pressure. Discussions about friendship and making appropriate choices could also be incorporated (Schwartzman, 2002; Sharp et al., 2006).

Curriculum Content: Adolescence and higher risk firesetters

Best practices indicate that an FSE component should be incorporated regardless of motive or pathology (Mackay et al., 2004; Sharp et al., 2006; Slavkin & Fineman, 2000). However, because firesetting at this stage of development is frequently associated with pathology or delinquency, intervention within a multidisciplinary team is recommended. This is because techniques such as role-playing stop drop, cover and roll will not engage them, create an impact, or be successful in behavioural change (Slavkin & Fineman, 2000). Furthermore, there is evidence that FSE alone is not sufficient enough for more pathological and complex firesetters (Kafry, 1980; Kolko et al., 2006; Mackay et al., 2006; Sharp et al., 2006).

In addition, the program may emphasise such aspects as: taking responsibility, accountability, consequences, defying adults or authority, risk-taking behaviours, peer pressure and challenging incorrect assumptions of no consequences for firesetting.

5.4 Tertiary intervention: Psychological intervention and closed facilities (residential settings)

The groundwork for firesetting treatment was initially established in the 1930s using psychoanalytic techniques (Heath et al., 1976; Lewis & Yarnell, 1951). However, it was not until much later that clinical case studies appeared which provided adequate descriptive and therapeutic details. The types of therapies fell into three general categories: case studies, family and behaviour therapy (Gaynor, 1991).

Many earlier studies and case reports up to the 1980s failed to provide objective documentation of outcomes, such as whether or not the child had ceased lighting fires or if there had been improvement on certain collateral behaviours. Instead, these studies relied primarily on subjective impressions of change. Thus, in the absence of experimental designs or follow-up outcomes, it was difficult to determine the impact of these earlier interventions (Kolko, 1983).

There have been few studies that have reported mental health intervention with juvenile firesetters. Kolko's (1985a) meta-analysis found only 16 reports that describe interventions with firesetters; most were individual case studies (14) and only one study had larger samples (Bumpass et al., 1983).

In the 1990s, interventions began to increase in complexity in recognition of the fact that firesetting is a multidetermined behaviour. Single case studies were still reported in the literature but studies began to emerge with samples of children and frequently compared treatments with control groups (Kolko, 1985a).

5.4.1 Behaviour therapy

Behaviour therapy is based on learning theories and the following strategies have been used successfully with juvenile firesetters, including: behavioural modification strategies and contingency management training (Carstens, 1982; Stawar, 1976), parental behaviour training (Cox-Jones et al., 1990; Nishi-Strattner, 2005), individual behavioural therapy (Stawar, 1976), satiation techniques (McGrath, Marshall, & Prior, 1979; Welsh, 1971), or combination therapies (Holland, 1969; Kolko, 1983).

Parent training

Child firesetters can be under-controlled, impulsive and aggressive and parents have reported problems in controlling their child's behaviour (Kolko & Kazdin, 1991a; Kolko et al., 1985b; Nishi-Strattner, 2005). Evidence provided in Chapter Four indicates that parents of firesetters demonstrate poor parenting skills.

Parental training is considered most effective in treating juvenile firesetting. Some studies have concluded that primary intervention should focus on augmentation of parenting skills- using contingent positive and negative reinforcement and teaching the child prosocial skills (Patterson, 1982).

Parental training that uses simple, easy and highly directive methods of instructions are most effective in teaching parents skills to monitor, instruct, set limits, discipline and manage their firesetting child (Humphreys et. al, 1994).

Behavioural modification strategies

Contingencies often help parents establish structure, rules and consequences in the home. Specifically, these procedures aim to reduce firesetting and discourage involvement with fire by facilitating appropriate behaviour (Carstens, 1982; Holland, 1969) and reinforcing contact with non-fire materials.

Holland (1969) employed a combination of positive reinforcement and negative punishment in one intervention. This program consisted of response-cost (loss of a baseball glove) for each fireplay incident and monetary and social reinforcement for both returning matches and choosing not to strike a pack of matches during scheduled satiation sessions.

Carsten (1982) used a work penalty system where a threat of a one-hour penalty alone was employed (one hour of physical work) if the child was caught in possession of matches or lighters. Behavioural change was linked to consistent behavioural expectations and consequences for firesetting because the child experienced the punishment immediately and consistently.

Negative practice

This practice involves the young person repeatedly striking matches until they terminate the behaviour due to boredom. This technique is no longer practiced due to the possibility that “practicing” may reinforce a sense of control over fire and may lead to repetitive fireplay.

5.4.2 Cognitive behavioural treatment

CBT is effective with antisocial behaviours because it is structured, brief and problem-and solution focused. CBT is effective with firesetters because it:

- provides a structured framework that can assist the child in understanding his/her behaviour and develop alternate strategies for coping
- is designed to alter the child's cognitions and behavioural responses.
- is a structured therapy that facilitates behaviour change in: cognitions, beliefs and attitudes and awareness (i.e. of potential triggers to firesetting and exploration of consequences).

CBT also provides the firesetter with the following skills of:

- exploring alternative strategies to firesetting
- monitoring of cognitions and emotions
- coping skills and relaxation strategies
- problem solving skills (exploring feelings, thoughts and consequences)
- managing states
- social skills training
- anger management

One effective CBT technique that is specific to fire is the Bumpass Graphing Technique. This concrete and visual procedure gathers information from the child about the antecedents and consequences of fire, especially the emotional or cognitive precipitants of fire (e.g., anger, perception, and triggers). It involves listing all of the chronological events before, during and after the fire alongside the cognitive and emotional factors. It can also reveal the child's feelings of accountability and

responsibility for the fire. The technique can identify potential clinical targets for intervention, such as learning strategies when bored and applying alternative strategies in these times. It can also highlight the importance of emotional regulation and different strategies (i.e., making better decisions) that can be employed should they experience similar emotional states in the future (e.g., teaching the child to self-soothe and calmly think through a situation instead of reacting and acting out).

Bumpass concluded that this technique was effective in reducing recidivism – with three out of 29 children engaging in further fireplay. He also concluded that positive outcomes were reported by families, such as: family agreement on the problem, the child's ability to describe feelings and recognise both triggering events and associated sequences, and remorse over previous firesetting activity. The Dallas Fire Department also successfully incorporated BGT into their FSE program in 1981. After implementation, there was a 2% recidivism rate compared with a 32% rate before the intervention (Bumpass et.al, 1983).

5.4.3 Social skills

Children with antisocial behaviours such as firesetting may lack important social skills, empathy for others, or judgement and insight into appropriate social behaviour and social responsibility. Social skills refer to the ability to perceive social cues, control emotional reactions, organize cognitions and produce behaviors with the motivation to achieve socially acceptable outcomes.

The child firesetter may lack awareness of socially responsible behaviours and this may hinder intervention efforts. A program that is highly structured and builds

accountability into the intervention may be required (Muller & Stebbins, 2007; Palmer et al., 2007).

5.4.4 Family therapy

Evidence suggest that children who light fires often come from dysfunctional families and the child's firesetting behaviour may in fact be a symptom of a family problem.

Family therapy presumes that the acute symptoms in a designated patient are symptomatic of a disturbance in the family system.

In family therapy, the treatment does not focus on the behaviour of the individual but the precipitant factors within the family system. One study used family therapy to treat the problems of a 14-year-old boy who confessed to lighting a grass fire. The focal point of the treatment was to address role relationships, particularly the father who was distant and ineffectual, the mother who was over-controlling, and the adolescent who had adopted a "parentified" role in the absence of his father.

Triadic therapy model

Triadic intervention has been used effectively with interventions with juvenile firesetters. In triadic therapy, the parent receives instruction from the therapist to directly intervene with their own child. In one study, the parent received training in contingency management that included giving the child tokens for good behaviour and applying consistent punishment for negative behaviour (Kolko, 1983). In another case study, the triadic model of training was provided to parents to intervene with the child's firesetting by teaching them fire safety. A further goal was to improve the bond between mother and child (Madanes, 1991).

5.4.5 Incarceration or psychiatric inpatient treatment

In certain cases, the firesetting behaviour or general behaviour may be so serious that incarceration or an inpatient admission may be the only way to contain the behaviour. A therapeutic group home or residential setting may provide the necessary structure, monitoring, behaviour management and discipline that the family is having problems implementing.

The Oregon Youth Authority has a correctional facility for juvenile firesetters aged between 12 and 19 years (but can stay up until 25 years of age). This treatment is based on alcohol prevention models, is CBT-focused and aims to reduce criminogenic risk. In this program, the juvenile's are screened using the Oregon Screening Tool and they also undertake a mental health assessment. The emphasis of the program is fire-specific, general behavioural and skills building. The fire-specific component of the curriculum has several modules including the meaning of and being responsible with fire; fire and the media; fire safety education; education about feelings, impulses, thinking and empathy; and identifying with the victim.

This curriculum uses CBT therapies that target fire-specific behaviours. The CBT treatment model can also be utilised to facilitate non-fire specific treatment components. Offenders can be treated for behaviours associated with firesetting including aggression and anger, skills building (social skills) and alcohol and drug rehabilitation.

5.5 Background of multidisciplinary intervention

The rationale for a multidisciplinary approach is that high-risk clients with pathologically-driven firesetting behaviour and psychological problems cannot be adequately treated by the fire service. FSE, as a sole intervention, is most appropriate for children whose firesetting is considered low-level curious and accidental, whereas pathological and higher-risk firesetters require a more intensive treatment that targets comorbid behaviours in addition to the firesetting.

In the 1990s coalitions and multidisciplinary teams were established, signifying advancement in the movement to treat and evaluate child firesetting in a holistic and comprehensive way.

Very few multidisciplinary programs have reported on their outcomes due to the infancy of these programs. However, three multidisciplinary programs in the United States (Trauma Burn Outreach Prevention Program (TBOPP), Michigan and Oregon JFIN) and Canada (TAPP-C) have reported outcomes. These multidisciplinary programs have been identified as well designed and effective.

5.5.1 Research and effectiveness of a multicomponent program

Many researchers, as discussed in Chapter Three and Four, consider that juvenile firesetting risk factors are a combination of both fire-specific and general behavioural, indicating that firesetters require an intervention that targets both risk factor components (Kolko and Kazdin, 1986, 1991c, 1994; Kolko et al., 2001b; Nishi-Strattner, 2005; Mackay et al., 2006). Research and treatment has investigated the effectiveness of combined FSE and mental health treatments to provide evidence for best practice. Firesetting intervention can be fire-specific (FSE), or can target more

general behavioural (psychological) or a combination of the two. FSE and CBT are the two most common approaches to intervention with firesetting children and their families (Kolko, 2000).

Using recidivism primarily to measure effectiveness, some studies have evaluated the combined approaches of FSE and CBT/behaviour therapy and have concluded that this approach can be applied successfully both individually and through group interventions (Cox-Jones et al., 1990; McGrath et al., 1979). However, one research study found combined intervention approaches no more effective than FSE (Adler et al., 1994).

Individual intervention studies have applied diverse methods and modalities to treat juvenile firesetters because these clients generally experience problems with fire and have deficits in numerous areas (Cox-Jones et al., 1990; Kolko et al., 1991; McGrath et al., 1979). In one treatment study, McGrath et al. (1979) incorporated social skills training, “over-correction” (a procedure similar to satiation), covert sensitisation, home contingencies and fire safety training. This intervention was administered to an 11-year-old boy to reduce his firesetting and increase appropriate collateral behaviour. After the intervention, it was concluded that his collateral behaviours had improved; this was demonstrated by his ability to cope with stress, participate in social activities and other age-appropriate behaviours. Furthermore, there were no fires reported at two year follow-up.

In another case study, Cox-Jones et al. (1990) implemented a multicomponent treatment in an inpatient psychiatric setting to a five-year-old boy who presented with

several clinical diagnoses (dysthymia disorder and conduct disorder), recurrent firesetting (he had burnt down the family home) and lived in a highly dysfunctional family environment. The treatment that focused on firesetting and other associated behavioural and clinical problems provided fire safety prevention skills training using both educational and CBT strategies, individual and parent behaviour management training, and pharmacotherapy. After discharge, the boy was admitted to a therapeutic group setting for ongoing treatment and management, while his mother and father (in a limited way) continued treatment in both therapy and parent management training. The multicomponent closed-treatment strategy, parental training and therapy were deemed successful because there was no repeat firesetting at one-year follow-up with some additional improvement in aggression, disruption and non-compliant behaviours. The authors concluded that a multicomponent therapy was crucial when intervening with more severe cases of firesetters with psychiatric disturbances.

Group interventions that combine the approaches of cognitive behavioural skills training that are fire-specific and FSE intervention have also been evaluated for their effectiveness. Kolko et al. (1991) implemented a brief group-based cognitive-behavioural skills training curriculum that was fire-specific in conjunction with FSE to a group of young psychiatric inpatients. The group fire safety skill training (FSST) program was delivered to groups of four children by a trained specialist or nurse for four weekly one-hour sessions. This program combined FSE and CBT by providing fire safety education, fire-specific intervention in a CBT framework and group behavioural strategies. The impact of group fire safety (FSST) was evaluated against an individual fire awareness (FAA) program that included individual discussion about fire with the nurse educator. In this study, it was found that FSST was more effective

than FAA because it was associated with less contact and involvement in fire-related stimulus and an increase in fire safety knowledge as compared with FAA. At six month follow-up, parents reported that FSST children were significantly less involved with fire than the FAA group, indicating that FSST had been more successful in both the short and longer term in reducing involvement with fire of young psychiatric inpatients.

Adler's et al. (1994) study had four conditions and aimed to evaluate treatment effectiveness. One condition was a combined FSE with psychological intervention (specialist-intervention group). They concluded that the specialist-intervention was no more effective in reducing firesetting and that fire safety education by firefighters was the most appropriate approach to this serious community problem. Kolko questioned this intervention because it was not monitored for treatment integrity. I also question the findings of this study because the intervention may not be reflective of accepted contemporary best practice that is fire-specific FSE-, CBT- and PMT-based intervention (described in 5.6.2). It also included controversial techniques (satiation) and behavioural modification techniques that were delivered by firefighters and are now considered too complicated for them to administer. The mental health component of the specialist-intervention group was not explained in the study, therefore it is unknown whether or not this intervention targeted firesetting behaviour or only treated collateral behaviours.

5.5.2 What is best practice?

The limited firesetting literature in the area of best practice and program effectiveness endorses a multidisciplinary intervention approach because firesetting is a community

problem. Evidence-based analysis has concluded that the most effective way to reduce recidivism and build skills in juvenile firesetters is within a multidisciplinary program (Sharp et al., 2007). Multidisciplinary approaches target both fire-specific and general behavioural dysfunction risk factors, are best practice and are based on collaboration with several agencies that are concerned with and involved in the firesetting problem (Gaynor & Hatcher, 1987; Kolko, 2002; Webb et al., 1990).

The APA international guidelines for evidence-based practice seem to be consistent with many components presented as best practice in the juvenile firesetting literature. Best practice is discussed below in terms of: (1) international guidelines for evidence-based best practice as recommended by the APA and (2) effective multidisciplinary components as recommended by the firesetting literature.

APA International guidelines for evidence-based best practice

The American Psychological Association (APA) recommends general treatment guidelines for clinicians delivering intervention. According to APA I international guidelines the following components are considered best practice in intervention, and are summarised as:

- Prevention and early intervention
- Family-centred practices that is accessible to clients (i.e., low income families or culturally and linguistically diverse [CALD])
- Multidisciplinary approach
- Assessment
- Therapeutic alliance- rapport building
- Case formulation and treatment plans

- An understanding of developmental processes
- Targeted treatment for the specific disorder
- Continuity of care (ongoing monitoring and follow-up)
- Clinician's knowledge of client diversity (individual, cultural and contextual differences), referral sources and awareness of: up-to-date research, their own limitations and potential biases.

This is based on both general APA guidelines (APA, 2005) and those specific to children and youth (APA, 2008).

Effective components of a firesetting intervention based on firesetting literature

After review the literature and programs in the United States and Canada, best practice firesetting components have:

- supportive infrastructure
- evidence-based program theory (multidisciplinary and a evidence-based curriculum)
- standardised protocols that guide the delivery and content of the program, monitoring and evaluation
- Program components of: a screening component, a standardised FSE component (mostly delivered by firefighters), an evidence-based curriculum that is CBT-and PMT-based (that is delivered by mental health), monitoring and evaluation component
- evidence of effectiveness
- option to refer to mental health services

- a relationship with allied professionals (Bumpass et al., 1985; Kolko, 1988; Mackay et al., 2004; Oregon State Fire Marshall, n.d; Palmer et al., 2007; Pinsonneault et al., 2002b; Schwartzmann, 2002; Webb, et al., 1990).

What are the benefits of a multidisciplinary approach?

Ex-firefighter A.C. of the Fireproof Children Organisation described the importance and benefits of working as a multidisciplinary team or coalition succinctly and powerfully. He spoke from the fire service perspective and stated that “Fire services are passionate, energised and motivated; they can say a lot of important and concise things about a family without getting too diagnostic”. However, when firefighters work outside of their domain or expertise, “they become part of the barrier to the solution because they don’t want to give it [the case] up”. A.C. stated the benefits of working in a coalition are that you will “get back more than you put in and it will unburden you of additional responsibilities”. Furthermore when asked about the idea of teaching firefighters about mental health issues, his response was that “it burdens people inappropriately and empowers others ... When the boundaries are fuzzy it rattles the system ... everyone has their own respective job to play, within their expertise.”

5.6 Description of effective components (as described in firesetting literature)

Effective components as outlined in the firesetting literature are addressed below.

5.6.1 Supportive Infrastructure and evidence-based program

Best practice contemporary programs for juvenile firesetter intervention are evidence-informed, community-based and have the supportive infrastructure of a

multidisciplinary or collaborative team that has to be organised at the policy level so that juvenile firesetters and their families receive a coordinated treatment response (Oregon State Fire Marshall, n.d).

Juvenile firesetting intervention requires a theory-driven program informed by evidence. Program theory plays a major role in guiding a program's design and evaluation (Pinsonneault, et al. 2002b). The theory defines the presenting problem, the target population for whom the program is designed, specifies the causal processes underlying the program effects, and identifies expected outcomes and factors that affect treatment processes. A well-designed program with a clear theory should help the organisation clarify and understand how their program works and what makes it work. Program theory also helps to provide direction for curriculum development in terms of both content and dosage of intervention and to ensure that the right intervention is targeted most appropriately to the client group (Kazdin & Nock, 2003; Mackay et al., 2004).

5.6.2 Best practice intervention with juvenile firesetters- fire-specific intervention (CBT-and PMT-based) with a FSE component

Fire-specific (i.e., fire fascination) and general psychological risk factors (i.e., parental and family dysfunction and pathology) have also been associated with juvenile firesetting that not only require intervention by the fire service, but also by an allied health professional. CBT strategies that are fire-specific (i.e., challenging assumptions and beliefs about firesetting) and PMT (to assist with parenting strategies) with an FSE component are most effective and best practice with juvenile firesetters because they target both risk factors.

In a multidisciplinary team, best practices endorse that a firesetter intervention comprises of a standardised FSE component and a fire-specific (CBT- and PMT-based) intervention (Mackay et al., 2004). Studies have found that combining FSE and psychological intervention (e.g., CBT) is more effective than FSE or psychological interventions alone. Barreto et al. (2004) concluded that psychological therapies (i.e., CBT) augmented the effects of FSE. Mackay et al., (2004) concluded that PMT augmented the effects of CBT in the treatment of juvenile firesetters. This approach is best delivered by firefighters and allied health practitioners within collaborative or multidisciplinary team approaches.

5.6.3 Standardised program protocols (intake, screening, curriculum and monitoring)

Best practice in juvenile firesetting intervention endorses the documentation of standard procedures because this provides structure and content, and promotes consistent program delivery (Palmer et al., 2007). Some guidelines include:

Intake/screening protocols

Well-established programs use screening tools to evaluate the child's risk for recidivism, to identify some behavioural correlates of firesetting behaviour, and help guide intervention strategies for collaborating partner organisations. The first screening tool and process was developed in the late 1970s by USFA/FEMA. This tool enabled firefighters to rate the degree of severity of firesetting behaviours among child or adolescent firesetters. The FEMA protocol was initiated in the San Francisco Fire Department, and then many other cities followed (Fineman, 1980). Other commonly used screening tools are the Fire History Screen (FHS), the Oregon Screening Tool (OST) and Risk Evaluator (used by TAPP-C).

Intake and screening protocols help guide the practitioner in building initial rapport and assessment of the juvenile's firesetting behaviour, need and risk. A standardised and reliable screening tool determines the intervention level needed. Best practice recommend that intervention for child firesetters and their families are initiated promptly by the juvenile firesetter interventionist. This is particularly important because children involved in the misuse of fire and their families are often classified as high risk and in crisis. Webb et al. (1990) suggested that intervention and a prompt referral to mental health services should be undertaken within a 48- to 72-hour time frame because families are more receptive to helping efforts during early stages of a crisis. Once the immediate crisis of the fire has subsided, other pressing problems frequently take precedence.

Curriculum protocols

A structured age-and culturally-appropriate firesetting curriculum protocols should include purpose, objectives, specific skills and instructional strategies for each intervention lesson. This is so that these objectives can also be monitored and measured for their effectiveness. This curriculum should be a structural protocol that is presented in a manual format that is delivered to both parent and child.

The protocol needs to be structured enough for consistency and quality, yet open to variation in style, approaches, and programmatic advancement and modification (Kolko et al., 1991). A culturally appropriate curriculum also takes into account that different cultures have a variety of values and perspectives.

There are certain strategies in juvenile firesetting intervention described as strategies to avoid (Cole et al., 2006; Gaynor, 2000; Grolnick et al., 1990; Schwartzman, 2002).

Best practice reviews have found that many of the strategies used historically are counter-effective to changing firesetting behaviours. Threats and warnings about the potential danger of fire (i.e., yelling and scaring children into compliance by exposing them to burn victims) should be avoided. Contemporary research has highlighted unsuccessful intervention strategies for children who set fires as: (1) satiation techniques, (2) threatening or (3) lecturing the child or waiting for the child to outgrow the behaviour (Sharp et al., 2006).

Modifications

In programs that utilise best practice standards which include programmatic evaluation, it is evident that advances and modifications are needed to enhance the effectiveness of fire safety training programs. Modifications could be as simple as the inclusion of supplementary audio-visual materials (e.g., film, records, specialised props) to increase fire awareness and prevention. Modifications may also include more complex and complete revisions of content and delivery where appropriate. In addition, novel instructional procedures are recommended to enhance maintenance of fire-safe behaviours (Kolko et al., 1991). In particular, as the world's communication systems become more advanced, more innovative technology-based materials and approaches are required.

Regular revision of the materials may also be required to engage children and adolescents. For instance, media can be a major environmental factor that influences juveniles' involvement with fire. Television and movies tend to glamorise fire and often fool us into believing that the hero can walk through flames and intoxicating smoke to rescue people. It does not portray the reality of the intense heat, toxic

smoke or how quickly fire can engulf a room and spread. The internet and mobile phones that have video capacity can also influence teens to undertake and film irresponsible dares and then post the images on the web or send them on to friends to view. These types of self-promoting and attention-seeking may be tempting to techno-savvy, bored teenagers who are seeking thrills.

Accountability and responsibility

Best practice recommends that programs need to reinforce appropriate behaviour and responsibility with structure and accountability, especially with adolescent firesetters who may lack socially responsible behaviours. Some programs inbuild accountability into their intervention, emphasising the legal, financial and injury/lethal consequences of misusing fire. One of the aims, aside from reiterating consequences, can be to introduce awareness and empathy for the victim of the firesetting act.

5.6.4 Engagement strategies and a family-centred approach

An effective intervention needs to consider who the target of the intervention is, where the program will be delivered, who will deliver it and the content of the intervention.

Setting

The setting of the intervention can be group or individual, as there is not enough evidence to conclude whether best practice in juvenile firesetting intervention should be delivered within a group or individual setting. Kolko et al. (1991) found that one group program was more successful than individual intervention, possibly because

group settings encourage peer interaction, a sense of belonging and learning from others' experiences.

Engaging parents and parental involvement

Evidence-based research suggests that parents also be targeted in juvenile firesetting intervention programs. Research has found that simple, directive and practical strategies are particularly beneficial in cases that are curiosity-driven and in situations where the parents are supportive, motivated, concerned, resourceful and engaged. The intervention for parents often involves psychoeducation about the child's firesetting and the safe storage of ignition sources along with parent management training and positive parenting.

Parental involvement is particularly relevant in the treatment of child firesetting because several family fire-specific variables (i.e., modelling and availability of ignition sources) and general behavioural dysfunction variables (i.e., family dysfunction and deficits in parenting skills) have been associated with the onset and continuation of firesetting (Kolko & Kazdin, 1991a; Kolko et al., 1985b; Nishi-Strattner, 2005).

The level of parental involvement may differ at the various stages of child and adolescent development. For instance, in the early years, parents tend to have more control over the environment than children and an effective strategy for parents can include basic psychoeducation in the safe storage and access to ignition sources.

In adolescence, the parents can still be involved in the intervention but the emphasis may be about the broader consequences and implications of their child's firesetting behaviours and its impact on the community. In the adolescent years, parental involvement may also focus on training parents in the management of behavioural problems, implemented by a skilled allied health professional.

Engaging children

Building rapport and engaging children is critical to an effective juvenile firesetting intervention program. Strategies used by both firefighter and allied health practitioners could include using behavioural training, activities, multimedia and experiential learning to retain the knowledge and skills. Positive reinforcement strategies are also endorsed because they are more effective than punishment strategies. Innovative technology-based materials and approaches are also required to engage children (described above).

5.6.5 Recommended program components in juvenile firesetting intervention

Programs require a screening, curriculum, monitoring, evaluation and referral component.

Screening component

A standardised and reliable screening tool is required because it determines the intervention level needed. This tool needs to assess both the fire-specific and general behavioural risk factors that firesetters present with. The evidence-based research suggests that fire assessment needs to include the age of onset, the firesetting history (in terms of the severity, frequency and duration of the firesetting behaviour), the

versatility (what was the ignition source, where the fire was lit and what was ignited), and who was involved (any accomplices). This in-depth fire-specific assessment is so vital to treatment planning and indication of risk for recidivism. The general behavioural assessment would assess for behavioural, clinical and family risk factors.

Curriculum component (CBT- and PMT-based intervention) and role of mental health practitioners

Firesetting frequently occurs in the context of other disruptive or antisocial disorders and CBT therapies for this population have been endorsed as more effective than other less directed therapies (section 5.4.2). Evidence has concluded that CBT and PMT have been shown to be effective with children with disruptive disorders (Kazdin et al., 1987).

The fire-specific intervention (CBT-and PMT-based and FSE) component has been discussed in section 5.6.1. CBT is more likely than less-directed therapies to facilitate behaviour change, thus some useful CBT-based strategies for firesetters could include:

- self-safety boundaries
- problem-solving techniques
- exploring beliefs about fire
- identification of emotions and learning self-management skills in relation to firesetting behaviour
- relapse prevention (L. NS., personal communication, 13 June 2007; S. M., personal communication, 1 June 2007; Mackay et al., 2004).

PMT-based strategies that are delivered by mental health professionals are also effective and can include:

- securing ignitions (planned searches for matches and lighters, JFSO)
- accepting boundaries set by parents
- discussion of family rules

FSE component and the role of the firefighter

The standardised FSE component has been described above (section 5.3). Firefighters will also play an important role in the intervention because commonly they are the first person to receive the firesetter referral. Thus, they are the first step in the crucial process of building rapport, screening (using reliable tools) and making observations of the juvenile firesetter within the context of the multidisciplinary team. Firefighter practitioners also delivered the standardised FSE, a vital component of treatment of all juvenile firesetters regardless of age, risk or motive.

Monitoring component

Monitoring protocols are dependent on the implementation of standardised screening and curriculum protocols that are purposeful and objective-driven. There are two types of monitoring: client monitoring of juvenile firesetters and their families, and programmatic monitoring. Monitoring consists of data and documentation collection of the program and juveniles' activities. This collection begins when the juvenile firesetter enters the "system". Methods of tracking data and documentation should be carefully considered and decisions need to be made about the activities to be monitored and what systems will be used for collecting and storing information (Gaynor, 2000; Kolko, 1988; Palmer et al., 2007).

Client monitoring

Best practice endorses program designs that have in-built evaluation and monitoring components. These programs have protocols that are based on ongoing data collection, monitoring, synthesis, analysis and evaluation components. Kolko and Kadzin (1994) suggest that programs need to be designed to quantitatively examine and measure change in attitudes, beliefs, skills, knowledge and behaviour. However, not all programs are evaluated or monitored. In Kolko's (1988) survey of 29 FSE community intervention programs, he found that 50% of Firehawk programs made follow-up calls to their clients, compared with 37% of FEMA programs.

In general firesetting intervention programs can collect data through screening and assessment tools, pre- and post-intervention/recidivism follow-up data, type(s) of interventions, participation in intervention, demographics, fire history, ignition, and prevalence data. Client monitoring can include the pre-and-post assessments in the both fire-specific and general behavioural risk domains. Here is a list of some of these domains and the assessments that have been used in both juvenile firesetting research and intervention.

- Knowledge – such as the destructiveness of fire (“Can one match burn down an entire house?”), how fires start (the fire triangle), and how quickly a fire spreads. Examples of knowledge questionnaires are the Fire Knowledge Test (e.g., FKT; Kolko et al., 2006).
- Curiosity and attraction – how curious and attracted to fire is the child after the intervention? Measures can include CFI, FRI or the FIRE attraction and

interest scale (e.g., the Fire Attraction and Interest Scale, FAIS; Kolko et al., 2006).

- Skills – can the child demonstrate the following safety skills? (These can be checked off on a checklist.) Can they verbally describe what to do? Examples of skills are outlined in Jones et al. 1981 study and can include whether the child can demonstrate: (a) how to slide to the edge of the bed, roll out and get in a crawl position, (b) how to cover the crack under the door and wait at the window for help.
- Behavioural change – has their behaviour improved after the intervention? The child behaviour checklist (CBCL) is a common behavioural and clinical questionnaire that is used to monitor the child's externalising and internalising behaviours.
- Recidivism – have they stopped firesetting? Best practice program follow up their clients over intervals to determine whether or not the client has stopped firesetting.

Without this information and data, it is impossible to identify and address the problem. If data is not collected and analysed, then program effectiveness cannot be ascertained.

There are noted challenges to following up child firesetter clients and their families due to the transient nature of the families. In addition to this, firesetting is known as a low-frequency, covert behaviour and therefore difficult to monitor. There has been some suggestion that monitoring collateral behaviours that are related to the target

behaviour is the most effective indicator of recidivistic behaviour and program effectiveness (McGrath et al., 1979).

Program monitoring

Best practice programs will document their own activities and clients in such ways as the source and type of referral, program development activities, budget, reports, conferencing minutes, and interagency networking. Most importantly, they will monitor whether or not the intervention is reaching the intended target clients with the right intervention (Gaynor, 2000; Kazdin & Nock, 2003). Quality control and the consistency of program delivery are important aspects of best practice. This can be maintained by regular case discussion, supervision, reviewing case files and debriefing procedures. Other procedures, such as the consistency of case reporting, should be included in training and checked for quality (Gaynor, 2000; Schwartzman, 2002)

Data and documentation collection guide the analysis and evaluation processes to help ensure that the right services/interventions are provided to juvenile firesetters and adequate resources both in personnel and money are allocated appropriately.

Evaluation component

Evaluation provides the framework to accurately identify the problem and measure whether the program has achieved its objectives. Evaluation can help develop or modify an existing program. Best practice endorses that evaluation is ongoing and is built into the design of a program at its inception. It may include evaluation questions such as:

- are there measurable behavioural changes (for example, are there repeat fires set)?
- are there measurable beliefs changes (for example, does the juvenile firesetter believe they can control fire)?
- are there measurable skill changes (for example, can the child demonstrate a personal safety skill or have they acquired prosocial skills)?
- are there measurable knowledge changes (for example, can the child correctly identify flammable materials)?
- are there measurable attitude changes (for example, do the child follow parental rules, accept responsibility)?

The conclusions from the analysis stage direct the development or redevelopment of a program. Evaluation begins at program design, is ongoing and involving, and is integral to best practice management of juvenile firesetter programs (Gaynor, 2000; Kolko, 1988; Palmer et al., 2007).

Referral component

The identification of a juvenile at risk of future firesetting logically leads to the referral to a mental health agency where the child and family can receive appropriate treatment. It was found that many FSE programs do not have in-house mental health practitioners who specialise in treating firesetters (Kolko, 1988)

Most juvenile firesetter programs, at a minimum, need to have an option to refer to mental health services. However, Kolko's (1988) survey of 29 FSE community

intervention programs found that only one fifth of them had an option to refer on to mental health services.

Mental health services role in juvenile firesetting

Firesetting is a clinical problem worthy of referral with reported prevalence as high as 30–40% in both community and (Grolnick et al., 1990; Kafry, 1980; Kolko, 1988) clinical populations (Kolko & Kazdin, 1988a). However, there are factors that obscure the significance of firesetting behaviour as a clinical problem, because firesetting is frequently not the primary complaint that has brought a child to the attention of services (Pierce & Hardesty, 1997). For instance, Vandersall's (1970) study found that reported firesetting was the main reason for referral in only three of the 20 cases in his study. Frequently, firesetting behaviour is viewed as the secondary symptom to a primary diagnosis, with some practitioners viewing firesetting as a behavioural instead of a clinical problem, thereby excluding their client from accessing clinical services (Winget & Whitman, 1973).

