

A survey of nightmare frequency and intensity in an
Australian University sample and treatment with a
Story-Line Alteration Technique (SLAT)

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Statement of Declaration

I, Fabian A. Elzo, declare that the PhD thesis entitled “ A survey of nightmare frequency and intensity in an Australian University sample and treatment of weekly nightmares with a Story-Line Alteration Technique (SLAT)” is no more than 100,000 words in length, exclusive of tables, figures, appendices, and references. 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 otherwise indicated, this thesis is my own work.

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Abstract

Nightmares have been described as the most common form of disturbed dreaming. The definition most widely accepted considers two criteria as definitive elements of nightmares, acute anxiety or fear, and awakening from sleep with full alertness. Contemporary studies suggest that nightmares are relatively common and can either be benign or malignant to the point of being compared to psychosis. Thus when nightmares become frequent and/or recurrent, they tend to become problematic and warrant treatment. The current study aimed to investigate the frequency of nightmares in a large community based sample and trial a brief story line alteration technique. More specifically, the current research was designed to conduct two related studies in order to elucidate nightmare frequency and intensity in an Australian sample and examine the efficacy of self-help nightmare treatments. The main hypotheses in the first study predicted that more than 10% of the sample would report weekly nightmares and significant gender differences in reporting nightmares would be observed. Participants in the first study were 440 university students (115 men and 325 women) aged between 18 and 34 ($M = 20.41$ years). Participants completed the retrospective metric/s Nightmare Frequency Questionnaire (NFQ) and Pittsburgh Sleep Quality Index (PSQI) and Addendum. The results showed that yearly, monthly and weekly nightmares were common, in particular weekly nightmares. However no significant differences between genders were found. Participants in the second study were 20 students who reported weekly nightmares aged between 18-31 ($M = 21.6$ years) and completed a battery of retrospective metrics including the Nightmare Effects Survey (NES), Posttraumatic Diagnostic Scale (PDS) and the Profile of Mood States (POMS-37 items). The main hypotheses in the second study predicted that the Storyline Alteration Technique (SLAT) would ameliorate nightmare frequency and waking distress overtime and achieve significantly better therapeutic outcomes in contrast to the Systematic Desensitization (SysD) technique. Results showed that the SLAT was efficacious in significantly ameliorating nightmare frequency overtime and in contrast to the SysD technique. It was concluded that weekly nightmares were more prevalent than previous retrospective findings had indicated and self-help nightmare treatments were efficacious in ameliorating nightmare frequency, associated waking distress and poor sleep.

Chapter 1

Introduction

1.1 Historical Overview

Nightmare experiences have been documented for hundreds, and in some cases, thousands of years in the writings of philosophers (Ross, 1955), poets (Shakespeare, 1914) and theologians (Kings James Version, 1990). However, significant medical interest in the nightmare phenomenon can be traced to the 18th century. In his medical treatise, now a classic text, *An Essay on the Incubus, or Nightmare* (1753) John Bond, a Scottish doctor afflicted by nightmares himself, explored the superstitious notion that mental disturbance stemmed from diabolical forces by examining the ‘incubus’. Through his analysis of the incubus, also known as a physical manifestation of the ‘Nightmare’ he described an evil spirit, which could manifest itself in a male (‘incubus’) or female (‘succubus’) form that visited sleeping victims. During these visits it would sit on the chest/breast of its victims who subjectively experienced the event as a horrific dream, coupled with a dead weight on their frontal torso; as the incubus/succubus contemplated committing depraved sexual acts. During this period, the incubus/succubus phenomenon was to become such an icon of the human psyche that it was immortalized by Henry Fuseli (1781) who painted various masterpieces depicting ‘The Nightmare’ as a grotesque demon-like figure that sat on its victims while they slept.



The Nightmare by Henry Fuseli (1781) (the Detroit Institute of Arts, Detroit)

Bond, in his medical treatise, aimed to identify a medical/physiological cause and consequently provide a treatment/intervention for nightmares. After completing his investigation on the nightmare phenomenon he suggested that nightmares commonly affected people who led debauched lives and/or tended to sleep on their backs. Accordingly, the most effective remedy for people suffering from nightmares was to rouse them from sleep by applying a stimulus - such as a pin prick, shaking them or speaking loudly. This 'intervention' would have the desired effect of arousing sufferers thus ending the horrific experience. As with many such novel 'ideas' a principal oversight was its reliance on external support - nightmare sufferers needed to have access to someone who could awake them, which was problematic for those who lived alone or had bedroom partners who were unreliable sleep monitors.

The original literary definition of the nightmare was a "morbid oppression during sleep, resembling the pressure of weight upon the breast" (Johnson & Walker, 1755 p. 491). This definition was codified by Dr. Samuel Johnson in his book entitled "A Dictionary

of the English Language” (1755) where he noted that the etymology of the word ‘nightmare’ originated from the words *night* and *mara*, which in northern mythology represented torment and suffocation in the night. Like Bond, Johnson aimed to provide a more medical explanation for the phenomenon in a bid to quash superstition (as manifested in the form of the incubus / succubus). Despite these attempts, a generational fascination with mystical forces still prevailed and continued to fuel the folklore of early European societies; stories of night witches and supernatural beings captured the common imagination of the medieval world view (Stewart, 2004).

It was the pioneering work of Ernest Jones’ (a Welsh neurologist and the first English speaking psychoanalyst) *On the Nightmare* (1931) that heralded a systematic investigation into the pathology of nightmares. Jones followed in the footsteps of Freud’s psychoanalytic perspective and considered nightmare experiences to be the legacy of infantile sexuality. Within this construction, the fulfillment of a repressed wish, in the form of psycho-masochistic desires, warranted therapeutic and medical attention. However, as Jones stressed in the opening paragraphs of his work, nightmare experiences in clinical settings, or indeed, patients concerns with nightmare experiences were commonly ignored by physicians. If and when any medical attention was paid to the problem it usually took the form of irrelevant and erroneous advice, followed by ineffective treatment.

Some three decades later the work of John Mack, *Nightmares and Human Conflict* (1970) refocused attention on the impact that basic and early traumatic responses had

on dream life. These traumatic responses were found to manifest in the form of nightmare experiences, which according to Mack reflected the development of the human mind. He asserted that the analyses of nightmare experiences often uncovered the earliest and most profound anxieties, such as separation and/or abandonment. By this time, scientific interest in the nightmare phenomenon was several decades into its development. In the first comprehensive review of nightmare literature, Hersen (1972) recounts the various systematic research studies conducted on nightmare behaviour, including the work of Cason (1935), Feldman and Hersen (1967) and Broughton (1968). This developing corpus of work was empirically grounded and constituted a scientific knowledge base, which would come to support further research into the phenomenon. In the process, many of the long-held, superstitious-fuelled interventions and opinions about nightmares began to dissipate.

The unintentional discovery of Rapid Eye Movement (REM) sleep and its association with dream mentation (Aserinsky & Kletmann, 1953) informed researchers such as Feldman and Hersen (1967), Broughton (1968) and Mack (1970), and heralded a new era in sleep research. Augmented by 'A manual of standardized terminology, techniques and scoring system for sleep stages of human subjects' (Rechtschaffen & Kales, 1968), this new era established a standardized empirical criteria for monitoring sleep. It enabled the integration of research findings and the establishment of a more comprehensive view of the nightmare phenomenon. By the 1990's the implementation of new technologies such as the Positron Emission Tomography (PET) in the study of sleep (Braun, Balkin & Wesensten, 1997) allowed sleep researchers to conduct in-

depth, multi-disciplinary studies that have further clarified many controversial issues regarding sleep and dreams.

These discoveries made enormous inroads into the scientific understanding of human sleep and dreams. Consequently, nightmare experiences began to be differentiated by physiological, phenomenological and behavioural parameters. Contemporary understanding of the psychophysiological underpinnings of nightmare experiences has identified four distinct nightmare related phenomena that were confounded in early interpretations, namely: (1) nightmares; (2) night-terrors; (3) sleep paralysis; (4) hypnogogic hallucinations (Hufford, 1982). Today, the understanding of nightmares is significantly more comprehensive and contemporary nightmare literature has provided greater clarification on definitional issues, categorical variability, measurement techniques and treatment management.

1.2 Literature Overview

Nightmares or nightmare experiences have been considered to be the most common form of disturbed dreaming (Levin & Nielsen, 2007). They have been defined as dream anxiety attacks accompanied by low to moderate levels of autonomic activation and arousal, such as tachycardia (increased heart rate), tachypnea (increased breathing rate) and diaphoresis (profuse perspiration) (Association of sleep Disorder Centers, 1979). Nightmare experiences are described as frightening dreams that usually entail perceived imminent harm to physical or psychological well-being and associated with

intense emotional experience(s). Nightmares can either be benign or malignant to the point of being compared to psychosis (Freud, 1940; Jung, 1974; Hartmann, 1984).

The definition most widely accepted considers two criteria as definitive elements of nightmares, acute anxiety or fear, and awakening from sleep with full alertness (Nielsen & Zadra, 2000). However, these criteria continue to be questioned by contemporary researchers. For instance, other emotions such as anger, grief and guilt have also been reported during nightmare incidents (Dunn & Barret, 1988; Mack, 1970), and the International Classification of Sleep Disorders 2nd Edition accommodates additional dysphoric emotions such as sadness and disgust (ICSD-2, 2005). Moreover, in various studies nightmares have been defined without the ‘waking criteria’ (Belicki & Belicki, 1982, 1986, Blagrove, Farmer & Williams, 2004; Miro & Martinez, 2005; Wood & Bootzin, 1990) signifying the lack of definitional consensus amongst researchers. In addition, only when nightmare experiences become frequent or recurrent, do they become problematic (Erman, 1987) and possibly warrant treatment. Another variable that has become prominent in determining ‘problem nightmares’ is nightmare distress (Levin & Nielsen, 2007), that is, distress experienced the following day as a result of the nightmare incident. Furthermore, if nightmares include the ‘waking criteria’, the disturbances and disruption in sleep can also cause additional impairment at a personal, social and occupational level (DSM-IV-TR, 2000).

The available research literature categorizes nightmare experiences in two broad classes - post-traumatic nightmares (trauma related nightmares) and non-traumatic (idiopathic)

nightmares (Levin & Nielsen, 2007). Posttraumatic nightmares are described as dreams related to a traumatic event that either makes reference to or replicate the traumatic incident in detail, such as in PTSD repetitive nightmares. In contrast, non-traumatic nightmares have no discernible trigger and are considered to be idiopathic in nature (American Sleep Disorder Association, 2005).

Over the past two decades there has been a proliferation of experimental research focused on these two categories and their associated psychopathological correlates (Levin & Nielsen, 2007). Researchers have investigated correlations between nightmares and anxiety (Hersen, 1971, Wood & Bootzin, 1990), post-traumatic stress disorder (PTSD) (Mellman, David, Bustamante, Torres, & Fins, 2001), major depression (Agargun, et al., 1998), bipolar disorder (Beauchemin & Hays, 1995), dissociative disorders (Agargun, et al., 2003), schizotypy (Claridge, Clark & Davis, 1997; Levin, 1998), borderline personality (Claridge, Davis, Bellhouse & Kaptein, 1998; Levin & Raulin, 1991), neurotic psychopathology (Berquier & Ashton, 1992) and psychosis (Hartmann, 1984; Fenning, Salganik & Chayat, 1992). Considerable work has also been conducted on investigating nightmare incidents and pathological correlates such as sleep disordered breathing SDB and snoring (Krakow, Haynes, Warner et al., 2004), obstructive sleep apnoea OSA (Krakow, Lowry, Germain et al., 2000); Parkinson's disease (Kumar, Bhatia & Behari, 2002), epilepsy (Silvestri, DeDomenico, Mento et al., 1995), and asthma (Schredl, Schmitt, Hein, Schmoll, Eller & Haaf, 2006).

Occasional nightmare experiences are ubiquitous among the general population (Hartmann, 1984; Zadra & Donderi, 2000) but frequent nightmares are less common. Research focused on large, community-based epidemiological studies report that between 10% to 24 % experience monthly nightmares (Feldman & Hersen, 1967; Levin, 1994), while other studies have found monthly frequency to be as high as 29.9% (Miro & Martinez, 2005). Levin and Nielsen (2007), in the most recent nightmare literature review stated that 4% to 10% of the general population experience problem nightmares on a weekly basis, but suggest that these estimates should be considered conservative. By implication, in Australia approximately 2,100,000 to 5,040,000 individuals may experience monthly nightmares and 800,000 to 2,100,000 individuals may experience weekly nightmares. However, a more precise and reliable figure remains unknown (Australasian Sleep Association, 20011) due to the lack of research in this area. At the time of writing this thesis, the Australasian Sleep Association (ASA) website did not post any information pertaining to nightmares, which is somewhat surprising given the potential prevalence in Australia.