Firesetting behaviour is frequently referred to the fire service and not mental health services because community agencies place differential emphasis upon firesetting as a significant psychological concern. Screening for firesetting behaviours may not occur in mental health or community agencies. The Heath et al. (1985) study of diagnosis and child firesetting found that 32 child psychiatric outpatients were identified as firesetters; however, examination of their clinical records revealed that only nine (28%) mentioned the child's firesetting behaviour. The screening did not pick up firesetting. Directing referrals to the fire service suggests that the firesetting behaviour is not being treated by the most appropriately skilled professionals. Many professionals will treat the collateral behaviours but not specifically the firesetting

behaviour, preferring the fire service to provide this intervention. Mental health professionals seem reluctant to intervene directly with firesetting behaviours (outlined in section 1.2).

An organisation called Fireproof Children Company was established in the United States in 2001 to help develop community-based multidisciplinary networks and present workshops for agencies working with juvenile firesetters. In a study by Sharp et al. (2006) they explored the basic assumptions that the clinicians had about juvenile firesetting behaviours. They found that the practitioners were not confident in working with juvenile firesetters because they often assumed that this required highly specialised skills that exceeded their expertise. The emphasis of the workshop was to educate clinicians about fireplay and firesetting behaviour and to emphasise that their existing skills as practitioners were adequate for working with this client group.

Mental health practitioners tend to design treatment strategies that are more reflective of their personal experience rather than directly drawing from firesetting research (Stadolnik, 2000). Kolko (1988) surveyed managers of 29 national community FSE programs and found that most of them expressed concern about the deficiencies of mental health workers' training and skills in dealing with juvenile firesetters because they appeared to not directly treat the child's firesetting behaviours. This lack of skills may be attributed to the scarce information in professional literature to inform practitioners of the clinical complexities of children who set fires (Stadolnick, 2000). Furthermore, these practitioners have not been given the opportunities in their studies or professional development to understand and examine juvenile firesetting behaviours in a meaningful way.

Barriers to psychological treatment for firesetters

Webb et al. (1990) acknowledged that engaging families in mental health treatment is one of the four key factors crucial to working with juvenile firesetters. Webb et al. and Wingett and Whitman (1973) found that juvenile firesetter clients were in general resistant to mental health intervention, perceiving it as the “last resort”. If the family does enter the system, they may disengage, blame the child or “symptom bearer”, and discontinue treatment prematurely. A lack of access and information may also be a barrier to receiving help, as many families of firesetters have been described as chaotic, of lower socioeconomic status and disorganised and are typically difficult to engage in required services. These families may lack connection with the community and thus be unaware of services that can help them.

Wingett and Whitman (1973) found that only about one third of the families with children who set fires ever take action that could lead to a mental health referral. In their study, they asked 300 adults, “If you had a child who repeatedly set fires, what would you do about it?” Of these, 54.3% made answers that could lead to a mental health referral, one-third stated that they would not contact a mental health professional, and 32% of the responses were deemed as ineffectual ways of managing the problem (i.e., reacting helplessly or punishing the child ineffectively).

Many families do not accept the firesetting behaviour as indicative of a need for mental health treatment (Webb et al., 1990) and they resist additional services because they do not believe in the value of mental health treatments or because they are overwhelmed or preoccupied by a variety of problems causing them to deny or minimise the seriousness of the child’s firesetting. Thus, referrals initiated by the fire

service may never be acted upon. Those parents who do consent to psychological intervention may subsequently resist their own involvement, believing that it is solely the child's fault. They rarely recognise that the situation at home or their own treatment of the child has contributed to the child's firesetting behaviour (Webb et al., 1990). This suggests that families may be resistant to treatment and require constant follow-up to ensure that they are complying with treatment. The Webb et al. study found that resistance to treatment was the norm, rather than the exception. The study concluded that without consistent follow-up from the fire department, the families may never have continued treatment.

There is some suggestion that families who experience difficulties and have children who engage in firesetting do not come in contact with mental health services because they have limited connections to the community and awareness of services. For instance, in Webb's et al. (1990) pilot study of an interdisciplinary firesetting intervention, it was found that of the 35 families involved, only two had been known previously to mental health services, despite long-standing histories of psychosocial problems, child abuse/neglect and alcohol and substance abuse.

Collaboration with mental health services

Best practice requires that collaboration with allied professionals includes the creation of formalised agreements with multiple agencies who are also working with firesetter children and families. Successful intervention with firesetting behaviour requires the ability to coordinate a multidisciplinary array of services, inclusive of mental health (Stadolnik, 2000). The juvenile firesetters intervention program in New York City argues that a large part of its effectiveness was due to an "aggressive" outreach

component, which relied upon close liaison between mental health services and the fire department, and also in the active role of key fire personnel (Webb et al., 1990)

5.7 Background of Best Practice Models

The background of the TBOPP, TAPP-C and Oregon JFIN are provided. These programs offer a multidisciplinary intervention and are considered well established, evidence-based and effective.

TBOPP

Is a one-day multidisciplinary program for juvenile arsonists and firesetters aged four to 17 years. The program is conducted at the University of Michigan Trauma Burn Centre and is delivered by a multidisciplined team of nurse educators, trauma surgeons, social workers and firefighters. The program emphasises interactive learning, didactic instruction, fire safety and peer counselling. Safety education is provided by nurses, firefighters and peers. The program also endorses a peer counselling approach in which former graduates and juvenile fire victims are involved. The juveniles are given interactive opportunities to visit the trauma burn intensive care unit, skin bank, debridement/tub room, morgue and injury prevention centre. With parents' consent, juveniles can have the opportunity to speak with juvenile burns victim patients on the unit about their experiences. Families are also given a smoke detector, fire extinguisher, safety light, home fire safety video and instructional material at the completion of the program at no cost (Franklin et al., 2002).

Franklin et al. (2005) investigated the effectiveness of the TBOPP by randomly assigning 132 and 102 firesetters and arsonists to the TBOPP treatment group and control group (no TBOPP), respectively. The treatment outcome measure was recidivism in a period ranging from eight months to 2.5 years. TBOPP treatment was significantly more effective than no TBOPP in terms of recidivism. The recidivism rate for the TBOPP group was 0.8% compared with 36% for the no TBOPP group.

TBOPP also sought program feedback from their participants and noted that the success of the program was attributed to four key elements: partnership with the burns centre for interactive prevention education, parental participation, providing safety equipment for the home and peer counselling with TBOPP graduates and juvenile burn victims. The authors also acknowledged that the multidisciplinary approach to this problem was necessary to create a greater impact and those community and court system supports were essential for assisting with referral and follow-up.

TAPP-C

TAPP-C is a hospital-based program based in Toronto, Canada. It was introduced in 1991 as a collaborative effort by the Office of the Fire Marshal of Ontario, the Centre for Addiction and Mental Health, and the City of Toronto Fire Services.

TAPP-C is a community-based screening, early intervention and dissemination program that have been implemented in communities across Ontario. The program offers psychoeducational treatment and fire safety education for juvenile firesetters between two and 17 years who have been involved in one or more instances of unsanctioned firesetting. Its aim is to ensure that firesetters and their families have

access to standardised firesetting assessment and intervention that addresses their firesetting behaviour and mental health needs in their local communities. Efforts to disseminate TAPP-C have occurred since 1993 and there are currently 700 local agencies affiliated with the TAPP-C initiative. The focus of this brief goal-directed treatment is “keeping your child safe” and this is used as leverage to sustain the family’s engagement, motivation and involvement in the treatment. The treatment is behavioural and fire-specific within the context of broad-based disruptive behaviour treatments (Mackay et al., 2004; TAPP-C – S. M., personal communication, 1 June 2007).

Oregon Juvenile Firesetting Intervention Networks (JFIN)

The Oregon JFIN was initiated by the Oregon State Fire Marshall (OSFM) who established a taskforce of fire service, law enforcement, juvenile justice, mental health and insurance organisations in 1989 with an aim to address the juvenile firesetting problem in a multidisciplinary way. The Oregon JFIN is an example of a multidisciplinary team approach that works at the local level to identify juvenile firesetter issues, develop mission statements, sets its goals and objectives, and with combined resources develop intervention strategies and curriculum.

The role of the OSFM is to provide infrastructure, training and support for the community networks. Standard operating guidelines have been set up for all networks and although the OSFM aims to provide a consistent program model to all networks, this does not always happen. There are several programs that have evolved from the network structures that truly exemplify best practice in multidisciplinary programs and a continuum care for juvenile firesetters and their families. These programs are

the SAFETY program that targets adolescent juvenile firesetter aged 12 to 17, while the Safety Academy program provides intervention services for juvenile firesetters from six to 12 years and their parent(s)/caregiver(s).

5.7.1 How do TAPP-C and Oregon JFIN compare against established guidelines?

The following section looks at how the TAPP-C and Oregon JFIN compare against the effective juvenile firesetting intervention components and International APA evidence-based guidelines.

The effective components as identified in section 5.6 are discussed in relation to the TAPP-C and Oregon JFIN programs. The programs of TAPP-C and Oregon JFIN have a separate section (5.8 and 5.9) respectively, as they have been identified as exemplar models of juvenile firesetting intervention practice. These programs are also compared against the International APA evidence-based guidelines in section 5.10.1.

5.8 TAPP-C

The following section discusses how TAPP-C compares against the effective components of best practice for juvenile firesetting intervention, as identified by the juvenile firesetting literature.

5.8.1 Supportive infrastructure and evidence-based program

TAPP-C is a collaborative program that brings together fire service and mental health professionals (Mackay, et al., 2004; TAPP-C – S. M., personal communication, 1 June 2007). It is supported, partnered and funded by both the Toronto Fire Service and the Ontario State Fire Marshall.

The program emphasises both prevention and intervention. The program is designed to be preventative at two levels. The first level involves encouraging parents to prevent their children's access to fire-starting materials and the second level is to discourage children from playing with matches and lighters. The intervention directly targets the fire misbehaviour directly using evidence-based strategies.

TAPP-C is based on best practice that draws from the theoretical base of antisocial and disruptive behaviour research. In particular, the work of Kazdin and Kendall has formed the basis for treatment strategies, mostly because firesetting is considered to be a form of antisocial behaviour. The antisocial literature base was also adapted to a fire-specific model of assessment and prediction. Similar to other antisocial literature and risk assessment frameworks, the TAPP-C model of juvenile fire involvement hypothesises that fire-specific risk factors and the presence of an atypical fire history coupled with concomitant child and/or family psychopathology places a child at specific risk for firesetting recidivism. Other theories that guide the design and treatment of TAPP-C are the existing firesetting literature (such as Ken Fineman's work), Parenting Management Training (PMT), positive parenting, triadic therapy, violence prevention literature (S. M., personal communication, 1 June 2007).

5.8.2 Standardised protocols and engagement strategies

The TAPP-C program has the standardised protocol for screening, curriculum and monitoring that ensured the consistent delivery of the program. The content of these components are discussed in section 5.8.3. In the TAPP-C program, parent and children are engaged in the sessions using strategies highlighted in section 5.6.4.

5.8.3 Program components of screening, curriculum, monitoring, evaluation and referral.

TAPP-C screening - risk evaluator and other assessment components

The TAPP-C model of juvenile fire involvement hypothesises that fire-specific risk factors cumulate with general risk factors of child psychopathology to increase the likelihood of further fire involvement (Hanson et al., 1995). Thus, a child or adolescent referred to TAPP-C is assessed by a trained clinician for risk factors in fire-specific behaviours, fire history, and general mental health. A developmental history of the child and existing clinical instruments (i.e., CBCL) are used to evaluate general mental health and behaviour. The fire-specific risks are explored using “a risk evaluator” and “fire interest” and “curiosity” measures. Recidivism is also tracked for 18 months to determine effectiveness.

The importance of assessment for risk is that it provides a framework for thinking about the case, a summary of risk and provides an indicator of treatment needs.

Sherry Mackay stated that “not everyone is high risk” and therefore an objective risk evaluation measure is necessary so that resources are not tied up. In practice, all fires set in Ontario by children under 12 years of age are automatically classified as “accidental” (S. M., personal communication, 1 June 2007).

TAPP-C curriculum component

The TAPP-C program is a brief, family-focused intervention based on five sessions that includes a parent and child mental health component that is delivered separately and concurrently by a trained mental health clinician. It also incorporates a three-session FSE component that is delivered by a trained firefighter practitioner (Mackay

et al., 2004). In the TAPP-C program, the content of both the child and parent programs are related so that they will be working as a team together (S. M., personal communication, 1 June 2001; Mackay et al., 2004).

The curriculum is based on CBT-and PMT-based strategies that are fire-specific, goal-directed, and family-focused. It aims to change attitudes, increase knowledge and change behaviour. One session in the program incorporates a CBT-based strategy called “Stop Now and Plan” (SNAP) that teaches the child to examine feelings and thoughts associated with previous firesetting episodes, problem-solve (and create alternative strategies), exercise self-control, and review the consequences of misusing fire. The SNAP sessions also focus on “thinking mistakes” with a view to help identify the thoughts that may promote fire involvement and to substitute them with more helpful thoughts. Scenarios are role-played with the child so that they can learn new strategies and alternatives to firesetting (Mackay et al., 2004).

The sessions focus on access to ignition sources, supervision, rules, parenting practices and training, behaviour change (rewarding the child), positive reinforcement, and building skills (fire safety, parenting skills, negotiation and communication; Mackay et al., 2004).

Education for parents about the safe storage of ignition sources plays an important part of the TAPP-C intervention. This simple strategy is effective in reducing the child’s opportunity to misuse fire (S. M., personal communication, 1 June 2007) and is particularly relevant for parents of children in the 8-12 years age group. Children at this age learn by observation and imitate their adult role models so the emphasis that

the adult places on fire safety within the home and the modelling of appropriate use of fire is highly relevant. Other psychoeducation strategies for parents can include understanding firesetting behaviours and exploring their child's motivation for engaging in the misuse of fire (Mackay et al., 2004).

The TAPP-C program also emphasises positive parenting practices and reviews the parents' methods of punishing and reacting to the child's involvement in fire. For instance, session four relates to the consequences of continual fire involvement and what to do if the child misuses fire again. This session explores why children light fires (what is the pay-off), and then explores safer ways of achieving similar outcomes. It also looks at managing the parental responses if the child misuses fire again – strategies that work and do not work. A review of the intervention, strengths and strategies that work is undertaken in session five. This empowers parents by recognising their accomplishments and helps them plan and deal with any future episodes (Mackay et al., 2004).

TAPP-C also incorporates a triadic model of intervention when they enlist the parents are co-partners in the intervention, and this frequently involves setting up reward systems for their child, particularly if they display responsible fire safety behaviours. This is usually achieved by teaching the parent strategies in parenting, discipline and establishing consistent rules and punishments. The parent will also be versed on the importance of appropriate modeling of fire-safe behaviours. One of the outcomes could be reduction in firesetting; an unintended outcome could be improvement in the parent-child bond.

Monitoring component

The TAPP-C collaborative program disseminates their training, assessment and intervention tools throughout Ontario, Canada. The standardised assessment protocols allow data collection on the youth's fire involvement, fire curiosity, interest, and general mental health. Furthermore, the intervention is delivered by trained mental health and firefighter practitioners and this is monitored through supervision and case notes on clients. Also, because TAPP-C is a dissemination program, group supervision is conducted with the mental health director and developer of the program. This is done via satellite group supervision (S. M., personal communication, 1 June 2007).

Evaluation component

Preliminary evaluation of TAPP-C's collaborative intervention and data suggests that the program is effective in reducing recidivism. The data from one- to two-year follow-up conducted with approximately 200 families has indicated that approximately 75% of participants have not lit another fire (Henderson et al., 2006).

Referral to mental health component

The TAPP-C program has specifically trained mental health practitioners with an evidence-based program and a procedures manual to guide them. However, TAPP-C has also established other alliances with allied health professionals to provide a continuum of care for juvenile firesetters and their families.

5.9 Oregon JFIN

The following section discusses how Oregon JFIN compares against with effective components of best practice for juvenile firesetting intervention, as identified by the juvenile firesetting literature.

5.9.1 Supportive Infrastructure and evidence-based program theory

Supportive infrastructure

The Oregon JFIN taskforce sought and received funding from the state legislature (the equivalent of an Australian State Parliament) that provided the ability to identify trends in juvenile arson, intervention resources, standardised public safety initiatives to meet the changing needs of communities, and the establishment of partnerships of public safety departments, social service agencies and Juvenile Firesetter Intervention Networks (JFIN; Oregon State Fire Marshall, n.d.; J.O. and C. B., personal communication, 11 June 2007).

The Oregon JFIN is supported by the Oregon State Fire Marshall (OSFM) who provides statewide support to the local communities intervening with juvenile firesetters. The Youth Fire Prevention and Intervention team provides the local communities with the resources, knowledge, expertise, training and tools to establish their own firesetting programs within a multidisciplinary framework. In 1996, multidisciplinary teams established to work with firesetters were in 24 of Oregon's 36 counties.

The OSFM provides key services and support (i.e., infrastructure) to the local community in the way of:

- information services (such as a state-wide fire reporting system, a clearinghouse for literature and program materials, a referral service that links at-risk children to mental health practitioners who have expertise within the field)
- technical assistance and partnering (providing intervention materials, clerical and publishing support, training, and meetings)
- research and development (development of standardised protocols, assessment and screening tools, and program design and development) in the area of prevention and intervention.
- communication (linking the local, state and national programs through the publication of its national newsletter called *Hot Issues*, as well as conferences and networking opportunities).

Program theory

The Oregon JFIN is an example of a multidisciplinary team approach that works at the local level to identify juvenile firesetter issues, develop mission statements, set its goals and objectives, and with combined resources develop intervention strategies and resources.

The JFIN is based on a philosophy of providing a continuum of services and the use of existing resources from the collaborating partner agencies in the community. The OSFM views firesetting behaviour as a community problem and thus a major role is helping establish a coalition in local communities using local people and resources.

Each community network identifies problems/issues, have varying resources and partnering agencies, and develop unique strategies to intervene with juvenile firesetters (Oregon State Fire Marshall, nd).

The Oregon JFIN uses a fire-specific (CBT-and PMT-based and FSE) intervention and also incorporates a triadic approaches.

5.9.2 Standardised protocols and engagement

The Oregon JFIN has the standardised protocol for screening, curriculum and monitoring that ensured the consistent delivery of the program. The content of these components are discussed in section 5.9.3. Both the Fire Safety Academy and SAFETY program also utilise engagement strategies, have in-built accountability and structure, and also utilise innovative techniques that are fully discussed below.

Parental involvement

In the Fire Safety Academy program, parents are integral to the success of the program. Parents and children attend separate classes and also participate in combined activities that are designed to reinforce both parental and child skills (L. NS., personal communication, 12 June 2007).

In the Fire Safety Academy program, parent classes are intended to provide them with information about juvenile firesetting, parental responsibility, home fire safety modelling and fire prevention, and positive parenting practices that will reduce repeat firesetting. Psychologists leading this group create an environment of trust that allows parents to share openly their experiences and concerns related to juvenile firesetting.

Following the individual class sessions, children and parents are reunited in one group and co-homework activities are assigned for completion during the intervening week. These assignments are cooperative parent–child activities designed to reinforce the information and skills taught in the class. At the beginning of each class, when children and parents are together, homework assignments are reviewed and purposeful rewards given, reinforcing retention and application of the concepts taught, and rewarding cooperation, compliance and responsible behaviours (L. NS., personal communication, 12 June 2007).

For the SAFETY program, although parental participation is encouraged, the focus is on the juvenile. This is because the firesetter had been through the court system and is directed by the juvenile court. It should be noted that while parents play an active and involved role in this program, they are not actual participants in the classes, except for the initial session in which they:

- complete the Achenbach Child Behavior Checklist
- complete a parent assessment of the child behavior
- provide informed consent (legal requirement)
- review the homework requirements with the Youth’s Homework Log
- receive an overview of juvenile firesetting and additional program information
- engage in psychoeducation regarding the legal implication of their juvenile’s firesetting behaviour (L. N., personal communication, 13 June 2007).

In Oregon, the OSFM provides the JFIN with a parental legal responsibility brochure that outlines the potential criminal consequences of juvenile firesetting for both parent and child. This brochure clarifies that juvenile firesetting is the parent’s responsibility

and all of the state laws and statutes are outlined for both parent and child. This includes parental liability for damages, restitution to the victim for damages, costs in suppressing fires, and potential offences (including reckless burning, and arson in the second or first degree). This brochure is given to parents as a reality check and to drive home the message to the family that there are severe penalties for firesetting if the offender is caught and deemed responsible and liable (C. B., personal communication, 11 June 2007).

Accountability and structured program

The SAFETY program curriculum strongly emphasises accountability, consequences and taking responsibility, all of which are common social deficits of juvenile firesetters.

Most notable sessions include identifying and empathising with the victim of the firesetting by writing an impact statement from the perspective of the victim and interviewing three people who were impacted by their firesetting. This session involves psychoeducation about the definition of empathy, as opposed to sympathy; a blindfold exercise (relating to trust); and explores the “ripple effect” of the silent victim (i.e., thinking about all of the people on whom the fire could have potentially impacted). Homework exercises include working on understanding the feelings of others, directly using these skills with others and reporting back to the group. Court-ordered restitution may also be a component for some of the participants in the SAFETY program.

Another innovative session in the program that is facilitated by both the juvenile justice worker and firefighter practitioner is called “Pay-up, Line-up, and Face-up”. In this session, the financial impact of the fire is explored in a session called “the cost of your firesetting”. Firstly, the adolescent is given \$1000 in play money and is asked to imagine how they would spend it. After this, the juvenile is asked to calculate the cost of their fire on a provided spread sheet – for instance, the cost of sending out a fire engine vehicle and the costs of suppression of the fire. They are then asked to “pay-up” the cost of the fire back to the facilitator. Other consequences are explored in this session, such as the legal and social consequences of firesetting. This is called “face-up”, and it encourages the adolescent to take responsibility for their firesetting (L. N., personal communication, 13 June 2007).

Innovation

The Oregon program has addressed the media problem by incorporating a compilation DVD into the program called *It's up to you*, which looks at the media's portrayal of fire. This DVD is also given to schools to dispel the myth that man has power over fire or that people are invincible and cannot be harmed (C. B., personal communication, 11 June 2007).

5.9.3 Program components of screening, curriculum, monitoring, evaluation and referral.

Intake/Screening component

In the Oregon JFIN, juvenile firesetters are referred into both SAFETY and Safety Academy programs through multiple channels such as fire service; law enforcement or juvenile court counsellors; mental health professionals; social workers; or self-

referral. In both programs, the JFIS practitioner uses the standardised Oregon Screening Tool for which the JFIS has undergone 40 hours of training. The intake process begins promptly as it is known that these families are in crisis. The firefighter practitioner, a certified Juvenile Firesetter Intervention Specialist (JFIS), makes telephone contact to collect information about the child and parent, the fire incident information and family relationships, and sets an appointment for a screening at the fire department. Best practice dictates that the screening should take place within a week of the incident (Gaynor, 2000; Webb et al., 1990).

In contemporary practice, the Oregon Screening Tool has been shared with numerous states and fire departments and provides the first level of basic screening for use by firefighter and other practitioners. This tool has been developed in the state of Oregon and has been disseminated for use in programs such as the Safety Clinic in Pittsburgh (D. K., personal communication, 8 June 2007). The referral inventory tool is easy to use, validated and includes a simple set of questions that primarily focuses on the fire incident. The basis of this tool is a “needs-assessment” rather than a “risk-level assessment”, which is the dominant model of other firesetting screening tools. The needs-assessment relates to such things as additional intervention through mental health services or other supports. This approach is consistent with the fire service perspective that recognises that all firesetting behaviour is high risk since any fire can get out of control due to environmental factors such as wind and fuel loads (Oregon State Fire Marshall, 2009).

In the Oregon JFIN, screening is undertaken by trained JFIS, usually fire department personnel, but affiliated agency personnel have also been trained to do screenings.

Following the referral intake, the interventionist makes initial contact with the parents of the juvenile firesetter to gather basic information, begins to establish rapport, and sets the appointment which will occur at the fire department or family home. Critical to the screening process, is the necessity to establish rapport and confidence with both the juvenile and the parents. The Oregon Screening Tool is designed to guide the interventionist through the establishment of this rapport. The screening generally takes approximately two hours and is comprised of guided, independent interviews with both the parents (who also complete a CBCL) and with the juvenile.

This screening tool is not a risk-level assessment but provides a picture of the firesetter, the fire incident, and the family environment without labelling the firesetter, and determines the intervention level needed. If the score is high and indicates a higher level of intervention, the JFIS then refers the juvenile firesetter and parents to the multidisciplinary team. The data collected from the screening and the JFIS report are submitted by the JFIS to the data system administered by the OSFM.

Once the multidisciplinary team receives the data and documentation from the Oregon Screen Tool and any other reports from network partners (e.g. law enforcement, juvenile court or allied health professionals), they review all the factors. Then they determine whether the juvenile firesetter is eligible for Safety Academy or SAFETY programs, whether the juvenile needs referral for mental health assessment/evaluation or whether the family needs other social services. In this collaborative, multidisciplinary model, decisions are made in a timely and responsive manner (Oregon JFIN – J. O. & C. B., personal communication, 11 June 2007).

Curriculum component

The Oregon JFIN SAFETY and Fire Safety Academy programs are delivered in a group format. Participation in the Fire Safety Academy program is limited to about five children and their parents in order to effectively teach to the developmental levels and learning styles of children in this age group.

The Fire Academy program (for six- to 12-year-olds) is delivered by clinical psychologists and firefighter practitioners. It is comprised of six classes of two hours each for both the child and the parent/caregiver. The SAFETY Program (for 12- to 17-year-olds) comprises 13-sessions and is delivered by facilitators (usually juvenile court caseworkers who hold at least a Masters degree in social work or psychology), and firefighters (two sessions), and program and curriculum oversight is provided by PhD psychologists (J. O & C. B., personal communication, 11 June 2007).

The SAFETY programs' fire-specific CBT-based curriculum has an emphasis on skill-building and some components include:

- improving problem-solving
- assertiveness training
- making better choices about friends (peer pressure)
- analysis of thinking errors
- exploration of feelings
- examining fire and the media
- exploring consequences of the fire (legal, financial, and personal costs, i.e., the victim's perspective; L. N., personal communication, 13 June 2007).

Innovative activities and multimedia are used to engage the adolescents. Weekly homework exercises and individual projects are a requirement of full participation in the program. One notable strategy in the SAFETY program curriculum is to challenge the firesetters' distorted cognitions and thinking errors about their fire involvement. For instance, a juvenile may have lit numerous fires without getting caught, with each subsequent fire reinforcing the thinking error that they never will get caught. They may justify their firesetting or "blame" others for the firesetting. Another example is a child who believes that they are invincible and can control fire (L. N., personal communication, 13 June 2007).

Monitoring component

The Oregon model, utilising a state-wide data and documentation collection system, allows the local community to identify their unique juvenile firesetter problems and provides direction and resources to service juvenile firesetters and their families more efficiently (Oregon State Fire Marshall, nd).

In the Oregon JFIN, program and client monitoring begins in the first session when parents complete the Child Behaviour Checklist and both parents and children take a pre-test. Monitoring continues throughout the six sessions with the collection of homework, participation/attendance, and observational reporting by the clinician and firefighter practitioner. At the final class, which culminates in a graduation ceremony, children and parents present their cumulative project, play a fire safety "Jeopardy" game, and take the post-test. Follow-on contact is conducted at six- and 12 months. These follow-on contacts with parents are conducted by phone using a standardised script to determine if there have been other firesetting incidents or other inappropriate

behaviours, and to assess the retention and application of the content presented in the Fire Safety Academy.

As with the Fire Safety Academy, monitoring for the SAFETY program begins with the first class and continues throughout the 13 sessions. Much of the same data and documentation as in the Fire Safety Academy program is collected, including pre- and post-tests, homework assignments, projects, and the parental inputs and checklists. Follow-on is conducted through the juvenile court, a multidisciplinary team partner. All the data is collected into a database that the juvenile court division has created for the program (J. O & C. B., personal communication, 11 June 2007).

Evaluation component

Program data and documentation is evaluated and utilised to assist in program modifications and also to determine program effectiveness.

The Oregon JFIN data and documentation, collected through the monitoring process, is retained by the multidisciplinary program coordinator. At quarterly meetings of the multidisciplinary team, the data is evaluated (synthesised and analysed). The findings from this evaluation process provide the information that dictates program modifications, if needed. For example, one of the outcomes for the Oregon JFIN evaluation process was the development of a standardised curriculum. Other program modification through the process of evaluation has included change to the design and development of activities that address different literacy levels that incorporate technological advancement (C. B & J. O., personal communication, 1 June 2007).

The success of the Fire Safety Academy program has been evaluated since the multidisciplinary approach was implemented in 2000. Through follow-on surveys, the data collected in 2005 indicated that 247 families with children ranging from four to 17 years old had participated in both SAFETY and Safety Academy programs. Data from the surveys indicated that 3% to 6% of the youth served by the Safety Academy program continued on to set another fire. However, prior to participation in the program, 56% of children were identified by their parents as repeat firesetters (Nishi-Strattner, 2005). More recent outcome data from the period of December 2006 to June 2008 has indicated that there were 132 youths who participated in the SAFETY program; however, seven did not graduate. Of that seven, three reoffended with another offence other than firesetting (43%) and one youth reoffended with a fire-related crime (14%), indicating there was a drop in firesetting with some exposure to the program. The 125 clients who completed the program were followed for six months. It was reported that only one reoffended with a fire-related crime (initially charged with arson one, and subsequently also charged with arson one). Thus, the recidivism rate was below 1% (.08% recidivism; Data collected by Fire Safe Children & Families and reported by C. KW., personal communication, 1 June 2009).

Because firesetting is often a red flag for other criminal behaviours (described in 2.4.2), the Oregon JFIN considers it important to record other offences, not just firesetting, and whether there has been a change in behaviours overall. The program followed 125 youth for six months, out of which 17 were involved in other offences (14%). Out of this cohort, 115 were followed for an additional six months because 10 of the group could not be followed up. Out of the 115 who were followed over the

full 12 month period, 22 of them (19%) had reoffended, and two (.2%) of these were fire-related while the other 20 were related to other crimes.

Referral to mental health component

The Oregon JFIN model has found that their networks (multidisciplinary teams) facilitate referrals and provide more “rapid access” to a continuum of services for identified at-risk juveniles (T. K., personal communication, 13 June 2007).

5.10 Summary and evaluation of exemplar models

Oregon JFIN and TAPP-C programs incorporate many of the recommended effective components and features of an effective juvenile firesetting intervention. The following Table 19 looks at how these programs measure against the international APA guidelines for evidence-based practice.

Table 19 International APA guidelines and TAPP-C and Oregon JFIN programs

APA guidelines	Comments
Prevention and Early Intervention	TAPP-C emphasises both prevention and intervention practices. The program is designed to be preventative at two levels. The first level involves targeting access to ignition sources and the second discourages children from playing with fire. The intervention directly targets the fire misbehaviour directly using evidence-based strategies. Oregon JFIN emphasises both prevention and intervention practices. They have a prevention component (i.e., delivering prevention in schools) and treatment component (i.e. the Fire Academy and SAFETY program).
Multidisciplinary Approach	TAPP-C is a collaboration program (between fire service and mental health) that also includes other professionals (if required). Oregon JFIN is a program that has a multidisciplinary network.
Family-centred approach	The TAPP-C and Oregon JFIN are family-centred because they include parents and children in their intervention. In the SAFETY (adolescent) program parents do not receive direct intervention, as in TAPP-C or Fire Academy program. However, parents receive psycho-education around their legal responsibilities and are involved in pre-and-post assessment.
Accessible	Both TAPP-C and Oregon JFIN are state-wide programs that are

APA guidelines	Comments
	widely disseminated and accessible to clients. TAPP-C has disseminated their program to over 700 local agencies in Ontario, Canada. Oregon JFIN has disseminated their program to 24 of Oregon's 36 counties. The program also offers rapid-access to a continuum of services for identified at-risk juveniles.
Assessment	Both TAPP-C and Oregon JFIN use validated and reliable fire-specific assessment measures (i.e., the risk evaluator and Oregon Screening Tool, respectively). They also evaluate mental health using existing tools (i.e., CBCL).
Therapeutic alliance- rapport building	Rapport building is a critical part of both programs. Both programs have assessment and screening tools that assist clinicians in developing initial rapport. Following this, engagement strategies such as developing trust, building rapport, utilising an engaging age-appropriate and innovative curriculum.
Case formulation and treatment plans	Practitioners of both programs engage in case formulation over the assessment and ongoing intervention phases. The intervention is also delivered by trained allied health clinicians who use case notes and engage in supervision as required.
An understanding of developmental processes	<p>The TAPP-C program has a separate manual for fire safety educators and mental health clinicians. The fire safety education program is divided into four developmental levels. The mental health manual is inclusive for all ages, but content will be adapted to the age and developmental level of the child.</p> <p>The Oregon JFIN program is developmentally appropriate offering a different and tailored intervention for 6-12 year olds (Fire Academy Program) and 12-18 years (SAFETY program).</p>
Targeted treatment for the specific disorder	The Oregon JFIN and TAPP-C both provide a fire-specific CBT- and PMT-based intervention with FSE.
Continuity of care	<p>Oregon JFIN and TAPP-C follow-up their clients over an 18-month period and facilitate additional referrals to other services (if required).</p> <p>Part of the Oregon JFIN strategy is to offer a continuum of services and care to clients.</p>
Practitioner knowledge and awareness of: Diversity (individual, cultural and contextual), referral sources, up-to-date research, and their own limitations and potential biases.	Oregon JFIN and TAPP-C provide essential training and supervision to clinicians and support them in developing the skills and self-efficacy to work with juvenile firesetters. This ensures that professionals are not working outside of their expertise and are provided with up-to-date research in this area. Also consistent with APA guidelines, clinicians have an understanding around the issues of diversity, referral sources, and their own limitations and biases

5.10.1 Summary and recommendations

The guidelines presented in section 5.6 are based on the firesetting intervention literature, best practice programs that are considered well-organised, evidence-based and effective, and consultation with leading experts in the field.