The prevalence of trauma related and/or idiopathic nightmares in the general population is presently also unknown due to researchers failing to distinguish the type of nightmares reported in community based studies (Levin & Nielsen, 2007) despite the awareness of the two broad classes reported in the literature. However, the prevalence of post-traumatic nightmares in individuals diagnosed with PTSD may be as high as 71% (Maher, Rego & Asnis, 2006), even though nightmare experiences are not a necessary criterion for the diagnosis of PTSD (DSM-IV-TR, 2000). Paradoxically,

nightmare experiences are listed as the second most common posttraumatic sleep disturbance by the American Psychiatric Association (APA, 2000) and are considered to be the hallmark of psychopathological correlates related to traumatic experiences (Zervas & Soldatos, 2005). In contrast, parasomnias, in particular Nightmare Disorder, accounts for an estimated 3% of young adults who report problems with nightmares, but once again, the specific prevalence is unknown (DSM-IV-TR, 2000, Krakow et al., 2001). Surprisingly, the International Classification of Sleep Disorders (ICSD-R) lists prevalence at a mere 1% (American Academy of Sleep Medicine, 1997), which appears to be a gross underestimation when considering the prevalence estimates reported in recent studies (Levin & Nielsen, 2007).

In clinical literature, frequent nightmares have been viewed and considered in two distinct ways - 'nightmares in a psychopathology' and 'nightmares as a psychopathology' (Zervas & Soldatos, 2005). The former view is based on the psychiatric paradigm which considers frequent nightmares a symptom or related to an underlying psychopathology, such as PTSD. The latter view is based on the more contemporary sleep medicine paradigm, which accepts that frequent nightmares are a psychopathology in their own right, the parasomnia 'Nightmare Disorder' (DSM-IV-TR, 2000; ICSD-2, 2005; Kennedy, 2002). Parasomnias are sleep disorders that arouse individuals from sleep at different stages of the sleep cycle or during the transition between sleep stages (DSM-IV-TR, 2000). For instance, REM Behaviour Disorder RBD a condition pertaining to individuals acting out their dreams and nightmares, since REM atonia, a regulatory mechanism that prevents body movements during REM sleep

is inactive (Fryer, 2009). Nevertheless, support for this view stems from the observation that chronic nightmares can “function like an independent sleep disorder because nightmares produce symptoms similar to psycho-physiological insomnia...” (Krakow, Hollifield, Schrader et al., 2000, p. 590).

Depending on the perspective adopted by treating therapists, psychiatric or sleep medicine paradigm, the orientation and implementation of treatment may vary. When nightmare experiences are diagnosed as a symptom, treatment is directly focused on addressing the underlying psychopathology, which is assumed to instigate nightmares; thus by treating the psychopathology it is expected that associated symptoms including nightmares will dissipate (Krakow, Haynes, Warner, et al., 2004). In contrast, when nightmares are diagnosed as a psychopathology, treatment is focused directly on eliminating or ameliorating the nightmare experiences (Kennedy, 2002; Krakow et al., 2000). Hence, it appears that clinicians adopting the psychiatric paradigm implement indirect treatment(s), in contrast clinicians adopting the sleep medicine paradigm implement direct treatment(s) for nightmares.

Traditional etiological explanations for nightmares derive from the psychoanalytical perspective (Mack, 1970). Although nightmares were perceived as manifestations of uncontrollable processes arising from the unconscious mind that seemed to reflect unresolved issues from past traumatic experiences (Lansky, 1995) they were associated with stored libidinal energy. In Freud’s (1900/1976) Wish Fulfillment Theory, dreams were considered as the ‘guardians of sleep’ and nightmare experiences (unfortunately)

represented counter examples of this premise since they aroused the sleeper. Furthermore, nightmares failed to accomplish any wish fulfillment as it seemed irrational to wish for such a horrid experience (Freud, 1920). However, within this construction, nightmare experiences were claimed to be manifestations from the superego desiring punishment due to the individual's perverse and immoral impulses. Freud recognized that his theory failed to explain repetitive traumatic nightmares adequately and some decades later he attempted to account for this type of nightmare by asserting that they represented primitive tendencies that recreated unpleasant experiences and manifested as 'repetitive compulsions' (Freud, 1920).

According to Carl Jung's commentary on dreams, nightmare experiences served a compensatory function similar to other types of dreams (Jung, 1963). Dreams in this paradigm, revealed more about the individual than they concealed as Freud posited. When the individual's conscious attitude became perfunctory or mundane, the individual was compensated by the experience of a nightmare, which served to enhance the transition of imparting messages that were too difficult to accept in the conscious or awake state. However, Jungian Dream Interpretation also had difficulty accommodating and explaining repetitive traumatic nightmares. Such nightmares were considered to be predominantly unrelated to the individual's conscious attitude, making the compensatory function inconsistent with the Jungian Dream Interpretation and thus invalid (Domhoff, 2000).

Mack (1970) refocused nightmare etiology on trauma exposure and contended that nightmares did not occur due to the eruption of stored libidinal energy, but were due to cognitive processes that dealt with the notion that the ego is relatively defenseless and vulnerable during sleep. Mack asserted that nightmares represented 'basic fear memories' that the ego confronted during an individual's dream life. These 'basic fear memories' derived from "the earliest, most profound and inescapable anxieties and conflicts to which human beings are subject; those involving destruction, aggression, castration, separation and abandonment, devouring and being devoured, and fear regarding loss of identity and fusion with the mother" (p. 16).

Contemporary research and clinical literature suggest that nightmare experiences may occur for various reasons. However, the most accepted cause for nightmares, according to much of the clinical literature, is the prevailing psychiatric view that nightmares are symptomatic of an underlying psychopathology (Kennedy, 2002; Krakow, Haynes, Warner, et al., 2004) such as PTSD, depression and/or schizophrenia-spectrum disorders (Krakow, Hollifield, Johnson, et al., 2001). In the absence of a psychopathology, nightmare experiences may be caused by stress (Chambers & Belicki, 1998; Dunn & Barrett, 1988), personality type - individuals with thin-boundaries or neuroticism (Hartmann, 1984, 1991; Spoormaker, Schredl & van den Bout, 2006) and/or ingesting certain medications (e.g., fat-soluble beta blockers, reserpine, thioridazine, certain antidepressants and benzodiazepines; Treatment Protocol Project, 2000). Sudden withdrawal from other drugs, such as nicotine and non-benzodiazepine hypnotics (REM sleep suppressors), have also known to cause nightmare experiences

(Treatment Protocol Project, 2000). Another cause mentioned earlier, refers to the supine sleeping position - sleeping on your back (Valipour, Lothaller, Rauscher, Helmuth, Zwick, Burghuber & Lavie, 2007). In addition, nightmares may also derive from organic related causes; for instance Solms (1997) found that repetitive nightmares increased when injuries to the temporal lobe occurred (i.e., in patients with epilepsy), and have been reported by individuals suffering from Parkinson's disease (Borek, Kohn & Friedman, 2006). It is important to note that the terms repetitive nightmares, recurrent nightmares and replicative nightmares are often erroneously interchanged in the literature. The differences between these terms are presented in Table 4.2 (page 90). Nightmares have also been linked to genetic or familial factors (Hublin, Kaprio, Partinen et al., 1999) and been reported by individual's with physical conditions relating to common/febrile illnesses such as fever (Karacan, Wolff, Williams, Hirsch, & Webb, 1968).

Traditional treatments for nightmares derived from the psychoanalytic paradigm, which included techniques such as free association, cathartic techniques (Halliday, 1987) and clinical hypnosis (Seif, 1985). Contemporary psychotherapeutic treatments in the literature are grounded on the principles of the empirically based Cognitive Behavioural Perspective, which include brief cognitive-behavioural techniques, such as Systematic Desensitization Techniques - SDT (Davis & Wright, 2005; Schindler, 1980), Imagery Rehearsal Therapy - IRT (Kroese & Thomas, 2006; Kellner, Neidhardt, Krakow & Pathak, 1992), Lucid Dreaming Therapy - LDT (Spoormaker, 2008, Spoormaker & van de Bout, & Meijer, 2003) and Exposure, Relaxation and Rescripting

Therapy - ERRT (Davis & Wright, 2005). However, IRT has received the most empirical support (Krakow & Zadra, 2006) and may be considered the current treatment of choice (Krakow et al. 2000; Levin & Nielsen, 2007; Spoormaker, Schredl & van den Bout, 2006). Another well-known contemporary nightmare treatment is pharmacological/drug therapy, which has included the administration of Prazosin (Taylor, Lowe & Thompson, 2006) and Aripiprazole (Lambert, 2006). These pharmacological treatments have been used as an alternative treatment to psychotherapy for frequent nightmares and have proven to be efficacious in ameliorating nightmare incidents.

1.3 Australian Research on Nightmares

In Australia, nightmare research has been restricted to a handful of studies that have focused on various aspects of the nightmare phenomenon. The work of Berquier and Ashton (1992) investigated the characteristics of the frequent nightmare sufferer. In their study they compared 30 participants with lifelong nightmares (one or more nightmares per month) with 30 participants similar in age, gender and socioeconomic status who reported a low nightmare frequency. Other interesting research conducted by Roberts and Lennings (2006) examined the correlation relationships between nightmare incidents, the presences of psychopathologies and personality traits. In this study the researchers sampled 148 students aged 12-18 years. Roberts, Lennings and Heard (2009) also examined the tension reduction hypothesis in a later study, which sampled 624 students aged between 12-19 years of age. In terms of nightmare treatment, Kennedy (2002) implemented hypnosis in the treatment of selected

parasomnias, including Nightmare Disorder. This research was based on the case study of a 37 year old female patient who experienced between 3-4 nightmares per week. Another nightmare treatment that has been trialed in Australia is IRT. Forbes and colleagues (2001) originally conducted a pilot study on 12 Vietnam veterans with combat-related nightmares with a subsequent 3-month follow-up. A couple of years later Forbes et al. (2003) conducted another study on 12 Vietnam veterans with combat-related nightmares and they performed both a 3 and 12 month follow-up (Forbes, Phelps, McHugh, Debenham, Hopwood & Creame, 2003). However, the treatment of choice according to the Australian Treatment Project of the World Health Organization Collaborating Centre for Mental Health and Substance Abuse Management Guidelines is an 8-week desensitization muscle relaxation program (Treatment Protocol Project, 2000).

1.4 Statement of Significance

The significance of this research pertains to the minimal research attention given in Australia. The lack of research focused on nightmares (with regard to prevalence and treatment) seems to suggest that researchers and therapists alike appear to have adopted the psychiatric paradigm and consider frequent nightmares as the secondary symptom of an existing psychopathology, such as PTSD, rather than a primary condition - such as the parasomnia Nightmare Disorder. Although, the classification of parasomnias in the DSM-IV-TR (2000) and ICSID-2 (2005) indicate that nightmare experiences may well be a primary condition that warrants primary and direct treatment, there are very few accounts of psychotherapeutic treatments that focus directly on addressing and

treating nightmare experiences in Australia despite the potential prevalence of weekly and monthly nightmares.

Another significant aspect of this project is that it engages with the changing social landscape in Australia. In particular, many refugees that have arrived from the former Yugoslavia and Africa (specifically from the Horn of Africa) have been exposed to war, trauma and loss (<http://www.aph.gov.au/library/intguide/sp/settlement.htm#stats>). Furthermore, floods, bushfires, cyclones and droughts are an ongoing aspect of the Australian way of life. Thus, there is a clear need for effective, 'evidence-based' treatments that directly address the spectrum of trauma experiences, including the impact of nightmares on nighttime and daytime behaviour. The immediate consequences of nightmares may manifest as the inability to focus and concentrate during the day, which may significantly affect personal, social and occupational functioning (DSM-IV-TR, 2000). Moreover sleep disruptions and disturbances may eventually lead to avoidance behaviours related to sleep and psychophysiological insomnia (Kennedy, 2002; Krakow, Hollifield, Schrader et al., 2000), which may become a chronic condition if untreated (Hublin, Kaprio, Partinen et al., 1999).

1.5 Contribution to Knowledge

As the first study of its kind in Australia, this research will survey the frequency and type of nightmare experiences in a sample of university students. As an initial step in promoting future nightmare prevalence research in Australia, the study will also be the

first research-based study to introduce and trial a brief and direct psychotherapeutic nightmare treatment based on a self-help approach/format.