It is recommended that juvenile firesetting programs included the effective components as outlined and also described in the exemplar programs of TAPP-C and Oregon JFIN. These, along with the International APA best practice guidelines, can provide a model for best practice in juvenile firesetting intervention.

Guidelines for practice

It is recommended that programs follow the below guidelines for delivering a best practice early intervention juvenile firesetting program that include the following components:

Prevention

Programs need to emphasis both prevention and intervention for successful intervention with juvenile firesetters. Prevention can include teaching fire-safe behaviours to young children to deter them from future fire-play. Prevention can include parents by educating them on fire-responsible behaviours (access and modelling).

Supportive Infrastructure

A supportive infrastructure or evidence-based program are not mentioned in the APA guidelines, perhaps because they are common practice for most successful

interventions (i.e. that they would be funded, receive support and be evidence-based). However, this can be a challenge for fire services because their main business is to fund and support operational fire fighting and not mental health efforts.

Evidence-based program theory

The other component is an evidence-based program and this is particularly relevant in an organisation, such as a fire service, where there is less emphasis on a research culture. The evidence-based program theory could be based on the following:

- An underlying philosophy that juvenile firesetting is a community problem.
- Accessibility in the community (i.e., low-income families)
- Multidisciplinary- working together collaboratively with partners can draw the skills, knowledge and skills of multiple professionals. This also ensures that they are working within roles and have knowledge of their limitations and skills.
- Evidence-based curriculum that directly targets the firesetting behaviour (i.e., a fire-specific CBT- and PMT-based and FSE intervention).
- Based on the evidence that the sole intervention of FSE is appropriate for low-risk clients, but a psychological intervention is required for high-risk intervention.

Standardised protocols and engagement strategies

To guide standardised delivery of the program in the way of: screening, assessment, curriculum and monitoring. This documentation of standard procedures provides structure, content, promotes consistent program delivery and assists in building rapport. Guidelines for these protocols are described in section 5.6.3.

Recommended program components for juvenile firesetting intervention

- **Screening** - A standardised and reliable screening tool that assesses fire-specific and general behavioural factors is required because it determines the intervention level needed. The TAPP-C screening protocol (the risk evaluator) and Oregon screening tool are evidence-based, reliable and valid measures.
- **Assessment** - assessments undertaken by mental health practitioners can include some fire-specific techniques and may include evaluating the firesetters risk. Some fire-specific techniques can included the Bumpass Graphing Technique, and other existing clinical tools (such as the CBCL) and practices (gathering a developmental history).
- **Curriculum** - a fire-specific intervention would be CBT- and PMT based with a FSE component. The content of the curriculum are described in section 5.9.3.
- **Monitoring**- includes data collection on clients and the program. This component guides program delivery and provides data for evaluation purposes.
- **Evaluation**- is critical to best practice and an evaluation component determines program effectiveness.
- **Referral to mental health**- Additional assessment, treatment and support should be provided to at-risk juvenile firesetters and their families.

These are guidelines are not standards so are open to review, however they provide guidance in what what is effective for children and youth and what is recommended for best practice intervention with juvenile firesetters.

CHAPTER SIX: Evaluation of national programs against best practice guidelines

Criteria for best practice in Juvenile Firesetting Program

Criterion for a best practice guidelines have been developed in Chapter Five. These guidelines can be used to evaluate juvenile firesetting programs in Australia.

Chapters Three, Four and Five have identified that juvenile firesetters and their families need a more comprehensive intervention to address their needs. A best practice framework, based on a multidisciplinary/collaborative approach, that is informed by evidence can provide guidance to program developers on the most appropriate action and intervention to enable more efficient and effective service for juvenile firesetters, their families and the community.

6.1 Methodology

The best practice guidelines established in Chapter Five will be used to compare Australian intervention and treatment practices. The methodology has employed both a clarificative and proactive evaluation model (Owen, 2000). This evaluation aims to identify any discrepancies between current and best practice. Once these gaps have been identified the study provides recommendations on how to progress to meet towards meeting these guidelines.

6.1.1 Research questions

- What are current practices, intervention and treatment for juvenile firesetters and their families in Australia?
- How do Australian programs compare to the best practice guidelines?

- How can a more effective intervention be provided for juvenile firesetters and their families in Australia, and serve the community more effectively?

6.1.2 Aim

This section provides an insight into the Australian approaches to firesetting intervention. The aim is to compare and evaluate Australian programs against best practice guidelines established through a comprehensive study of international practice (Chapter Five).

6.1.3 Guiding the research process

Constructivism was adopted as the guiding epistemological paradigm for this part of the study because each participant has had a range of experiences, diverse backgrounds and perspectives. Constructivism accounts for multiple perspectives and the person's unique view on the problem of juvenile firesetting and FSE practices in Australia. The fundamental assumption underlying this part of the study was that experience and meaning is specific to a given context and the individual within that context. This assumption is consistent with the constructivist paradigm and is based on a belief that multiple realities are constructed through individual experiences (Patton, 2002).

6.1.4 Participants

Participants included program managers or coordinators from juvenile FSE programs, delivered by the fire service in each jurisdiction in Australia. Table 20 identifies them and the program they manage or coordinate.

Table 20: Participants and role of managers and coordinators from juvenile FSE intervention programs in Australia

State	Name of program	Who participated and their role	How they responded
Victoria	VIC JFAIP	2 x CFA Managers, 1 x CFA coordinator, 1 x MFB coordinator, 1 x program psychologist	Face to face interviews
Western Australia	WA JAFFA	Director of FESA community safety	Phone interview and site visit
Tasmania	TAS JFLIP	1 x manager of community safety and 1 x coordinator of the program	Phone interview
Northern Territory	NT JFAIP	Coordinator of the program	Phone interview
Australian Capital Territory (withdrawn)	ACT JFAIP	Coordinator of the program	Phone interview
South Australia	SA JFLIP	Coordinator of the program	Phone interview and email response
Queensland	QLD FFF	Coordinator of the program	Phone interview, email response and site visit
New South Wales	NSW IFAP	Coordinator of the program	Phone interview and email response

6.1.5 Research instruments and data sources

Research methods included the distribution of seven national questionnaires to each Australian state or territory-based secondary intervention programs that intervene with juveniles who have misused fire, with the exception of VIC JFAIP, which were face-to-face interviews. The questionnaires and interviews aimed to gather details of each jurisdiction's program characteristics, operations, implementation, processes, challenges, effectiveness, and alliances with stakeholders. Semi-structured interviews were employed to explore the research question, the design of which was drawn up in collaboration with the VIC JFAIP

managers. They were also based on past research that has investigated the characteristics of juvenile firesetting programs in the United States. Research conducted by Kolko (1988) explored 22 programs investigating services they delivered and his study provided some guidelines for the questions used in this thesis. The state-wide and VIC JFAIP program managers' questionnaires can be found at Appendix 17 and 18, respectively.

6.1.6 Other data sources

Other data sources included reviewing some manuals and documentation (i.e., provided by the states of Victoria, Queensland and Tasmania). Data was also collected from site visits to Queensland's FFF program and Western Australia's JAFFA program.

6.1.7 Procedure

The state-wide questionnaires were either answered via email response, telephone interview or both (see Table 19). For Victoria JFAIP, six participants were interviewed face-to-face. A site visit and discussion of best practices were undertaken with the steering committee of the FFF program in Queensland. Another site visit was made to WA JAFFA where I presented and participated in their annual practitioner conference. I also went on a site visit to the New Zealand NZ FAIP, but they were not included in the formal interviews. The ACT JFAIP withdrew from the research study but the remaining six states and one territory were included in the data analysis and results section.

The principles of data collection were adhered to and included informed consent (for VIC JFAIP, Appendix 19), VIC JFAIP invitation to participate (Appendix 20), member checking for national coordinators in all states (except VIC JFAIP, Appendix 21), confidentiality, and rapport. Confidentiality was maintained, and participants were aware that they would not be identified in the report unless their permission was given. In addition, the MFB and Victoria

University were offered as a point of contact should any distress occur throughout interview process.

After interviews were scheduled, each participant was emailed a letter of invitation to participate in the research. This invitation and any questions regarding the research were discussed initially with participants over email or telephone. The respondents were offered two options of how to respond to the questions: either through email or telephone interview. With permission from the participants, the interview were taped and later transcribed.

To determine trustworthiness and accuracy of interpretation, transcripts were sent out to most participants for verification to all states (exception VIC JFAIP). Quotes for use in the thesis were also sent out to gain permission for use. All respondents authorised their quotes, with the exception of one state in Australia.

6.1.8 Data analysis

The initial focus was to understand the individual cases before they were aggregated thematically. The data was analysed by reading the transcripts of each individual participant line-by-line in an attempt to capture initial overall themes and the essence of the respondent's experiences and perceptions of their program. Chunks of the text were coded by attaching descriptive codes to the right hand margin, which allowed for brainstorming potential themes. Respondents' answers were put into a data analysis table as a way to reduce the data. This table allowed for cross-case analysis where patterns and themes across cases were reviewed (A sample of the table found at Appendix 22). This table was referred to throughout all stages because it was in a visual presentation, which permitted a view of a full data set in the same location. This method is often used in an attempt to identify core consistencies and meanings (Miles & Huberman, 1994).

Analysis of all themes continued until full integration. This was carried out in a cyclical and iterative manner, whereby themes were checked against transcripts to ensure that they were grounded in the data (Coolican, 2006).

The process of “member-checking” was also undertaken with participants (with the exception of VIC JFAIP, because they signed an initial informed consent form – Appendix 21) who authorised use of their quotes and also verified that the essence of their experience had been captured and interpreted accurately.

6.2 Results and discussion

6.2.1 Intervention for juvenile firesetters in Australia

Reviews of the literature and analysis of exemplar models indicate that best practice for juvenile firesetting intervention is a multidisciplinary team approach that is practiced in some areas in the United States and Canada. No juvenile firesetting programs in Australia are based on a multidisciplinary or collaborative approach that includes a range of professions, with the exception of the “Juvenile Arson Offender Program” (JAOP) that was jointly developed and is run by the Queensland Fire Service (QFS) and Department of Communities. This is a smaller scale program that is discussed in section 6.2.4. The Australia FSE model delivered by the fire service remains the prevailing model of service in Australia. This is the predominant model, with the exception of WA JAFFA that employs a “consequences” approach.

Best practice endorses that the firesetting intervention is jointly delivered by firefighters and allied health professionals. In Australia, this approach is not widely practised and may be due to:

- a lack of knowledge and research within the mental health arena about juvenile firesetting
- no formalised agreements between fire services and mental health services
- a model that maintains that firesetting is the sole domain of the fire service only.

These may serve as barriers in the establishment of multidisciplinary/collaborative approaches in Australia.

6.2.2 Background and program characteristics of FSE models in Australia

This section discussed the establishment and implementation of FSE programs in Australia. It also discussed background and provides an overview of: clients, program staff, training, and intervention.

Program establishment and implementation

The Victorian JFAIP was the first program to be established in Australia to address the firesetting problem and provide intervention for youths who misuse fire. This program was established in 1986 in conjunction with the Royal Children's Hospital and was also evaluated through a randomised control trial at the time. Following this, other states also responded to the firesetting problem by establishing programs in their jurisdiction.

The national programs have many similarities and this may be attributed to most program participants stating that their program had been modelled on the Victorian JFAIP, with some variances due to local conditions in different states. The VIC JFAIP has been instrumental in sharing its model, resources and training with most other states. Some jurisdictions are more closely aligned to the VIC JFAIP than others, namely, South Australia, ACT and Northern Territory. WA JAFFA appeared to be the only state that indicated that they did not model off other programs in the eastern states, but had some similarities with them. The

states that modelled off the VIC JFAIP would frequently defer to this model when responding to the questionnaire. The comparative analysis was predominantly based on VIC JFAIP because most states in Australia use this model.

Programs were originally established with some mental health consultation and guidance, but collaborative teams have not evolved since the inception.

Clients

The participants were asked to describe the typical client of their programs. Most identified them as males (90%) between the ages of nine and 10 years who engage in inappropriate fire use. Other common profile characteristics included a large proportion of single parent families (single mothers), low socioeconomic status, children with poorer academic achievement and approximately 65% with smokers living in the household.

Typically, the clients of the program were between the ages of three and 18 years. Some participants stated their programs are delivered to people over 18 years if they had an intellectual disability.

The number of clients involved in the programs annually varied in each of the jurisdictions. For example, VIC JFAIP has averaged approximately 200 to 300 clients annually over the past few years. QLD FFF has averaged approximately 150 clients per year over the past five years. However, in contrast, jurisdictions such as South Australia, Tasmania, Western Australia and New South Wales have lower referral numbers of approximately 50 to 60 clients per year.

FSE in Australia is generally delivered to both the parent and the target child (mostly those in middle childhood). However, some jurisdictions have predominately adolescent clients (WA JAFFA), while some do not accept referrals for adolescents over the age of 14 (TAS JFLIP), but have a separate initiative (explained in section 6.2.4). VIC JFAIP does not intervene with children under five years old. Thus, there are no national standards on age of clients referred to FSE intervention in Australia.

Parental involvement

Parental involvement is crucial in firesetting intervention because they have more control over the environment than their children (section 5.6.4). Best practice in standardised FSE endorses parental education about the safe storage and access to ignition sources, and most Australian FSE programs do this.

Parental involvement was emphasised by most jurisdictions because it is hoped that these strategies will be maintained by parents after the conclusion of the intervention. Best practice recommends that simple, directive and practical strategies about home fire safety are most appropriately delivered by a firefighter practitioner. However, if the family or child is disturbed it is recommended that a trained allied health professional provides parenting and family support.

Preschool children

Preschoolers are the most vulnerable group for injury and death in fires. For younger children (under five years), the most appropriate intervention may be to target parental fire safety. Researchers have also endorsed intervention with preschoolers as an effective

preventative strategy and some primary prevention strategies could be targeted to the secondary level (section 5.2).

Victoria's JFAIP does not intervene with very young children due to evidence that it enhances their fascination and actual fire experimentation (Adler, 1993). Instead, they deliver a different program called "Early Fire Safe" for parents and carers of children from birth up to five-years-old. TAS JFLIP, in contrast, delivers their program to children under five years old, but did not have many children in that category.

Adolescent and complex cases

Adolescent firesetting is frequently associated with pathology or delinquency, because they often present with more complex issues, in addition to firesetting behaviour. Thus, intervention within a multidisciplinary team is recommended. In most jurisdictions of Australia, a juvenile over the age of 14 can be charged and therefore may be an involuntary participant and required to do the program as an alternative to juvenile detention or conviction.

Most participants stated that they had high- and low-risk clients participating in their FSE programs. For example, numerous participants acknowledged the relationship between "client age" and "client risk", with older clients presenting as more risky. For example, some stated that there were certain conditions that were required for the program to work. Other participants referred to "complex cases" and questioned whether their program was appropriate with high-risk cases. This is more fully explained in section 6.2.5.

Two jurisdictions in Australia, TAS JFLIP and QLD FFF, do not provide FSE to higher risk and/or involuntary clients, and instead offer alternatives (discussed in section 6.2.4). WA JAFFA, on the other hand, mainly intervenes with juvenile justice (35%) or older adolescent firesetters. In the QLD FFF program, approximately 200 cases are referred annually and 15% of these are referred from juvenile justice. VIC JFAIP provides minimal intervention (3%) to juvenile justice clients, yet has a high percentage of children and juveniles who have experienced counselling (44%), known as a “red-flag” of potential pathological firesetting (C. B., personal communication, 11 June 2007).

Program staff

Many of the programs have steering committees that guide their program policies, while the program coordinator generally manages the daily operation of the program. The number of practitioners who are employed on the program varied from 11 in the NT program to 68 practitioners employed by the Victorian JFAIP. Some programs are in the early stage of development (i.e., three years), while other are more established (VIC JFAIP, 22 years).

Many of the program managers and coordinators are also firefighters and practitioners that both manage/coordinate the FSE program and deliver interventions to clients. The exceptions are WA JAFFA, TAS JFLIP and Queensland’s FFF program. In NSW IFAP, the program coordinator is the sole practitioner in the state of NSW who delivers interventions. In VIC JFAIP, the state MFB coordinator also delivers the intervention; however, the CFA coordinator does not deliver the intervention.

Training

Firefighter practitioners in Australian FSE undergo a fairly rigorous selection process.

Eligibility includes:

- being an operational firefighter
- successful Police and Working with Children check
- successful participation in outside activities involving children (i.e., scout leader)
- good communication and interpersonal skills
- an ability to relate to children
- a genuine interest in the program.

Some programs such as QLD FFF require a practitioner to have a sponsor who acts as both a referee and a mentor.

Once through the selection process, all jurisdictions offer some form of training. The duration, content and intensity of the training will vary from state to state. Three of the states are trained using the Victorian JFAIP model (i.e., NT JFAIP, ACT JFAIP and SA JFLIP). VIC JFAIP training has been described in section 2.1.4.

Queensland FFF has a five-and-a-half day training course. Tasmanian practitioners do not participate in formal training, but attend an annual conference and receive ongoing peer mentoring. This is because they place more emphasises on peer mentoring and on-the-job training.

Ongoing training is also undertaken in most states. This can include peer mentoring, case discussions, reviews and regular meetings.

Home-based intervention

Most interventions are conducted in the home, with the exception of the South Australian program that made a corporate decision that this was too risky. A home visit often gives the practitioner insight into the safety in the home and how the family functions. In the home environment, the practitioner may be able to observe family interactions but will lose an element of “control” by not undertaking the intervention in an “official” location (section 5.3.5).

Most coordinators and managers recognised the value of conducting the intervention within the family home. The main benefits of a home-based intervention included the opportunity to do a home fire safety risk assessment and to then put these strategies in place immediately. The home safety audit can include investigating the fire risk hazards within the home identified as:

- no smoke alarms (or non-working alarms)
- matches or lighter availability
- storage of flammables
- exits within the home
- use of deadlocks
- number of people living in the home
- general housekeeping.

It is also thought that delivering the intervention in the home aids the development of rapport between the young person and the practitioner because it is conducted in a familiar environment. In the home environment, relevant strategies can be put in place that are more relevant to the child or adolescent, as described by one participant:

The practitioner will do a walk-through audit in the home and this can include a home fire escape plan, a discussion about smoking in the home, the setting up of strategies for securing matches and lighters and positive rewards for the child if they bring in matches ... Another part of the strategy is getting parents on board, setting up reward mechanisms, involving the child, encouraging the child and parent to take responsibility for fire safety ... they try to make the home situation as safe as possible through education.

Another benefit cited of a home visit includes gaining an insight into the family dynamics, which may give clues as to whether a referral may be necessary, as reported by one participant: “While they are there as well they give them advice and then if needed, if the warning bells go off, that mum’s not coping, she’s got five kids it’s a bit out of control, then they’ll make the linkages back to us to the appropriate program.”

While home visits from the firefighter have been endorsed as an effective strategy, they can also encourage the practitioner to work outside of their domain (giving advice and making assessments on the family and child functioning) and could also be perceived by the juvenile firesetter as attention for setting a fire and thus reinforcing that negative behaviour.

Program dosage

Best practice programs need to have adequate dosage so that the behavioural change occurs and can be sustained over time. Most jurisdictions deliver between two and three interventions; however, this will vary depending on the case. For instance, “Yeah, if this is a four year old who has just shown an interest in matches or mum’s caught him with the cigarette lighter, then there will generally be one visit. But if the kid’s set fire to the park and done \$20,000 damage then it will be two sessions.” (Quote from a FSE manager.)

In my view a child who has set fire to a park and has caused \$20,000 in damages is likely to have serious mental health issues, may be pathologically driven to light fires, and is a risk

both to himself and the wider community. I therefore conclude that it is unlikely that behaviour change will occur by providing one extra intervention.

Kolko (1996; 2001a) and Kolko et al. (2006) argued that two to three interventions (four to five hours) may not be enough to sustain behavioural change. In these studies, Kolko and others examined the differences between FHV and FSE interventions and found that the FHV (a two session visit) that provided a safety workbook and some basic fire safety education was less effective than the FSE (roughly four or five visits). Optimal dosage has not been evaluated in this thesis; however, juvenile FSE programs in Australia have lower dosage than are considered adequate and effective for FSE intervention by Kolko and other researchers. Although FSE programs in Australia are skill-based, including behaviour training and basic behaviour modification strategies as recommended by Kolko, their dosage is similar to the FHV, which Kolko considered inadequate.

Conclusion

Australian FSE programs are generally modelled on the VIC JFAIP and have similar features, with some variations from state to state. In the following sections, Australian practices are clarified and assessed against guidelines established in Chapter Five.

6.2.3 Program theory and supportive infrastructure

Program theory drives intervention and a poor articulation of theory can result in confusion, lack of direction and program drift. Program theory helps clarify how a program works. Best practice suggests that juvenile firesetting programs should have an evidence-based program theory and a supportive infrastructure (5.6.1).

Supportive underlying infrastructure

In the review of models and interventions in the United States and Canada two programs that in my view exemplify multidisciplinary best practice (TAPP-C and Oregon JFIN) have a highly supportive infrastructure. They either collaborate with partners who jointly fund and commit resources to the program (TAPP-C) or have an organised and state-wide infrastructure that provides support to the juvenile firesetting intervention network (Oregon JFIN). This infrastructure has been organised at the policy level to ensure that juvenile firesetters and their families receive a coordinated treatment response or a “Continuum of Care” (Oregon JFIN).

The question of ownership of the firesetting problem has been posed in the literature and in practice. In Australia, firesetting intervention has been the sole domain of the fire service, as one participant described:

The fire service model as I see it now, that the program is owned, directed and delivered by the fire service out to the community. And it's the community, being independent families and organisations, who refer people. But it's very much the fire service at the centre and the referral groups are off to the side, who support, but it all revolves around the fire service.

The Western Australia's JAFFA program is attempting to move away from the fire service as the sole central group by increasing other agency alliances and support. They are starting to form stronger alliances with such agencies as the juvenile justice team and positive parenting team so that WA JAFFA program operates more as an adjunct service dealing with the firesetting problem only and not case managing or being responsible for the case. NSW IFAP also endorses more involvement from other supportive agencies.

Resources and funding by fire services provided to most Australian juvenile FSE programs was generally described by the participants as inadequate. The cost in running the program

varies in the differing jurisdictions, with some providing more funding than others.

However, those states that do provide more funding are generally paying overtime wages to firefighter practitioners to deliver the program if it cannot be delivered “on-shift”, which is frequently the case. In some states, this overtime rate wage expenditure concerned some participants because it is the most costly budgetary item. For instance, the CFA managers stated that their contribution to the VIC JFAIP was costly in terms of firefighter practitioner overtime rates (i.e., approximately \$40,000), as compared with other expenses: travel costs \$10,000, training \$10,000 and resources such as stationary and printing \$20,000. In WA JAFFA the practitioners voluntarily deliver the program.

However, some managers have now questioned the costs of running the program and overtime costs incurred. Firefighter practitioners also find it difficult to juggle the responsibilities of their “on-shift” duties with trying to deliver a JFAIP intervention at the same time. Contemporary research not only endorses multidisciplinary approaches as a better service to clients, but also as a cost saver for programs. This is because resources are shared, funding can be jointly provided or existing resources are utilised (Bumpass et al., 1985; Franklin et al., 2002; Slavkin & Fineman, 2000).

Many of the programs stated that they were under-resourced in terms of staff. Often programs do not have full-time staff members working solely on the program and do not have enough practitioners to service their jurisdiction. For instance, in VIC JFAIP the state coordinator will work on the program approximately 80% of this time. The WA JAFFA program stated that one of the challenges was:

Sustainability of the program, its very labour intensive, you know the coordinator would spend 70% of her day working on JAFFA and she also has other jobs that she has and fills within the directorate, so not having a dedicated resource from an

agency point of view is a limitation. We just layer and layer and layer and they want want but you can only do what you can. So it's just an adjunct for us.

Some of the jurisdictions also noted that the program was under-valued by the fire service and there was very little committed to the program compared with other priorities such as operational firefighter activities. One participant commented that the value of the program needed "to be communicated from the top down ... [To endorse] that we are committed to the program". Other programs such as VIC JFAIP stated that the program was not recognised and valued overall by the fire service, and only really valued by "those involved in the program". This lack of commitment and under-valuing from the "top" suggests that other priorities are more pressing for both funding and resources. In a hierarchical power structure it is well accepted that decisions are made and actions are executed from top levels and without their support, funding and resources to provide this necessary infrastructure may not be possible.

Promoting and raising awareness of the program

Some participants indicated that they wanted to promote and raise awareness of their program more but their limited resources restricted them. This was explained by the WA JAFFA director:

I think we tend not to promote the program because we don't have enough JAFFA support officers so it's a double-edged sword. So I think if we work on recruitment and on promotion at the same time. It's just advertised informally, we don't go out of our way to promote it purely because we don't have the capacity.

Program theory: Australian FSE programs

The VIC JFAIP program theory has been adopted by the majority of Australian juvenile FSE intervention programs with the exception of Western Australia's JAFFA program that is predominantly based on the "consequences" of misusing fire and the JAOP that is a

collaborative approach. The components of the JFAIP program theory that were outlined in Chapter Two are clarified in this section.

Clarifying program theory

Several of the managers of the VIC JFAIP answered the program theory question by stating that the program was based on the deliverer of the message (the career firefighter), fire safety education and some components of behavioural modification theories, frequently described as a “strengths-based approach”. Other states did not explicitly describe their program theory, but stated that their program was based on the Victoria JFAIP model and that they had the same theory as them. The states of the Northern Territory, South Australia and Australian Capital Territory are aligned more closely with VIC JFAIP and most of these participants referred back to the Victorian model to provide their answers to questions.

While conducting interviews with program managers it was notable that many participants found it difficult to articulate a response to the question, “What is the program theory of your FSE intervention?” This observation was also confirmed by research undertaken on Australian FSE intervention programs by Muller and Stebbins (2007), who also found that managers were unable to explain their program’s theory.

In this study, some participants answered the program theory question by explaining what their program activities were or key components of their program. Others were vague and stated that their program was based on “major valid theories”, without stating the theory they were referring to. Two of the participants, who were both psychologists, suggested that the program theory was based on FSE and cognitive behavioural or social learning models. The confusion around the question of program theory may be due to a general lack of

understanding of research terms, such as program theory and mechanisms of change, within the fire services.

Although most participants failed to succinctly articulate their program theories many described some key salient features of their programs. For instance, all of the programs endorsed the use of career firefighters and most provided fire safety educational intervention that employed some behavioural modification strategies with an option to refer to other agencies.

From the interviews undertaken with participants and additional data gathered (observations, general discussions, meetings and site visits), this study provides clarification on program theory that most Australian FSE use to guide their programs.

6.2.4 Evaluation of the components of the program theory

Program theory for the majority of FSE programs in Australia includes: FSE, use of career firefighters and is a skill-based program. These components are evaluated in this section. There are two alternative approaches/programs in Australia (WA JAFFA program theory and JAOP) that will also be evaluated.

FSE

FSE generally operates under the assumption that fire safety education, knowledge and awareness leads to behaviour change (no firesetting). However, the findings in Chapter Four and previous research (Kolko et al., 1991; Kolko et al., 2006; Kafry, 1980 and Grolnick et al., 1990) have indicated that behaviour change may only occur with certain (low-risk) children. FSE and fire safety knowledge may not change behaviour or satiate an “atypical” curiosity about fire, particularly for high-risk firesetters.

Some of the program managers indicated that their FSE program had been designed for “normal kids” and expressed concern that they were receiving more complex case referrals and that their program was not suitable for them. These concerns are quite valid and appear to be consistent with the findings of Chapter Four and other research, which tells us that FSE on its own is not enough for pathological firesetters (Kolko & Kazdin, 1986, 1994; Kolko et al., 2006; Mackay et al., 2006; Nishi-Strattner, 2005; Root et al., 2008).

The TAS JFLIP has a program policy not to intervene with juveniles over the age of 14 years because the original design of the program “does not meet the needs of older juveniles involved in more serious cases of firesetting”. The management of the program also maintains that other agencies may be in a better position to offer the youth guidance, counselling and support to modify their behaviour. The manager stated that as: “We don’t see children over 14. This is where community conferencing kicks in because that is the age where they generally stop engaging with fire out of curiosity or boredom and are into a range of criminal behaviours which is beyond the scope of the program and not within the experience of the firefighter practitioner.”

NSW IFAP stated that as a result of a recent evaluation, the program has recognised the limitation of the firefighter dealing with complex cases. This participant stated that “the program had been designed for normal kids ... and they were [now] running into kids with severe psychological difficulties and the fireys weren’t in a position to assist these kids”. Some managers of the VIC JFAIP agreed with the NSW IFAP Program Coordinator’s comments. One program manager of VIC JFAIP expressed concern that there were “a lot of cases that we shouldn’t do and, you know, I think the theory of the program was originally designed to deal with the fire safety aspect of the firelighting behaviour”. This participant

also suggested that some firefighter practitioners liked to work with children with disabilities and she thought that it was “beyond the parameters of the program”. Another VIC JFAIP program manager also acknowledged that the program may be inappropriate for some clients:

I think in many cases we are targeting kids who the model wouldn't work for anyway. So if you've got kids with behavioural problems stemming from major disturbances then I doubt that this type of educational model would work.

This participant did suggest that the program may be appropriate for some clients under certain conditions:

I think it would work for some kids. I could imagine kids who are involved in firefighting and having a firefighter turn up and getting a bit of a shock when mum and dad are focused on it and they are all upset and the external person comes in and there are talks. I can imagine that having an effect on some kids to stop the behaviour and I think the uniform and the firefighter experience does give the credibility but I am not sure that it is an issue of credibility in the first place.

Another respondent also supported this idea:

Well obviously if it's the “right family”. I think to be positive the benefits are they might learn, some more appropriate behaviours. The child might actually learn or become familiar with some of the consequences of his fireplay so, perhaps, might modify his behaviour.

Another participant suggested that the best conditions are set up when the family is self-referred to the program, for instance: “I'd say that when a family has initiated the contact the chance of a positive outcome are probably better than when it has been mandated – going to the other end of the extreme.”

The question of “What is the right family and conditions?” was answered in Chapter Four. It was concluded that an FSE program may work better as the sole intervention in some circumstances where the child has:

- lower curiosity about fire

- a later onset of fire interest
- less firesetting history and less involvement in firesetting acts
- no reported clinical or behavioural disturbances
- parents who effectively discipline and supervise them.

The NSW IFAP coordinator indicated that a recent evaluation of their program recommended that a new approach (i.e., a multidisciplinary approach) was required. The participant described this as “a new approach [that] recognises that in many cases the education-based program isn’t sufficient and that it is more important to develop relationships”.

Many states were starting to question their program’s theory, aims, clients and objectives.

They were concerned about:

- the design of their programs
- whether they were accepting too complex case referrals
- whether they were targeting the right intervention to the right client
- whether the educational-based program was sufficient
- whether they were working beyond the scope of the program
- whether a different model that focused on building relationships with other agencies was more appropriate.

These questions are quite valid because the evidence has suggested that FSE alone is inappropriate for certain high-risk clients. However, there were also many respondents who did not raise such questions and nor did they question the current model.

Use of career firefighter to deliver the program

Firefighters deliver the intervention in all programs Australia-wide because they are perceived as the most qualified to deliver fire safety and education due to their credibility and standing in the community. They are predominately career firefighters (current or retired), with the exception of Victoria JFAIP who employ two volunteers and WA who employ 17 volunteer firefighters.

When asking the VIC JFAIP the question about program theory, four participants commented that the use of career firefighters was part of the program theory. The MFB program managers frequently linked the image of the career firefighter to the success of the VIC JFAIP. A few of the managers assumed that the firefighter had a greater opportunity to change the child's behaviour than other practitioners because they had "power and impact", "that people have a lot of respect for firefighters- in a way they won't for other adults", "they are seen as the good guys, you know, the people who save lives" and that firefighters were "the number two favourite profession in Victoria so people do look up to us (firefighters). And I think kids don't listen to what mum and dad are saying but we've got the knowledge, we've got the skills, we've seen it,... so we've got some credibility in what we say and do."