Key elements in other psychotherapeutic treatments, which have proven to be effective in reducing frequency and alleviating distress - such as therapeutic 'suggestion', 'cognitive restructuring' and developing a sense of 'mastery' - constitute the brief treatment which aims to obtain measurable benefits in a considerably shorter period of time in comparison to the current Australian treatment of choice Systematic Desensitization.

Presently, the Treatment Protocol Project of the World Health Organization Collaborating Centre for Mental Health and Substance Abuse Management Guidelines in Australia promotes an 8-week desensitization muscle relaxation program as its treatment of choice for individuals experiencing problem nightmares. In the first two weeks clients/patients learn and practice progressive muscle relaxation techniques and write down their nightmare narratives. In weeks three and four clients/patients learn and practice imaginal desensitization once a day and muscle relaxation each night before going to sleep. Finally, in weeks five to eight clients/patients are instructed to practice imaginal desensitization. However, if nightmares persist which may be due to the severity and high frequency of nightmares or the presence of differential diagnoses, clients/patients are instructed to continue to practice imaginal desensitization techniques. Thus, the guidelines suggest that once the program has been completed and if patients continue to experience nightmares they should be instructed to practice the

desensitization technique ongoing until it is effective. This aspect of the approach could be demoralizing for individuals suffering from frequent nightmares that need urgent assistance. With this in mind the proposed brief alternative treatment is specifically directed at eliminating and alleviating nightmare incidents in shorter period of time.

1.6 Thesis Focus

The research thesis will focus on two distinct, but related studies. The first study focuses on determining the frequency of nightmare experiences across three periodicities - yearly, monthly and weekly, the type of nightmares (trauma related or idiopathic) reported and nightmare correlates (sleep quality and PTSD symptoms) in a sample of Australian university students.

In the second study, students who reported weekly nightmares will be administered either the pilot treatment (Storyline Alteration Technique – SLAT) or a ‘variant’ of the treatment of choice (Systematic Desensitization Technique – SysD) according to the Australian Treatment Protocol Project of the World Health Organization Collaborating Centre for Mental Health and Substance Abuse Management Guidelines. These treatments will be based on a self-help format where the instructions pertaining to the intervention will be presented on a CD and participants will be instructed to listen to the CD for seven consecutive days.

1.7 Aims for the First Study

- Determine the frequency of yearly, monthly and weekly nightmares in a sample of 440 participants from Victoria University using a retrospective metric

- Determine the frequency of trauma related and idiopathic nightmares across the three periodicities yearly, monthly and weekly
- Ascertain if any differences were observed between genders when reporting nightmares
- Ascertain associations between nightmares, sleep quality and the presence of PTSD symptoms

1.8 Aims for the Second Study

- Introduce and trial a brief and direct treatment for nightmares (participants will be randomized [in a controlled intervention] to either receive the storyline alteration technique [SLAT] or systematic desensitization [SysD]).
- Determine any significant differences over time (pre-post) for both the SLAT and SysD treatments
- Determine any significant differences between SLAT and SysD post treatment
- Investigate the benefits of the SLAT treatment on other sleep related correlates (sleep quality, negative nightmare effects and emotional moods/states)
- Investigate the benefits of the SysD treatment on other sleep related correlates (sleep quality, negative nightmare effects and emotional/mood states)

The hypotheses of the thesis are based on the findings and propositions of specialist proponents in the field of nightmares and aim to contribute to the developing knowledge base that pertains to the expanding sleep medicine paradigm.

1.9 Hypotheses for the First Study

- It was hypothesized that over 10% of participants would exclusively report at least one nightmare per week
- It was hypothesized that between 8- 30% of participants would exclusively

report at least one nightmare per month

- It was hypothesized that more women than men would report yearly, monthly and weekly nightmares
- It was hypothesized that trauma related nightmares would be more prevalent than idiopathic nightmares in participants who report weekly and monthly nightmares

1.10 Hypotheses for the Second Study

- It was hypothesized that participants administered the SLAT treatment over-time (pre-post) would experience a significant decrease in nightmare frequency
- It was hypothesized that participants administered the SysD treatment over-time (pre-post) will also experience a significant decrease in nightmare frequency
- It was hypothesized that participants administered the SLAT treatment would report significantly fewer nightmares in comparison to participants administered the SysD post-treatment
- It was hypothesized that participants administered the SLAT treatment would report better outcomes in the other sleep related measures (sleep quality, negative nightmare effects and emotional states) in comparison to participants administered the SysD technique post-treatment

1.11 Thesis Structure

The thesis structure aims to explore and review the field of dream research in order to provide the necessary background to gain a thorough understanding of nightmare phenomenon and research. Thus, Chapter one commences with a brief history and overview of the nightmare literature. It identifies the significance of the present

research project and sets out the aims and hypotheses of the thesis. Chapter two reviews selected traditional and contemporary dream theories/hypotheses to elucidate the progression of field of dream and nightmare research. It also reviews how each theory or hypothesis has accommodated or failed to accommodate nightmare experiences. Chapter three reviews contemporary nightmare hypotheses/models and associated theories to underline the current state of theoretical knowledge pertaining to the nightmare phenomenon. Chapter four examines contentious issues of dream and nightmare definitions, reviews sleep architecture and discuss how nightmares have been reported in the literature. Chapter five examines nightmare prevalence and frequency studies and discusses related issues relating to the discrepancies reported in the literature. Chapters six examines and discuss three foundational questions pertinent in any dream research the formation, function and interpretation of nightmares. Chapter seven reviews traditional and contemporary treatment options for frequent and problem nightmares. Chapter eight provides a detailed review of the research methodology employed in the thesis project. Chapter nine cites all of the research results and outcomes for both the first and second studies. Chapter ten discusses the findings and implications of the first study and Chapter eleven discusses the findings and implications of the second study. Chapter twelve posits a theoretical review based on the key findings of the research project and discusses some proposals for future research.

Chapter 2

Dream Theories/Hypotheses

2.1 Introduction

The fascination with dreams commenced early in human history with almost every culture having literature and/or writings on dreams (Mackenzie, 1965). The vast dream literature extends from the times of ancient Egypt to the early philosophical works of Aristotle compiled in 'Parva Naturalia', to the numerous contemporary theories available to present-day dream researchers (Sutton, 2009). Dreams have been studied from numerous perspectives and disciplines over the course of human history (Hobson, Pace-Schott & Stickgold, 2000) including psychiatry (Freud, 1900/1976), anthropology (Bourguignon, 1954), psychophysiology (Dement & Kleitman, 1957), neurobiology (Jouvet, 1962), philosophy (Flanagan, 1997; Putnam, 1975), psychology (Foulkes, 1985), neural network modelling (Antrobus, 1991), artificial intelligence (Crick, 1994) and evolutionary biology (Revonsuo, 2000b) amongst others.

The literature on dreams is extremely extensive due to the nature of the subject matter and the diversity of disciplines that have engaged in the study of dreams in one form or another. This phenomenon encompasses both neural and cognitive-emotional constructs, therefore to thoroughly comprehend dreams and dream literature it is imperative that both the physiological as well as psychological elements of the phenomenon are examined. The following (selected) theories represent some of the most influential perspectives/hypotheses that have shaped the development of the

contemporary theoretical dream knowledge and they also elucidate some of the various controversies that still impact the field of dream research today. In chronological order the following perspectives/hypotheses will be briefly examined; Sigmund Freud's *Wish fulfillment Theory of Dreams (1900)*, James Allan Hobson and Robert McCarley's *The Activation-Synthesis Hypothesis (1977)*, David Foulkes' *Cognitive-Psychological Analysis of Dreams Model (1985)*; and William Domhoff's *Neuro-Cognitive Model of Dreams (2003)*. These theories/hypotheses are reviewed in order to shed some light on the relatively systematic progression of knowledge and current understanding in dream research. In addition, the nightmare phenomenon will be briefly examined from the perspective of each theory/hypothesis, to elucidate how each paradigm/model has accommodated or failed to accommodate nightmare experiences.

2.2 Wish fulfillment Theory of Dreams

One of the greatest contributions and influential pieces of work in the study of dreams is Sigmund Freud's *The Interpretations of Dreams (1900)*. Within this corpus of work - based on his clinical observations and experiences - Freud postulated the Wish fulfillment Theory of Dreams. His conception of dreams was revolutionary; dreams were perceived to be the 'royal road' to the vast knowledge contained within the unconscious mind. According to Freud, dreams did not stem from the 'gods' and/or 'demons' associated with early Judaeo-Christians beliefs (Hobson, 2003), but had psychic origins pertaining to the interplay between the conscious, subconscious and unconscious entities of the mind (Freud, 1900). He posited that dreams were composed of two interrelated contents, the manifest and latent contents. The manifest content

reflected the surface of the dream (similar in some respects to the notion of the conscious mind) and the latent content reflected deeper thoughts and feelings (similar in some respects to the notion of the unconscious mind). Individuals upon waking from sleep, had access to the superficial manifest content, images and feelings that they could remember about their dream. However, these dream images were heavily disguised and concealed hidden messages, which were inherent by design. Thus, in order to gain an accurate interpretation of these recollections, the latent content, which reflected expressions of wishes and desires, needed to be accessed and analyzed. The distortion intrinsic in the latent content further represented a kind of censor that was essential due to the perverse nature of these immoral wishes, which were considered to be manifestations of basic instincts stemming from infantile sexual, aggressive and egotistical impulses (Freud, 1900/1976).

During the prologue pertaining to concepts of the manifest and latent contents of dreams Freud made reference for the very first time, to the 'Oedipus Complex', a phylogenetically inherent phenomenon according to Freud (Freud, 1900/1976). He identified 'it' as the instigating 'source' of these basic instinctual immoral impulses that commenced between 5 – 7 years of age and impinged the dreamer's consciousness as dreams. Freud's interpretation of the Oedipus complex reflected a tremendously powerful unconscious desire in boys to sexually possess their mother and eliminate their immediate competition, their father. According to Freud, girls also had their own instigating 'source' of immoral desires represented by what he termed the 'Electra Complex', the counterpart of the Oedipus complex. Thus, girls also possessed and experienced the tremendously powerful immoral unconscious desire to sexually possess

their father and eliminate the immediate threat, their mother (Freud, 1900/1976).

The method Freud employed to interpret dreams was a variant of the method implemented by Artemidorus Ephesius. Artemidorus was a professional Greek diviner who lived in the second century and author of the literary work that has been considered the very first manual for interpreting dreams, the five-volume work *Oneirocritica* (White, 1990). In *The Interpretations of Dreams* (1900), Freud identified two main methods for interpreting dreams that were common practice in antiquity, the ‘symbolic method’ and the ‘decoding method’. The ‘symbolic method’ interpreted complete dream narratives, which were thought to represent daily incidents; in contrast the ‘decoding method’ interpreted dream imagery via a manual detailing specific meaning for each dream element. Despite acknowledging that these traditional methods were essentially based on superstitious notions, Freud insisted that dreams could be interpreted in a meaningful way by scientific methods.

Freud demonstrated his technique by ‘breaking down’ dream narratives into specific dream images and attributed meaning(s) derived from ‘free-association’ techniques. He fervently believed that this psychological process would enable him to uncover essential information from the unconscious mind to accurately interpret the presumed hidden message(s) in dreams (Freud, 1900/1976). He inaugurated his psychological ‘decoding method’ on the infamous ‘Irma’s Injection dream’, which he analyzed by pondering on specific thoughts that surfaced as he systematically contemplated every dream image separately. Upon completion of his analysis, Freud came to the realization that the essence of dreams was to demonstrate how individuals wished

things were, they dreamt about wishes that stemmed from the unconscious and manifested as distorted dreams. Thus, Freud theorized that dreams symbolized personal wish fulfillments (Freud, 1900/1976).

2.2.1 Nightmare Experiences - Wish fulfillment Theory of Dreams

Nightmares in this paradigm represented an immediate objection to the Wish Fulfillment Theory of Dreams. What possible rationale could an individual have for wishing for such a horrid experience? Furthermore, dreams under this construction were conceived to be the ‘guardians of sleep’ that preserved and maintained this essential activity, and nightmares by definition interrupted and aroused individuals from sleep. Freud attempted to accommodate nightmares by stressing the distinction between the manifest and latent contents. In his original explanation he postulated that when the ‘censoring agency’ attributed to the latent content failed to transform immoral desires, the outcome was a dream that turned into a nightmare. Moreover, the emotional anxiety and fear experienced in nightmares were believed to be due to the inability of the individual to mask latent immoral wishes and desires. Hence, nightmares were thought to stem from wishes that had not been properly censored (Freud, 1900/1976). This explanation could be considered suspiciously valid for idiopathic and even some trauma related nightmare experiences; however, repetitive traumatic nightmares were somewhat more problematic.