In VIC JFAIP there were divided opinions regarding how effective the current program model is and whether the career firefighter was part of the mechanism of behavioural change (no firesetting) for the client. One manager stated that the use of career firefighters was a key component in the VIC JFAIP program theory because they were the most appropriate person to deliver the intervention. He suggested that there were three essential "ingredients" to the intervention, including (1) the credibility of the career firefighter, (2) employing the

right firefighter, and (3) that the firefighter has the awareness and insight to know if the intervention is working or not.

Another respondent from the VIC JFAIP was asked whether the career firefighter was part of the program theory and she stated that “I wouldn’t put that down as the theory, I don’t know if there is any theory to support that so I wouldn’t be able to say that there is a theoretical basis for that.” However, they stated that the use of career firefighters was based on common sense and because they are respected in the community:

It is just common sense that a child will listen to what a firefighter has to say, especially when the firefighter can call upon real life examples there, rather than a counsellor who doesn’t have that firefighting experience. So they’re an expert in fire behaviour, you know what fire can do, and how it behaves, how quickly it can get out of control and that is important in getting messages across to kids. ‘Cos often kids are so used to being told all sorts of things by adults and they get to a point where they just don’t take everything on board.

She also stated that:

the fact that firefighters have a lot of respect in the community [means] they are seen as the good guys, you know, the people who save lives. They are not seen as punitive like the police, they are not seen as a sanctioning body. They are seen as people who come and save lives. That’s another powerful impact ... They would be seen as more like ambulance officers and doctors. A firefighter can’t say, “I’m going to arrest you if you play with fire” but can explain in a very clear way from life experience why it is dangerous to play with fire. They [the children] are rebellious anyway; if they don’t listen to authority they don’t listen to adults but they are more likely to listen to a firefighter talk about the dangers of fire and they tend to have respect for the firefighters in the way they won’t for other adults.

The South Australian Coordinator had a similar view, and described the firefighter practitioner as having a more positive impact with children and families than other practitioners:

We can get rapport with the kids where other agencies can’t (other agencies have failed). Kids seem to respond to the firefighter far better than other agencies. They [parents] say he goes to his psychologist and he won’t talk, the police come over and he didn’t want to talk to them.

In this case the firefighter may be perceived as less threatening than the police and may be viewed as less stigmatising than talking with a mental health worker. However, this anecdotal evidence is not driven by theoretical approaches or evidence-based practice.

A former manager of the VIC JFAIP was critical of the career firefighter program model and argued that it was flawed because there is no current evidence that their credibility is the factor that creates behavioural change in firesetting behaviours. He suggested that:

I am not sure that credibility is the critical factor to trigger the change. Maybe it is but I haven't seen anything other than the initial research which was with the lower level curiosity with young children and that is probably where you can imagine the firefighter working best or having the most impact in terms of presence and uniform for young kids.

This participant questioned the validity of the model because it is just implied or assumed to work, and not questioned:

As I see it, you have "a problem behaviour", and that can be changed through fire safety education. And that FSE is instrumental about bringing about that change because of the role of the firefighter with the "X factor" who makes that information and the experience so significant that it leaves the child modifying their behaviour.

He described the mechanism of change:

The presumed explanation is that change is caused by a couple of possibilities. One is the authority and expertise of the firefighter being influential and the other one is that somehow that brings about a greater level of responsibility by the child, they see the error of their ways, understands the consequences. So there are a couple of implied psychological processes but I don't think they are spelt out anywhere. And think there is another version that says that it is the influence of the education on getting the kid to see the consequences and then getting them to change their behaviour.

Furthermore, he suggested that certain stakeholders of the JFAIP "have too much commitment to it [the use of career firefighters], they don't question it ... and have too much invested". This comment appears to resonate with A.C. (page 238) who believed that when

the firesetting problem is treated solely within the domain of the fire service then they can “become part of the barrier to the solution because they don’t want to give it up”.

The program psychologist attempted to explain the differing philosophy of VIC JFAIP managers regarding the use of career firefighters in the program:

Their argument [the CFA], is well, they’re [firefighters] trained to provide education, this is an educational program. But my position, and the MFB’s position, is that it’s more than just education, it is an intervention. And part of the intervention is having the messages come from someone who’s fought fires and can talk about real life experiences, which has more of an impact. It’s kind of blurred because education is an intervention as well, when you think about it.

She suggested that it was important that the program had uniformed career firefighters because:

Practitioners don’t just provide the information, they have to convince the child and the parent about why their messages are real, true, have authority and why they have to change their behaviour. ’Cos otherwise they could just be handing out books on the dangers of fires and why they should stop. It wouldn’t be as effective.

This position suggests that the program, using career firefighter, is an intervention and that without this essential component it is just an education program without as much impact.

The view of the MFB appears to be that the career firefighter is a credible authority on fire and can be trained to deal with the areas out of their domain. In contrast, the CFA considers that it is more important for the deliverer of the program to have existing skills with families and children (i.e., counsellor, psychologist or similar professional) and to then be trained or skilled-up in fire safety education and fire. The CFA view may be more aligned to best practice programs, such as Oregon JFIN, who do employ other practitioners if required to do screenings and also deliver FSE to children and families.

Despite some of the conflict of VIC JFAIP managers regarding who delivers the program and what is an effective intervention, all states endorsed the use of career firefighters as

facilitators of the intervention due to their credibility. For instance, the TAS JFLIP manager stated that:

Using the firefighter as practitioner, as the deliverers of the program works well in terms of the credibility of the message that they can deliver- given that we are using an educational behavioural kind of model. The credibility of the source is very important.

Most program participants unequivocally confirmed that the use the respected firefighter practitioner in uniform was crucial to their programs' success. The reasons for this included knowledge, credibility, commitment, passion, and the firefighter's ability to engage the client. Furthermore, some stated that anecdotal feedback from parents indicated that children were responding more positively to the firefighter than other professionals (such as police or mental health practitioners).

There is no published empirical data that supports the claim that a firefighter in uniform has a greater impact on the child firesetter and their family than an ordinary non-firefighter person. Anecdotally, the firefighter appears to have more of an impact than other practitioners, but this is difficult to verify due to a lack of research and evidence (particularly in measuring the alliance between practitioner and child) and the current low dosage of FSE. More likely, there are combinations of factors that lead to behaviour change and not one sole factor, particularly in complex or high-risk cases. Best practice endorses that firefighters still have an important role in delivering a standardised FSE component, but theirs is no longer the sole intervention effort.

The practicalities of a career firefighter-delivered program

Australia is a large country geographically and this poses difficulties in reaching clients that need assistance in remote areas. This has been a long-standing problem for many agencies

in remote locations. Sometimes it is not practical to have a career firefighter deliver the program because they generally live and work in metropolitan areas and interventions are often required in remote areas. The stipulation that the deliverer of the intervention must be a career firefighter is very limited if they cannot service clients who are in need in regional and rural areas. Intervention for juvenile firesetters is known to successfully reduce recidivism rates, and without intervention repeat firesetting can be approximately 80% (Massachusetts State Police – P. Z., personal communication, 30 May 2007).

Western Australia is particularly challenged geographically because it is the largest state in Australia. It is divided into six regions, and four of these regions are covered by the WA JAFFA program. The two areas not covered by the program are the Great Southern and Kimberly region. The JAFFA program has difficulty in reaching clients who are geographically remote and therefore the program “not only works one-on-one with people but does targeted interventions in hot spots”. The director of the program explained a recent problem and their response to a spate of indiscriminate firesetting in the remote Kimberly region of Western Australia:

Well, I'm in the Kimberly now to do some recruitment because they have had 40 fires in the last 20 days that have been litten by kids. It's dry season, so it is like wildfire season up here ... So what we've done is come up and run a fire prevention dry season program with all the schools and I think we would have covered 1,000 kids in the last three days- talking about fire prevention. So we have done elements of the JAFFA program with the school but also dry season prevention around the impact on the environment and the land ... if we see a trend in indiscriminant firelighting we will go out to the schools within those localities and deliver it more broadly to the kids and do fire prevention.

In addition to this, the WA JAFFA employed allied health professionals (Helping Young People Engage, HYPE) to deliver a modified version of their JAFFA program due to lack of practitioners in the Kimberly region:

We are going to work with a program called HYPE. It's a funded program with the Attorney General's Department. We are going to run some training with them around JAFFA so when they are mentoring the Aboriginal kids they can, apply some of the stuff we have taught them around fire prevention. But they won't be JAFFA support officers, and then we will work with the volunteers in the bush fire brigade around any of those people becoming interested in becoming JAFFA support officers and train them ... because it is a local issue, local solution and if you look at sustainability I think it's the better way to go in such a remote location ... it's about using the existing resources.

This is an example of a program that has demonstrated flexibility by adapting and responding to meet the needs of the local community. Program theory could incorporate this type of flexibility to effectively serve the needs of their clients and the community.

The director of WA JAFFA also explained that she would have preferred to employ career firefighters to deliver the program because she believed they were more effective and had a more positive impact than the ordinary non-firefighter person. However, this is not possible, as described below:

I think if I had to choose I would have career firefighter delivering it, but we don't have them in regional areas, we have to deliver it the best way we can. Before they tried FESA staff delivering it – I don't think that works. I don't think you have any credibility with the child or the family. I mean who am I – I don't fight fires, I haven't experienced it, so yeah they did try that but that fell by the wayside. I think it was the same with the psychs delivering it. What do psychs know about fighting a fire?

Programs that believe that the “career firefighter” in uniform is responsible for behavioural change in the client may be less flexible in the use of other practitioners or volunteers to deliver the program. The CFA argued that the VIC JFAIP model in its current form (predominately using career firefighters as deliverers of the program) may work well for the MFB in metropolitan and urban areas, but it was impractical for them because the CFA covers greater distances in regional and rural areas throughout the state of Victoria (see map, Appendix 1). Both fire services run very differently, and one of the main differences is that

the CFA is predominately an organisation of volunteers. The CFA's key concern was that volunteer firefighters should be able to also deliver the program, especially in remote locations, because it would be more efficient in terms of time and costs. The CFA argued that they needed to use volunteer firefighters to meet the needs of both the organisation and clients in these locations because:

We have kids who light fires often 100–200 kms from where a career firefighter works ... so if we could build up a pool of volunteer firefighters around the state to deal with the kids that do live in the middle of nowhere ... that would be really good.

In 2006, the MFB stated that they had yielded on the strict use of career firefighters to accommodate the needs of the CFA. There are currently two volunteers out of 68 firefighter practitioners delivering the VIC JFAIP intervention.

Other states such as South Australia also confirmed that it was challenging reaching children and families in regional and remote places and that “the SA Country Fire Service being a volunteer-based organisation are unable to provide suitably qualified practitioners in a timely manner to address unsafe firelighting behaviour”.

Career firefighters are the traditional deliverer of FSE programs in Australia, and anecdotally are important to the success of these programs. If jurisdictions are not flexible on the use of practitioners or only provide limited practitioners in remote areas then some families will not receive the intervention they require. However, some jurisdictions have recognised the restriction of employing only “career firefighters” because the needs of the clients and community come first.

Skill-based programs

In Australia, current FSE programs delivered by the fire service have been designed to incorporate a skill-based approach that includes both behavioural training and some basic behavioural modification strategies.

Behavioural training and experiential activities

FSE programs in Australia use a variety of strategies and interactive approaches to deliver the fire-safe message, such as active discussions, demonstration of skill and role plays (such as crawling low under the smoke). These practices, as outlined in section 5.3.5, are endorsed in a standardised FSE component because children learn best and retain information more if they actively rehearse skills.

Many practitioners also employ activities such as a “treasure hunt game” involving looking through the house and gathering as many matches and lighters as possible. Other programs such as the QLD FFF describe different strategies. One is to ask the child to gather as many household items as they can, such as hammers, wrenches, bikes, dolls, lighters and matches. The practitioner then asks the children to put the items into either the “toy” or “tool” pile. The QLD FFF coordinator of the program noted that this strategy was effective for younger kids because it is an age-appropriate concrete task that gives the practitioner the opportunity to see what the child knows (i.e., does the child put the lighter on the toy pile?) and allows for immediate correction if a mistake is made.

Behavioural modification strategies

Some respondents described their FSE program as based on both FSE and cognitive behavioural or social learning models because the practitioner provided modelling to the family in the intervention (i.e., modelling safe-fire behaviours in the home). These programs

believed that by employing these approaches they were addressing the firesetter's behavioural or family problems. One participant from the VIC JFAIP described the FSE skill-based approach as a "strengths-based" approach that incorporates basic behavioural modification strategies:

It is based on education and behaviour change and behaviour modification strategies. So it's about increasing the use of positive reinforcement for fire safe or fire responsible behaviour in a population with kids who don't receive a lot of positive reinforcement. They are only used to getting told off or getting into trouble most of the time. The use of positive reinforcement and building up their self-esteem can be very powerful- so it's not just education unlike what some people think which can be delivered by anybody it is an intervention as well.

Most participants stated that a "strengths-based" or positive reinforcement approach (i.e., praising the child if they told an adult when they found matches) worked because this is more effective than punishment, helped the firefighter build rapport and also led to behaviour change (fire safety) in the child. In all jurisdictions the common practice was a non-threatening, non-authoritarian, friendly and mentoring style of delivery. Many participants emphasised the relationship of trust built between the child and practitioner. Some noted that less emphasis was placed on the fire incident in the initial session of the intervention, and was instead focused on the child, their interests and developing rapport with that child.

Most programs also use rewards as a part of the positive reinforcement strategy. This reward is frequently negotiated with the juvenile and family because they actively participated in the program, and have demonstrated fire responsible behaviours by remaining fire-safe at the conclusion of the "fire-safe period" (usually three months for younger children and six months for older). Many programs who model from the VIC JFAIP will use contracts and star-charts (described in section 2.3.1).

Some of the jurisdictions discussed the use of different rewards and reward systems. In South Australia, rewards are given to the child after a two-week period and not 12 weeks (as employed by VIC JFAIP) because “if it’s too long they (the child) will lose focus and forget about it”. Some FSE programs such as WA JAFFA do not give a reward on the basis that token rewards can reinforce negative behaviours and they maintain that a “consequences” approach is more appropriate (discussed below). The Queensland FFF program stated that “tangible gifts are not generally well regarded in the program as rewards. In the past this was the case; however, now the focus is the time spent with the child. Promotional items (e.g., torch or home fire safety officer badge) are tools that are linked to a particular fire safety strategy [and] are given instead”. This approach is more consistent with best practice that maintains that if rewards are given, they need to be “purposeful” versus a “toy” or a “treat” and that the juvenile work towards gaining the reward. Furthermore, providing rewards to a child or juvenile for misusing fire can potentially reinforce negative behaviour.

Contemporary evidence endorses that a positive reinforcement approach works, but there are limits to this approach and evidence both in research and from experts in this field indicate that a lower dosage FSE intervention that incorporates a low level skill-based approach is not sufficient for firesetters who are more pathological or for adolescent firesetters (as outlined in section 5.3.3). This is not to say that the basic approach does not work under certain conditions, as the findings from Chapter Four have demonstrated. However, the majority of juvenile firesetters have greater needs and require a more intensive intervention and due to this there has been some revision in models and what works for juvenile firesetters.

WA JAFFA consequences approach

A FSE skill-based approach is used within most jurisdictions, with the exception of the JAFFA program in Western Australia which does not include FSE, but a “consequences” approach. The JAFFA program makes use of burns images and pressure suits so that the child understands the impact of their actions on others. The director of the JAFFA program briefly described their approach as:

So we put them into pressurised bandages that you have to wear if you do get burnt. So they get to experience the level of discomfort that they would have to go through. That’s when we work around pressure suits and talk about consequences. We put the pressure suits on them and they are quite uncomfortable and we ask them how would you feel wearing this for the next three years of your life, it’s a bit of a reality check. A lot of people are not into the shock tactics in other jurisdictions, but I don’t think it’s shock tactic, I think it’s reality. If you’re burnt, that’s what you are going to be wearing. They just look like a girdle and they are really tight, and they can go over the whole body or just the portion that was burnt.

The follow-up [second session] then starts to talk about the consequences:

So they will be shown the DVD, they take them through the series of photos that are quite graphic, some of them consist of burnout bushland, burnout cars, burnout houses. But then it will go into the burns, so there is a picture of a boy who is eight, and there is one shot of him where he is beautiful – he is gorgeous and then there is a picture of him in his pressure suits, basically his face is non-existent, it has healed but they can see the impact. Then we show them different types of burns, what a burn looks like – you know, what a surface burn looks like. They work with the pressure suits and then they generally leave them with brochures and fact sheets.

WA JAFFA mostly provides intervention to adolescent juvenile justice clients and it must be noted that an approach that “only” includes consequences has not been validated as an effective juvenile firesetting intervention. The approach may be more effective within the context of a comprehensive intervention that has both a standardised FSE component and a targeted fire-specific intervention delivered by both firefighters and allied health professionals. However, just reiterating consequences and putting children into pressure suits, to perhaps build empathy for the victim, is not directly targeting both the fire-specific

and general psychological problems associated with juvenile firesetting of a more pathological nature.

In addition, this program does not deliver FSE. Best practice recommends that a standardised FSE component is delivered by firefighters because firesetting is often a learned behaviour and by only addressing consequences it does not treat the client and family holistically.

Successful interventions in best practice that target this client group include consequences (i.e., legal, financial and personal) within the framework of a broader juvenile firesetting intervention. One example of an exemplar program that intervenes with this population is the Oregon JFIN SAFETY program that addresses such aspects as thinking errors associated with fire (i.e., denial or blame); problems with peers (i.e., making better choices); antisocial behaviour; problem solving; management of emotional states (i.e., anger, boredom) and impulses; media influence; and parental/and or family problems.

The SAFETY program also delivers evidence-based structured lessons to address consequences, and build empathy, accountability and personal responsibility. The program has an objective to build empathy with the adolescent client by engaging them in activities that help them identify with the victim of their firesetting behaviour (i.e., writing restitution statements and essays). Consequences are addressed in a broader context (i.e., legal, financial, personal) than the WA JAFFA program. In addition to this, parents are provided with brochures regarding the legal consequences of their child's firesetting behaviour. The WA JAFFA program, although a step in the right direction, is not comprehensive enough when it only targets the personal consequences. This may even be considered a

scare tactic because wearing suits are uncomfortable and the images they view may be disturbing to them. By only addressing consequences in this way, competencies and new skills are not built and may not be the right intervention to achieve behavioural change. Evidence-based programs, such as the Oregon SAFETY or TAPP-C programs, that are designed for the adolescent group are more likely to address the client's needs in a more comprehensive way. A program that is evidence-based, includes FSE and targets the firesetting behaviour (fire-specific) with CBT skills-building strategies (e.g., enhancement of pro-social skills and elimination of antisocial behaviours) is more likely to reach the intended target clients with the appropriate intervention.

JAOP collaborative approach

The JAOP is a collaborative approach jointly run by the Queensland Fire Service (QFS) and the Department of Communities. The three-day adventure-based learning program is provided to 13–17 year-olds as an alternative to further adjudication or conviction of arson. There are approximately 8–10 clients who participate in the program, which runs twice a year. The facilitators are two trained firefighters and case-workers. The firefighters facilitate the program, but are not expected to manage challenging behaviours as this is the role of the case-workers. This program has been operating for six years and no adolescent client who has participated in the JAOP has reoffended. On a site visit to the QLD FFF program the key facilitator of this program stated that “every activity had a purpose built into it”. He described some of the components of the program that include:

- experiential learning
- taking the adolescents out of their comfort zone (i.e., camping in a shack in a remote bush location with few comforts, confronting fears)
- team-building exercises (i.e., working as a team and building trust on the ropes)

- learning skills (i.e., developing life-skills, gaining first-aid certificate and extinguisher training)
- how to use fire as a tool (in a bush setting)
- teaching kids how to assess risk
- goal setting (QLD FFF coordinator, consultant social worker and senior practitioners, QLD FFF – L. S., personal communication, 29 May 2008).

This program is promising because it is jointly organised between fire services and allied health services and appears to be effective in reducing recidivism and increasing other skills. A notable observation is that the program is age-appropriate for adolescence, theory-driven and appears to have been clearly thought through from theory to practice.

Clear understanding of roles

A multidisciplinary approach ensures that the appointed team of professionals are working within their expertise and have a clear understanding of their roles. Many participants realistically appraised the role of the firefighter and the limitations of their program, frequently stating that “at the end of the day we are just fireys” and “because the program is delivered by the firefighter it has to have a limit so we are not asking them to work beyond their abilities and training”. The Queensland coordinator also agreed and stated that they had “clear professional boundaries and purpose”. A former manager of the VIC JFAIP recognised the limitation of the role of the firefighter in difficult cases and stated:

I don't think the firefighters have got the expertise to deal with, you know, major social problems, psychological problems, disability. It might work by accident, but I don't think they have the expertise to go in and assess. Is some fire safety videos the way to deal with this? I mean, some of the descriptions you hear of the cases, the kids sound quite off their tree ... you know kids who lock themselves in a caravan and tell you to f... off. Telling the practitioner to f... off. Nobody can open the caravan in the backyard to even talk to the kid. Well, I had the firefighter say that “I've spent about half an hour outside the caravan trying to talk him.” Well it sound to me like they need a CAT (crisis assessment team) team, you know a clinic intervention. So in this case I don't think that the firefighter has the expertise to deal with that.

The NSW IFAP have recognised the limitations of their roles as firefighter practitioners in dealing with dysfunctional families and children with problematic behaviours and see building relationships with mental health agencies as a priority to future program directions.

The participant stated that their practitioners:

... were running into kids with huge problems and we would go in, but it was proving to be more difficult ... there were kids with severe psychological difficulties and the fireys weren't in a position to assist these kids ... The fireys felt uncomfortable about their effectiveness and were walking into situations with children who were involved with case management and juvenile justice ... the program has been more designed for normal kids ... Often with these families it was more important to make the home situation safe ...

The TAS JFLIP, recognising the limitation of the firefighter practitioner, has a policy that they do not intervene with complex cases (i.e., juveniles over the age of 14), which clearly demarcates the boundary of the firefighter practitioner's role. For complex cases, the juvenile is dealt with through community case conferencing, in which the fire service has some involvement. The QLD FFF also does not intervene with complex cases and refers juvenile justice clients to the JAOP.

The VIC JFAIP managers did have different perspectives on the role of the firefighter practitioner and whether or not they were working within their expertise. Some managers suggested that the program aimed to change firesetting behaviours and to provide fire safety education only. Other VIC JFAIP participants responded in a way that suggested that the firefighter practitioner is working outside of their role as fire safety educator:

The goal is to do that through providing education about the danger of the fire, about fire safety practice, improving the child's self-esteem and [their] sense of responsibility for keeping the family and house safe. Engaging the child and the young person as an assistant to the fire brigade, "the junior fire officer". Some of the other goals are to assist parents in changing their disciplinary practices and their behaviour change strategies so that they are more effective. And also alongside that is identifying kids who are in need of further assistance through community services or mental health services.

Furthermore:

It's also about assessing the other problems in the family and assisting families in linking in with services and that's part of the intervention as well. That is recognising if there are other problems in addition to the fire lighting or maybe even causing the fire lighting.

Analysis of these comments suggests that there is an expectation that career firefighter practitioners fulfil a range of roles, some of which are related to fire safety education (i.e., discussing the dangers of fire and the consequences of misusing fire) and some unrelated to the role. These unrelated roles may entail providing parenting advice (i.e., assisting parents in changing their disciplinary practices), referral advice or recognising if there are other problems in addition to the firesetting (i.e., assessment).

This is too great an expectation for unskilled firefighters. In particular, "assessment" requires specialist skills that firefighters do not have and without a valid screening tool they are working out of their domain (Cole et al., 2006). A further participant of VIC JFAIP also highlighted that their role was not to coordinate services but to recognise when there was a lack of coordination between services, as described:

It's about the practitioner recognising when there is a lack of coordination between services and even though it's not their role to provide that coordinating role, trying to find an agency that will do that, hold a case conference or something so families aren't pitting agencies against each other, and maintaining communication when different agencies could be sending different messages to the families.

It may be that firefighter practitioners are receiving mixed messages regarding their role, which is becoming blurred as a consequence. The allied health professional is the most appropriately skilled and trained professional to identify problems (assessment) and coordinate services.

There appeared to be differing views amongst the program managers of the VIC JFAIP regarding “who should be clients of the program” and “whether or not the practitioners have the skill and expertise to intervene with more complex cases and high-risk cases”.

Two participants of the VIC JFAIP thought that the practitioners had enough experience with kids, were supported enough by the program through consultation with the program psychologist and through a basic half-day training in psychological problems and participation in practitioner conferences, and thus could intervene with more difficult or high-risk cases (i.e., those young people with a disability or mental health issues). One respondent stated that:

I think they're pretty skilled in a sense that most practitioners are those who have had some sort of experience in [a] teaching or training capacity, whether it's coaching footy or assisting in schools or kindergarten, etc. So they have had a fair bit of experience with children. So would have learnt a lot of that through normal life experience. So in addition to that, we have the training that adds to their knowledge and skills and reinforces or consolidates what they already know in practice. So they do an awful lot in their training now. So we go through a lot of the teaching of children with various learning disabilities, etc. So in addition to that they are often calling me up when they feel stuck if they've got a child they feel they are not getting through to and we discuss over the phone what other strategies they might use to get through to that child. So more and more these days, particularly with more of the experienced practitioners, I'm surprised with just how much they've been able to figure out themselves, so often they call me to say, “This is what I've done. What do you think?” and I say, “You've done exactly what I would have suggested.”

Another MFB manager also felt that the firefighters were skilled to intervene with more difficult cases, and stated that they:

Had the knowledge about the different disorders out there, and [had] an understanding [of] strategies to overcome that [the disorders]. This child with a learning disability might be a bit slower; instead of doing two visits I might do four visits. The practitioner has an understanding through their training in juvenile behaviour. A specific course in the training itself, and it's ongoing when we meet with the clinical psychologist.

Some of the MFB program managers noted that the training provided gives the practitioner the necessary skills to intervene with more difficult cases. However, other VIC JFAIP

managers felt that the current training was unrealistic in equipping people with the necessary skills to intervene with children with disabilities, stating that “they certainly don’t get enough training, I mean you have to have a Special Ed Degree if you are going to be teaching people with disabilities” and that “one hour on Friday afternoon” was not enough because the issues were too complex. One participant argued that it takes years of experience and training to be able to intervene with children who, for example, have disabilities and that the program is not suitable for some people, especially adults with disabilities because “it’s never been designed to do that”.

The CFA coordinator, contrary to MFB managers, felt that the program training did not guide the practitioners enough and that they were not trained to “judge that [the needs of a disabled person] either ... I mean, we send them out, really, I think, with a huge job to do, with little professional kind of guidance, and that’s not to deny – look, they really believe that they can make a change.” To illustrate her point she stated it would be similar to “me going out to the fire ground and saying, ‘Well, I reckon I can knock that bushfire off, you know, in a couple of hours based on my passion to want to do it.’” She suggested that what they were “relying on, I guess, is their [the practitioner’s] good will and judgement to make those decisions. But who’s to say they’re appropriate decisions?” Furthermore, she stated that the current resources and the current training do not provide practitioners with adequate structure and support to conduct the session. The resources were described as “pretty ordinary and not necessarily matched to the right kids”.

Another MFB manager acknowledged that the practitioners needed to be self-aware enough to understand where their limitations are in a case and whether or not they are being effective or not. It was acknowledged that they “needed to have really clear parameters given to them

about their role”. This manager stated that the training provides practitioners with the expertise to know if they are doing a good job, yet also stated that this concerned him:

[It is assumed] that the individual that we sent along is the right individual or the right firefighter and that we have trained that firefighter and supported that firefighter sufficiently that they can recognise that they are doing a good job or that they are not achieving their objectives in this particular case. It is probably that last bit that concerns me the greatest – that you can feel that you are doing a great job and you are not looking to see if the chemistry or whatever is not necessarily effective between you as the individual firefighter and that particular person that we are dealing with. So there is a fair degree of honesty and self assessment required.

As this manager stated, practitioners need to be provided with clear parameters about their role, so that they are not working out of their expertise. Otherwise, there may be corporate risks. A.C’s remarks (section 5.5.2) are quite valid when he discusses firefighter practitioners who are given basic mental health training and may become too empowered. It may be a case of too little knowledge can be a dangerous thing. One of the CFA managers felt that the firefighters’ passion to help may create a blind-spot:

I just don’t think sometimes they know where their limitations are – their own personal limitations or the program’s limitations. Because of their passion they tend to sort of jump in and say “Oh, I’ll do this, I’ll do this” and I think that’s a bit risky.

She felt that “what’s evolved is that many of our practitioners are incredibly passionate and proud and keen to tackle problems”. These comments resonate with A.C’s caution that passion can cloud the firefighter practitioner’s perspectives on boundaries.

If passion does cloud the firefighter practitioner’s judgement and they are not adequately trained, they may not be self-aware enough to recognise that they are over-stepping boundaries. Self-reflection, analysis and awareness of practice are also skills that quite frequently need to be taught and updated regularly through supervision practice so it can not be assumed that all practitioners have this level of skill. Self-awareness may also require dispassionate analysis and a kind of objectivity that needs constant external supervision.

It is important to clarify and clearly articulate the role of the practitioner. However, when working with a multidisciplinary team each professional understands their roles and responsibilities and shares the problem. Thus, the boundaries are clear and demarcated because each person is automatically working within their professional capacity and the roles are not blurred or confused.

6.2.5 Standardised program protocols, content and processes

Program protocols

Best practices in juvenile firesetting intervention endorse program protocols that guide the processes and procedures for intake, screening and assessment, age-appropriate curriculum and monitoring. In Australian FSE programs, there are few standardised protocols or agreements with external agencies.

Program content and processes

The aim of most FSE programs is to educate children about appropriate use of fire and the dangers of misusing it. Programs in most states appeared to be very similar in content, materials and activities, and provided adequate content for younger and low-risk children, as endorsed by best practice standardised FSE (described in section 4.3.5.).

One program stood out because it appeared to be more thought through than the other programs and based on some evidence of development theories. This was the the QLD FFF program, which employed innovative educational strategies. For instance, they employed 10 strategies in their intervention and this depended on the age of the client. One example of a strategy with a younger child is the use of a soft toy called “Blazer”. This toy is used in conjunction with the session and “Blazer gets to stay in the home when the practitioner and child think that the home is safe enough for him to stay there”. The QLD FFF coordinator

also stated that “It’s effective because it is also a reminder for the child”. For adolescents, the program employs a strategy called “Growing up and down” that asks them to picture their future goals and how they are going to reach these goals. Similar positive coping techniques that utilise such as strategies as creative imaginary, positive thinking, hope and goal setting are a commonly used in mental health treatment settings with at-risk adolescents (Grewal & Porter, 2007; Hanna, Constance, & Keys, 1999; Kingery et al., 2006; Sawyer, Pfeiffer, & Spence, 2009; Turner, 2005)

Referral intake processes

In most instances, referral intake processes include the intake interview over the phone, and assignment of the case. These processes vary across the jurisdictions. However, referrals to the program are usually processed by the state or regional coordinators in the jurisdictions. This referral can come from multiple sources including self-referral, schools, mental health services, fire stations, juvenile justice and police.

Most programs accept referral from these multiple sources, with the exception of the TAS JFLIP program that insists that referrals to the program are taken directly from the parent or caregiver because their program philosophy is centred on parent and family engagement (further explained in parent involvement sections, above). The WA JAFFA program mainly receives their referrals from the juvenile justice department (35%) and this is quite high compared with other states, e.g. VIC JFAIP (3%).

At intake, the coordinator of the program will provide the family with initial advice and guidance regarding firesetting behaviours. This is frequently followed up with an information pack that is sent out to the family before the intervention is commenced. In the

initial phone contact, as much detail as possible is gathered about the family background and the firesetting behaviour of the child or adolescent. This initial conversation is an opportunity for the coordinator to build rapport, provide details of the service and also to start some form of intervention (i.e., providing parents with simple and practical advice about the safe storage of ignition sources). The intake form that VIC JFAIP uses is found at Appendix 2.

Screening/assessment tools component

Appropriate screening of juvenile firesetters needs to be implemented at the first line of contact, and this is more commonly the fire service. Best practice endorses a screening tool as an objective way of deciding whether or not the juvenile requires further psychological intervention. Practitioners who are given limited training (one training day and some ongoing support) are not in the position to make an assessment of the juvenile's or family's mental health needs. Therefore, utilising a screening tool in a juvenile firesetting intervention is best practice.

All participants stated that there was no formal screening assessment tool or protocol available to enable practitioners to make an objective decision on whether the young person requires a referral to a specialised agency. The exception was the WA JAFFA program, which receives a high proportion of referrals from the Juvenile Justice Team (35%) and this team will screen the child for appropriateness of referral before it is sent on to the WA JAFFA program. While most participants stated that their program gathers information on the family, child and firesetting behaviour through a formalised interview process (e.g., Appendix 3 for VIC JFAIP interview form), this instrument does not provide direction. Some participants indicated that their program was considering incorporating screening and

assessment tools in the future. For instance QLD FFF stated they were “currently talking with Children and Youth Forensic Outreach Service about developing a screening tool”.

Two of the participants stated that their practitioners do make decisions about cases but not with a formalised or objective tool. One participant stated that the practitioner makes a distinction between pathological (variously described as a cry for help, delinquent or cognitively impaired motives) and non-pathological firesetting (described as curiosity and fascination). When asked how the practitioner made their decision to refer a case on to another agency, to which that respondent replied:

The decision is based on where the referral is coming from and the practitioner’s experience. For example, the practitioner may walk into a family situation and see that a whole lot of stuff is happening.