Freud’s subsequent attempt to accommodate different types of nightmares provided a rationale for repetitive traumatic nightmares; he suggested that some people found

pleasure in being humiliated and hurt. Such individuals had masochistic wishes that manifested in the form of repetitive nightmares, which were a variation of the wish fulfillment function that aimed to contain and manage anxiety from the influence of libidinal impulses (Freud, 1900/1976). However, unsatisfied with the rationale provided in *The Interpretation of Dreams*, Freud revisited the topic of nightmares in the form of post-traumatic dreams in *Beyond the Pleasure Principle* (1920). Freud acknowledged that repetitive post-traumatic dreams did not fulfill an instinctual sexual wish as first postulated; instead they fulfilled a wish for mastery that was based on the Ego component as opposed to the Id component of his revised theory of the psyche. However, repetitive traumatic nightmares stemming from ‘war neuroses’ *per se* became an insurmountable obstacle for the Wish-fulfillment theory and later Freud conceded that some dreams such as this ‘type of nightmare’ did not fulfill wishes at all (Barrett, 1996; Bulkeley, 1997).

2.3 The Activation-Synthesis Hypothesis

Since the *Interpretation of Dreams*, perhaps the most prolific dream researcher for the past few decades has been psychiatrist and neurophysiologist James Allan Hobson. Hobson and his fellow psychiatrist and neurophysiologist Robert McCarley proposed *The Activation-Synthesis Hypothesis* (1977) - a Neurobiological Theory of Dreams. This theory directly challenged Freud’s Dream theory on numerous key points, most notably on the suggestion that it was neurochemical changes in the brain that occurred cyclically, as part of the sleep cycle, that instigated dreaming or dream mentation not psychological libidinal urges as proposed by Freud. This directly refuted the notion

that it was dreaming that caused REM sleep and implied that it appeared to be the other way around; REM sleep caused dreaming, which directly questioned the meaningfulness of dreams.

In the article 'The Brain as a Dream Generator: An Activation Synthesis Hypothesis of the Dream Process', the model was postulated. Hobson and McCarley (1977) employed two methods of research that informed their Activation-Synthesis Hypothesis. Firstly they reviewed 37 pieces of work (references) relevant to their hypothesis and secondly they conducted research on sleep and dreaming patterns of animals, in particular cats. Hobson and McCarley postulated that all mammals experience similar sleep stages as humans; therefore there was a clear link between the sleep physiology of humans and non-human mammals. This conceptual link permitted the researchers to generalize their sleep research findings to human sleep physiology.

Hobson and McCarley (1977) postulated that dream sleep occurs due to a 'dream state generator' found in the brain stem. Furthermore, it was the periodic occurrence of REM (dream) sleep that instigates the systematic appearance of dream experiences not necessarily sexually based wishes. More specifically these dream experiences have corresponding physiological substrates in the central nervous system (CNS) that are activated during the REM sleep stage (Hobson & McCarley, 1977). The brain structures, which appeared to be directly associated with REM sleep included the pons (responsible for breathing and arousal, feeling and movement in the face and eyes) and the reticular activating system (responsible for regulating arousal and sleep-wake

transitions) located in the brain stem (Rolls & Treves, 1998). During REM sleep ponto-geniculo-occipital (PGO) waves, which may be recorded from the pons, the lateral geniculate nucleus (LGN) and the occipital cortex, stimulate higher midbrain and forebrain structures and appear just before the commencement of REM sleep. Hence, they were considered to be specific to the occurrence of REM sleep mentation (Hobson & McCarley, 1977).

Another identified function of these brain structures was the deactivation of the brain's control of movement during REM sleep, which results in a state of muscular paralysis (Hobson & McCarley, 1977); a condition that was associated with sleep paralysis documented in early descriptions of nightmares (Jones, 1931/1951). Consequently, when specific neural networks that enable the ability to walk are intermittently activated during REM sleep, the brain encounters difficulty in expressing the corresponding behaviour. Thus, when a higher brain centre, such as the forebrain detects this neural activity it attempts to give meaning to these random messages. This process is achieved by synthesizing the neural activity with existing memories, thus conveying a relatively meaningful narrative to the dreamer, which reflects the forebrain's attempt at making sense of the erratic impulses. The activation part of the hypothesis refers to the cyclical activation of REM sleep and the synthesis part of the hypothesis refers to forebrain's attempt in making sense of the random neural static which produces the dream experience.

Hobson and McCarley's (1977) Activation Synthesis Hypothesis drew considerable criticism from other dream researchers due to the claim that dreams were random and

meaningless (Laberge, 1985; Vogel, 1978). In fact, the Chairman of the Department of Psychiatry at Yale University, and a past president of the American Psychoanalytic Association Morton Reiser claimed that Hobson and McCarley overextended the implications of their theory (Goleman, 1984). Reiser acknowledged that advancement in brain physiology research had provided empirical evidence that ‘hidden wishes’ may not instigate dreams, but that did not imply that dreams were in fact meaningless. Another notable dream researcher Domhoff (2000) stressed that there was a considerable body of literature (Domhoff, 1993, 1996, 2000; Hall & Van de Castle, 1966; Schneider & Domhoff, 1995) that indicated that dreams are notably more “coherent, consistent over time for both individuals and groups, and continuous with past and present waking emotional concerns” (p. 1). In response to some of these criticisms, Hobson published *The Dreaming Brain* (1988), where he revised the Activation Synthesis theory by alluding to the idea that certain dreams may well reflect a continuation of emotional residue associated with memories. In fact, Hobson (1999) modified his position further by suggesting that new brain imaging data demonstrated that during REM sleep limbic structures in the forebrain were highly active, implying that emotions may also play a key role in the instigation of dreams.

In 2000 Hobson, Pace-Schott and Stickgold further updated the Activation Synthesis Hypothesis by considering new findings in cognitive and neurobiological disciplines that led them to propose the Activation-Input-Modulation (AIM) model. The AIM model reaches far beyond REM dreams and focuses on ‘conscious states’ that may be explained by a three-dimensional-state space model, where ‘A’ represents the degree of

brain activation (level of activity in the brain), 'I' represents information flow (internal/external or both) and 'M' represents the mode of information processing (neurochemical systems - cholinergic - operating in REM dreams or adrenergic - operating in ordinary waking consciousness). In essence, the AIM model is considered by Hobson and colleagues as a 'powerful tool' in the advancement of consciousness studies (in particular brain-mind isomorphism). This model aims to cover: "(1) the information processing capacity of the system (activation); (2) the degree to which the information processed comes from the outside world and is or is not reflected in behaviour (information flow); and (3) the way in which the information in the system is processed (mode)" (p. 7). Thus, Hobson and colleagues revised the Activation Synthesis Hypothesis/theory in three main ways; firstly it considered the notably high cortical activation in accessing vast amounts of information, secondly, the deactivation of external incoming information and processing of REM events (i.e., PGO waves), which gives rise to dream mentation. And thirdly, the significant shift in brain physiology from aminergic to cholinergic neuromodulation, which underlies the bizarre nature of certain dream and nightmare narratives (Hobson, Pace-Schott & Stickgold, 2000).

2.3.1 Nightmare Experiences - The Activation-Synthesis Hypothesis

From this neurophysiological perspective, nightmares like dream experiences were originally perceived to be nonsensical and random, attributable to an underlying physiological state such as temporal seizure or periodic activation during the sleep cycle; rather than an underlying meaningful psychological concomitant as Freud had

postulated. The anterior cingulate cortex (ACC) and subcortical centres, in particular the amygdala, have been referred to as the 'axis of fear' (Woodward et al., 2006). These brain regions that govern and regulate anxiety and fear are activated during REM (while the dorsolateral prefrontal cortex is inactive) allow anxiety and fear to predominate, thus making these emotions most common in dreams. Hence, when anxiety becomes uncontrollable a dream may transform into a nightmare. Consequently, according to the revised view of Hobson it may either be the activation of these brain regions that cause nightmare experiences or anxiety related to daily incidents (Hobson & Silvestri, 1999). In addition, nightmares could also be explained via certain neuromodulators such as dopamine, a catecholamine neurotransmitter, which is thought to play a crucial role in mental and physical health of individuals (Hartmann, 1984). Certain studies have implied that dopamine influences both dreaming and the intensification of nightmare experiences (Hartmann, 1978; Thompson & Pierce, 1999). Thus, ingesting any form of dopamine would most likely increase and intensify nightmare frequency. For instance, medication/drugs that include L-Dopa, such as migraine drugs, and/or antidepressants called clomipramine and fluoxetine (Prozac) have been reported to cause nightmares (Hobson & Silvestri, 1999). This may partly explain why nightmares are commonly reported by many adults diagnosed with various conditions that require them to take medications or drugs such as anti-depressants that influence REM sleep, for instance individuals diagnosed with clinical depression (Agargun, Besiroglu, et al., 2007).

Hobson and colleagues' (1977, 1999) hypothesis unfortunately also encounters notable difficulties in adequately accommodating the nightmare phenomenon. Expounding active brain regions that regulate anxiety and fear and implicating their prevalence

during REM sleep does not constitute a satisfactory explanation for the nightmare phenomenon. Furthermore, this hypothesis could merely provide insight pertinent to REM nightmares since its underlying assumption was based on the notion that dreams were exclusive to REM sleep. The intriguing aspect about the presence of nightmares is that different types of nightmares have been reported from different sleep stages (Pagel, 2000); hence any model that aims to comprehensively explain the nightmare phenomenon needs to accommodate all types of nightmare experiences.

2.4 Cognitive-Psychological Analysis of Dreams Model

The original model of the Activation Synthesis Hypothesis encountered its first serious obstacle when the premise that dreams were specific to REM sleep, which was pertinent to the theoretical underpinnings of Hobson and McCarley's (1977) hypothesis, was challenged by the work of psychologist David Foulkes. Foulkes' sleep laboratory research on the relationship between REM and NREM sleep (Foulkes, 1962); found that dreams were reported by subjects awakened from both sleep states (Foulkes, 1982) which immediately brought into question the specificity of REM dreaming. However, convinced that such research could not provide answers to key questions, such as 'how' the mind forms actual dreams Foulkes turned his focus to cognitive psychology (Foulkes, 1985). Researching the latest models in this field, his attention was placed primarily on the development of human language. Foulkes adopted the opinion that dreams could be thoroughly explained via cognitive systems in a similar way as ordinary speech had been explained via psycholinguistics. His investigation of the psychology of psycholinguistics (Foulkes, 1982) and later studies

on the development of dream mentation in children, informed the comprehensive model of Dreams Analysis, which he proposed in the book *Dreaming: A Cognitive-Psychological Analysis* (1985). Foulkes stressed the point that dreaming was previously thought of as being in the domains of psychoanalysis (Freud) and psychophysiology (Hobson and colleagues). However, Foulkes insisted that “dreaming (was) a mental act with distinct properties. To understand dreaming, therefore (there is need to identify) those mental systems that are active while...dream(ing occurs) and..characterize their modes of action and interaction” (p.1).

Foulkes subsequently conducted considerable research on children’s dreams as a means of understanding the development of the dreaming. In 1982 Foulkes published the book *Children’s Dreams: Longitudinal Studies* based on a remarkable series of studies. This research extended from the 1960’s to 1980’s and reported dream narratives elicited from children aged between 3-15 years. In the first study, Foulkes followed two groups of children for a period of 5 years, in the first group children were aged between 3 to 5 years and in the second group children were aged between 9 to 10 years, a total of 46 children participated in the study. These participants were required to sleep in sleep-laboratories for nine nights, in the first, third and fifth years of the study. Foulkes (himself) conducted a total of 2,711 REM/NREM awakenings (Foulkes, 1985) as part of the research data collection. In the second and fourth year of the study, dream reports were collected from the children’s homes by their caregivers, namely their parents.

The longitudinal study found that younger children (aged 3-5 years) seldom dreamt. These children reported no dreams during NREM awakenings and only about 15 % of the REM awakenings elicited dream reports. The reports were found to be notably brief, static and insubstantial. This trend continued up-to about 9 to 11 years of age, when approximately 30% of REM awakenings elicited dream reports and then suddenly increased to approximately to 80%, similar to adult reports. In the younger group (aged 3 to 5 years) dream reports did not include the children as themselves; or if they did they were usually in the role of passive observers. Prominent in these reports were animal characters that usually appeared in a relatively static form. The dreams became more 'dreamlike' as children became older, with more action and motion, and more complex themes and narratives related to their everyday activities. By the time the children were 7 or 8 years of age symbolic sophistication in dreams was more prevalent and by adolescence dream reports were more comparable to adult reports both in duration and structure (Foulkes, 1979). Foulkes concluded that the ability to dream develops over time from simplistic short bland dreams to complex long detailed narratives. Thus, the cognitive ability to dream is not present from birth, accessible to all, in fact 'dreaming' seemed to be a cognitive achievement (Foulkes, 1982). Foulkes further asserted that the sleeping mind was not functionally different in comparison to the waking mind; therefore the same cognitive processes were utilized in both states. Hence, as cognitive abilities develop in waking life they were also presumed to develop in a similar manner in dreaming life. In essence dreaming according to Foulkes, involved cognitive sophistication and appeared to be continuous with waking concerns and emotionality or affectivity (Foulkes, 1982).

2.4.1 Nightmare Experiences - Cognitive-Psychological Analysis of Dreams Model

Nightmare experiences under this construction could be explained from a psycho-developmental view. That is, if dreaming is considered to be a cognitive achievement so then it must follow that nightmare experiences also fall within this realm and would be dependent on the development of cognitively sophisticated abilities. Thus, in order for children to have nightmares they would be required to have an advanced cognitive system that would enable them to experience nightmares. Furthermore, Foulkes claimed that the content of children's dreams were not filled with debilitating anxieties as they occurred in adolescences or adulthood, but instead they represented everyday activities common in children's daily lives (Foulkes, 1982). Hence, the experience of a nightmare may coincide with children's waking cognitions, perceptions and preoccupations; such as negative experiences they may have encountered in the playground and/or at school, but Foulkes claimed that they were not predominately terrifying.

This perspective encounters notable problems when literature reporting nightmare frequency is taken into account. For instance, Salzarulo and Chevalier (1983) among many others, stress that children report the highest nightmare frequency in comparison to all other age cohorts. Moreover, both nightmares and night terrors have been reported to be ubiquitous in childhood (DSM-IV-TR, 2000). Perhaps, Foulkes' conclusions may be explained by the large number of dream reports collected from the laboratory setting that informed his theory, which he claimed were the only reliable representation of dream narratives; since consensus findings suggest that dreams

reported in laboratories contained less anxiety, fear and misfortunes in contrast to dreams collected from familiar settings like the home environment (Bulkeley, 1997, Van de Castle, 1994). For example, Hartmann (1984) found that participants in his study reported a sense of security during polysomnography examinations due to being aware that sleep technicians were present whilst they slept.

Like the previous models reviewed, Foulkes' proposal does not offer a thorough explanation of the different types of nightmares reported in the literature and thus it also fails to adequately accommodate the nightmare phenomenon. Furthermore, Foulkes' interpretation of nightmares is limited to children; contending that children's nightmares were not necessarily terrifying and stemmed from idle situations from daily experiences, which may be applicable to some idiopathic nightmares, but fails to cover the more intense trauma-related nightmares.

2.5 Neuro-cognitive Model of Dreams

The most empirically diverse model of dreams reviewed in this work, was proposed by professor of psychology and sociology William Domhoff. He proposed a Neuro-cognitive Model of Dreams (2003) in his book *The Scientific Study of Dreams: Neural Networks, Cognitive Development and Content Analysis*. Domhoff studied under Calvin S. Hall who was the first to develop a quantitative coding system for dream interpretation and co-authored the book *The Content Analysis of Dreams* with Van de Castle (1966). Domhoff integrated findings from the neuropsychological and neuroanatomy network for dreaming, the development of dreaming and content analysis of dreams to develop his theory. This corpus of work is largely based on the

findings of Solms on neurological patients who suffered brain lesions (Solms, 1997), Foulkes' studies of children's development of dreaming (Foulkes, 1985), and Hall and Van de Castle's dream coding system (Hall & Van de Castle, 1966).

Domhoff reviewed the biological and physiological correlates of dreaming that he considered represented a consensus amongst contemporary dream researchers and proposed four contours associated with the 'neural network' that were necessary for dreaming. These included: (1) The most vivid dreams are generated by the mechanisms that elicit REM sleep; (2) Forebrain controls of the REM generator are located in tegmental region of the pons; (3) A complex forebrain network is required for dreaming; and 4) The forebrain network shapes dream content.

Domhoff provided evidence for the neural network of dreaming by examining neuropsychological and neuroimaging research findings in the 1990's. Domhoff concluded that these research findings were 'strikingly consistent' and thus served to identify a neurophysiological substrate for dreaming. The work of Solms (1997) was however the primary source of the neuropsychological derivatives that informed his Neuro-cognitive Model of Dreams. Solms' neuropsychological research was based on detailed reports on dream alterations experienced by 361 neurological patients between 1985 and 1989. Solms subsequently integrated these reports with the consensus findings of 73 research studies from the neurological literature. From these two sources, Solms concluded that there were two predominant alterations that neurological patients experienced; dreaming deficits and dreaming excesses. The dreaming deficits

included loss of visual (imagery) dreaming and/or complete cessation of dreaming altogether. In contrast, the dreaming excesses included intrusions of dreaming imagery into waking cognition and/or the increase of nightmare experiences, specifically nightmares that were repetitive in nature (Solms, 1997).

Overall Solms' work illustrated seven particular findings that were pertinent to Domhoff's theory; (1) The neural network for dreaming is highly localized; (2) Changes occur in dreaming when injuries to the medial occipital-temporal region of the visual association cortex occur; (3) Unilateral and/or bilateral injuries in or near the parieto-temporo-occipital (PTO) junction caused total loss of dreaming; (4) Bifrontal lesions in white matter in the ventromesial region, caused loss of dreaming; (5) Lesions in either the medial prefrontal cortex, anterior cingulate cortex, or the basal forebrain increased the frequency and vividness of dreaming; (6) Injuries to the temporal lobe increased 'repetitive nightmare' experiences; and (7) Lesions to the brainstem, which is thought to generate REM sleep, did not affect the phenomenology of dreaming (Solms, 1997).

Domhoff subsequently examined and implemented the large-scale longitudinal and cross sectional studies conducted by Foulkes, as the one of the main sources of the developmental evidence that informed the cognitive aspect of his model of dreams. In particular, he integrated the cross-sectional study which examined children 5-8 years of age that aimed to replicate the findings of the longitudinal study (Foulkes, 1985). A total of 80 children representing the age groups of the longitudinal study groups were awoken 10 times each for a total of 800 awakenings. Accompanying these awakenings

there were three additional interview tests on development and self-awareness; and several cognitive tests on verbal, descriptive memory and visual-spatial abilities. Several outcomes replicated the findings of the longitudinal studies that according to Domhoff were significant in verifying Foulkes' original findings and supporting his theoretical model (Domhoff, 2003).

Finally, Domhoff reviewed the work of Hall and Van de Castle (1966) the other main source that informed the cognitive component of the model of dreams. Domhoff proclaimed Hall and Van de Castle's work to be most comprehensive and systematic model of dream content analysis ever established. During a period spanning over 40 years, between the 1940's – 1985 at Western Reserve University, Hall gathered over 50,000 dream reports provided by students. From these dream reports, 1,000 reports were thoroughly examined using the normative coding method proposed in the book *The Content Analysis of Dreams* (1966) in order to create a normative classification system that could be used to conduct quantitative analysis and interpretation of dream reports.

Hall considered dreams to be part of a cognitive process that represented 'conceptions' of fragments from an individual's personal history. Consequently, Hall focused on establishing patterns or themes in dream reports by examining the frequency of elements in dreams, such as male or female characters, interactions and setting. There were five basic categories that were used for content analysis, which included settings, characters, interactions, objects and emotions (Hall & Van de Castle, 1966). Dream elements of dream narratives were subsequently compared to a normative classification

system. Thus, in order to interpret dreams, specific information was required such as, identifying the objects and characters in dreams, the dreamer's actions in dreams, the interactions in dreams and the setting(s) which represented the contextual elements of the dream narratives (Hall & Van de Castle, 1966).

Domhoff stressed that there were four general findings from the work of Hall and Van de Castle (1966) that inform the Neuro-cognitive Model of Dreams. The four findings included: (1) Dream lives remained the same despite major cultural changes; (2) There was minimal change in dream contents once an individual reached adulthood; (3) Similarities and differences between cultures were relatively stable; and (4) There were considerable individual differences that related to the on-going relationship between waking thought and dream content, also known as the 'continuity hypothesis/principle'.

2.5.1 Nightmare Experiences - Neuro-cognitive Model of Dreams

Nightmare experiences according to Domhoff reflected emotional preoccupation with past, present and future concerns. More specifically, they reflected preoccupations that had not been resolved, and therefore influenced dream mentation. Thus, if an individual was preoccupied with a stressful incident or was overly concerned with an event, the associated distress manifested as a nightmare.

Domhoff (1996) also examined and proposed the concept known as the 'repetition dimension' in dreams which he contended was pertinent to all recurrent dreams and nightmares. The repetition dimension or principle refers to both repetition in dream

content (thematic pattern) and/or affectivity (Domhoff, 2000). Thus, individuals may experience repetition in dreams in terms of recurrent imagery – dreaming about the same scenes over and over again or in terms of affectivity – experiencing the same emotions time and again. Moreover, recurrent nightmares under this construction appear to reflect ‘on- going preoccupations’ with unresolved issues (unfinished business), which was considered as definitive of the repetitive nature of recurrent dreams and nightmares. By and large all dreams including nightmares according to Domhoff are the embodiment of an individual’s accumulated thoughts that are turned into pictures and images during sleep.

This model elucidates two important constructs that are imperative to understanding and explaining nightmares, the continuity hypothesis and repetition principle. These concepts provide clarity to the nature of recurrent nightmares including trauma related nightmares and how they may become problematic. However, similar to the previous theories reviewed in this work the explanation provided was rather rudimentary in regards to the different types and intensity of nightmares reported in the literature.

2.6 Summary and Conclusion

In summary, four dream theories were briefly examined in order to elucidate the progression of dream research and in turn provide some theoretical background for the nightmare phenomenon.

Freud’s Wish Fulfillment Theory placed focus exclusively on the influence psychological properties such as the interplay between the conscious and unconscious

mind and refuted the superstitious notion that the formation of dreams stemmed from divine/diabolic sources. He aimed to establish a scientific methodology where dreams could be empirically interpreted. Furthermore, he made multiple attempts to accommodate the different types of nightmares, but eventually conceded that repetitive traumatic nightmares were an obstacle to his theoretical construction. Hobson and McCarley's Synthesis Activation Theory refuted the psychological properties proposed by Freud as the genesis of dreams and proclaimed biochemical and physiological cyclical processes as the generator of dreams. Thus, they aimed to provide empirical evidence that dreams stemmed from physiologically based processes that occurred systematically and were uninfluenced by psychological properties, thus making dreams and nightmares the epiphenomenon of REM sleep. Dreams and nightmares were originally considered nonsensical; however, this model has been updated various times and Hobson has modified his position on more than one occasion and now accepts that dreams and nightmares may also derive from emotional processes.

Foulkes' Cognitive-Psychological Analysis Model refocused attention on psychologically based properties like cognitions and stressed that dream experiences were in fact a cognitive achievement. Individuals developed the ability to dream as part of maturation and challenged the specificity of REM sleep dreaming, by providing evidence that dream reports could also be elicited from NREM sleep. Nightmares were considered to coincide with waking cognitions, preoccupations and perceptions; a cross-state continuity, but Foulkes reiterated that nightmares did not dominate children's dreams as some believed. In contrast, Domhoff's Neuro-cognitive Model of

Dreams integrated contemporary findings to develop a model that encompassed both neural and cognitive-emotional constructs. The model identified neurological structures and cognitive-emotional constructs imperative to dreaming. In order to experience dreams the underlying neurological network and cognitive sophistication needed to be intact. Furthermore, under this construction dreaming was considered to become stable once dreamers reached adulthood and there was continuity between waking and dreaming mentation. Nightmare experiences according to Domhoff, represented emotional preoccupation with past, present and future concerns that reflect the properties of the 'continuity hypothesis' and 'repetition principle'.