Another participant stated that their program gathers information about the child, family and firesetting behaviour and then allocates the child into the three risk categories of “extreme concern”, “definite concern” and “little concern”. The way the practitioner allocates the child is not an “official scoring system”, but is dependent on whether the child and family respond to some questions in ways that indicates high risk. Cases are then divided into “simple curiosity” or “complex”. The participant acknowledged that the current allocation of children into risk categories is vague and that the program is currently looking at a more formalised screening matching tool as part of their risk intervention program review.

Many of the practitioners in Australian FSE programs will make informal assessments based on the firesetting behaviours (level of severity, frequency and type of firesetting) and also by observation of the child in the family home. A participant indicated that observations of the home environment and discussions with the family can frequently generate clues and

provide the practitioner with direction on how to tailor the intervention for the child and whether they need additional intervention, suggesting that:

If you look at the fire the child has lit, how many kids were involved, the level of severity, you know he can't sit still for five seconds because he is suffering ADHD, the yelling and screaming happening at home- looking at how the mother and father interacts with the child and then they [the practitioner] can make an assessment by the triggers of what may be affecting the child – you know, that mum's constantly nagging and they don't have a good relationship – and then they'll deliver the session according to meeting their needs.

However, again this relies on skills that the practitioners may not necessarily have and encourages them to work outside of their role. There were mixed responses about the use of formalised screening tools as some commented that it would be too prescriptive while others commented that they were currently working on developing such a tool. However, my view is that there does need to be an objective tool in place that can guide practitioners who are unskilled in mental health assessment to make appropriate decisions regarding the needs of families with complex issues.

Evidence-based age and culturally appropriate program curriculum

In a multidisciplinary approach, firesetting intervention curriculum protocols are evidence-based, have a FSE component (delivered by firefighters) and a fire-specific (targets the firesetting behaviour) intervention that is CBT- and PMT-based (provided by allied health professionals). Because there are no multidisciplinary approaches (except JAOP) the Australian FSE component is discussed in this section.

FSE curriculum component

A best practice curriculum for juvenile firesetters needs to be evidence-based, taking into account developmental tasks, competencies and limitations, and the trends in firesetting of

each age level. A best practice curriculum protocol would have different intervention for each age level of preschool, childhood, and adolescence that addresses:

- developmental appropriateness (i.e., a child engaging in fireplay out of curiosity is very different from an adolescent who uses fire as a weapon of revenge)
- cultural diversity
- specific fire misbehaviour (e.g. child lighting candles at home necessitates a far different content than a child setting a school fire).

This protocol should be structured and presented in a manual of processes and procedures for consistency and quality. However, open enough for variation in style, approaches, and programmatic advancement and modification.

In all jurisdictions, participants indicated that there was a basic program in place that was structured and often modified according to the needs of the child (e.g., age, individual abilities, challenges, and firesetting behaviour). Many participants stated that the structured nature of the program was important to the success of the program because it encouraged consistency and standardised delivery. However, investigation of some program protocols indicated they do not provide detailed guidance nor are they well developed.

QLD FFF and TAS JFLIP appeared to have more structure than other programs. For instance, the QLD FFF program has documented some lesson plans, where they have designated 10 strategies that practitioners can employ in their intervention plan. TAS JFLIP also provides guidelines for the initial interview, session plans, building rapport, program delivery, policy, resources and information for parents. In a recent forum I attended organised by WA JAFFA, there was no documentation of a curriculum protocol.

The VIC JFAIP provides some basic guidelines for practitioners but does not provide them with structured curriculum protocols. Instead, practitioners are guided by:

- their initial training on the basics of juvenile firesetting behaviours, clients, and program (see section 2.1.4)
- a practitioner kit (with various resources; Appendix 7)
- a three-page information sheet on what is included in an intervention (Appendix 5)
- consultation with the program psychologist and peer support, if needed
- quarterly practitioner meetings (which are compulsory, but not regularly attended).

A manager from the VIC JFAIP suggested that the structure of the program and the level of guidance provided in the training were inadequate, described as:

There isn't a sort of set program. There are some resources and there are some delineation – well, you'd give this one to the young ones and those to the old ones. But in terms of what would be an ideal first session, you know, what would be an ideal follow-up session, I don't think there is nearly enough guidance.

This participant felt that the VIC JFAIP practitioners were “thrown in with, ‘Here’s a suitcase full of a few old videos ... and a couple of poster sets and a couple of books, you know, devise a program.’”

Overall, FSE programs in Australia are not well structured in terms of adequate program curriculum protocols that are purposeful, age-appropriate and objective-driven with instructional strategies outlined for each lesson. From my observations and interviews, the fire services have not made any formal attempts to consult with relevant professionals within the Education Department to establish appropriate educational strategies. I also found that processes, procedures and lessons in general were not presented in a detailed manual for practitioners to follow.

Culturally appropriate curriculum

A culturally appropriate curriculum has been included in the Oregon JFIN because it is known that different cultures view fire differently. For instance, the Native American culture views fire as a “deity”, so Good Fire/Bad Fire materials on the curriculum had to be amended. Although VIC JFAIP does not have data on cultural diversity, and it is unknown if other states collect this data, qualitative data in Chapter Four indicated four out of 29 families were Aboriginal clients. One of the Aboriginal children stated in the interviews that he thought “fires were sacred” and referred to his Aboriginal culture (see Table 3, pg. 114). It might be important for FSE programs in Australia to consider that fire may have different meanings for people of other cultures. Materials and content may need to be reviewed and adapted to target culturally diverse clients.

Adolescent curriculum and complex cases

There is no age-appropriate standardised curriculum for adolescents who are referred to Australian FSE programs. Some program managers indicated that their program was designed for adolescents because they had a selection of practitioners who were considered more effective in dealing with this age group, as described in one jurisdiction:

The JAFFA coordinator is critical on who she gives cases to and this depends on their level of experience. She knows how long they’ve been in the force and how long they’ve been in the program. So she makes that judgement call. So it’s quite openly known who can do the really complex ones and who shouldn’t. And it’s sometimes the appropriateness whether the child’s indigenous or multicultural or if they are a teenager we try to send the younger guys out.

Although this strategy may work well, it does not constitute an age-appropriate curriculum that targets adolescents and nor does it foster program consistency. Most program managers stated that their practitioners modify the standard program in some way to cater for the adolescent client, such as using different resources, incorporating more complex details of the nature of fire (i.e., the fire triangle), discussing consequences of firesetting (i.e., legal and

personal) and some peer pressure advice. However, no program had curriculum protocols that were objective-driven and purposefully targeted for adolescence that took into account developmental tasks, competencies or limitations and the trends of firesetting at this level. Thus, without a curriculum protocol specifically designed for this group, consistency in delivery may be highly variable and difficult to monitor, document and evaluate (section 5.9). Although certain practitioners may have experience in working with this age group, a program designed in this way cannot be monitored for its effectiveness if different practitioners are doing “what works for them”.

In some programs, reaching older children and adolescent groups was noted as a challenge, with many program managers acknowledging that their adolescent curriculum was a weakness of their program and an area that needed improvement. This was discussed by one participant, who stated, “I think where our program is lacking is the upper end of the teenagers, the 12- to 16-year-olds. I think the program is very good for reaching the younger ones but it needs to be reviewed for that older age bracket.”

Only a few program participants acknowledged the role of the internet or media in influencing adolescent firesetting. One participant stated that:

The level of influence by internet and YouTube has changed. Truly, the kids just sit there and watch people doing silly things on YouTube and the *Jackass* movies. So they are influenced by media and technology, as well as curiosity. They get on there and learn how to make sparkler bombs. We’re gonna look at YouTube to deliver some of our messages. We’re trying to be innovative.

The reason why there are challenges with this group is that adolescent firesetters are generally more pathologically driven, may be delinquent, frequently have clinical and behavioural problems, tend to exhibit higher levels of aggression and hostility compared with those who set fires at other age, and often misuse fire as a weapon or for motives of

anger or revenge (Kolko & Kazdin, 1991, 1994; Slavkin & Fineman, 2000; Yarnell, 1940).

Innovative resources, creative strategies and a “structured” program are required to successfully reach and have a behavioural change on this population.

Adolescents represent a different client group and most participants distinguished between the older and younger firesetter (see section 1.4.2 and 1.4.3). Some programs do not take young people over 14 because the firesetting is considered more deliberate and linked to either mental health, social or family issues (TAS JFLIP). However, most programs in Australia continue to engage with adolescents and the same FSE program is delivered to younger and older children, with some modifications. This suggests that a “one-size fits all” approach has been adopted, with slight variations that are based on the practitioner’s own resources, experiences and engagement style. Implications are that the right intervention is not targeted to the right client and that program effectiveness is difficult to document, monitor and evaluate.

Monitoring component

Best practice endorses that all program designs and protocols are based upon in-built evaluation components including ongoing data collection, monitoring, synthesis, analysis and evaluation. This is so that programs can objectively conclude whether or not they are effective or not. Kolko (1983) suggested that objective documentation of outcomes, such as whether or not the child had ceased lighting fires or if there had been improvement on certain collateral behaviours, needed to be systematically gathered. Research of Australian practices in juvenile firesetting intervention has indicated that there is currently minimal monitoring of programs or clients.

In Australia, there is a lack of protocols or ways to measure program effectiveness, which makes objective evaluation difficult. The only data collected is centred around basic demographics and some fire behaviour, which can only provide summary descriptive statistics.

Data collection allows you to analyse the problem and guides the development of appropriate intervention protocols. Concrete data is also used in funding applications, allocation of resources and measurement of outcomes.

Client monitoring

Most participants stated that the aim or goal of their program was to reduce the incidence of deliberate firesetting in children and adolescents. However, in most jurisdictions there appeared to be few systems to directly follow up with clients and to review the status of the child's firesetting behaviour after the intervention. Accurate measure of outcomes cannot be made without this information. One participant was asked "How successful the program was in meeting its aims?" He stated:

Well, I think it is safe to say that nobody would really know because there is no system designed as far as I know of following up on cases. I think there is anecdotal evidence from the practitioner that it makes a difference and parents give feedback and letters saying that they appreciate the program, etc. But in terms of any systematic assessment about how effective the program is, it has never happened.

Those programs that commented on recidivism rates stated that they were fairly low. For example, VIC JFAIP quotes a 5–10% recidivism rate on both its website and in program documentation. The SA program reported that "on gut feel it [recidivism] is very low, for example we saw 82 kids last year and I can only think of two who had been seen before ... there is nothing officially recorded."

Validity of these recidivism rates can not be considered reliable due to poor follow-up processes (i.e., such as relying on the parent to get back in touch with the program) and no accurate rates recorded on their databases. A comment from one of the states was:

It is hard to give accurate data on recidivism because we rely on what we get from the family and parents. Some juvenile justice people have commented that the child has lit further fires. Recidivism is not officially recorded in the database; however, anecdotally the rate is low. Anecdotally, out of 75 clients in the past year, there were two recidivists that were referred again from juvenile justice.

Recidivism status was generally not actively sought, nor was it in-built into the program.

Follow-up with clients was recommended by some jurisdictions, but not as a requirement.

Most other jurisdictions relied on the parent to get back in touch with the program to report on progress or if the child reoffends:

It is only based on the responses that come back, and presumably there is a bias in that, it [parental feedback] would be more likely to come back if it had worked rather than come back and say, “No, he’s still lighting fires and in fact he burnt down the school last week.” No, I don’t think that is going to happen. So it’s biased anyway.

Two different jurisdictions made the following comments regarding follow-up: “You might not find that out until you see them the next time, and if you don’t see them again you are hoping they haven’t repeated the crime” and, “What we also do is that we get parents to contact us if there is any further recidivist behaviour so that we can provide service support.”

Some participants stated that their clients were followed up but not systematically.

For example, they “encouraged their practitioners to follow up ... to make sure they’re on track and everything is fine. It’s more for the parents than anything. We don’t have a set time if that’s what you’re asking ... it’s not formalised, but encouraged.” Some practitioners will follow up with families, not because it is required of them, but due to their genuine concern for the child and family and because they are passionately committed to the program. For example, one participant was asked whether they did a six-month follow-up

with the client and stated, “It’s not built into the program; that’s just something that they have taken upon themselves ... and I think they do that because of the passion of the people.”

One state coordinator explained that they did not follow up because the program is under-resourced. The SA coordinator was asked if they continued their two-month follow-up with the child and he stated that “that has fallen away due to being understaffed” and that “we are very short-staffed with everyone doing everything else”. Some clients were followed up more because of their perceived risk and needs. If they seemed remorseful then they did not follow up the client due to a lack of resources to keep following up on cases.

Some other program managers felt that the client group was too transient, dysfunctional and chaotic in nature so there was little point in doing follow-up, as the families often moved on:

If you set the standard that effectiveness is that the kids who lit fires no longer light fires then you need to have a pretty good sample or a pretty rigorous follow up ... and I would say that is almost impossible to do given the nature of the people we are dealing with. There seems to be difficulty in follow-up ... you don’t get a huge response rate. I think in this case a lot of the families have all sorts of issues: they split up, they move around, they come together. They are fairly chaotic, many of them. Some of the kids are in pretty significant care. So I think there would be a lot of difficulties in assessing the effectiveness in that way.

In the VIC JFAIP, clients are sent birthday cards for the duration of two-year post-program participation, as a token. This practice does not appear to be a purposeful activity or have value because it does not directly illicit any exchange of feedback from the parents.

In only one jurisdiction (QLD FFF), client recidivism rates were formally evaluated by an external survey. The participant in this jurisdiction stated that “recidivism was evaluated in 2005 by survey by an external research company. There was a sample of 300 past clients

and they were followed up between one month to five years after participation in the QLD FFF. Of these, 112 past clients were successfully contacted and were asked if their child had been fire safe. The response was that “91% of the clients had been fire safe”. This seems like a reasonable outcome for this program, which in my view had better targeted and thought-out educational strategies. In all other jurisdictions no formal evaluation of recidivism has been collected or reported on.

Best practice recommends that monitoring be implemented and data collection begins at the point where the firesetter enters the “system”. The data collection tools that do this are the Oregon Screening Tool and State Oregon Juvenile with Fire Reporting System (10J). These tools allow the local communities to identify their juvenile firesetting problem and to test whether they are being effective in meeting their programs’ objectives. Client monitoring can include collecting data on both fire-specific and general behaviours. Monitoring is not only limited to firesetting but can also include other behavioural problems and criminal behaviours, thought to be also linked to juvenile firesetting. The Oregon JFIN program tracks juvenile firesetters for both repeat firesetting and other criminal behaviours.

Program monitoring

Most program managers indicated that their programs were monitored informally through meetings and discussions. One example of program monitoring has been described thus:

Informally, reviews are happening where every time we meet we look at how can we make the program better, what works well, what doesn’t; we do a bit of scan around what’s happening nationally and internationally. But I’m always, I suppose, improving the process. So we are in a cycle at the moment of reviewing a lot of our processes, the forms and everything that we use.

The Northern Territory JFAIP is currently three years old and has not undergone evaluation because it is in its formative stages. The coordinator stated that they monitor the program informally, for instance:

Once a case is completed the practitioner will report to one of us and basically tell us how they went, what went wrong, what can be changed, and what worked well. And if things worked well we keep it and if there is a problem then we try to work out how to improve it for next time. The majority of the interventions have been delivered by the three of us anyway.

Although there is intention to monitor program development, this is not documented in a formal way. Best practices in juvenile firesetting require that both client and programmatic monitoring is undertaken. Without this information and data, it is impossible to identify and address the problem with resources and services. In Australia very limited data is collected and this means that program managers do not know if the intervention they are delivering is reaching the intended target clients with the right intervention.

Evaluation component

Best practice suggests that evaluation is ongoing and is built into the design of a program at its inception. In Australia, juvenile firesetting intervention programs do not have monitoring or evaluation in-built into their design. Programs have not been rigorously evaluated because no jurisdiction collects measurable data. A VIC JFAIP manager highlighted that the program was not being measured and was inconsistently delivered and stated that “As long as you’ve got an inconsistently delivered program it’s very hard to measure it because which bit are you measuring?”

Evaluation analysis could include measuring behavioural, belief, skills, knowledge and attitude change. The conclusions from the analysis stage can direct the development or redevelopment of juvenile firesetting intervention programs.

6.2.6 Mental health treatment and assessment

At present there is no treatment model or fire-specific intervention available for juvenile firesetters in Australia, representing a gap in services for juvenile firesetters. This is surprising, considering the prevalence rates of firesetting within the United States are reported as high as 40% in clinical and community populations (Kolko & Kazdin, 1988). Although we do not know the figures in Australia, if they in any way parallel the figures as reported in the United States then we are seriously ignoring this problem. These types of statistic stress the need for the more attention and involvement of mental health services in the juvenile firesetting problem.

With such a high prevalence in the clinical population within the United States, it's also probable that Australian mental health practitioners may have encountered a juvenile firesetter in a mental health setting. Evidence has suggested that mental health practitioners will frequently target the collateral behaviours such as conduct disorder or ADHD, but will not target the firesetting behaviour directly. The mental health practitioner may also refer the child to the fire service to deal with the firesetting behaviour rather than deal with it directly. This may be because they think they lack the expertise to directly treat the behaviour, lack understanding about juvenile firesetting behaviours and may view firesetting as a secondary problem and not a primary clinical diagnosis.

Fireproof Children has suggested that mental health practitioners already have sound clinical intervention skills through their training. Thus, the teaching of fire-specific intervention and treatment can be an extension to their already existing repertoire and skills (Cole et al., 2006).

Referrals to mental health services

Most of the participants recognised the value of the firefighter-delivered program but also expressed concerns about their limitations. They concluded that having an option to refer was a strength of the program if the family agreed to this. However, to my knowledge no data is available on how many people FSE programs refer out to mental health services.

The level of collaboration between mental health providers and the different fire services vary considerable. Some programs employ a consultant psychologist who can provide advice and expertise (but not direct intervention with clients); two programs have registered psychologists who manage or coordinate their program, and some have strong links and relationships with mental health providers. Four participants stated that they wanted to develop more alliances with mental health providers. They were either in the process of doing this or wanted to do so in the future. Two participants stated that they had some formal agreements and memorandums of understanding between their program and other agencies.

Access to mental health services was highlighted by two participants as quite challenging.

These participants appeared frustrated with mental health service providers. A comment was made regarding the lengthy waiting lists of public mental health providers:

The mental health services are extremely overloaded with long waitlists. It can be difficult to get the child into the system. I had one kid and I was trying to get him an assessment and they told me that that was going to take 10–12 weeks just to get assessed and then a further 12–13 months to get him into treatment.

Some program participants suggested that children are often already seeing a mental health practitioner when they are referred to their program for firesetting. A strategy that is frequently employed is to direct parents back to their current mental health practitioner

because there was already an existing relationship with the child and family. For instance, “If the child is receiving additional support the practitioner will suggest that they make contact with those supports and inform them of the problem as well.” Often the fire service can partner with this agency or mental health practitioner (if confidentiality permits) to work together in developing strategies to stop the firesetting behaviour. Unfortunately, collaboration with mental health services and the fire service rarely occurs.

Relationship between mental health services and the fire service

When participants were asked about their relationships and alliances with other agencies, they typically named schools and juvenile justice, mental health and police services.

However, they could not provide specific details (i.e., agencies they were aligned to or those that they had agreement or memorandum with). For instance, most of the VIC JFAIP program managers identified generic stakeholders, with the exception of one who noted the distinction between “stakeholders” and “users” of the program. When asked about who were the stakeholders of the program he stated:

That’s an interesting question actually because often there are a few who are listed as stakeholders, but it depends what you mean by stakeholders. I mean, human services refer people to the program, schools and a number of others. But they don’t actually assist in anyway with the program, or contribute or steer it. But they are users of the program, whether you want to call them stakeholders or not.

WA JAFFA stated that they were aligned with two agencies (i.e., juvenile justice and the positive parenting program) described thus:

So we have linked into them. They are called Positive Parenting. Now our JAFFA support officers, when they go out and you walk in a house and you can see that the mother is just so not in control of the family, they can then work with Positive Parenting. And we will talk to the mother about possibly being referred there ... If it’s around parenting, it will go to positive parenting, but if it is something around child abuse then it would go to child protection [DCP], or mental health it will go to CAMHS [Child and Adolescent Mental Health Service], but if it’s just complex social issues and poor parenting then that is our primary agency that we will link them back to. So you are not just walking out of the house and leaving it ... They will work with the parent or that family around rebuilding some values and parenting

skills for them and they provide like a linkage so they draw in the necessary services for that family to support them as a whole ... They will own the case and work with the case intensively for six months.

It's commendable that the WA JAFFA program has initiated some agreements and collaboration with a supportive agency. However, during a recent attendance of the WA JAFFA practitioner conference the program director revealed that the partnership with the Positive Parenting program was fragmented and had not worked out to be as collaboratively as previously hoped.

Collaboration with mental health services

Some participants expressed concerns about the lack of collaboration between their program and other service providers, such as referrers and referral sources. One participant expressed concern was that there were no reciprocal feedback systems between the fire service and other agencies that could exchange details of clients' progress:

Once people have referred people to us we don't have any further contact with those organisations. They wouldn't even necessarily know from us whether it's happened; they might from the child perspective. But there is no discussion about how did it go, did it work do you think, he's still doing it, what are we going to do? I don't think I have ever had one of those conversations.

This participant was also concerned that the users of the program (referrers) sent clients to the JFAIP as part of a risk management strategy. This was explained further:

I am not sure whether there is any integration or cooperation between the fire service and the case manager of what has happened. It seems to me much more of a risk management strategy by other organisations to say that the bloody kid is lighting fires, we better get him off to the fire service before they do some damage.

Another participant was concerned that the lack of collaboration between multiple agencies impacted on the well-being of the families who were not being treated in a holistic way.

This quote depicts the complex issues frequently seen:

Firelighting is not their only issue and there is usually a multitude of agencies involved already. So you've all got the same client and we are all delivering our own program instead of delivering it in a holistic way. When we should look at what are the total issues and how do we meet it instead of us all going in there and wanting our five cents with them? So that's my concern. If you've got a kid lighting fires, he could also be doing break-and-enter and vandalising and graffitiing and possibly have ADD and mental health issues.

In addition, the lack of coordinated responses between organisations has implications for the family's well-being:

With these families that have so many agencies involved they can be quite scattered; you'll find that each agency is less efficient in what they have to offer. In mental health services we're very wary of families that have too many other agencies with their finger in the pie. There needs to be better coordination.

A lack of coordination can impact on the family because:

I think they're the ones [firesetting clients] that – you're seeing them, CAMHS [Child and Adolescent Mental Health] is seeing them, DCP [Department of Child Protection] is seeing them. You know, there would be a multiple agencies in the community that would be working with that child unknowingly to each other, so it is not a coordinated response. So the family would have so many requirements to meet each agency need, and then she gives up, because it's too hard because we all want her to do something but we don't know what onus we are putting on that mother because DCP might want her to go off and do this course and you're asking her to go off and do something else, and another agency will be asking her to do something else and when you have overloaded this poor woman with everything we want her to do, instead of having a coordinated response to the issue.

This participant also suggested that the role of the practitioner could be to provide other services, such as:

It's about the practitioner recognising when there is a lack of coordination between services, and even though it's not their role to provide that coordinating role, trying to find an agency that will do that. [They could] hold a case conference or something so families aren't pitting agencies against each other. [Or] maintain communication between the different agencies – because they could be sending different messages to the families.

6.3 Conclusion

6.3.1 Program theory

The findings of Chapter Four and previous literature suggest that juvenile firesetting is multidetermined, a community-based problem, and that both fire-specific and general behavioural dysfunctional risk factors contribute to firesetting behaviour. Exemplar programs such as the Oregon JFIN and TAPP-C multidisciplinary approaches have program theories that are informed by the evidence of firesetting as well as antisocial, developmental and educational literature.

There is only one collaborative small-scale juvenile firesetting program known in Australia called the JAOP that has been jointly developed and is delivered by both firefighter and allied health professionals. All other intervention for juvenile firesetters in Australia is delivered by the fire service solely and is mostly FSE-based.

In Australia, many of the program participants were unable to articulate a program theory and were more likely to describe what their program did. Some programs, such as VIC, JFAIP did not have consensus about their program's theory, aims or philosophy. Joint consensus regarding these important aspects is of high priority for these programs to ensure that they are effectively dealing with the problem and serving the client and community.

Inadequate resources, funding and support were identified as barriers in most jurisdictions. Lack of support from the "top" in the fire services may create barriers to providing the necessary infrastructure required to establish an effective evidence-based multidisciplinary approach. Given that misuse of fire and arson is so costly, embracing new collaborative approaches may be a priority. Some of the recent Black Saturday bushfires in Victoria were

thought to be deliberate, so under-resourcing firesetting programs may be putting communities at high risk. Evidence concludes that early prevention is paramount to treating pathological interest in fire before it becomes well-established in the adolescent and adult years and difficult to change.

Many program managers questioned whether the design of their educational-based program was sufficient to deal with complex cases. Some jurisdictions had conducted research projects (unpublished) that recommended a new model and approach in which it “was more important to develop relationships”. Priorities may be shifting and new thinking appears to be on the horizon for some programs. However, there were some program managers who did not question the model, believing that the current model is the right one.

Most programs agreed that the firefighter was the most respected, credible and knowledgeable practitioner to deliver the fire safety message. Anecdotally, some programs reported that firefighter practitioners were more effective than other practitioners (i.e., mental health practitioners or police) in stopping the child’s firesetting.

All states endorsed firefighters as the most effective practitioner to deliver FSE in Australian programs. However, there is controversy as to whether the program should be delivered by only trained “career firefighters”. This is because career firefighters generally work and reside in metropolitan areas, so children in remote areas may not have access to the program. Recognising the restriction of employing only “career firefighters” is a priority because the needs of the clients and community come first. A.R., from Fireproof Children, stated that in “many cases the family has no services involved at all” and the priority is for families “to receive the help they need [so that they] don’t fall through the cracks”.

Most FSE interventions in Australia have the components of FSE, basic behavioural training and behavioural modification principles and this is considered as an important component of best practice (except WA JAFFA). However, this low-level skill-based intervention does not appear to be enough for clients who are pathological firesetters and are unlikely to stop firesetting when they receive FSE alone. Addressing only “FSE” (most Australian programs) or only “consequences” (WA JAFFA) is not considered best practice. Evidence-based analysis had concluded that the most effective way to reduce recidivism and build skills in the juvenile firesetter is within a multidisciplinary program.

6.3.2 Firefighter practitioner role

While fire departments have an important role, theirs should not be the sole intervention effort, because it has been established that complex juvenile firesetters have mental health and behavioural issues. The firefighter’s role is to provide screening as a first step in the evaluation process; observational data of the fire incident, child and family; delivery of a standardised FSE; and to network and collaborate with mental health practitioners. Clearly articulated roles and agreements can help define each allied partner’s responsibilities.

6.3.3 Protocols

Many programs had some features and adequate content in accordance with standardised protocols for best practice FSE for younger children only (as explained in section 6.2.4). However, most did not provide detailed documentation in a manual of processes and procedures. They did not have adequate screening tools, curriculum or monitoring protocols that are considered a best practice FSE component.

6.3.4 Relationship and collaboration with mental health services

Some jurisdictions have stronger relationships with mental health services, but there was no full collaboration in terms of joint “steering” of the program, funding or sharing of

resources, memorandums or agreements between services. The collaborative efforts may have been hindered by factors such as long waiting lists, minimal feedback between services, few agreements and fragmentation of services.

6.4 Limitations

This analysis was mostly based on VIC JFAIP as the predominant model of FSE in Australia because it is the model used for four states in Australia. My study was based in Victoria, therefore I was able to investigate and observe this program more thoroughly than the other programs. Although interviews and some site visits (QLD FFF and WA JAFFA) were used to collect data in the other states, many of the conclusions drawn in this section were based predominately on VIC JFAIP evidence. Other programs that I was unable to visit were not as thoroughly investigated, and relied on data from interviews and some documentation (if provided).

CHAPTER SEVEN: Conclusions and recommendations

Summary

Chapters One and Two discussed the prevalence of firesetting, reviewed of the conceptualisation and developmental models of firesetting and provided background on the JFAIP intervention. Chapter Three discussed the biopsychosocial conceptualisation of firesetting. This review supports the need for the development of evidence-based clinical practices for this population.

Chapters Four of the thesis examined the risk factors of juvenile firesetters using Kolko and Kadzin's risk assessment measures of the FRI, CFI and FHS. Chapters Five and Six focused on the treatment options for this group both internationally (Chapter Five) and in Australia (Chapter Six).

7.1 Summary of Chapter Four findings

7.1.1 Risk factors - all JFAIP participants

Chapter Four found that there was significant improvement on risk factors for all participants and that the JFAIP program overall appeared effective in reducing firesetting risk factors and recidivism in two thirds of JFAIP clients. However, one third of the children remain at risk for recidivist firesetting after exposure to the JFAIP intervention. In comparison with non-recidivist children, this study identified the risk factor in which a child may be more likely to be a recidivist, including:

- greater externalising and behavioural disturbance
- social deficits
- family dysfunction (poorer parenting practices)
- an “atypical” curiosity (fascination) with fire

- early onset of fire interest
- a more extensive fire history
- less capacity to gain fire safety skills through FSE intervention
- greater exposure to models who are fascinated with fire
- parents who misuse fire and model inappropriate fire behaviours.

Recidivists had some significantly greater fire-specific and general behavioural risk factors than non-recidivists, suggesting that they need a more intensive intervention that targets both risk factors. Furthermore, these factors may be “red-flags” of more pathological firesetting behaviour and recidivism and are unlikely to stop without intensive and comprehensive intervention.

7.1.2 Summary of High-risk recidivist firesetters

Evidence from Chapters Four and Six has indicated that “high-risk” clients participate in FSE programs. Some FSE programs in Australia do not intervene with these juveniles (i.e., TAS JFLIP and QLD FFF programs), whereas other jurisdictions (i.e., WA JAFFA) have a high proportion of adolescent clients referred from the courts (35%). However, it is considered best practice to provide all clients with a standardised FSE component, regardless of motive, severity of firesetting or pathology. It is recommended that this FSE is part of the intervention because firesetting is frequently a learnt behaviour.

FSE that aims to increase knowledge and awareness of fire safety and misuse of fire may not be enough for more pathologically driven recidivists (section 5.3.3). Past research and evidence from Chapter Four has concluded that FSE may not “sate” a child’s curiosity about fire. Children identified as “recidivists” in this study displayed more curiosity about fire after the JFAIP intervention, had a greater fire history and an earlier onset of fire interest

than non-recidivists. It is likely that their firesetting is more pathological and “atypical”, requiring a more intensive intervention that focuses on interrupting their intense preoccupation and attraction to fire (Lowenstein, 1989). A more intensive intervention is required because there is some evidence that child interest in fire is the most robust predictor of adult arson (Rice & Harris, 1991). Furthermore, firesetting is a potential marker for other criminal behaviour and serious mental health, family and social issues. Without appropriate intervention these problems can escalate. Identified recidivists in the study also exhibited psychological, social and family problems. These included externalising behavioural problems and social deficits. This may indicate a more severe trajectory of firesetting behaviour (Root et al., 2008). The parents of these children also lacked skills in discipline and effective punishment strategies.

Interventional approaches with more at-risk clients should be identified through assessments or screening. In Australia, there are no tools to help objectively guide firefighters to assess high- and low-risk clients. A standardised and reliable screening tool determines the intervention level needed. Firefighters are not trained or should not be expected to “assess” children or families. Without a screening tool, firefighter practitioners may be working outside of their domain of expertise as fire safety educators.

7.2 Multidisciplinary approaches

This study, along with numerous other studies, confirms that a proportion of firesetters are likely to have family problems, comorbidity with other disorders and a pathological interest with fire, underscoring the need for a multidisciplinary approach.

Evidence-based analysis has concluded that the most effective way to reduce recidivism and build skills in juvenile firesetters is within a multidisciplinary program (Sharp et al., 2006).

Best practice juvenile firesetting intervention endorses a combination of a standardised FSE component (section 5.3.5) delivered by firefighters, and a fire-specific CBT- and PMT-based intervention delivered by allied health professionals (section 5.6.2).

Research on standard practices of community FSE programs and multidisciplinary approaches in the United States and Canada have found that effective best practice firesetting intervention programs have:

- supportive infrastructure
- evidence-based program theory
- standardised protocols that provide guidelines on the delivery and content of the program, monitoring and evaluation
- standardised FSE
- evidence of effectiveness
- option to refer to mental health services
- collaborative relationships or networks with allied professionals (Bumpass et al., 1985; Kolko, 1988; Mackay et al., 2004; Oregon State Fire Marshall, n.d; Pinsonneault et al., 2002; Schwartzmann, 2002; Webb et al., 1990).

7.3 Australian juvenile firesetting intervention practices

There are no multidisciplinary approaches in Australia, with the exception of a smaller-scale program in Queensland for arson offenders called the JAOP. Chapter Six focused on the FSE component of Australian programs because this is the predominant intervention for juvenile firesetters.

This study has found that Australian programs have met minimum best practice standards for the FSE component of juvenile firesetting intervention in some areas because they have:

- appropriate content and materials (for younger children only)
- trained firefighters to deliver FSE component. This is best practice but can be flexible depending on the needs of client (i.e., if they are in a remote location then it may be more appropriate to have other practitioners deliver the program so that the family receives some intervention)
- a skill-based program that incorporated some behavioural training and basic behavioural modification strategies (except WA JAFFA, that focuses on “consequences”)

Analysis of FSE programs in Australia has identified certain areas where there are gaps between “current practice” and “best practice” for the FSE component and these include:

- poorly articulated program theories
- lack of supportive infrastructure
- some evidence of firefighter role confusion
- low dosage programs (two to three sessions). Best practice FSE recommends a higher dosage of five to six sessions (particularly if the FSE intervention is a sole component, i.e., not delivered within a multidisciplinary program)
- lack of protocols
- inappropriate content and materials for adolescent age groups
- poor monitoring and collection of data
- minimal evaluation of program effectiveness
- minimal alliances and agreement between the fire service and allied health professionals.

Many of the programs require redevelopment in some way to meet these best practice guidelines. It is important that the redevelopment of the FSE component is undertaken first to provide a sound foundation for the future development of multidisciplinary approaches.

Some recommendations are:

7.3.1 Program theory

Unclear responses emerged from the interview question “What is your program theory?” across and within state FSE programs. After analysis of participants’ responses and collation of other data sources (observations, general discussions, and site visits) current FSE program theory for the majority of Australian programs was concluded and below provides an explanation.

- Fire safety education (FSE) is based on the assumption that education about fire and fire safety leads to behavioural change.
- The program needs to be delivered by career firefighters because they have expertise, authority and credibility. They firmly believe that this factor leads to behaviour change in the juvenile firesetter.
- Because the program is skill-based, incorporating behavioural training, some basic behavioural modification strategies, and basic parenting training, the fire safety messages are more likely to be retained by the parent and children and lead to behavioural change.

There are some limitations of this theory as identified in Chapter Six, namely:

- FSE that includes knowledge and awareness about fire safety and misuse of fire may not be sufficient for pathological firesetters.

- FSE- or- consequence-based interventions that are solely delivered by firefighters may not be the right intervention to achieve behavioural changes (i.e., no recidivism, and increasing other skills).
- FSE may only stop the firesetting behaviours when the risk factors are considered low
- Use of career firefighter practitioners only may be limiting if they cannot service remote and rural clients adequately.
- There is not sufficient evidence to confirm that firefighters are the most appropriate practitioners to deliver the FSE component.
- Low-level skill-based programs may not be sufficient for pathological firesetters who need a more intensive intervention.
- The firesetting problem is not the sole domain of the fire service and needs to incorporate a model or theory that includes other professionals.

Roughly half of the FSE managers identified problems with or questioned the current “model” or theory, while others did not question the current model. The interviews indicated that around half of the FSE managers raised questions about the quality of their programs and these included such things as:

- the design of their programs
- whether they were accepting too complex case referrals
- whether they were targeting the right intervention to the right client
- whether the educational-based program was sufficient
- whether they were working beyond the scope of the program
- whether a different model that focused on building relationships with other agencies was more appropriate.

These are important and valid questions that could be explored at a national level to create some standardisation and consensus around FSE practice in Australia. In addition, four states in Australia follow the VIC JFAIP model and may not question it. Although the different states appear to talk to each other, national meetings may be beneficial to share perspectives so that each state has a voice, can learn from each other and challenge some of the assumptions of the current model in a more formalised setting.

7.3.2 Supportive infrastructure

Best practice recognises that a supportive infrastructure is fundamental. Programs considered well-established and exemplars of best practice have an infrastructure that is organised at the policy level. Some program managers of Australian FSE programs concluded that their programs were not well supported or valued in general by the fire service. Inadequate resources, funding and support were identified as barriers in most jurisdictions.

The evidence from Chapters Four and Six has concluded that “high-risk” clients participate in FSE programs in Australia and that this intervention may not be sufficiently targeted to them. Juveniles with a firmly established pattern of firesetting can have a destructive impact on themselves, family and community. It may be that community money and effort are better directed into preventing or modifying children’s preoccupation with fire before it becomes more established and difficult to change in adolescence or adulthood. This is consistent with the developmental approach to crime. Under-resourcing these programs results in ineffective interventions and may be putting communities at risk.

Without the commitment from the “top” in the fire services, the necessary infrastructure required to establish an effective evidence-based multidisciplinary approach may not come to fruition.

7.3.3 Clear roles

The firefighter practitioner has a key role in multidisciplined intervention programs.

Firefighter practitioners provide:

- screening using a validated and reliable tool to gain a picture of the juvenile firesetter as a first step in the evaluation process
- observations of the juvenile firesetter within the context of the multidiscipline team
- delivery of the standardised FSE, which is a vital component of treatment for all juvenile firesetters regardless of age, risk or motive
- a role in networking and collaborating with mental health and other allied professionals.

Firefighters do have limits to their role as identified by past research (Cole et al., 2006) and also the findings of Chapter Five. These limits include: intervening with at-risk firesetters without adequate support from allied health professionals, undertaking “assessment” and coordinating services for the family or child.

Establishment of a multidisciplinary team will automatically demarcate roles. However, establishment of these teams needs careful consideration, planning and collaboration. These efforts will take time and additional resources. However, in the interim regular debriefing or supervision and clear documentation of the practitioner’s role in juvenile firesetting intervention may be required.

Furthermore, the training of practitioners may need review, particularly the mental health component that is delivered to firefighters. While this component aims to educate practitioners about disorders, it may over-empower some to work outside of their domain. In my view, psychology education for firefighters needs to be delivered by a psychologist and should be carefully thought through in terms of what is the objective of this component.

While many of the programs have a consultant psychologist who assists practitioners with advice about families and gaining appropriate referral, the clients do not directly receive psychological intervention from an allied health professional for their firesetting behaviour (i.e., a CBT- and PMT-based program that directly targets firesetting behaviours).

7.3.4 Program protocols and components

Empirically validated screening and assessment tools, age-appropriate curriculum, and monitoring/evaluation protocols are critical in best practice.

Screening tool

A standardised validated and reliable screening tool is required to determine the intervention level needed and/or the client's risk.

Curriculum protocols and component

A best practice curriculum protocol would have a different intervention for each age level of preschool, childhood, and adolescence that is formally presented in a manual of processes and procedures. Although many programs had some features of a standardised best practice FSE for younger children, most did not provide detailed documentation of this. Some program managers suggested that they provide a different program for adolescence. However, there were no specifically tailored adolescent program protocols that took into

account their developmental needs or different firesetting behaviour. Section 1.4.3 of this thesis describes in detail the “typical” adolescent firesetter. Some managers indicated that they had modified their FSE program to accommodate adolescents. This approach appeared to be ad hoc and does not promote standard delivery, which could be measured for effectiveness.

The findings of Chapter Six indicated that most current Australian FSE curriculum protocols were not best practice standard. This is because they:

- had inadequate or no structured lessons plans
- had low dosage (approximately two to three sessions)
- were not age-appropriate and did not have a different intervention for each age level
- did not detail clear objectives and aims
- did not adequately target adolescent or “higher risk” groups
- were not culturally appropriate for all clients
- had some innovative modifications, yet most of the materials were outdated (e.g., old videos) and may not be reaching target audiences that are more “techno-savvy”
- did not present protocols in a manual format.

An appropriate curriculum protocol is essential to ensure that the right intervention is targeted to the right client. It is recommended that there is a complete revision of curriculum content, protocols and delivery and that this is done at a national level. Revisions of the content and educational strategies also require formal consultation with the Educational Department who could provide specialist guidance on formulating educational objectives, age-appropriate lesson plans and innovative teaching strategies.

Monitoring protocols and component

Collection of relevant data allows programs to define the problem, helps with the resourcing and allocation of funding, gives direction to development of intervention protocols and helps measure effectiveness of programs. Research into Australian practices in juvenile firesetting intervention indicates that there is currently minimal program or client monitoring. Some jurisdictions quoted highly successful recidivism rates of 5–10% (VIC JFAIP), but as this data is not systematically gathered across Australia it cannot be considered reliable.

Objective documentation of outcomes is best practice and client monitoring protocols could collect data on: firesetting trends, recidivism, changes in knowledge, skill and attitudes and documentation of other criminal behaviour.

Program monitoring component

The scope of the juvenile firesetting problem in Australia has not been fully estimated because statistics on firesetting are not systematically gathered at state or national levels, nor is there a centralised system that records this data. Without this data, government bodies and concerned stakeholders are not fully informed of the seriousness, cost or severity of the problem. Nor can they ascertain the impact of intervention efforts. Furthermore, funding opportunities may be lost because the scope of this problem is not known. I recommend the establishment of a national database as a central repository to collect juvenile firesetting data. The Oregon 10J form is an example of a successful system where such data has been collected.

Evaluation component

Evaluation involves assessing the data that is collected in the monitoring phase. Australian programs collect basic descriptive and demographic data, but not data that assists them in guiding or monitoring their programs or evaluating their effectiveness. Evaluation is a

critical component of best practice in the reporting of program effectiveness. External evaluation is a priority for Australian FSE program so that managers know how effective the program is and they can clarify their goals, mission, objectives and program theories and make revisions as required. It is also recommended that programs are evaluated periodically and that effectiveness be examined over longer intervals, such as a six- to 12-month follow-up with clients, to ensure that change and improvement are sustained over time.

7.3.5 Mental health services

Chapter Four results provided evidence that FSE was not enough as a stand-alone intervention for one third of clients. Although a smaller sample, this result is generally consistent with many large-scale overseas studies that have indicated that one in four firesetters will be recidivists (Kolko, 1985) or that 40% are defined as pathological firesetters (Schwartzmann, 2002). In the United States research on clinical samples, some research has reported firesetting as high as 40%, and recidivism rates of 52% for outpatients and 72% for inpatients (Kolko & Kazdin, 1988). Although we do not know the figures in Australia, if they in any way parallel those in the United States then this is a problem of high magnitude that should not be ignored. These types of statistics stress the need for more attention and involvement from mental health services in the juvenile firesetting problem.

Agencies that intervene with juvenile firesetters in Australia may not be treating the behaviour directly or documenting this as a clinical problem. There is currently no known mental health treatment for juvenile firesetters, and allied health professionals who do identify a firesetter will generally refer them to the fire service to deal with that part of the problem.

The reported high rates of firesetting and recidivism underscore the need for mental health practitioners to become skilled in treating firesetting behaviour directly. They can be readily trained to develop expertise in juvenile firesetting behaviour as an extension of their existing skills. Along with additional training, valid screening and assessment tools could be introduced into mental health services to determine the juvenile's risk. If an assessment tool indicates that the firesetter is "pathological" then this should be viewed as a "clinical" as opposed to a secondary symptom to obtain access to clinical services.

Relationship with mental health services

Some jurisdictions have formed relationships with mental health services; however, it's not a true collaboration in terms of joint "steering" of the program, funding or sharing of resources. There are only limited agreements between mental health services and the fire service in Australia. Mostly, this relationship is based on a mutual referral systems (i.e., the fire service will refer clients to mental health services and vice versa).

Collaboration with mental health services

Some of the problems in collaborating with mental health services were identified in Chapter Six as:

- long waitlists for public mental health services in Australia
- limited or not actively sought-out feedback about the client's progress between allied health agencies and the fire service
- minimal "formal" agreements or memorandums of understanding between allied health agencies and the fire service
- fragmented and uncoordinated services for clients.

Some recommendations include:

- development of a collaborative network with mental health agencies and formalised agreements that may provide more rapid services to juvenile firesetters and their families
- collaboration with key agencies or privately contracted psychologists who are skilled in working with juvenile firesetters so that they can receive treatments that target their firesetting directly.

7.3.6 Summary and Conclusion

A priority for Australian fire services is to bridge the gap between “current practices” and “best practice” for the FSE component. Recommendations have been provided to meet a standardised FSE guideline; the next step is to consider a multidisciplinary approach to the problem. The following guidelines identified in section 7.4 may facilitate this transition.

7.4 Multidisciplinary networks

Some guidelines towards a multidisciplinary team approach can include:

- capturing data about the scope of the juvenile firesetting problem to ensure effective allocation of resources and time
- having program theory and infrastructure
- stakeholder analysis (i.e., mental health agencies, human services, schools and police) for the purpose of identifying potential partners
- networking with stakeholders identified through the analysis to establish a cooperative action plan
- commissioning a champion or organisation that is committed to leading a multidisciplinary effort because of its importance to the Australian community
- working towards guidelines

7.5 Further recommendations

7.5.1 Primary prevention

State-wide campaign for targeting parents and access to ignition sources

Parents generally have more control over the home environment than children do so the significance they place on fire safety is a critical factor. It is known that children frequently light fires because they have access to ignition sources and are not supervised or monitored. Restricting access to fire sources, combined with adequate supervision, is perhaps the most realistic and effective procedure for preventing future firesetting (Humphrey, Kopet & Lajoy, 1995; TAPP-C – S. M., personal communication, 1 June 2007; Wilcox, 2006).

Parental psychoeducation about child access to ignition sources through a targeted state-wide campaign is recommended.

Primary prevention

The MFB offer primary prevention fire safety educational programs in grade prep (six years old) and again in grade six. It is recommended that a prevention program is offered in grade three (eight- to nine-year-olds). This is because evidence has suggested that children do not retain fire safety knowledge and awareness due to cognitive limitation (Satyan et al., 2004). Furthermore, there is a high prevalence of firesetting between the ages of nine and ten years. It is recommended that fire safety educational prevention should also be targeted to grade three pupils to reinforce their learning and to target groups of children who may be at risk of firesetting.

7.5.2 Other conclusions

Kolko and Kazdin (1986) risk-factor model and FRI and CFI measures

Kolko and Kazdin's risk model and assessment measures are considered reliable and have been used in the current and numerous other studies (as outlined in section 4.1.1). They concluded that there was a strong need for theory development and testing in the area of juvenile firesetting. They also asserted that their risk-factor model was tentative and may be revised.

In the process of data collection and analysis in this study, it is recommended that some FRI and CFI variables such as "knowledge" and "involvement" could be revised to include more domains. For example, the "knowledge" variable could incorporate other aspects such as the nature of fire, what firefighters do, and knowledge of hazards and flammables. The "involvement" variable could also be revised to include such aspects as the age of onset, versatility and frequency of firesetting (the firesetting history). The recommended items on the "involvement" variable are included in the TAPP-C "risk evaluator" measure that yields a score of the firesetter's level of severity, frequency and versatility, which can be useful in determining risk.

Curiosity versus fascination

Researchers have suggested that the widely used label "curiosity firesetter", used to convey low-risk, should be reassessed (Mackay and Henderson, 2006 and Kolko's motive's study). This study supports this assertion.

In personal communication with David Kolko, he suggested that the two constructs of "fascination" and "curiosity" were different, but no study has attempted to distinguish them.

This may be worthy of future investigation because “fascination” appears to be a red flag for pathological firesetting behaviours, but this needs to be validated through empirical research (D. K., personal communication, 8 June 2007).

7.6 Conclusion

This study supports contemporary risk-factor models that suggest that firesetting is multidetermined and includes individual, familial, social and environmental factors. These models suggest assessment and treatment of both fire-specific and general behavioural factors is required and this can be successfully achieved through a multidisciplinary approach.

The findings from Chapter Four have provided conditions where FSE may be appropriate as the sole intervention. However, past research, the Chapter Six qualitative evidence and findings from Chapter Four have confirmed that FSE in Australia do have high-risk clients, and that FSE may not be effective as the sole intervention. International evidence has concluded the the most effective way to reduce recidivism and build skills in juvenile firesetters is within a multidisciplinary program.

Best practice criteria have been established by reviewing the literature, through extensive interviewing, and site visits of juvenile firesetter programs that were well designed, implemented and had evidence of effectiveness. The criteria can be used as a guide for intervention with juvenile firesetters in Australia. The recommendations provided can also be used to make the necessary steps forward to bridge the gap between “current” and “best” practice.

Both fire services and allied health professionals play an important role in treatment and intervention with juvenile firesetters. This is to ensure that the clients and families receive the most effective intervention and the community is not placed at risk.

If we consider the impact of disasters such as Black Saturday and the probability of increasing climatic change that may create riskier conditions, it is important that we minimise the impact of such destructive behaviours. This is a national problem that we cannot afford to continue to ignore.

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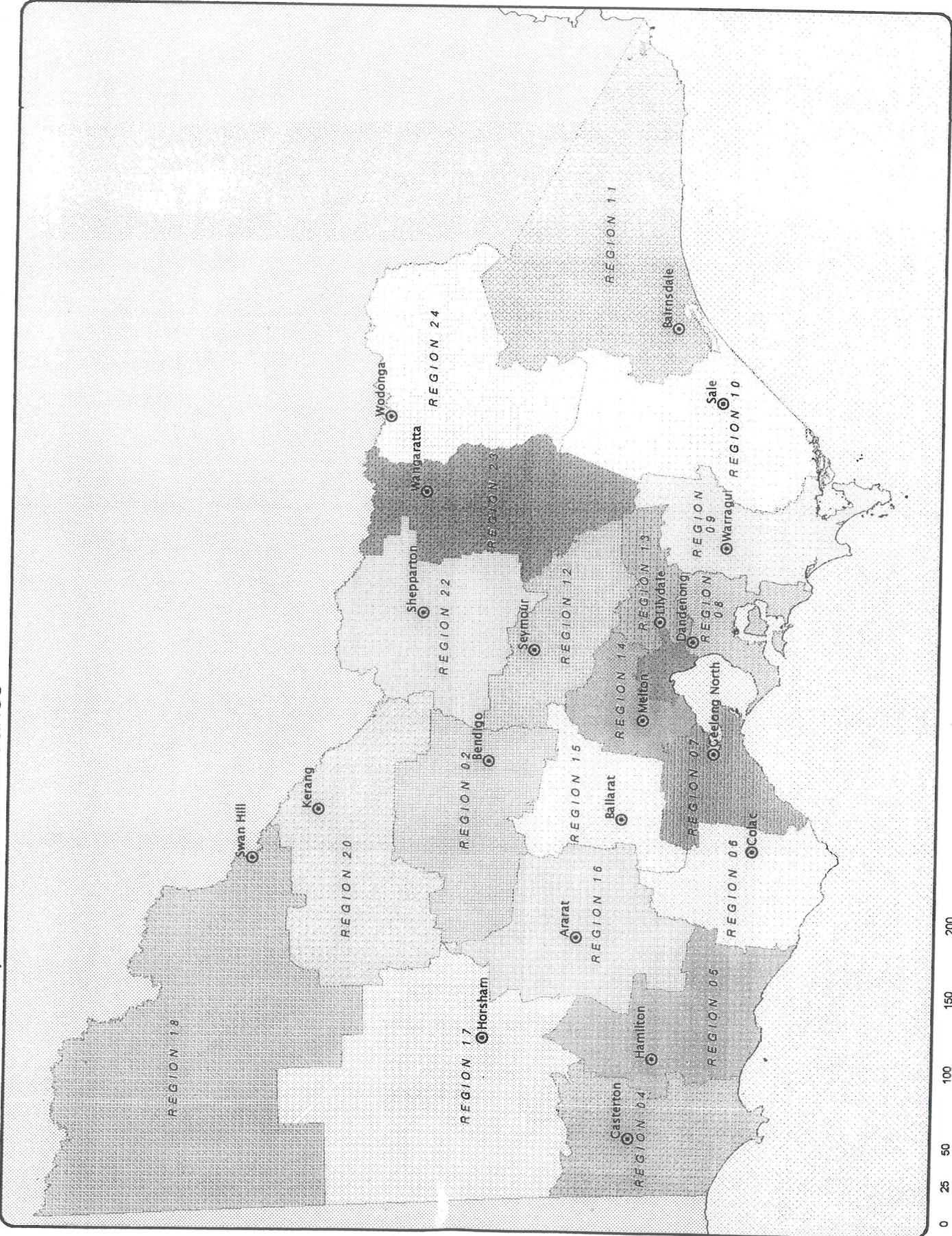
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Appendix 1: Map of Victoria

CFA Regional Headquarters and Boundaries



CFA Regional HQ's
MFESB Area



Appendix 2: JFAIP intake interview form

Appendix 3: JFAIP practitioner interview and post-intervention form

Case number:

This form is to be used at all cases. Its purpose is to provide relevant details regarding "active" cases, information for possible future reference, evaluation and statistics. This document form has four sections.

Yellow section –questions 1 to 41 is to gain an understanding of the family situation and status of the child within the family.

Blue section –questions 42 to 46 if a request for psychological support or an offer of counselling or therapy, this section only will be copied and sent to the appropriate Client Adolescent and Family Psychiatry Service. Where no request for psychological support is sought this section will be retained by the Practitioner for their own information.

*Yellow and Blue sections form the interview. **Bold** questions maybe asked of the parent/guardian/carer (with respect to the young person's age and maturity).*

Grey section –suggested resources the practitioner may use during the interventions that would be suitable to the young person.

Green section - to be completed by the practitioner at the completion of each Intervention

ALL SECTIONS ARE TO BE COMPLETED AND FORWARDED TO JFAIP OFFICE FOR FILING.

Confidentiality Agreement.

All information obtained in the Juvenile Fire Awareness and Intervention Program is treated as **private** and **confidential**. It will not be disclosed to any person, organisation or Government department without the consent of the participating young person's parent/guardian/carer unless disclosure is required by law or is necessary to protect a person's safety or welfare, subject to the following:

- (a) Statistical data that does not identify any individual may be published from time to time; and
- (b) The young person's status in the program may be disclosed to the person or organisation that made the referral. The wording of the disclosure will be limited to either: "participating in the program"; "completed the program"; or "did not complete the program".

JFAIP Parent/Guardian/Carer Declaration.

I have read and understood the "confidentiality agreement" above.

Name
[Parent/Guardian/Carer]

Signed:

Date:/...../.....

JUVENILE FIRE AWARENESS AND INTERVENTION PROGRAM

METROPOLITAN FIRE BRIGADE & COUNTRY FIRE AUTHORITY

J.F.A.I.P Interview Form.

Case number:
Interview Date:

Practitioner:

Practitioner note: Questions 1 to 30 (BOLDED QUESTIONS) may be asked of the parent/guardian/carer (with respect to the young persons age and maturity).

1. **Young person's First Name** **Preferred Name**.....
2. **Young person's Surname** 3. **Male** **Female**
4. **Young person's Age** 5. **Date of Birth** ___ / ___ / ___
6. **Address**
7. **Suburb** 8. **Postcode**.....
9. **Telephone (H)** **(W)** **(Mob)**
10. **Interview conducted with**
 Mother **Father** **Carer/Guardian** **Other**
11. **Name(s), age and relationship of any other member of the household:**

Name	Relationship i.e mother, father etc	Age (optional for adults)

12. **Other family Surnames**

13. **Adults' relationship to young person:**
- | | |
|---|--|
| <input type="checkbox"/> Natural mother and father | <input type="checkbox"/> Natural mother only |
| <input type="checkbox"/> Natural father only | <input type="checkbox"/> Adopted/Foster Parents |
| <input type="checkbox"/> Carer | |

14(a) **Mother's / Father's Marital Status:** only applicable if living with birth parent(s)

Married or De Facto Relationship

Divorced, Separated, Single or Widowed

14(b) **Occupation of primary household earner?**

15. School Attending..... 16. Grade/Year

17. MFB / CFA* Zone / Region**
* -strike out whichever is not applicable. ** -enter Zone or Region number.

18. Referred From
- O.I.C – Fire Call
 - DHS – Mental Health Services
 - Family Doctor/Paediatrician
 - Self Investigation
 - Other Agency (specify)
 - Police
 - DHS-Child Protection
 - School

19. How old was the young person when they first showed any interest in playing with or lighting fires?
3 4 5 6 7 8 9 10 11 12 other

20. Have any of your other children played with matches or light fires?
 Yes No

21. Do you ever provide the young person with the opportunity to light fires under supervision? (eg: BBQ, stove or heater)
 Yes No

22. Rate the young person's interest in fire? (0 being no interest and 10 extremely interested)
0 1 2 3 4 5 6 7 8 9 10

23. Have you ever tried to explain the dangers of playing with matches/lighters or lighting fires?
Before the fire Yes No
After the fire Yes No

24. Why did the young person play with the matches/cigarette lighter or light the fire? (tick only one)
 Curiosity/Interest
 Anger/Revenge
 Malicious Mischief
 Attention Seeking
 Peer Pressure
 Don't Know
 Other (specify)

25. How did you first react? (tick only one)
 Dismissed as insignificant
 Felt distressed/helpless
 Felt angry
 Punished child How

26(a) Has the young person ever received help or therapy from a professional ie psychologist, psychiatrist, school counsellor or social worker?
 Yes No

26(b). Is *the young person* still receiving help or therapy?
 Yes No

26(c). IF YES: What other services/agencies are involved with the family

- 1
- 2
- 3

27. Sometimes the *young person* has other problems as well as firelighting. Would you like to seek further help for *the young person's* behaviour(s)?
 Yes No

28. Has *the young person* ever been in trouble with the Police or Children's Court?
 Yes No

IF YES: for what reason

29. Has *the young person* been placed in an institution or in foster care?
 Yes No

30. Does anyone in the house smoke?
 Yes No

31. How many fires have been lit that have caused injury or substantial property damage?
Total fires _____ In the last 12 months _____

32. How many fires have been lit that have **NOT** caused injury or substantial property damage?
Total fires _____ In the last 12 months _____

33. When was the last time there was playing with the matches/cigarette lighter or a fire started?
 0-1 week 1-2 weeks
 2-4 weeks 4-8 weeks
 Over 8 Weeks

34. Where did this happen? (specific area to be recorded)

35. What was use?
 Matches Lighter Other (specify)

36. Where did you get it?
 Found Bought Went out of the way to get
 Other (specify).....

37.(a) Do you know where matches/ cigarette lighters are kept in the home?
 Yes No

37.(b) If yes, where?

Note: ensure all matches and lighters are kept out of the reach of all children.

JUVENILE FIRE AWARENESS AND INTERVENTION PROGRAM

METROPOLITAN FIRE BRIGADE & COUNTRY FIRE AUTHORITY

38. Tick the appropriate response to the following.

Did you plan the fire?
 Yes No Don't know

Were you trying to destroy property or hurt someone?
 Yes No Don't know

Did anyone encouraged or talk you into starting the fire?
 Yes No Don't know

How did you feel after the fire?
 Happy Sad Frightened
 Scared Panic No Feelings

Did you stay to watch the fire?
 Yes No Don't know

Did you try to get help?
 Yes No Don't know

After the fire did *the young person*:

Admit, they lit the fire

Lie, about the fire

Neither, Admit or Lie

39(a) Smoke Alarm information:

Installed Yes No

Tested Working Not working

39(b) Family pack left:

Yes No

COMMENTS:

CHILDHOOD FIRELIGHTERS STUDY - QUESTIONS FOR CHILD

PRACTITIONER INSTRUCTIONS: the following questions should only be completed by the young person who has been lighting fires in the last 12 months, who is aged 10 years or older.

40. Rate your interest in fire? (0 being no interest and 10 extremely interested)

0 1 2 3 4 5 6 7 8 9 10

41.

How were you feeling <u>before</u> each fire?		
Incident	Nature of Fire	Your feelings
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

44.

Does the *young person*?

Get along with young people of the same age easily?
 Yes No

Make new friends easily?
 Yes No

Have problems with their schoolwork?
 Yes No

IF YES: please describe problems

.....

.....

.....

.....

Have behaviour problems other than firefighting (at home or school)?
 Yes No

IF YES: please describe problems

.....

.....

.....

.....

Have any health problem or a disability?
 Yes No

IF YES: please describe problems

.....

.....

.....

.....

45.

Likes/Hobbies

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

46.

Any other comments which might add to the understanding of the child?

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

PROPOSED INTERVENTION RESOURCE LIST.

Do not send to Child Adolescent and Family Psychiatry Service when making a referral this is for **Practitioner use only.**

Questionnaires

- Questionnaire A
- Questionnaire B
- Questionnaire C
- Questionnaire Flammable Liquids
- Questionnaire Flammable Gases

Videos

- Matches are tools not toys
 - Stop the home fires burning
 - Bedroom fire
 - Mattress fire
 - Christmas tree Fire
 - You're fired
 - It couldn't happen to me
 - Bradford – soccer stadium
 - Consequences of Fire
 - Kids Hospital (NZ)
 - Janda Marra
 - Franklin and the fire**
 - Rescue 911**
 - A countdown to disaster**
 - Fire, a cause for alarm**
 - Lounge fire**
 - Pressure can explosion**
 - Burns camp**
- * For loan only –contact office.*

Books

- Olivia -Good fires Bad fires book.
- Capt Barney and the house on fire.
- Fire dog Kitt gets his badge.
- Little Big Book of Helpers

Activities / Resources.

- Good fires/bad fire -flip cards.
- Workbook –junior, intermediate, senior
- Stop drop cover and roll
- Crawl down low and go go go
- Fire triangle
- Home escape plan

Reward

- Star Chart
- Agreement

JUVENILE FIRE AWARENESS AND INTERVENTION PROGRAM

METROPOLITAN FIRE BRIGADE & COUNTRY FIRE AUTHORITY

Post-Intervention Form.

Case number:
Practitioner:

This form is to be completed by the practitioner at the completion of each Intervention.

The Practitioner must detail on this form date/time of intervention, who sat in on the interview/intervention, where intervention was conducted, what activities used –videos and resource aids and important observations made during the intervention.

Child's First Name:	Preferred Name:
Child's Surname:	<input type="checkbox"/> Male <input type="checkbox"/> Female
Child's Age:	Date of Birth ___ / ___ / ___
Address:	
Telephone:	
(H) (W) (Mob).....	

QUESTIONS SHEET A

1 Some fires are good fires and some are bad. Which of these fires are good and which are bad, and why?

A BUSHFIRE	GOOD or BAD	WHY _____
A BARBECUE FIRE	GOOD or BAD	WHY _____
A FIRE IN THE FIREPLACE	GOOD or BAD	WHY _____
A HOUSE ON FIRE	GOOD or BAD	WHY _____
A CAMPFIRE	GOOD or BAD	WHY _____
PLAYING WITH FIRE	GOOD or BAD	WHY _____

2 What is the FIRST thing you should do if something is on fire in your house?

.....

3 Can fire hurt you? (If yes) How can it hurt you?

.....

4 If your clothes catch on fire, what should you do?

.....

5 Can smoke hurt you? (If yes) What does it do to you?

.....

6 How do you move through a house which has lots of smoke in it?

.....

7 Matches and lighters are not toys, what should you do if you find matches or lighters anywhere?

.....

8 If in a fire should you hide from your fireman friends?

.....

9 Would you like to be **OUR** friend by being our Junior Fire Safety Officer?

Yes No

What do you think a Junior Fire Safety Officers Role is?

QUESTION SHEET B

1. What would you do if your clothes were to catch fire?

.....

2. Some clothes catch fire quicker than others. Can you explain?

.....

3. What would you do for someone with a minor burn?

.....

4. Can Doctors get rid of serious burn scars?

.....

5. What is the most common cause of death in house fires: smoke or flame and explain why?

.....

6. What is the best way to move through smoke: crawl, walk, or run? Why?

.....

7. What is a flammable liquid?

.....

8. In a flammable liquid fire is it the liquid itself or the vapours which burn?

.....

9. What number would you call in an emergency?

.....

10. Do any of your friends carry out fire experiments? If so what type?

.....

11. Do you have a home evacuation plan?

.....

12. What does "Being responsible with fire" mean?

.....

.....

.....

QUESTION SHEET C

1. Are you aware of the dangers of "Fire Play" involving Pressure Pack cans, if so tell me what can happen?

.....

2. What dangers are there in igniting Pressure Pack cans?

.....

3. What is the correct way to dispose of Pressure Pack cans?

.....

4. What does the term flammable liquid mean to you?

.....

5. With a flammable liquid fire is it the liquid or the vapour that burns?

.....

6. Why are some types of glue dangerous?

.....

7. What first aid should be given to someone who has minor burns?

.....

8. What risks are there associated with L.P.G?

.....

9. What is an explosion?

.....

10. Have you ever been involved in fireplay, which resulted in an explosion?

.....

11. Are you aware of any of your friends conducting dangerous fire experiments? Explain?

.....

.....

12. Do you smoke? (If no go to Q. 14)

.....

13. Are you aware of the dangers of smoking in the grasslands/bush etc.?

.....

14. What does Total Fire Ban mean?

.....

15. Are there any warning signs, when an electric fire is imminent? Give Examples?

.....

16. Do you know the consequences of being charged or convicted of arson? What effect would it have on your life or future employment prospects?

.....

17. Are you aware of the misleading information that's frequently shown on T.V, DVD, Video and Films?

.....

18. Give an example of the above question?

.....

19. Do you know what "Being responsible with fire" means?

.....

.....

.....

.....

FLAMMABLE LIQUID QUESTIONS

1. Do you know what a flammable liquid is?

.....

2. Is it the liquid or the vapour that actually burns?

.....

3. Are flammable liquid vapours heavier or lighter than air?

.....

4. Are some flammable liquids more dangerous than others, if so why?

.....

5. Do you have flammable liquids at home?

.....

6. How can you identify flammable liquid containers?

.....

7. What is the correct way flammable liquids should be stored?

.....

8. What flammable liquids have you used in fireplay?

.....