The theories examined attempted to accommodate nightmares experiences; however the common thread that seemed to re-emerge time and again was the difficulty associated in adequately accommodating the different types of nightmares reported in the literature. Nonetheless, the development of dream and nightmare research has progressed immensely, from rudimentary understanding of nightmares to comprehensive dream models that explain both the physiological and psychological aspects of dreaming. However, in order to thoroughly comprehend the nightmare phenomenon, the next chapter reviews contemporary hypothesis and/or models specific to the nightmare experiences.

Chapter 3

Contemporary Nightmare Models and Theories

3.1 Introduction

Models and theories that adequately explain nightmares have been relatively scarce throughout the history of dream literature. Notwithstanding the fact that nightmares have been documented since antiquity (Mackenzie, 1965) dream theorists have seldom devoted significant time and energy to developing comprehensive theoretical models that accurately explain the nightmare phenomenon. This seems to be partly due to the difficulty encountered by dream theorists in accommodating nightmare experiences in existing theoretical dream frameworks and the perception that nightmares represent one of the many reactive symptoms to trauma exposure (Barrett, 1996). However, since the recent progression and development of sleep medicine various researchers have proposed models and related theories that aim to encompass the different types of nightmare experiences reported in the literature.

The following section will briefly examine and critique some of the more prominent nightmare related models and theories in order to elucidate the current theoretical status of the nightmare phenomenon. The following contemporary Nightmare perspectives/hypotheses will be briefly reviewed in chronological order; Ernest Hartmann's *Nightmare Theory/Hypothesis* (1984), Annti Revonsuo's *Threat Simulation Theory* (2000), Ross Levin and Tore Nielsen's *Neuro-Cognitive Model of*

Dreaming (2007), and Victor Spoormaker's *Cognitive Model for Recurrent Nightmares* (2008).

3.2 Hartmann's Nightmare Theory/Hypothesis

One of the best known contemporary nightmare theories was originally proposed by Ernest Hartmann, professor of psychiatry and director of the Sleep Disorders Centre at Newton-Wellesley Hospital. Hartmann has published numerous books on dreaming (The Biology of Dreaming 1967, Sleep and dreaming 1970, The functions of Sleep 1973, The Nightmare: The Psychology and Biology of Terrifying Dreams 1984, Boundaries of the Mind 1991, Dreams and Nightmares: The New Theory 1998 to name a few) and some 325 journal articles on related topics. Hartmann first proposed his nightmare theory in the book titled *The Nightmare: The Psychology and Biology of Terrifying Dreams* (1984). Hartmann's examination of the nightmare phenomena began with the exploration of very basic questions pertinent to nightmare experiences and sufferers. These questions included; What is a nightmare? Who has them? And how and why do they occur? In formulating the answers to these questions he reviewed the available literature, took into account his own clinical experience and conducted experimental research.

Hartmann's (1984) hypothesis, however, was largely based on his own experimental research on 50 lifelong nightmare sufferers, who responded to newspaper advertisements recruiting people who experienced frequent nightmares. His approach was founded on the idea that nightmares should be studied in its purest form or in 'pure culture'; therefore participants who reported weekly nightmares were considered to

reflect such a culture. Subsequently, in order to learn more about the psychological and social correlates of this sample, Hartmann conducted two studies. In the first study, 38 participants 11 men and 27 women aged mostly in their twenties underwent intensive psychiatric interviews. These interviews involved discussions of nightmare contents, related stressful and/or traumatic incidents, drug and alcohol consumption, related psychological and physical conditions; and general sleep hygiene practices (Hartmann, 1984). Other aspects of interest to Hartmann included the participant's life styles, occupations, relationships, as well as childhood and adolescence experiences, and family members (past or present) who suffered from nightmares. All participants from the first study also underwent several psychological tests including the Minnesota Multiphasic Personality Inventory - MMPI (Hathaway & McKinley, 1940), Cornell Index (Weider, Wolff, Brodman, Mittelman & Wechsler, 1944), Rotter Locus of Control test (Rotter, 1966), and Rorschach test (Rorschach, 1921). In addition, almost half of the participants completed the Fear Survey Schedule (Wolpe & Lang, 1964) and eleven participants underwent polysomnography for a period of four nights (Hartmann, 1984).

In the second study, twelve nightmare sufferers were compared with two control groups comprised of twelve participants each who were also recruited from newspaper advertisements. All participants were between 20 and 35 years of age. The selection criteria for nightmare sufferers (experimental group) included the report of at least one nightmare per week and the categorization as a 'lifelong' nightmare sufferer which implied experiencing weekly nightmares from at least childhood (Hartmann, 1984).

The first control group comprised participants who reported frequent vivid dreams (without nightmares) and the second control group comprised participants who did not report nightmares or vivid dreams. All three groups were subjected to similar psychometric testing procedures as participants in the first study, with the additional administration of the projective Thematic Apperception Test (TAT) (Morgan & Murray, 1935) and the Pendulum tracking test (Holzman, Proctor & Hughes, 1973).

Upon the completion of his investigation - first and second studies - Hartmann (1984) reached various conclusions about nightmare experiences and sufferers. Perhaps one of the most prominent findings was that there were three main distinct types of nightmares that seemed to have been confounded in what was previously believed to be one 'nightmare phenomenon'. These incorporated 'life-long nightmares', 'post-traumatic nightmares' and 'night-terrors'. Hartmann found that these distinct types of nightmares occurred in either different stages of sleep and/or had different phenomenological qualities. For instance, life-long nightmares occurred predominantly in REM sleep in the later part of the night and upon awakening nightmare sufferers could easily recall the content, which was commonly thematic but not necessarily repetitive or replicative. Whilst post-traumatic nightmares occurred in both types of sleep (REM and NREM), participants reported clear recollection of the dream. The dream content was normally repetitive and replicative of a traumatic incident previously experienced by the dreamer. Night-terrors on the other hand, occurred in stage 3 or 4 of NREM sleep in the first few of hours of the night and sufferers experienced difficulty arousing from sleep,

which often meant that they had little or no recollections of the experience (Hartmann, 1984).

Hartmann's (1984) main finding however was that individuals who experienced frequent (weekly) nightmares had what he termed 'thin psychological boundaries', which rendered them susceptible to anxiety filled dreams. The concept of 'psychological boundaries' represented a personality dimension that reflected a continuum based on boundary permeability. According to Hartmann the formation of these 'psychological boundaries of the mind' was a natural part of an individual's development of mental structures. For example, in infancy a child soon developed the ability to differentiate between his/her self and others, reality and fantasy, waking and dreaming. All of these distinctions reflected "mental realms with boundaries around them" (p. 137) that form parameters of mental concepts pertaining to objective reality, which are considered specific to cognitive development. These boundaries could be thin or thick, fluid or solid, and/or permeable or rigid (Hartmann, 1991). Individuals who reported weekly life-long nightmares according to Hartmann had formed thin, fluid, or permeable boundaries during the course of their cognitive development.

Hartmann (1984) proposed that life-long nightmare sufferers were a distinct group of people, different to those who reported traumatic nightmares - related to a traumatic experience, specifically a traumatic incident that develops into PTSD (Kilpatrick, Resnick et al., 1998) or those who reported night terrors – an arousal disorder, which is characterized by terror (Fisher, Kahn, Edwards, Davis & Fine, 1974). According to

Hartmann the life-long nightmare group had failed to develop adequate boundaries possibly due to the impact and/or effects of early negative life experiences pertaining to both a biological predisposition and/or the absence of a nurturing significant care-giver such as a mother figure (Hartmann, 1984). As a result such individuals exhibited distinct characteristics for example being overly sensitive and/or open, which rendered them vulnerable to experience events more intensely. Hartmann found that these individuals had artistic and creative predispositions and appeared to gravitate towards employment that required inherent openness and sensitivity, for instance therapeutic and/or teaching related work.

Hartmann (1984) contended that individuals with life-long frequent nightmares also had similarities with individual who presented psychopathological symptoms, in particular psychosis related symptomatology. “(Individuals) with this biological predisposition (thin boundary personality) can be seen as having a vulnerability to later developing schizophrenia..” (p. 157). The association between nightmare incidents and the presences of psychosis, stemmed from the notion that nightmares could be precursors to psychotic decompensation (Levin, 1998). However, the idea that dreams and nightmares could be associated with psychosis had been previously discussed by Immanuel Kant two hundred years earlier (La Barre, 1975), and later reiterated by Jones (1931/1951), Freud (1940), and Jung (1963). Interestingly, it seems that ‘life-long nightmares sufferers’ reflect individuals who meet the DSM-IV-TR and ICSD-2 criteria for Nightmare Disorder. Conceivably, the low estimated nightmare

frequency/prevalence reported in contemporary classificatory systems represents this population and not the general population.

Hartmann's (1984) hypothesis elucidated a specific type of group of individuals that were identified as 'life-long' nightmare sufferers. It addresses one key aspect pertaining to nightmare sufferers and related psychopathological characteristics, boundary permeability – a personality factor that renders them vulnerable to manage emotional intrusions while awake and during sleep (Nielsen & Levin, 2007). This group was considered distinct from other nightmare groups predominantly because of this intrinsic vulnerability. Thus, implied within the characteristics of this group is the notion that there appears to be a genetic component inherent in the formation of nightmares. Hence, it seems that this particular group was born to experience dreams and other dysphoric incidents more intensely than non-life-long nightmare sufferers; however such assertions require diligent empirical examination to ascertain cause and effect. Perhaps the most intriguing aspect about Hartmann's findings is that there are not only various types of nightmares, but that there are also different types of groups of nightmare sufferers. Moreover, the link between nightmares and psychosis may apply to lifelong nightmare sufferers, but not necessarily to other types of nightmare sufferers. Hence, Hartmann's findings appear to reveal only a fraction of the population of individuals who experience frequent and chronic nightmares.

3.3 Threat Simulation Theory (TST)

An interesting theory that interprets the nightmare phenomenon from an evolutionary perspective is Revonsuo's Threat Simulation Theory (2000). Annti Revonsuo a Professor of cognitive science and the editor of the 'Consciousness and Cognition' Journal, has published numerous articles on dreaming including, The Contents of Consciousness During Sleep: Some Theoretical Problems (2005), Did Ancestral Humans Dream for Their Lives? (2000), Dreaming and the Place of Consciousness in Nature, (2001), and Neuroscience and the Explanation of Psychological Phenomena (1999), amongst others. In his article 'The reinterpretation of dreams: An evolutionary hypothesis of the function of dreaming' (2000), Revonsuo postulates his Threat Simulation Theory (TST).

Revonsuo (2000) contends that dreaming needs to be placed in the right context, which other dream theorists had failed to do, in order to accurately comprehend the dreaming brain and contemporary dreams. This evolutionary context pertains to how the dreaming brain has evolved over hundreds of thousands of years, which directly influences dream structure and content. After a detailed review of the literature Revonsuo postulated six empirically testable propositions that aim to explain the biological function of dreaming (p. 878):

- Dream experiences are not random or disorganized; instead, they constitute an organized and selective simulation of the perceptual world
- Dream experience is specialized in the simulation of threatening events

- Encountering real threats during waking has a powerful effect on subsequent dream content: real threat activates the threat simulation system in a qualitatively unique manner, dissimilar from the effects of dreaming of any other stimuli or experience
- The threat simulations are perceptually and behaviourally realistic and therefore efficient rehearsals of threat perception and threat-avoidance responses
- Simulation of perceptual and motor skills leads to enhanced performance in corresponding real situation even if the rehearsal episodes were not explicitly remembered
- The ancestral environment in which the human brain evolved included frequent dangerous events that constitute extreme threats to human reproductive success. They thus presented serious selection pressures to ancestral human populations and fully activate the threat-simulation mechanisms

Nightmare experiences according to this theory are virtual representations of daily threatening events. They appear to be assigned a central role that fulfills a specific biological function identified as the development of evolutionary threat-avoidance skills. The active rehearsal of responses elicited in dreams, enhances the biological survival of the individual. Moreover, children's dreams under this construction are very significant since it has been reported that children commonly dream of animals and monster like figures (Foulkes, 1999), which Revonsuo posited that were reflective of ancestral threats that have been inherited.

According to the six propositions postulated, nightmares specifically relate to the second proposition: 'dream experience is specialized in the simulation of threatening events'. Revonsuo cites the findings of the normative study conducted by Hall and Van de Castle (1966) and stresses the dysphoric nature of emotions reported in these dreams. From the collective analysis of 1000 dream reports, 80% of the 700 plus

emotions reported were negative (Hall & Van de Castle, 1966). Approximately half of these were classified as 'apprehension' and the other half were classified as either 'anger, sadness or confusion'. Other studies cited by Revonsuo in support of his theory include Snyder (1970); and Strauch and Meier (1996) who also found that the majority of emotions or states reported in dreams they examined were negative or dysphoric in nature - predominantly fear, anger and stress.