9. Where did you get the flammable liquids?

- Home
- Shop
- Friend
- Other

10. What does "Being responsible with fire" mean?

.....

.....

.....

FLAMMABLE GAS QUESTIONS

1. Do you know the difference between a flammable gas and a non-flammable gas?

.....

2. Are flammable gases heavier or lighter than air?

.....

3. Do you know the different flammability ranges for Butane, Propane etc?

.....

4. Do you know what a BLEVE is?

.....

5. Do you know you can burn yourself with gases?

.....

6. What is the explosive potential of a lighter?

.....

7. What is meant by expansion ratio when talking about liquefied or compressed flammable gases?

.....

8. What does "Being responsible with fire" mean?

.....

.....

.....

Appendix 5: JFAIP curriculum – what is included in the intervention?

JUVENILE FIRE AWARENESS and INTERVENTION PROGRAM.

TITLE: The Intervention	Subject: PROGRAM
	Guideline No: JFAIP05/001
Version Number: 1/2006	Dated: January 2006. Page Number: 1 of 2

The program has three stages: interview, intervention and reward.

All interventions must be conducted within **ten days** of the interview or previous intervention.

The intervention stage operates for a period between two to four weeks, depending on case circumstances. A minimum of two interventions are required for each case. This ensures the child/young person's level of understanding regarding fire safety can be adequately determined.

A single intervention may occur depending on the practitioner's individual feelings and discretion, but also relevant to the seriousness and nature of the fire incident. (Program Co-ordinator to be notified)

The practitioner makes it clear that a room should be set aside for each session with the television, radio etc turned off. There should be **NO** other children or activity going on in the room. The parents are strongly encouraged to be present during the session or in "earshot" of the activities and discussion.

On average, the practitioner initially attempts to keep visits spaced one week apart in order to maintain continuity. Once again, this is flexible depending on the family circumstances. Each session takes approximately one hour.

The intervention consists of three components:

- Trust building
- The syllabus
- Positive reinforcement/rewards

Trust Building

This process takes place immediately. The Practitioner aims to develop a positive relationship with the child/young person through discussions about the child's/young person's hobbies (which may have been communicated to the practitioner during the interview), and any other relevant interest such as pets etc.

During this time the practitioner volunteers information about themselves that contributes to the relationship.

It is during this time that the initial "Ground Rules" are established in relation to the home environment from each visit.

The syllabus is not initiated until rapport has been established between the practitioner and the child/young person.

JUVENILE FIRE AWARENESS and INTERVENTION PROGRAM.	
TITLE: The Intervention	Subject: PROGRAM
	Guideline No: JFAIP05/001
Version Number: 1/2006	Dated: January 2006. Page Number: 2 of 2

The Syllabus

The aim of the syllabus is to increase the child/young person's understanding of the elements of fire and to develop fire safety awareness.

There are two aspects of the syllabus:

- Questionnaires -used by the practitioner based on the age and maturity of the child/young person. The practitioner covers all questions on the sheet. When it is apparent that the child/young person's knowledge in a particular area is lacking, the practitioner endeavours to educate the child/young person to remedy this.
- Activities –are practical in nature to develop the child/young person's fire safety awareness. These may include:
 - Development of a fire escape plan for the family home.
 - Responsibility for the maintenance of the home smoke alarm.
 - Taking on the role of the Junior Home Fire Safety Officer.

Younger children may also be asked to do specific activities such as draw pictures about good fires and discuss what they have drawn.

The adolescent may be asked to write an essay or do a project about fire safety or the storage of flammable liquids around the home.

Positive Reinforcement/Rewards

Throughout the program there is a strong emphasis on providing the child/young person with positive verbal feedback for non – firelighting or great work.

The child/young person (according to age and maturity) may be given a fire related sticker, poster, cloth badge as a small reward for work well done.

Appendix 6: JFAIP contracts and rewards (star charts and contracts)



AGREEMENT



I, _____
will not use matches, lighters or start a fire of any description,
that could be a danger to myself or others, or may damage any
property.

This agreement will have effect at least until

_____ and hopefully forever after that.*

If I am successful in upholding this agreement I will be
entitled to _____

However, if I break this agreement I will lose the privelege of

_____ for a period of _____

Signed: _____ Date: _____

Witnesses: _____

Parent/Guardian: _____

*Please note that in order for the above entitlement to occur we require you to
contact us on or shortly after the agreement date.

Star Chart

FOR:



Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Week 13*

**Parents/Guardians: Please note that for the reward to occur you are to contact J.F.A.I.P before, on or shortly after the 13th Wee*

Appendix 7: Details of the JFAIP practitioners “kit”

JUVENILE FIRE AWARENESS and INTERVENTION PROGRAM.

TITLE: Practitioner Kit

Subject: PROGRAM

Guideline No: JFAIP02/001

Version Number: 1/2006

Dated: January 2006.

Page Number: 1 of 2

The practitioner kit remains the property of the Juvenile Fire Awareness and Intervention Program and must be returned to the JFAIP Office on the Practitioner's decision to withdraw from the program.

It is the responsibility of the Practitioner to use the kit according to the values and beliefs of the program, in that the Practitioner will use the contents of the kit according to the:

1. Age and maturity of the child/young person.
2. Child/young person's firesetting behaviours i.e. frequency, severity, motive etc and not use any of the kits contents in a manner that will increase the child/young person's:
 - Behaviour.
 - Fascination or curiosity to fire.
 - Knowledge to other unsafe fire behaviours.

It is the responsibility of the Practitioner to ensure their kit is updated with minimum quantity of items after each case and before every new case (replacements available through JFAIP Office).

JUVENILE FIRE AWARENESS and INTERVENTION PROGRAM.

TITLE: Practitioner Kit	Subject: PROGRAM
	Guideline No: JFAIP02/001
Version Number: 1/2006	Dated: January 2006. Page Number: 2 of 2

ITEMS	Minimum quantity
JFAIP Manual	1
Diary	1
Folders of Forms	
➤ Information Handouts	
▪ JFAIP Brochures	10
▪ JFAIP Posters	5
▪ JFAIP Profiles (A4 sheet)	5
➤ Letterheads (blank)	5
➤ "With Compliments" Slips	10
➤ Introduction Letter	5
➤ Parent Requirements Letter	5
➤ Interview, Referral, Post Intervention	1 Pad
➤ Evaluation Form	5
➤ Question Sheets	
▪ Sheet A	3
▪ Sheet B	3
▪ Sheet C	3
▪ Flammable Liquids	3
▪ Flammable Gases	3
➤ In Case of an Emergency	3
➤ Home Escape Plan Sheets	3
➤ Star Charts (appliance, helmet & dog)	3 of each type
➤ Contract/Agreement Forms	1 Pad
Training Aids	
➤ Good Fires/Bad Fires Flipchart	1
➤ "Good Fires/ Bad Fires Olivia" Book	1
➤ "Kitt gets his Badge" Book	1
➤ "Capt Barney and the House Fire" Book	1
➤ Video	1
➤ DVD	1
➤ Fire Triangle Jigsaw	2
Workbook -junior	2
Workbook -intermediate	2
Workbook -senior	1
Kitt the Dog Stamp	1
Assortment of Stickers	
Smoke Alarm	1
9 Volt Batteries	2

Video Resources used at Interventions

Junior Level.

Matches are tools not toys –this video covers issues of matches and lighters, stop drop, cover and roll, and crawling low in smoke. Ideal for primary school children. (8 minutes)

Stop the home fires burning –MFB & CFA production, by taking a few moments to view this video you'll have a much greater chance of avoiding the devastating effects of fire. Be Aware, Be Alarmed, Be Safe. (7 minutes)

Franklin's Fire –animated fire safety awareness video for children. The town where Franklin lives has a fire which burns down the general store, Franklin tries to make his house fire safe. Franklin and his parents discuss safe and unsafe fires, smoke alarms, home escape planning, home hazards and calling the fire brigade.

Intermediate Level.

Bedroom fire –shows an initial fire lit by a single match and it's rapid spread through a room, the heat build-up, and the smoke given off. (5 minutes)

Mattress fire –shows an initial fire lit by a single match and it's rapid spread through a room, the heat build-up, and the smoke given off. (5 minutes)

Christmas Tree Fire –shows an initial fire lit by a single match and it's rapid spread through a room, the heat build-up, and the smoke given off. (2 minutes)

You're fired –exciting video about fire hazards. The powerful message is "be careful with fire: fire won't be careful with you". (12 minutes)

It couldn't happen to me –MFB produced this video deals with the issue of juveniles playing with flammable liquids and pressure spray cans. (7 minutes)

Rescue 911 –boys playing petrol. The video shows how dangerous the naked flame or hot surface and how quickly a flammable liquid can ignite when misused. (Duration 10 minutes)

Burns camp –produced by Today Tonight. A camp set up for children who have scarring from burn or scalds. (Duration 7 minutes)

Senior Level.

Bradford – soccer stadium fire that shows rapid spread of fire, peoples reactions, stop drop and roll, and evacuation. (7 minutes)

Consequences of Fire – examines the effect fire can have on society and ourselves. By using a test facility to show speed of fire from a small spark to 'flashover', personal consequences if burnt and the judicial system if caught lighting a fire to cause damage. (12 minutes).

Kids Hospital (NZ) – this video details one child's trauma of being burnt.

Janda Marra – fire injury is one of the most debilitating and painful experiences a person can endure. Its along road to recovery. This is a heartbreaking story of one child's therapy.

Appendix 8: The Firesetting Risk Interview

FIRESETTING RISK INTERVIEW (FRI)
(Parent)

Instructions for Administration and Scoring

The FRI was designed to evaluate several dimensions believed to be associated with firesetting, based on the clinical and empirical literature. The measure is described in the following source: Kolko, D.J., & Kazdin, A.E. (1989). Assessment of dimensions of childhood firesetting among patients and nonpatients: The Firesetting Risk Interview. *Journal of Abnormal Child Psychology* 17, 157-176. For purposes of clarification, there are 86 items in the FRI (not 92, as was implied in the article). The item pool began with 92 (not 99) items, six of which were deleted for psychometric reasons.

Due to the inclusion of diverse items, the various dimensions or sections incorporate alternative response choices. This makes the interview somewhat complicated to complete. For this reason, the measure has been administered in interview-format. The dimensions reflect fire-specific and non-fire-specific content, as reflected below:

Specific to Fire

Curiosity about Fire (A)
 Knowledge of Fire Safety (B)
 Fire Skill/Competence (C)
 Complaints/Concern about Fire Behavior (G)
 Exposure to Peer/Family Models (H)
 Involvement in Fire-Related Activities (I)
 Parental Fire Awareness/Preparation (J)
 Early Experiences with Fire (K)

Not Specific to Fire

Expression of Positive Behaviors (D)
 Expression of Negative Behaviors (E)
 Exposure to Supervision/Discipline (F)
 Frequency of Mild Punishment (L)
 Efficacy of Mild Punishment (M)
 Frequency of Harsh Punishment (N)
 Efficacy of Harsh Punishment (O)

The FRI is scored simply by summing the items in (and deriving a separate score for) each of the 15 dimensions. Because the specific items associated with the final four dimensions may be difficult to determine, the items in each dimension are described here: L (71, 73, 75, 77, 79), M (72, 74, 76, 78, 80), N (81, 83, 85), and O (82, 84, 86).

(9/89)

FIRESETTING RISK INTERVIEW (FRI)
(Parent)

Case#: _____ Your child's name: _____

Your name: _____ Your relationship to child: _____

Today's Date: ___/___/___ Interviewer: _____

FIRESETTING RISK INTERVIEW (FRI)
(Parent)

Case#: _____

Today's Date: ___/___/___ Interviewer: _____

We are asking you to provide information about your child's exposure to and involvement with fire. You will also be asked other questions about fire and your child's behavior in general. Most of the questions can be answered by selecting a number from 1 to 5, although some questions ask you to use your own words.

A. Curiosity about Fire

	<u>Not at All</u>	<u>Somewhat</u>	<u>Very Much</u>		
1. How curious is your child about fire?	1	2	3	4	5
2. How much does he want to play with fire?	1	2	3	4	5
3. How much does he think that fire is special or magical?	1	2	3	4	5
4. How much does he get excited or fascinated when fires or fire-related topics are mentioned in everyday conversation?	1	2	3	4	5
5. How much does he like to talk about fire?	1	2	3	4	5
6. How much does he want to visit exhibits or watch movies about fires, or to actually watch a real fire?	1	2	3	4	5
7. How much does he read and attempt to learn about fire and its uses?	1	2	3	4	5

B. Knowledge of Fire Safety

8. To what extent does your child understand his own behavior, in general?	1	2	3	4	5
9. To what extent does he know different facts about fires or firefighters?	1	2	3	4	5

	<u>Not at All</u>		<u>Somewhat</u>		<u>Very Much</u>
10. To what extent does he understand why playing with fire is dangerous?	1	2	3	4	5
11. To what extent does he know what things will burn and what things won't?	1	2	3	4	5
12. To what extent does he know how to use matches or lighters correctly?	1	2	3	4	5

C. Fire Skill/Competence

13. To what extent does he know what to do if something catches fire suddenly?	1	2	3	4	5
14. To what extent has he been taught to use matches or lighters correctly?	1	2	3	4	5
15. To what extent does he play safely when alone or with others?	1	2	3	4	5
16. To what extent is he able to light a fire and put it out correctly?	1	2	3	4	5
17. To what extent is he allowed to use matches or lighters at home?	1	2	3	4	5

D. Expression of Positive Behaviors

"HOW OFTEN DOES HE EXPRESS HIMSELF IN EACH OF THE FOLLOWING WAYS": [positive behaviors]

18. by touching or using some form of pleasant physical contact?	1	2	3	4	5
19. by complimenting or praising others?	1	2	3	4	5
20. by laughing or using humor/jokes?	1	2	3	4	5
21. by providing attention to others?	1	2	3	4	5
22. by making pleasant conversation?	1	2	3	4	5

G. Complaint/Concern about Fire Behavior Not at All Somewhat Very Much

- | | | | | | |
|---|---|---|---|---|---|
| 39. How often do you receive complaints about his behavior, in general, from others in the community? | 1 | 2 | 3 | 4 | 5 |
| 40. To what extent do you receive complaints about his play with fire from others in the community? | 1 | 2 | 3 | 4 | 5 |
| 41. How often do you worry about him playing with fire when he is left unattended? | 1 | 2 | 3 | 4 | 5 |

H. Exposure to Peer/Family Models

- | | <u>Not at All</u> | | <u>Available/
Not easy
to get to</u> | | <u>Available/
easy to
get to</u> |
|--|-------------------|------------|--|--------------|--|
| 42. How available are matches, lighters, or other fire-starting materials at his school or in his friends' homes? | 1 | 2 | 3 | 4 | 5 |
| 43. How available are matches, lighters, or other fire-starting materials in or around your home? | 1 | 2 | 3 | 4 | 5 |
| | <u>Not at All</u> | | <u>Some of
the time</u> | | <u>Almost Always</u> |
| 44. How often is he in the presence of friends who smoke anywhere outside the home (e.g., school, friends' homes)? | 1 | 2 | 3 | 4 | 5 |
| 45. How often is there cigarette or other smoking in your home? | 1 | 2 | 3 | 4 | 5 |
| | <u>None</u> | <u>One</u> | <u>Two</u> | <u>Three</u> | <u>Four/More</u> |
| 46. How many times have other family members been burned or hurt because of a fire in the last year? | 1 | 2 | 3 | 4 | 5 |
| 47. How many people who live at home including yourself, smoke cigarettes or other smoking? | 1 | 2 | 3 | 4 | 5 |
| 48. How many family members have an interest or fascination with fire? | 1 | 2 | 3 | 4 | 5 |

	<u>None</u>	<u>One</u>	<u>Two</u>	<u>Three/</u> <u>Four</u>	<u>Five</u>
49. How many family members has he observed playing with matches or lighting fires in the last year?	1	2	3	4	5
50. How many people that you know have been burned or hurt because of a fire in the last year?	1	2	3	4	5
51. How many times has he ever been burned or hurt because of a fire in the last year?	1	2	3	4	5
52. How many times have other family members been burned or hurt because of a fire in the last year?	1	2	3	4	5
53. How many of his friends smoke or experiment with smoking?	1	2	3	4	5
54. How many unsafe fires have there been in your neighborhood in the last year?	1	2	3	4	5

I. Involvement in Fire-Related Activities

	<u>None</u>	<u>One</u>	<u>Two</u>	<u>Three</u>	<u>Four/More</u>
55. How many times has your child ever hidden matches, lighters, other fire-starting materials?	1	2	3	4	5
56. How many times has your child left burn marks on things in your home?	1	2	3	4	5
57. How many times has anyone, like teachers, the police, or your neighbors, told someone in your family about your child playing with fire?	1	2	3	4	5

J. Parental Fire Awareness/Preparation

"PLEASE ANSWER NO (0) OR YES (1) FOR THESE QUESTIONS:"	<u>NO</u>	<u>YES</u>
58. Do you usually give instructions about fire to the babysitter or others who take care of your children?	0	1
59. Do you know the phone number for the local fire brigade?	0	1
60. Do you have a fire extinguisher in your home?	0	1
61. Is there a smoke alarm in your home?	0	1
62. Have you ever received any formal fire education or training?	0	1
63. Have you ever received any guidance or general information about children playing with fires?	0	1
64. Have you ever told your child why it is bad to play with fire?	0	1
65. Have you ever practiced fire-escape drills with your child/ren?	0	1

K. Early Experiences with Fire

	<u>NO</u>	<u>YES</u>
66. Were there any smokers living in your home more than 1 year ago?	0	1
67. Did any members of your family play with matches or lighters, or light fires more than 1 year ago?	0	1
68. Was your child exposed to any neighborhood fires or to other people who played with fire more than 1 year ago?	0	1
69. Did your child ever play with matches/lighters or fire more than a year ago?	0	1
70. Did your child ever show any special interest in fire more than 1 year ago?	0	1

Appendix 9: The Child Firesetting Interview

Children's Firesetting Interview (CFI)¹

Child's Name: _____

Case # : _____

Practitioner: _____

Interviewer: _____

Children's Firesetting Interview (CFI)¹

Interviewer _____ Date: __ / __ / __

CASE #: _____

Instructions to the Interviewer

Administration: This semi-structured interview is designed to elicit information from the child regarding several dimensions which may help us to better describe and predict firesetting behavior. The interview contains two different formats for recording the child's responses. The more common format (multiple-choice) involves recording the child's response which matches one of the available answers included on this form, such as, a number from "1 to 5" or a "Yes or No". To help the child remember what each available answer choice means, a card that lists each selection should be explained and given to the child before questioning begins.

The other format (fill-in) involves simply writing down the child's answer verbatim, such as, an explanation or a number. It should be obvious when each format is employed.

If the child says he/she doesn't know an answer, say "Are you sure?" If the child fails to respond, use 1 or 2 prompts to elicit a response (e.g., "What would you say?" "Think about it for a second and then tell me."). If these prompts fail, simply fill in a "DK" (don't know) in the space provided.

Scoring: To score the CFI, simply sum the scores for the items in each domain (A, B, C, etc.). Use this information to identify domains that suggest low levels of desirable behaviors (C, D, F) or high levels of undesirable behaviors (A, B, E, etc.).

Instructions to the Child

We are interested in what children, like you, know about fire. Please listen carefully to my questions and try to answer each question as best you can. For some of the questions, I'll show you a card from which you can choose the best answer. The answer could be: 1) not at all true, 2) very little, 3) somewhat, 4) a lot, or 5) very much true. Here, you pick only one of these answers or choices.

For the other questions, I just want you to answer the question in your own words. I'll write down your answers as we go through the questionnaire.

¹Source: Kolko, D.J., & Kazdin, A.E. (1989). The Children's Firesetting Interview with psychiatrically referred and nonreferred children. *Journal of Abnormal Child Psychology*, 17, 609-624. Certain items were based on questions contained in the Child Questionnaire published by the Federal Emergency Management Agency (1979), Washington, D.C. Item #35 is based on the work of Jones, R.T., Kazdin, A.E., & Haney, J. (1981), *Journal of Applied Behavior Analysis*, 14, 249-260.

Children's Firesetting Interview (CFI)

Case #: _____ Interviewer _____ Date: __/__/__

Scale for #'s 1-8: (Give card to child):

1 = not at all; 2 = very little; 3 = somewhat; 4 = a lot; 5 = very much

A. Curiosity about (or attraction to) fire

1. How curious are you about fire (i.e., want to know more about it)? () 1
2. How much do you think about fire? () 2
3. How much do you want to play with fire? () 3
4. How special or magical is fire to you? () 4
5. How excited or interested do you get when people talk about fires? () 5
6. How much do you like to visit exhibits or movies about fires, or to watch a real fire? () 6
7. How much do you like to read about and learn about fire, and the right way to use it? () 7
8. How much do you like to talk about fire, rather than other things? () 8
9. What do you like most about fire?¹ _____ () 9

1 = Nothing

2 = Heat/Cooking/Light

3 = Observing fire (e.g., color, movement, campfire) or firefighters, or some other contact with fire

4 = Fire play or use without burning (e.g., use for cigarettes)

5 = Use of fire to burn, hurt, control, or influence (e.g., power property destruction, killing)

10. When you think about fire, what do you think about?¹
_____ () 10

1 = Nothing/Fire safety/Concern about injuries or destruction

2 = Heat

3 = Candles/Colors/Flames

- 4 = Matchplay, camping, fireplace, paper burning
- 5 = Lighting things on fire/Excitement/Supernatural

¹ "Other responses should be assigned a score for that item with which they are most closely associated; otherwise, assign a middle score of 3.

B. Involvement in fire-related activities

11. Did you ever set off a fire alarm or make a false call to the fire brigade when there really wasn't any fire or smoke around?

1 = NO

YES (If yes: How many times?) () 11

2 = one

3 = two

4 = three-five

5 = six or more

12. Did you ever hide matches, lighters, or other fire-starting materials?

1 = NO

YES (If yes: How many times?) () 12

2 = One

3 = Two

4 = Three-Five

5 = Six or more

13. Did you ever leave burn marks on things in your home?

1 = NO

YES (If yes: How many times?) () 13

2 = One

3 = Two

4 = Three-Five

5 = Six or more

14. Did anyone, ever tell someone in your family about your playing with fire? For example, someone from the school, the police, or your neighbours?

1 = NO

YES (If yes: How many times?) () 14

2 = One

3 = Two

4 = Three-Five

5 = Six or more

C. Knowledge about Combustibles

15-29. Now I'm going to mention a lot of different things. I want you to tell me if it will or will not burn when you touch it with a lighted match. So, answer YES (it will) or NO (it won't) for each item. Guess if you have to. (Code number corresponding to answer):

	<u>0</u>	<u>1</u>		
15. Chalk that you would use to write on a blackboard	Y	N	DK	() 15
16. Aluminum cans, like a Coke can	Y	N	DK	() 16
17. Pieces of wood	N	Y	DK	() 17
18. Glass, like a window	Y	N	DK	() 19
19. Clothes, like a shirt or pair of socks	N	Y	DK	() 18
20. Bricks that are used to make houses or buildings	Y	N	DK	() 20
21. Steel or metal, like a matchbox car or the parts of a large building	Y	N	DK	() 21
22. Fuel used to make cars go	N	Y	DK	() 22
23. Orange juice or apple juice	Y	N	DK	() 23
24. Skin, like on your hand, face or body	N	Y	DK	() 24
25. Chocolate milk	Y	N	DK	() 29

		<u>0</u>	<u>1</u>		
26.	Baby lotion, like what mum or dad would put on a small child	Y	N	DK	(____) 26
27.	Shampoo for your hair	Y	N	DK	(____) 27
28.	Detergent that you might use to clean clothes	Y	N	DK	(____) 28
29.	A couch, like the kind you sit on	N	Y	DK	(____) 25

D. Fire Safety Skills

30. Are there any dangers to playing with fire? (____) 30

- 1 = No/Don't Know
- 2 = General problem (get in trouble, people get mad at you)
- 3 = Burn things (damage)
- 4 = Burn self/others (hurt, killed)
- 5 = Burn things & people

31. If you were going to light a few pieces of wood in a fireplace using a match, what steps would you follow? (____) 31
 (What would you do first?...what next?)
 Note: Not a gas fireplace! (score 1 point for each item listed below and enter total score at right).
 total # of correct steps [code "0" if D/K or none correct]

- 1 Get something to hold wood off floor (bracket, holder)
- 2 Put some paper (or suitable fire starter) on the holder
- 3 Put some wood on top of fire starter
- 4 Light match and light corners or the paper/starter (i.e., not throwing match on pile or into fireplace)
- 5 (Remove Screen, Open Door) Close screen

32. How would you put out this fire in the fireplace? (____) 32

- 1 = Questionable behavior (i.e., use a poker, stamp out); Don't know
- 2 = Let it burn, don't add more wood
- 3 = Smother, cover, beat
- 4 = Water/Chemical substances (e.g., baking soda)
- 5 = Use extinguisher

33. Now I want you to pretend that this is a real pack of matches. Let's say that you were alone. How would you light a match if you had to? (Don't worry, these matches won't really light or burn.)

() 33
total # of
correct
items [code
"0" if D/K
or none
correct]

- 1 Removes match from the pack
 2 Closes cover
 3 Strikes away from body
 4 Places fingers away from match head
 5 Strikes match on its side

34. What would you do if your clothes caught on fire? (select primary answer if more than 1 are given)

() 34

-
- 1 = Don't know/nothing/run/run to water
2 = Call for help (tell grown-up)/helpless behavior (cry)
3 = Throw water on them
4 = Smother/behavior involving taking off clothes
5 = Stop, drop, cover and roll

35. Imagine that you're sitting on your bed when a fire starts in your house. You start to cough and your eyes are burning, and you can't leave through a window. Tell me everything you would do. (Score one point for each item listed below.)

() 35
total # of
correct
items [code
"0" if none
or D/K]

-
- 1 Slide to edge of bed
 2 Roll out of bed
 3 Get in a crawl position
 4 Crawl and get the rug
(blanket, etc.)
- 5 Push rug in crack
 6 Crawl to window
 7 Open window
 8 Yell & signal for help

36. Has your family ever discussed a plan to follow if there was a fire in your house? (If yes: What is it?)

() 36

- 1 = None
3 = Self-plan only/some general details (i.e., family has plan but child doesn't know it)
5 = Clear/reasonable family plan (i.e., involves other members and is written and visible)

37. Pretend that you are home all alone and that you suddenly see a fire at your neighbours house. Here's a real telephone. How would you use the telephone to get help? What would you do? (Act it out; Show me, don't tell me)(This task requires the use of a real/play phone.)

(____) 37
total # of
correct
items [code
"0" if D/K
or none
correct]

DIALS

- ___ 1 Picks up receiver
___ 2 Places receiver to ear
___ 3 Dials "000" (NOT a random or incomplete set of numbers)

Interviewer says: "Let's pretend that I'm the operator -- "Operator."

REPORTS THE FIRE

- ___ 4 There is a fire at my neighbour's house (Summarize remarks)
-

GIVES NAME

- ___ 5 First name
___ 6 Last name

Other comments: _____

GIVES ADDRESS

- ___ 7 House number
___ 8 Street name/ Cross Street
___ 9 Suburb/Town

Other comments: _____

E. Exposure to Models

38. How many of your friends smoke? () 38

- 1 = None
- 2 = One
- 3 = Two
- 4 = Three-Five
- 5 = Six and more

39. How many of your friends have you seen playing with matches or lighters, or setting fires? () 39

- 1 = None
- 2 = One
- 3 = Two
- 4 = Three-Five
- 5 = Six and more

40. Are you permitted to use matches or lighters at home? What for?: _____ () 40

- 1 = NO
- 3 = YES (restricted use/under supervision)
- 5 = YES (unrestricted use)

Scale for #'s 41-46: (Give card with scale to child)

Scale: 1 = never, 2 = a little, 3 = sometimes, 4 = most of the time, 5 = almost always

I have just a few more questions. Please pick the best answer from this card (review choices before administering questions):

41. How often are you with friends who smoke? () 41

42. How often do you smoke or experiment with smoking? () 42

43. How often are you supervised by an adult when you are in your house? () 43

F. Discipline/Supervision

44. How often do you get into trouble at home when you do something that you're not supposed to do -- something wrong (i.e., corrected by your parents)? () 44
45. How often do you get into trouble with other people outside of your home when you do something you're not supposed to do? () 45
46. How often are adult or an older brother/sister there when you are at your friends' homes (i.e., someone who is watching over you)? () 46
-

Appendix 10: The Fire History Screen

Firesetting History Screening Questions (FHS)
Pittsburgh *SAFETY* Program

CHILD'S NAME: _____

CASE NO: _____

PRACTITIONER: _____

INTERVIEWER: _____

Firesetting History Screening Questions (FHS)
Pittsburgh SAFETY Program

CASE NO: _____

DATE: ___/___/___

INTERVIEWER: _____

INSTRUCTIONS: *Please answer each question as best you can. Your information is necessary for us to learn about the kinds of fires with which your child may have been involved.*

Firesetting

1) Based on THE LAST 6 MONTHS, would you say that your child has been interested in fire -- that is, did s/he seem to like fire or fascinated by fire? N Y ?

2) In the last 6 months, how many times did your child burn something like paper, clothes, toys, furniture, walls or the house, or set something on fire, without permission from an adult? _____

3) What did your child burn or set on fire in the most recent incident?

4a) Was the fire brigade called? N Y ?

...4b) Did an fire investigator write up a report about the fire? N Y ?

5) [if applicable]: On previous occasions what else was burned the other times, beginning with the next most recent incident)?

6) What was the most serious damage/injury caused by any of these incidents?

7a) Was the fire brigade called then? N Y ?

...7b) Did an fire investigator write up a report about the fire? N Y ?

Fireplay

8) Did your child ever just play with matches, lighters, or the stove, candles without burning anything else, IN THE LAST 6 MONTHS? N Y ?

9) About how often do you think s/he did this? _____

10) In that time period, was your child seen with any matches or lighters, or were they in his/her possession (i.e., like in his/her room)? N Y ?

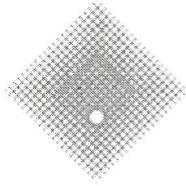
11) About how often do you think s/he did this? _____

12) In that time period, did your child talk about fire? N Y ?

13) About how often do you think s/he did this? _____

Appendix 11: Invitation and Plain Language Statement (Parents)

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METROPOLITAN FIRE BRIGADE AND COUNTRY
FIRE AUTHORITY

For Parents

INVITATION TO YOU TO JOIN JFAIP RESEARCH

The Juvenile Awareness and Intervention Program (JFAIP), established in 1986, is a community initiative offered by Fire Service personnel. This program is part of the community education programs offered by the Metropolitan Fire Brigade (MFB) and recently the Country Fire Authority (CFA). The JFAIP intervention aims to educate and inform the child of fire safety and the dangers of playing with fire.

In this research we need to find out what might be useful to children and families participating in the JFAIP program in Victoria. We need to know if the program has had an impact you and your family. This is so that the MFB and CFA can make sure that what it offers to families can be of best possible help. This research is a commitment to continually improve the services for families and children.

Our aim is to gain information about your child's exposure to and involvement with fire. We would like to learn about how fires are started and about the children who start fires. You will also be asked other questions about fire and your child's behaviour in general. A further aim is to talk with your child about what they know about fire. You and your child's experiences are invaluable in increasing knowledge and research in the area.

What is involved for you? The research interviewer would spend up to one hour with you and your child on two occasions. The first interview will occur in the first session of the JFAIP intervention with the JFAIP practitioner. The second interview will occur 3 months later with a researcher. These interviews would occur at a time and place convenient to you. A follow-up phone call will also occur 6 months after the intervention first started to gain additional feedback on the program and whether or not your child is currently fire-safe.

In the sessions, our interviewers would be asking about fire behaviours, such as interest and curiosity. Examples of questions are: How curious is your child about fire? And To what extent does he/she understand why playing with fire is dangerous? We would also like to conduct a brief interview with your child, as we are interested in what children know about fire. With your permission, we would like to conduct this interview independently, but in the same room, so that we can gain the most accurate information. Examples of questions are: (1) how curious are you about fire? (2) Are there any dangers to playing with fire?

Additionally, we would like to have your permission to access your case file that is held with the MFB or CFA. Any information gained from this file will be confidential and any notes would not be identified, that is they would be anonymous. This case file will not be accessed without your consent.

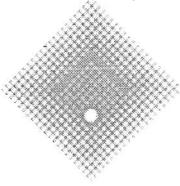
We will not use your name in any report. We will not give to anyone else, including JFAIP staff, your name in connection with any information given by you.

You would be free to withdraw from the research at any time, for any reason. In the very unlikely event that you become upset by the research, our interviewer would bring things to a halt. They would then be in a position to discuss with you how best to address the concern and perhaps organise other assistance if this was what you wanted.

Our interviewer is keen to answer any questions you have about the research. For further information you can contact the researcher Kate McDonald on 9919 2200, Professor Dorothy Bruck on 9919 2336 (who is supervising the research). You can also call Murray Talbot, JFAIP program coordinator on 9420 3893 or CFA coordinator, Penny Wolfe on 9262 8409.

Any queries about your participation in this project may be directed to the research supervisor (Professor Dorothy Bruck, ph.9919 2336). If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MCMC, Melbourne, 8001 (telephone no. 03 9688 4710).