Revonsuo (2000) stated that based on the evidence found in the literature, misfortunes such as accidents, losses of possessions, injuries or illnesses, obstacles and threats from the environment are seven times more prominent in dreams than good fortunes. Furthermore, interactions in dreams were overwhelmingly aggressive in comparison to other types of interactions such as friendly and/or sexual; and dreamers were more commonly the 'victims' in such interactions as opposed to the aggressors. Revonsuo theorized that normative dream contents generally tend to be more filled with unpleasant and threatening dream elements that appear to serve the purpose of simulating threatening events related to daily stressors.

Revonsuo reported that recurrent dreams (in particular anxiety dreams) are relatively prominent in dream narratives. He cites the work of Robbins and Houshi (1983) who surveyed 123 university students about recurrent dreams and found that 60 per cent reported recurrent dreams stemming from childhood that were classified as 'anxiety dreams' and involved being threatened or chased. In addition, an examination of dream contents reported by traumatized children living in dangerous war prone territories were

considerably more threatening than dream reports of less or non-traumatized children (Valli, Revonsuo et al., 2005). Furthermore, Revonsuo and Valli (2000) found that 66% of dream reports of university students reflected frequent threats, 39% severe threats, 73% realistic threats directed at the dreamer, and 56% of the dreams elicited threat-avoidance responses.

Revonsuo (2000) concluded that negative tone (perceptual and emotional properties) in dreams serve a specific biological adaptive function that commenced early in human history. Moreover, the evolving dreaming brain simulates threatening events in order to rehearse threat avoidance skills that are applicable and functional in waking life. Nightmares under this construction are not necessarily perceived in a negative light; in fact they appear to be the proto-typical dream that serves as a simulator of threatening events. However, it may be an overextension to consider that all negatively toned dreams are in fact nightmares; bad dreams that arouse the sleeper. Nonetheless, nightmares that involve virtual representations of the dreamer engaged in relatively realistic scenarios that elicit threat avoidance responses definitely accomplish the biological function of dreams as postulated by Revonsuo. The experience of such nightmares eventually becomes biologically advantageous. In essence all individuals have predominantly dysphoric dreams for the purpose of meeting the biological function of dreams, which is directly associated with the individual's survival.

Revonsuo assigns 'threat' and the associated fear a central role in the formation of dysphoric dreams (Nielsen & Levin, 2007). Nightmares and other dysphoric dreams

are considered representations of actual threats that function as ‘practice runs’ to increase threat avoidance skills. However, despite the intriguing aspects of the theoretical constructs proposed and the additional assertion that the six propositions that underpin the TST model could be empirically tested, this hypothesis is difficult to scientifically scrutinize or test. This is due mainly to the inherent assumption that the presence of dysphoric dreams with lifelike threats automatically provides evidence that they have an evolutionary adaptation function, a concept that is intrinsically complex to establish. In addition, nightmares could be easily considered as delayed reactions to threats that occur during waking life that could not for various social or practical reasons be acted upon. Nevertheless, there has been some support for the TST model from a couple of empirical studies. Hublin, Kaprio et al. (1999) found that the evolutionary assumption that nightmares are inheritable was supported by the persistent genetic effects on the disposition to experience nightmares in childhood and adulthood. Furthermore, Zadra, Desjardins & Marcotte (2006) conducted research that tested the theory in recurrent dreams. Examining a sample of 212 recurrent dreams they found that 75% of the propositions were supported. However, as intriguing as this hypothesis may be the inherent difficulties in validly testing the propositions make it highly speculative and at best philosophically sound.

3.4 Neuro-Cognitive Model of Dreaming

The most comprehensive theory or model of dysphoric dreaming was proposed by Ross Levin and Tore Nielsen. The Neuro-Cognitive Model of Dreaming (2007) is a multi-level model of dream function and nightmare production which aims to explain all

types of dysphoric dreaming including, bad dreams, idiopathic nightmares and trauma related nightmares. Ross Levin is an associate Professor of psychology at Ferkauf Graduate School of Psychology, Yeshiva University. Tore Nielsen is Professor in the Department of Psychiatry, University de Montreal, Director of the Dream and Nightmare Laboratory, Research Professor of the Quebec Mental Health Research Fund.

In their article ‘Disturbed dreaming, Posttraumatic Stress Disorder, and Affect distress: A Review and Neurocognitive Model (2007) Levin and Nielsen examined and organized research findings around a model of nightmare formation that considers neural and cognitive-emotional explanatory concepts. Central to the neurocognitive model is the distinction between two equally important factors in nightmare production, namely affect distress and affect load. Affect distress was defined as “a disposition to experience events with distressing, highly reactive emotions” - a trait like factor; and affect load, “a consequence of daily variations in emotional pressure” - a state like factor (p. 482).

Levin and Nielsens’ (2007) nightmare model is based on two global assumptions, firstly cross-state continuity and secondly a multi-level explanation of the nightmare phenomenon. Cross-state continuity refers to the notion that similar brain structures and processes that are involved in the production of nightmares during sleep may also be involved in the manifestation of psychopathological symptoms experienced during wakefulness. Thus, there appears to be continuity between waking and dreaming

mentation. Mental states like stress, anxiety, trauma, and depression would consequently be considered to significantly influence dream mentation. The multi-level explanation refers to the idea that nightmare experiences are best understood by considering the cognitive-emotional processes involved in the production of nightmares, in particular fear imagery and affectivity, and the corresponding brain and neural network/circuitry that underpins the production or formation of this type of dream.

In the two separate articles published by Levin and Nielsen (2007) 'Disturbed dreaming, Posttraumatic Stress Disorder, and Affect distress: A Review and Neurocognitive Model'; and Nielsen and Levin (2007) 'Nightmares: A new neurocognitive model' they comprehensively review the plethora of literature that informs their neuro-cognitive model. More specifically, Levin and Nielsen examined more thoroughly the neurophysiological branch of the model which is termed the AMPHAC network. This acronym represents the following brain structures: amygdala (A), the medial prefrontal cortex (MP), the hippocampus (H), and the anterior cingulate cortex (AC). And Nielsen and Levin examine more thoroughly the cognitive branch of the model, which is termed the AND (network), an acronym that represents the following cognitive structures: affect (A) network (N) and dysfunction (D).

As part of their postulation Levin and Nielsen (2007) reiterate that affect distress and affect load refer to both state and trait-like factors respectively as mentioned earlier. For instance, affect distress is conceptualized as a trait-like factor that reflects a

disposition to react to events with a relatively extreme emotional and behavioural response. These extreme responses according to Levin and Nielsen are consistent with the ‘diathesis-stress modelling’ in experimental psychopathology. Conversely, affect load is conceptualized as a state factor which integrates the capacity of an individual to regulate negative emotions and/or states that invoke stress. Thus, Levin and Nielsen stipulate and propose that as individuals are exposed to more negative emotions affect load pressure builds, which in turn influences both waking and sleeping states. This is considerably more evident in individuals who are susceptible to the accumulation of affect load such as individuals high on affect distress.

Levin and Nielsen (2007) in addition proposed a typology of dreaming that aims to encompass different types of dreams, in particular dysphoric dreams. The typology is based on a dream continuum as a function of imagery intensification and severity. Dreams under this construction are specifically categorised as normal dreams – normal dysphoric dreams – bad dreams – idiopathic nightmares low stress – idiopathic nightmares high stress – posttraumatic nightmares trauma related – and replicative posttraumatic nightmares. Increasing affect load, affect distress and the severity associated with trauma exposure determines the type of dream an individual will experience. For instance, Levin and Nielsen postulate that progressively increasing affect load leads to increasing incidence of all types of dreams, in particular dysphoric dreams. Whereas, increasing affect distress leads to an increase in frequency of severe nightmares, which is considered to be closely associated with the manifestation of

psychopathology. In essence, the unique interplay between affect distress, affect load and trauma exposure influences the dream experience.

The function of dysphoric dreams as posited by Levin and Nielsen (2007) is to extinguish fear memories. That is, the purpose of dysphoric dream mentation is to extinguish fear based memories that were formed earlier in life. Thus, bad dreams, dysphoric imagery and associated affectivity that do not arouse the dreamer are considered to be examples of dreams that have accomplished their 'function' of extinguishing fear based memories. The rationale for this function is to eliminate these types of memories, which most likely stem from earlier experiences during infancy, childhood and/or adolescence, in order to lessen the influence such fears may have on contemporary functioning. However, nightmares - bad dream that do arouse the dreamer - under this model represent examples of 'failed fear extinctions' that disrupt the purpose of dysphoric dreams. The difference between experiencing bad dreams and/or nightmares seems to be based on an individual's ability to regulate affect load fluctuations adaptively. Thus, experiencing bad dreams is indicative of effective emotional regulation, which consequently does not disrupt sleep; whereas, experiencing nightmares is indicative of ineffective emotional regulation, which consequently leads to disruption of sleep.

The Neuro-Cognitive Model of Dreaming comprehensively integrates recent advances in cognitive neuroscience, sleep neurophysiology, and fear conditioning. This multilevel model of dream function and nightmare production proposes various

notions that are consistent with contemporary findings related to PTSD research and stress models of psychopathology in particular (Levin & Nielsen, 2009). In addition, this model stresses the continuity hypothesis between waking and sleeping cognitive processes which makes it amendable to empirical examination. Nonetheless, despite the empirical evidence and support for the different aspects that comprises the model - neurophysiological branch of the model (AMPHAC), the cognitive branch of the model (AND), and the function of dysphoric dreaming – fear memory extinction, it remains broadly speculative about the sequence of events and functions of the different physiological and psychological components. Identifying research findings that are consistent with established paradigms does not immediately imply empirical evidence. Moreover, establishing empirically causal associations requires thorough examination of each component pertinent to the model which has not occurred thus far.

3.5 Cognitive Model of Recurrent Nightmares

A more specific model for nightmares was proposed by Spoomaker (2008) in the article ‘A Cognitive Model of Recurrent Nightmares’. This model of recurrent nightmares aims to build on and elaborate the work of Levin and Nielsen’s (2007) Neuro-Cognitive Model of Dreaming; in particular the AND branch of the model. It draws from the following sources including, cognitive models of affective disorders (Beck, 1976; Ehlers & Clark, 2000; Ehlers & Steil, 1995; Rachman, 1980), sleep disorders (Harvey, 2002), dream formation (Domhoff, 2001; Hartmann, 1996; Seligman & Yellen, 1987) and the role of expectations and scripts (Domhoff, 2001; Hartmann, 1996; Seligman & Yellen, 1987; Haberlandt, 1997). The cognitive model of

recurrent nightmares provides a description of how both trauma related and idiopathic nightmares become repetitive by focusing on the cognitive dynamics involved in maintaining the persistence of nightmares and associated distress.

Victor Spoormaker a researcher from the Department of Clinical Psychology, Utrecht University has published various articles on nightmares and correlates which include, 'Depression and anxiety complaints; relations with sleep disturbances' (2005), 'Lucid dreaming treatment for nightmares: a pilot study' (2005), and Nightmares: from anxiety to sleep disorder (2005), to name a few.

The foundational premise the cognitive model of recurrent nightmares is based upon is that frequent nightmare experiences commonly have repetitive storylines (Schredl & Pallmer, 1998). Lancee and Spoormaker (unpublished cited in Spoormaker, 2008) in a study of 188 college students who reported nightmares found that 60% of all the reports of nightmares regardless of frequency (non-frequent, occasional and/or frequent) had a repetitive storyline. Furthermore, this percentage increased to 91% in participants who reported more than one nightmare per week. These recurrent thematic storylines become 'scripts' in memory that could be easily activated via the most subtle of associations.

Spoormaker (2008) reiterated that repetitive storylines of recurrent nightmares either stem from actual traumatic incidents in the case of post-traumatic nightmares or broader themes in the individual's life such as experiencing loss, which may be

considered to be the cause of either trauma related or idiopathic nightmares. These storylines represented fixed expectations that become specific memory scripts, which may be accessed and activated during REM sleep. According to Spoormaker scripts are typical sequences of events that are poorly integrated into autobiographical memory and further represent variability in context such as in time, place and known characters. Furthermore, scripts may represent either ordinary dreams, in the case of recurrent dreams, or nightmares in the case of recurrent nightmares. For example, nightmare scripts tend to be isolated and highly distressing in comparison to other dreams and can be conceptualized to be 'similar to a mental groove for verbal behaviour or a schema for procedural memory' (p. 17). If the dreamer has a particular nightmare script as a constituent of their autobiographical memory, ambiguous dream elements may be easily interpreted as threatening events, which subsequently activates the nightmare script via association.