THANKYOU FOR CONSIDERING THIS INVITATION



Additional information for families

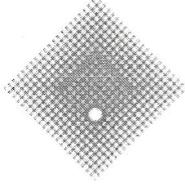
This is additional information for those families who have been mandated by the court to take part in the JFAIP. We would like to reassure you that participation in the research is voluntary and separate from both the JFAIP and any other agency, such as Juvenile Justice. Furthermore, involvement or non-involvement in the research will not impact upon your participation in the JFAIP or interaction with other agencies.

We will not use your name in any report. You can be assured that any information that you tell a researcher will remain strictly confidential. We will not give to anyone else, including JFAIP staff, your name in connection with any information given by you. In addition, you would be free to withdraw from the research at any time, for any reason.

Any queries about your participation in this project may be directed to the research supervisors (Professor Dorothy Bruck, ph.9919 2336. If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MCMC, Melbourne, 8001 (telephone no. 03 9688 4710).

Appendix 12: Invitation and Plain Language Statement (Children)

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METROPOLITAN FIRE BRIGADE AND COUNTRY
FIRE AUTHORITY

For Children

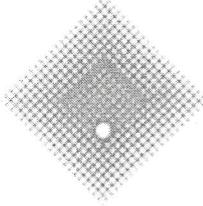
INVITATION TO YOU TO JOIN JFAIP RESEARCH

We are doing a project about children and fire. In this project we want to learn about children and the fires they set. Before and after the program with the fireman we would like you to talk with me for about half an hour. I will ask you questions such as (1) how curious are you about fire? (2) Are there any dangers to playing with fire? Also, it is okay if you don't want talk with me, and only do the program with the fireman.

I would like you to give us your best answers, but it is not a test. I am just interested in what you think. If you don't want to answer questions you don't have to, you won't get into trouble. Also if you want us to stop, say, and we will.

Appendix 13: Informed Consent (Parents)

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METROPOLITAN FIRE BRIGADE AND COUNTRY
FIRE AUTHORITY

Consent by Parent to Participate

I hereby freely consent to participate in the research project "Perspectives on effectiveness: What works in a juvenile fire awareness and intervention program".

The aim and nature of the project has been explained to me and I have had the chance to have any questions answered. I have been given a copy of the invitation to participate that outlines the details of what the project involves.

I know that what I say will remain confidential and that my name will not appear in any report. I also know that I can withdraw from the research at any time.

My Name:

Signature (parent):

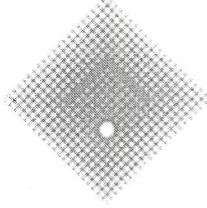
Date: / /

Any queries about your participation in this project may be directed to the research supervisors (Professor Dorothy Bruck, ph.9919 2336. If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MCMC, Melbourne, 8001 (telephone no. 03 9688 4710).

Appendix 14: Informed Consent (Children)

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METROPOLITAN FIRE BRIGADE AND COUNTRY
FIRE AUTHORITY

Consent by child to participate

I am happy to be part of the research about firelighting and the project has been explained to me.

My Name:

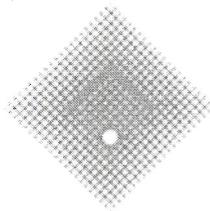
Signature(child) :

Signature (parent):

Date: / /

Appendix 15: Informed Consent (Parents for Children)

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METROPOLITAN FIRE BRIGADE AND COUNTRY
FIRE AUTHORITY

Consent by parent to allow their child to participate

I hereby freely consent for my child to participate in the research project
“Perspectives on effectiveness: What works in a juvenile fire awareness and
intervention program”.

The aim and nature of the project has been explained to my child and me and we have
had the chance to have any questions answered. I have been given a copy of the
Invitation to Participate that outlines the details of what the project involves.

I know that what my child or I say remains confidential and that my name will not
appear in any report. I also know that I can withdraw from my consent at any time.

My Name:

Child's Name:

Relationship to child:.....

Signature:

Date: / /

Any queries about your participation in this project may be directed to the research supervisors (Prof. Dorothy Bruck, ph. 9919 2336. If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MCMC, Melbourne, 8001 (telephone no. 03 9688 4710).

Appendix 16: Normality Measures

Normality measures for FRI pre-and-post intervention fire-specific and non-fire-specific variables

FRI Variables	Shapiro-Wilks	Kurtosis	Skewness	Extreme Outliers
FRI pre fire specific				
Pre Curiosity	.96, p = .25	-.462	.593	
Pre Knowledge	.90, p = .08	-.90	.606	
Pre Skill	.95, p = .15	-.783	-.047	
Pre Exposure	.90, p = .009	.937	1.025	
Pre Involvement	.94, p = .08	-.485	.376	
Pre Complaints	.98, p = .05	.146	.640	
Pre Parental Fire Awareness	.90, p = .01	.866	.231	
Pre Early Experiences	.89, p = .05	.660	.047	
FRI post fire specific				
Post Curiosity	.90, p = .08	-.901	.606	
Post Knowledge	.93, p = .30	-.783	-0.47	
Post Skill	.97, p = .48	-.001	.118	
Post Exposure	.91, p = .02	-1.222	.338	
Post Involvement	.41, p = .01	4.558	2.373	
Post Complaints	.86, p = .01	1.701	1.320	
Post Parental Fire Awareness	.85, p = .01	.727	-.861	
Post Early Experiences	.9, p = .01	2.491	.845	
FRI pre non-fire specific				
Pre Positive Behaviour	.96, p = .38	.560	-1.22	
Pre Negative Behaviour	.97, p = .44	.039	.539	
Pre Supervision	.96, p = .34	-.700	-.153	
Pre Frequency Mild Punishment	.95, p = .18	1.305	-.642	
Pre Effectiveness Mild Punishment	.95, p = .21	-.069	-.331	
Pre Frequency Harsh Punishment	.97, p = .43	-.574	.243	
Pre Effectiveness Harsh Punishment	.90, p = .009	-.785	.319	
FRI post non-fire specific				
Post Positive Behaviour	.90, p = .38	.484	-.472	
Post Negative Behaviour	.94, p = .11	.088	.759	
Post Supervision	.93, p = .07	.681	.825	
Post Frequency Mild Punishment	.95, p = .21	.767	.725	
Post Effectiveness Mild Punishment	.95, p = .25	.275	-.638	

Post Frequency Harsh Punishment	.87, p = .002	-1.595	-.132
Post Effectiveness Harsh Punishment	.85, p = .001	2.307	1.453

Normality measures for CFI pre-and-post intervention variables

CFI Variables	Shapiro-Wilks	Kurtosis	Skewness	Extreme Outliers
CFI pre variables				
Curiosity	.94, p = .09	-.378	-1.01	
Involvement	.89, p = .004	1.119	1.131	
Knowledge	.94, p = .10	-.492	.195	
Fire safety skills	.96, p = .32	.026	1.296	
Exposure	.75, p = .001	2.155	5.253	
Discipline/ Supervision	.93, p = .07	.277	-.755	
CFI post variables				
Curiosity	.95, p = .14	.754	.550	
Involvement	.35, p = .001	2.748	5.961	
Knowledge	.80, p = .001	-1.639	2.638	
Fire safety skills	.94, p = .10	-.872	.587	
Exposure	.66, p = .001	2.652	7.586	
Discipline/ Supervision	.94, p = .10	.274	-.616	

Normality measures for pre FRI recidivist and non-recidivist variables

FRI Variables	Shapiro-Wilks	Kurtosis	Skewness	Extreme Outliers
Recidivist FRI pre fire-specific				
Curiosity	.98, p = .97	-.12	.26	
Knowledge	.91, p = .34	1.27	-.64	
Pre Skill	.93, p = .52	-1.54	-.02	
Pre Exposure	.85, p = .08	.06	.87	1 extreme outlier
Pre Involvement	.94, p = .55	-.53	.16	
Pre Complaints	.93, p = .50	.26	.56	
Pre Parental Fire Awareness	.83, p = .05	-.29	.00	2 extreme outliers
Pre Early Experiences	.90, p = .28	1.56	1.01	
Non-recidivist FRI pre fire-specific				
Pre Curiosity	.93, p = .13	-.58	.61	
Pre Knowledge	.91, p = .08	1.92	-1.13	
Pre Skill	.93, p = .19	-.41	-.25	

Pre Exposure	.90, p = .03	2.28	1.20
Pre Involvement	.93, p = .19	-.28	.43
Pre Complaints	.91, p = .05	.26	.56
Pre Parental Fire Awareness	.90, p = .05	-.82	.37
Pre Early Experiences	.89, p = .02	-.40	.00
Recidivist FRI pre non-fire specific			
Pre Positive Behaviour	.93, p = .48	-.06	-.73
Pre Negative Behaviour	.89, p = .21	-.97	.57
Pre Supervision	.93, p = .49	-.42	-.27
Pre Frequency Mild Punishment	.95, p = .67	.85	-.19
Pre Effectiveness Mild Punishment	.91, p = .32	-1.50	-.19
Pre Frequency Harsh Punishment	.94, p = .56	-1.60	-.15
Pre Effectiveness Harsh Punishment	.77, p = .009	-.36	1.03
Non-recidivist FRI post non-fire specific			
Pre Positive Behaviour	.89, p = .03	4.03	-1.5
Pre Negative Behaviour	.98, p = .92	.41	.53
Pre Supervision	.97, p = .65	-.72	-.02
Pre Frequency Mild Punishment	.92, p = .11	1.61	-.79
Pre Effectiveness Mild Punishment	.97, p = .63	.69	-.23
Pre Frequency Harsh Punishment	.93, p = .16	.90	.85
Pre Effectiveness Harsh Punishment	.91, p = .06	-.55	.06

Normality measures for FRI post recidivist and post-non-recidivist variables (fire-specific and non-fire specific)

FRI Variables	Shapiro-Wilks	Kurtosis	Skewness	Extreme Outliers
Recidivist FRI post fire-specific				
Post Curiosity	.83, p = .05	- 2.17	-.11	
Post Knowledge	.90, p = .26	- .99	.18	
Post Skill	.96, p = .84	.99	.52	
Post Exposure	.95, p = .65	.42	-.58	
Post Involvement	.50, p = .01	7.42	2.70	2 extreme outliers
Post Complaints	.95, p = .69	-.29	.50	

Post Parental Fire Awareness	.83, p = .06	-1.04	.22	
Post Early Experiences	.82, p = .04	2.16	.80	1 extreme outlier
Non-recidivist FRI pre fire-specific				
Post Curiosity	.87, p = .01	-1.32	.45	
Post Knowledge	.97, p = .74	-.57	-.11	
Post Skill	.95, p = .30	-.52	.50	
Post Exposure	.86, p = .01	-.88	.75	
Post Involvement	.45, p = .01	3.72	2.27	3 extreme outliers
Post Complaints	.85, p = .05	2.59	1.20	
Post Parental Fire Awareness	.86, p = .01	.143	-.76	
Post Early Experiences	.92, p = .10	-.78	-.13	
Recidivist FRI post non-fire specific				
Post Positive Behaviour	.95, p = .64	-.31	-.53	
Post Negative Behaviour	.95, p = .70	-1.01	-.11	
Post Supervision	.86, p = .10	-1.82	.08	
Post Frequency Mild Punishment	.84, p = .05	.79	1.13	
Post Effectiveness Mild Punishment	.91, p = .32	-.54	-.58	
Post Frequency Harsh Punishment	.77, p = .01	.08	-1.22	
Post Effectiveness Harsh Punishment	.83, p = .05	-.43	-.66	
Non-recidivist FRI post non-fire specific				
Post Positive Behaviour	.95, p = .30	-.35	.08	
Post Negative Behaviour	.96, p = .61	-.45	.35	
Post Supervision	.90, p = .05	1.96	-1.07	
Post Frequency Mild Punishment	.96, p = .46	.64	.56	
Post Effectiveness Mild Punishment	.96, p = .46	-.01	-.33	
Post Frequency Harsh Punishment	.88, p = .02	-1.48	.30	
Post Effectiveness Harsh Punishment	.90, p = .04	.86	1.04	

Normality measures for CFI pre recidivist and pre-non-recidivist variables

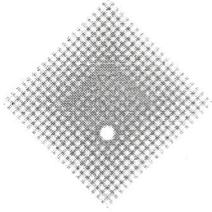
CFI Variables	Shapiro-Wilks	Kurtosis	Skewness	Extreme Outliers
Recidivist pre CFI variables				
Curiosity	.81, p = .03	2.84	-1.63	
Involvement	.90, p = .28	-.92	.52	
Knowledge	.90, p = .27	-.29	.66	
Fire safety skills	.97, p = .86	-1.06	.15	
Exposure	.76, p = .008	2.22	1.69	
Discipline/ Supervision	.86, p = .10	.12	.51	
Non-recidivist pre CFI variables				
Curiosity	.96, p = .58	-1.10	-.01	
Involvement	.87, p = .01	1.46	1.28	
Knowledge	.89, p = .02	.14	-.79	
Fire safety skills	.91, p = .07	2.97	-.40	1 extreme low outlier
Exposure	.83, p = .003	2.78	1.56	
Discipline/ Supervision	.93, p = .13	-1.82	-.23	

Normality measures for CFI post recidivist and post-non-recidivist variables

CFI Variables	Shapiro-Wilks	Kurtosis	Skewness	Extreme Outliers
Recidivist post CFI variables				
Curiosity	.93, p = .50	-1.23	.41	
Involvement	.54, p = .001	.74	1.62	
Knowledge	.89, p = .19	-.93	-.34	2 extreme outliers
Fire safety skills	.93, p = .48	-.63	-.52	
Exposure	.84, p = .06	.12	1.13	
Discipline/ Supervision	.90, p = .25	-1.21	.35	
Non-recidivist post CFI variables				
Curiosity	.97, p = .68	.79	.32	
Involvement	.24, p = .001	20.00	4.47	
Knowledge	.72, p = .001	3.67	-2.01	1 extreme outlier
Fire safety skills	.94, p = .25	-.32	-.46	
Exposure	.81, p = .001	-.88	-.15	
Discipline/ Supervision	.95, p = .37	-.62	.06	

Appendix 17: Qualitative interview questionnaire for state-wide program managers

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METROPOLITAN FIRE BRIGADE AND
COUNTRY FIRE AUTHORITY

INTERVIEW PROTOCOL FOR PROGRAM
COORDINATORS AUSTRALIA WIDE

I am calling from Victoria University, I am currently a researcher working with the MFB and CFA on a PhD project called Perspectives on effectiveness: What works in a juvenile fire awareness and intervention program? I would just like to ask you some questions regarding the current practice of your juvenile fire intervention program.

Background and History of the program-

What is the name of your program?

When did the program start (what year?) Does this program model off another program?

What is the program theory?

What is the philosophy of the program?

Who developed the program?

What fire services are involved in the program?

Sites and service-

How many sites are currently operating? Do you have both rural/urban services?

Aims-

What is the aim of the program?

Do you believe the program currently meets these aims?

Models-

Do you work with a fire service model or mental health model?

Referrals

How does your referral process work?

Clients

How many clients have been referred to your program over the years of 2002, 2003, 2004, 2005, 2006?

Where do most of your referrals come from?

What is the main profile of your clients?

Assessment

Do you have an assessment process? If so, what is it? (i.e. what assessment tools do you use?)

Do you reject cases, i.e. the child has multiple problems deemed as too advanced for the fire service?

If so, what happens here? What is the process?

Staff-

Who are the staff involved in the program? (need to get names and position details- or do they have an organisational chart?)
i.e. Managers/ Psychologist/Practitioners

Does this program have a steering committee that strategically guides the program? If so, who is involved on the committee, their names and their position?

Variables contributing to success-

In your opinion what aspects of the program do you believe contribute to its' success? (i.e. use of practitioners?)

In your opinion what works well in the program?

In your opinion what aspects of the program can be improved? And why?
What are some of the challenges in the program? (i.e. program delivery, communications)

How is effectiveness measured?

What is deemed as success in the program (is it less recidivism in children?)

Evaluations and quality review-

Has your program been evaluated?

Is there regular quality reviews conducted?

Best practice-

Do you have a best practice framework?

What is best practice?

Does the program measure up to this?

How is the program intended to work?

Interventions-

Who delivers the program? And how many people deliver the intervention?

Where do you deliver the intervention?

Can you step me through a typical intervention? What does it involve?

How long is the intervention?

Are there rewards?

Is a contract drawn up with the child?

Follow-up

Do you follow up with families? If so, what is the process?

Do you think the follow up is effective?

Do you attempt to get feedback from families? If so, how? And how is it recorded?

What is done with the information?

Do you currently get much feedback (how much in % terms)?

Practitioners-

How many practitioners do you have?

How many are career firefighters/ volunteer fire fighters?

What is the criteria and eligibility of selecting a practitioner?

Relationships with external organisations-

Other Juvenile fire awareness programs:

What are your relationships like with other Juvenile fire awareness programs?

Do you talk to each other?

Which states do you talk to more?

Do you share information? Is there a central database that you report to, or is it individual (based on State by State)?

Other organisations that are involved in the program-

Can you tell me about your relationship with mental health practitioners?

How involved are they?

Do you have an option in your program to refer children to a mental health practitioner?

How many would you refer onto a mental health practitioner?

Are they supportive, (i.e. do they work collaboratively with you to solve the problem)?

Do you have a good relationship with external organisations that are dealing with the problem? If so, why? If not, why, and what could be improved?

Practitioner training -

How are the practitioners recruited?

What is the selection process?

Are they career or volunteer practitioners?

What are key attributes that you look for in practitioners?

Do they receive training?

What does the training involve?

Do the practitioners receive ongoing mentoring and support? If so, what is it, and for how long?

Data Base-

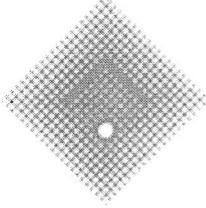
How do you record data?

What do you record on the data base?

Who has access to the data base?

What types of reports can you retrieve or generate from the data base?

**Appendix 18: Qualitative interview questionnaire for VIC JFAIP
program managers**



Interview schedule for program staff

Who are the key stakeholders in the JFAIP program?

What are their roles, and how do they influence program development, direction and ongoing operations?

What is your role and responsibilities?

What is the role of the steering committee? How effective is this committee?

What are the aims, goals and objectives of the program?

What does the program aim to modify?

How successful is the program in meeting these aims?

What is the rationale for the program? What is the theory behind the intervention? Is the intervention based on any modern theories that you can recall? (i.e. behaviour modification, reinforcement theories?). Is the content/materials based on any theoretical foundation?

What are some of the benefits for the families involved in the program?

How would you describe the families involved in the program? PROMPT- what are their challenges?

What is the process of mandated vs voluntary clients? How are they different? How is the intervention different? Is there any difference in the client?

In your opinion does the program work better more for some families than others? If YES, what type of families does this program work better for and why?

What is your communications like between the CFA and MFB regarding direction and implementation of the program?

How is quality measured? What systems are in place?

What is the role of the practitioner? In what ways do practitioners vary?

What are the qualities of a good practitioner? What makes a good practitioner?

The problem of juvenile firesetting-

What do you believe is the best way to manage the problem of juvenile firesetting?
(i.e JFAIP, psychotherapy, CBT)

What are the core elements of the intervention? (i.e. practitioner, materials etc).

What are some of the challenges involved in implementing this intervention (i.e. in terms of resources and activities)?

If you could change something about this program what would it be? How do you think this change would benefit the program?

What program elements or structures need to be modified to maximise program potential to achieve the intended outcomes?

Murray/Penny How effective is the screening process over the phone? (i.e. does what you gain and assess on the phone match the situation in with the child and the family)? How do you decide which practitioner to send to the intervention? (age, experience, area).

Is recidivism a measure of success? How is recidivism measured? How is the progress of the client tracked? Is this working for you? How effective is the feedback form? How many do you receive back? Do you follow up progress with mental health professionals?

What does the program aim to change? How do you measure this change?

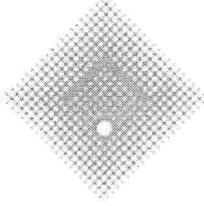
Do you think that the program does change these aspects? Why? Why not?

Any further comments

Appendix 19: VIC JFAIP Informed Consent

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VICTORIA UNIVERSITY
SCHOOL OF PSYCHOLOGY

METROPOLITAN FIRE BRIGADE AND COUNTRY
FIRE AUTHORITY

Consent by Program Staff to Participate

I hereby freely consent to participate in the research project "Perspectives on effectiveness: What works in a juvenile fire awareness and intervention program."

The aim and nature of the project has been explained to me and I have had the chance to have any questions answered. I have been given a copy of the invitation to participate that explains the details of what the project involves.

I know that what I say will remain confidential and that my name will not appear in any report. I also know that I can withdraw from the research at any time.

I consent / do not consent to our interview being audio taped.

My Name:

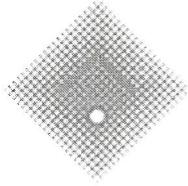
Signature:

Date: / /

Any queries about your participation in this project may be directed to the research supervisors (Prof. Dorothy Bruck, ph.9919 2381. If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MCMC, Melbourne, 8001 (telephone no. 03 9688 4710).

Appendix 20: VIC JFAIP Plain language statement and invitation to participate in the research

**VICTORIA
UNIVERSITY**



O F
T E C H N O L O G Y

VICTORIA UNIVERSITY
SCHOOL OF PSYCHOLOGY

METROPOLITAN FIRE BRIGADE AND COUNTRY FIRE
AUTHORITY

For JFAIP program staff

INVITATION TO YOU TO JOIN IN WITH THE JFAIP RESEARCH

Perspectives on effectiveness: What works in a juvenile fire awareness and intervention program?

We need to find out more about the way the JFAIP operates in Victoria. The aim of the research is to find out what is effective about the program and what works well. In addition to this would like to know what isn't working well and any suggested areas for improvement. The people involved in the program, practitioners and staff, are those best to answer these questions.

The research will examine and investigate the salient factors that contribute to the success of the JFAIP. The most appropriate way to address this is utilising qualitative methods, and will involve interviews with program staff and participating families.

As staff you are familiar with the problem of children and fire and the life-threatening consequences for children, families, and communities. An additional aim of the research is to promote greater insight into the problem of children and fire. This knowledge can add our understanding of this problem, the effectiveness of interventional strategies designed to manage the problem behaviour of firesetting, and improve the quality of life for children and families.

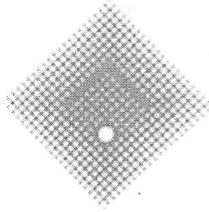
What is involved for you? Our interviewer, Kate McDonald, will spend 45 minutes - 1 hour interviewing you. In this session, you will be asked about your perspective and experiences of the program. The areas and types of questions that will be asked include: program characteristics, operations, implementation, processes, challenges, effectiveness, and alliances with stakeholders.

With your permission, we would like to audio tape the interview so that we don't miss anything that is said, but the tapes will be stored securely and only the Victoria University researchers will have access to the tape (no MFB or CFA personnel). No names will be used and if you don't wish to be taped we can still proceed with the interview. Please rest assured that your confidentiality is strictly protected, as we will not use your name in any report. We will not give to anyone else, including MFB/CFA staff, your name in connection with any information given by you.

You would be free to withdraw from the research at any time, for any reason. If you have any questions regarding the research, the researcher Kate McDonald can be contacted on 9919 2200. The additional contacts at Victoria University are, Prof. Dorothy Bruck 9919 2381.

Appendix 21: “Member Checking”– Letter to state-wide program managers (except VIC JFAIP) regarding gaining permission to use quotes

**VICTORIA
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OF
TECHNOLOGY

VICTORIA UNIVERSITY
SCHOOL OF PSYCHOLOGY
and
METROPOLITAN FIRE BRIGADE AND
COUNTRY FIRE AUTHORITY

National Approaches to the Firesetting Problem in Australia Section of Thesis

To program managers/co-coordinators of state firesetting programs,

A few months ago, or for some more recently, I conducted either phone or email interviews with you regarding a section of my thesis called "National approaches to the firesetting problem". Firstly, I would like to thank you for taking the time to speak with me and also your valuable contribution to understanding the best ways to intervene with juvenile firelighters in Australia.

I am writing to advise you of your contribution to my thesis. I have provided to you a section where your quote is applicable and the context around it (the statement that is written before) so that it makes sense. I have not provided you with any other participant's quotes.

With your permission this will be included in the thesis. I have highlighted the quote applicable to you in the "comments" field. The quote you have provided to me will be either identified or not identified, and this is stipulated in this field. When it is identified I say that the program co-ordinator or manager of this program said So I am explicitly stating your comment and identifying you. For non-identified quotes you remain anonymous.

I am seeking to gain your permission to use your quote. If you could email me back with your permission by 30 October 2008 to Kathryn.McDonald@live.vu.edu.au it would be appreciated.

With regards

Kate McDonald

Appendix 22: Data-display qualitative themes from program manager's interviews

Example of the data displays of qualitative themes- related to the themes of “program theory” and “recidivism”

THEME	STATE PROGRAM	RESPONSE
Program Theory	VIC- JFAIP	<p>Person 1: it is based on other programs. Based on the best parts of other programs (but does not specify which ones- or how they came to conclude which programs are the Best ones!!). Based on positive reinforcement, building the child’s self-esteem and giving them information about the dangers and consequences of what they are doing.</p> <p>Person 2: From my personal theory and I have read a lot of theoretical material- but my personal theory is that firefighters carry a certain amount of credibility because of their occupation, their appearance, the tools that they use (i.e. big trucks) and with training have the opportunity to change the mind-set of the child.</p> <p>Person 3: It based on other programs- the person who developed the program looked at all the other programs (particularly in the US) and adapted it to Australia- again didn’t really say which program(s) JFAIP was modelled from. Also based on a theory from a book by Gaynor- i.e. based on understanding motives for firesetting. It is also based on education and behaviour change- and positive reinforcement for firesafe or responsible behaviour- its delivered by FF so it not just education –which can be delivered by anyone.</p> <p>Person 4- the theory is that a firefighter intervenes and because they are seen as the credible expert then the child will stop setting fires. Im not sure about this theory and would like it explored more.</p> <p>Person 5- the theory is that you have a problem behaviour (firesetting) and that this can be changed through fire safety education. And that the because the firefighter has the “X” factor it changes the child’s behaviour- i.e. it shops the child from lighting fires. The Firefighter is the expert and because of his/her authority, expertise, experience and credibility can lead to behaviour change (no fire play) of the child.</p>

Program Theory	WA- JAFFA	<p>The program theory is that the career FF or someone in a uniform delivers the program. It does not have a strong focus on MH, but uses a consequences approach. They have a strong partnership with Juvenile Justice who refers 35% of cases to the JAFFA program.</p> <p>At WA JAFFA conference the managers were questioning their model and whether they were being effective.</p>
Program Theory	NSW- IFAP	<p>NSW IFAP has recently forged a new direction with the program. After a recent evaluation by a masters student the findings indicated that the education based program wasn't sufficient for some children, and that it was more important to develop relationships. The program was dealing with kids with more psychological difficulties and difficult families. The new direction is to focus less on the firesetting behaviour, and more on fire safety in the home (such as undertaking a safety audit). This was what the NSW co-ordinator described as the program theory, but perhaps is not clear??? Is the theory to work within the limitations of the service and develop working alliances with other specialist agencies.</p> <p>Based on the VIC JFAIP Model</p>
Program Theory	SA- J-FLIP	<p>FFF is a preventative strategy to proactively deal with the problem of fireplay/ firesetting by children and young people. The FFF deals with youth who have not been through the court system. The theory uses approaches from solution based, positive reinforcement, educational, experiential, and family systems.</p> <p>JAOP targets 13-17 year olds who have been charged with arson or other fire related offences. This program is offered as an alternative to further adjudication or conviction. This program is multidisciplinary – was designed and is operated by both Department of Communities and QFS.</p> <p>QLD FFF stated that they were aware of the boundaries about practitioners dealing with complex cases.</p>
Program Theory	TAS- JFLIP	<p>Behavioural and social learning theory.</p>

<p>Program Theory</p>	<p>ACT- JFAIP</p>	<ol style="list-style-type: none"> 1. The program is a secondary fire prevention program that deals with children who have exhibited dangerous fire behaviour. 2. They recognise the limitations of the FF and understand that their role is limited. 3. That the FF in uniform is recognised by children and adolescents. The position that the FF has gives them the opportunity to educate and provides the benefit of experience. The FF in uniform tends to have a greater impact on children, rather than somebody just arriving and chatting to them.
<p>Program Theory</p>	<p>NT- JFAIP</p>	<p>Based on the VIC JFAIP Model</p>
<p>Program Theory</p>	<p>NZ- FAIP</p>	<p>Based on the VIC JFAIP Model</p>
<p>General Comments</p>	<p>All</p>	<p>Most programs had difficulties in providing and answer to the question of "what is your program theory". Many needed to be prompted for an answer. The prompt was the researcher providing the program theory for the VIC JFAIP program and in most cases the respondent would say that they too had that theory (after being provided with the theory) or they would say that they had modelled off the VIC JFAIP so it would be the same.</p> <p><u>ISSUES</u></p> <ul style="list-style-type: none"> • Some programs questioned the role of practitioner and if they were working within their boundaries (NSW IFAP, QLD FFF, VIC JFAIP -CFA managers only, TAS JFLIP) • Some didn't question this at all (VIC JFAIP- MFB, ACT, SA, NT) • 4 states out of 7 questioned the current model (NSW IFAP, VIC JFAIP-CFA only, TAS JFLIP, WA JAFFA)
<p>Recidivism and follow-up</p>	<p>VIC- JFAIP</p>	<ul style="list-style-type: none"> • No current follow up <p>Feedback is sought by way of a survey that is given to the client at end of the intervention. It is up to the parent to send it back so the return rate is low.</p> <p>It is up to the parent to contact the program if the child re-offends. The client is not followed up due to lack of resources.</p>

		<ul style="list-style-type: none"> • Reported as between 5-10% • The recidivism rate may not be accurate as it is based on feedback forms that are left with clients. They are submitted voluntarily and therefore only small portions are returned.
<p>Recidivism and follow</p>	<p>WA- JAFFA</p>	<ul style="list-style-type: none"> • There is not an official follow-up that is built into the program. Most practitioners follow up with the family because they are passionate about the work. • Clients are followed up generally at the 6 month point or they will be re-referred back to the program. If the client re-offends they are recorded on the data-based. You might not find that out until you see them the next time, and if you don't see them again you are hoping they haven't repeated the crime. • This data is not actively or formally followed up with the client. So no we don't formally chase that up. So have they come back into the system, or what have we found out from JJT.
<p>Recidivism and follow</p>	<p>NSW- IFAP</p>	<ul style="list-style-type: none"> • Follow-up is not built into the program, but is encouraged • Typical follow-up involves phone contact 2 weeks after the final home visit and then 2 months after that phone contact is made again. If the families seek help from other agencies we may follow-up on more occasions over a 12 month period. • It is hard to give accurate data on recidivism because we rely on what we get from the family and parents. Some juvenile justice people have commented that the child has lit further fires. Recidivism is not officially recorded in the database; however, anecdotally the rate is low. Anecdotally out of 75 clients in the past year, there were 2 recidivists that were referred again from JJ.
<p>Recidivism and follow</p>	<p>SA- J-FLIP</p>	<ul style="list-style-type: none"> • The child is followed up until their agreement time (which is often 2 weeks after the completion of the program) • The practitioners have undertaken follow-ups up with the families over the phone between 3-6 months to determine if the fire play has stopped. This is no longer occurring due to time constraints. • Recidivism is not officially recorded in a data base. The co-ordinator suggests that anecdotally the rate is low, for example last year there were 82 cases, and there were 2 cases that he is aware of that continued firesetting. •

Recidivism and follow	QLD-FFF	<ul style="list-style-type: none"> • The practitioner contacts the family approximately 6 months after the last visit. This is done either by sending a birthday or Christmas card as well as a phone call. • Feedback is sought by way of a survey; however the return rate is low due to the highly transient nature of the clients involved. • Recidivism was evaluated in 2005 by survey by an external research company. There was a sample of 300 past clients (1 month- 5 years follow-up time) of the FFF. 112 past clients were successfully contact and we asked if their child had been fire safe. 91% of the clients had been fire safe.
Recidivism and follow	TAS- JFLIP	<ul style="list-style-type: none"> • Clients are followed up at 6 months to determine if there fireplay has stopped. • It's very successful but we can't pull out the figures easily. I think in the past it has been 88%.
Recidivism and follow	ACT- JFAIP	<ul style="list-style-type: none"> • There is not an official follow-up that is built into the program. There is usually a 6 month follow-up period. It is up to the practitioner and there are no strict guidelines. • It is hard to give accurate data on recidivism because we rely on what we get from the family and parents. Some juvenile justice people have commented that the child has lit further fires. Recidivism is not officially recorded in the database; however, anecdotally the rate is low. Anecdotally out of 75 clients in the past year, there were 2 recidivists that were referred again from JJ.
Recidivism and follow	NT- JFAIP	<ul style="list-style-type: none"> • Practitioners are encouraged to follow-up with clients but it is not built into the program
Recidivism and follow	NZ- FAIP	<ul style="list-style-type: none"> • Follow-up at 3 months- a questionnaire is posted out to families. • The FAIP measures its success by its recidivism rate. If firesetters are re-referred to the FAIP within one year of the first referral, they are counted as recidivist firesetter. Around 97% of the firesetters who have taken part in the FAIP are not referred back to the FAIP within one year of completing the program.