Recurrent nightmare scripts as mentioned above follow a common sequence of events, for instance the nightmare script of 'being chased' which has been reported as a universal theme (Hartmann, 1984) may be depicted in the following sequence of events:

- Scene 1: walking in the dark or seeing an unfamiliar person or meeting the attacker
- Scene 2: unfamiliar person starts moving towards the dreamer or the chase starts
- Scene 3: the attacker moves near towards the dreamer or the attacker catches up with the dreamer or climax
- The dreamer experiences intense fear/anxiety/apprehension and wakes up

(Spoormaker, 2008 p.17)

According to Spoomaker (2008) the persistence of a recurrent nightmare is determined by the presence of various variables related to the nightmare sufferer including the trait/personality factor 'neuroticism', cognitive avoidance and activation of a nightmare script. Spoomaker reiterates that the trait/personality factor 'neuroticism' refers to the tendency of individuals to experience negative affectivity/emotion more readily and in addition may be described as anxious individuals. Moreover, nightmare distress serves as the mediating variable that determines if nightmares become repetitive, recurrent and thus problematic (Levin & Nielsen, 2007). Spoomaker stresses that the same dream of being chased may be experienced very differently by other persons who thrive on thrill seeking activities such as 'adrenalin junkies'. Anxious individuals according to Spoomaker seem to be more prone to experience ambiguous events as threatening and potentially harmful, a notion that has been postulated on more than one occasion (Hartmann, 1984; Levin & Nielsen, 2007).

When recurrent nightmares have become significantly distressing individuals automatically avoid thoughts and cognitions related to the nightmare experience almost immediately upon awakening. This common reaction (when exposed to potentially traumatic experiences) has several important implications; firstly the nightmare narrative tends to become an isolated memory that has failed to integrate into the individual's autobiographical memory. Consequently, normalization of affectivity/emotion is prevented hence when the nightmare narrative is re-experienced the intensity of the emotion(s) are maintained. Secondly, brainstorming about

alternative responses or reactions to the nightmare is prevented, which leads to a fixation resistant to change. Thirdly, the nightmare narrative is replayed during REM sleep which continuously projects memories and related phenomena. As nightmare scripts are considered to be sequences of interconnected images, once the first image is triggered subsequent dream images will follow. In fact, it is thought that nightmare scripts are activated when elements of a neutral stimuli within dream mentation resemble elements (in the perception of the dreamer) of the nightmare script, thus via perceived associations specific to the individual.

The present model systematically examines the psychology of recurrent nightmares and reiterates established conceptual constructs pertaining to trauma related reactions. Its focus on the recurring nature of specific nightmares elucidates part of the pathological aspect of experiencing a nightmare. Nightmares are considered problematic when they become recurrent and disrupt intrapersonal and interpersonal functioning. However, this focus also presents a notable limitation. The application of this model refers exclusively to a specific type of nightmare: recurrent nightmares. There are other types of nightmares such as idiopathic and certain trauma related nightmares that are not recurrent in nature but are also problematic (Hartman, 1984), hence fall outside the scope of this model. The nightmare phenomenon encompasses various types of nightmares that are differentiated by frequency, intensity of imagery and affectivity, as well as associated distress (Levin & Nielsen, 2007) not only the recurrent nature of the dream; thus the applicability of this model is limited.

3.6 Summary and Conclusion

Hartmann's hypothesis focuses on what he considered to be the 'pure culture' of the nightmare phenomenon, individuals who reported at least one nightmare per week. As part of his research investigation he aimed to explain who had nightmares, and how and why they occurred? He concluded that frequent nightmare sufferers who reported lifelong nightmares were in fact a distinct group of people. Part of the distinction he made was between individuals who experienced lifelong nightmares, those who reported traumatic nightmares and those who had night-terrors. The lifelong nightmare group was categorized as having 'thin psychological boundaries' which rendered them vulnerable to experience incidents more intensely and were thus prone to potentially developing psychosis as a result. Furthermore, this group of individuals appears to be synonymous with individuals suffering Nightmare Disorder.

Revonsuo on the other hand, proposed a theory that focused on the biological function of dreams. The underlying premise of his theory was that the majority of dreams were composed of negative imagery and emotions. To claim that most negative dreams are nightmares may overextend the implication of the model. Nevertheless, the biological function of dreams proposed is to create threat simulations for the purpose of developing threat-avoidance skills and ultimately resiliency. Nightmares under this construction appear to be the prototypical dreams that perform this function. However, the inherent difficulties in empirically testing this theory make it highly speculative.

Levin and Nielsen proposed the most comprehensive model of dysphoric dreaming that includes all types of dysphoric dreams from ordinary dreams to the most intense type of dreams repetitive traumatic nightmares. They emphasize a cross-state (wake and sleep mentation) continuity and a multi-level explanation for nightmares that provides a comprehensive explanation of the formation of different types of nightmares. The mediating variables for the occurrence of different types of nightmares include the constructs affect distress and affect load. The function of dysphoric dreams according to Levin and Nielsen is the extinction of fear based memories stemming from childhood. Although, nightmares by definition arouse the dreamer and are thus considered to be dysphoric dreams that have failed this function - because they disrupt sleep - the occurrence of nightmares merely reflects the malfunction of the purpose of dysphoric dreams; an underlining premise of the model.

Finally, Spoomaker proposes a cognitive explanation for recurrent trauma related and idiopathic nightmares. He stresses that most nightmares in particular frequent nightmares have repetitive narratives. Recurrent nightmare scripts tend to become isolated and fail to integrate into autobiographical memory. This is common in individuals with high levels of neuroticism which renders them susceptible to experience otherwise common incidents as highly distressing. Furthermore, 'nightmare distress' under this construction is the mediating variable that determines whether nightmares become recurrent and problematic.

These models appear to share some commonalities as well as differences. For instance, Hartmann, Levin and Nielsen, and Spoomaker stipulate that individuals who experience frequent nightmares are prone to having ‘thin boundaries’, ‘elevated levels of affect distress’ and/or ‘neuroticism’ respectively. These constructs seem to have a similar property - ‘inherent sensitivity’ which is reflective of a trait like factor that appears to be intrinsic in all nightmare sufferers. Another commonality between a couple of the models is the perceived function of nightmares, for instance Revonsuo stipulates that the function of dysphoric dreams is to develop threat avoidance skills, which conceptually leads to resiliency, similar in some respects to the function of dysphoric dreams proposed by Levin and Nielsen, which is to extinguish fear based memories. On the other hand, differences among these models include the different aspects of the nightmare phenomenon under investigation. For example Hartmann's hypothesis focused predominantly on the formation of nightmares, Revonsuo theory focused mainly on the biological function of dreams, whereas Levin and Nielsen model focused on both the formation and function of dysphoric dreams; and Spoomaker focused on the cognitive dynamics pertaining to the persistence of nightmares. Furthermore, Hartmann examined primarily life-long non-trauma related nightmare sufferers; Revonsuo's emphasis was principally on dreams in general but in particular bad/dysphoric dreams and not necessarily nightmares. Levin and Nielsen's model focused on all types of dysphoric dreams including all types of nightmares; and Spoomaker's emphasis was on a specific type of nightmare, frequent recurrent nightmares.

A complete integration of these models may be somewhat elusive; but nonetheless there appears to be a number of similarities that can possibly serve as the building blocks to the establishment of a more general and cohesive theory of nightmares. Having stated that, Levin and Nielsen's (2008) model is the most comprehensive of the nightmare models reviewed and perhaps already answers the most salient enquires pertinent to nightmare researchers. Nevertheless, this field is in its infancy and there are still numerous basic issues that need further consideration and clarification as will be illustrated in the next few chapters.

Chapter 4

Contentious Issues associated with Dream and Nightmare Definitions

4.1 Introduction

The general concern regarding establishing a consensual dream definition relates to the vastness and intangibility of the subject matter and the implementation of indirect study methods, due to the fact that dreaming is an entirely subjective phenomenon. Hence, researchers commonly rely on dream questionnaires (Domhoff, 2003; Hall & Van de Castle, 1966; Schredl, 2002), dream interviews (Hartman, 1984), dream diary logs (Schredl, 2002) polysomnography studies (Walker & Stickgold, 2004), CT scans (Schenck, Bundlie, Ettinger & Mahowald, 1986), PET scans (Kjaer, Law, Wiltschiøtz, Paulson & Madsen, 2002) and MIR/fMIR studies (Maquet, Schwartz, Passingham & Frith, 2003), in order to systematically study dream experiences and related physiological and psychological correlates.

4.2 Dream definitions

During the history of the study of dreams there has been a plethora of definitions that have been proposed including: ‘the royal road to the unconscious mind’ (Freud, 1900), ‘organized communications from the unconscious to the conscious mind’ (Jung, 1974), ‘a product of neuro-physiological release during rapid eye movement sleep’ (Hunt, 1991), ‘mental activity during sleep’ (Hartmann, 1995), ‘ever-present excitations of long term memory’ (Tarnow, 2003) amongst others. However, despite the enormity of the literature on dreams, a definitional consensus has been relatively elusive. This was

highlighted by the most recent task-force of specialists, who failed to reach consensus on a definition for ‘dreams’ (Pagel, Blagrove, Levin, States, Stickgold & White, 2001). Part of the problem identified was the diversity of dream definitions and the diversity of perspectives found in dream literature. Nevertheless, consensus findings included:

- A working conceptual definition of dreaming for the purpose of discussion and scientific inquiry should be inclusive rather than exclusive
- Incorporation of the diversity of current approaches and historic inquiries
- Definitions of dreaming can be considered to have three primary characteristics:
 - ~ Association with wake/sleep states
 - ~ Recall
 - ~ Content

A definition that may be considered sufficiently inclusive is the one proposed by Hobson, Pace-Schott, and Stickgold (2000). They considered dreams to be:

“mental activity occurring in sleep characterized by vivid sensorimotor imagery that is experienced as waking reality despite such distinctive cognitive features as impossibility or improbability of time, place, person and actions; emotions, especially fear, elation, and anger predominate over sadness, shame and guilt and sometimes reach sufficient strength to cause awakening; memory for even very vivid dreams is evanescent and tends to fade quickly upon awakening unless special steps are taken to retain it” (p. 795).

4.3 Nightmare Definitions

Nightmare definitions and descriptions like dream definitions have inundated the literature. Nightmares have been defined and described as ‘morbid oppression during sleep, resembling the pressure of weight upon the breast’ (Johnson & Walker, 1755 p.

491), 'long, vivid, frightening dreams, which awaken the sleeper and are usually clearly recalled' (Hartmann, 1984, p. 12); 'a vivid and terrifying nocturnal episode in which the dreamer is abruptly awoken from sleep' (Levin, 1994, p 127) amongst others. Early definitions and descriptions however, of nightmare experiences were confounded with other sleep disturbances, such as night terrors, sleep paralysis and somnambulism (sleepwalking) (Levin & Nielsen, 2007). Ernest Jones' classic work *On the Nightmare* (1931) and some aspects of John Mack's work on *Nightmares and Human Conflict* (1970) are examples of such amalgamations. For instance, Jones' depiction of the nightmare experience as described by many of the authors cited in his work seemed to read as though the nightmare came upon the sleeper rather like a silent gloom overwhelming its victim than a terrifying dream - "The whole mind during the paroxysm (nightmare attack) is wrought up to a pitch of unutterable despair; a spell is laid upon the faculties, which freezes as if pent alive in his coffin, or over powered by resistless and immitigable pressure"(p. 17). This particular description appears to be more synonymous with the phenomenology associated with night-terrors and sleep paralysis rather than nightmares.

4.4 Physiological and Psychological Distinctions between Sleep Disturbances

It is now known that different types of nightmares have distinct physiological/biological and psychological properties (Hartmann, 1984) from other sleep disturbances such as night terrors, sleep paralysis and somnambulism. This distinction was facilitated by the work of Hans Berger (1929) the original pioneer of the electroencephalograph methodology, which served to empirically classify the different

stages of sleep. The classification enabled researchers to investigate the occurrences of these disorders and the corresponding sleep stages. The contemporary electroencephalograph methodology now includes the electro-encephalogram (EEG) which measures electrical brain activity (firing of neurons within the brain) via electrodes placed on various parts of the scalp, electro-myogram (EMG) which measures muscle tension via electrodes placed on the chin; and electro-oculogram (EOG) which measures eye movements via electrodes placed on the outer canthus of the eyes (Figure 4.1 a).

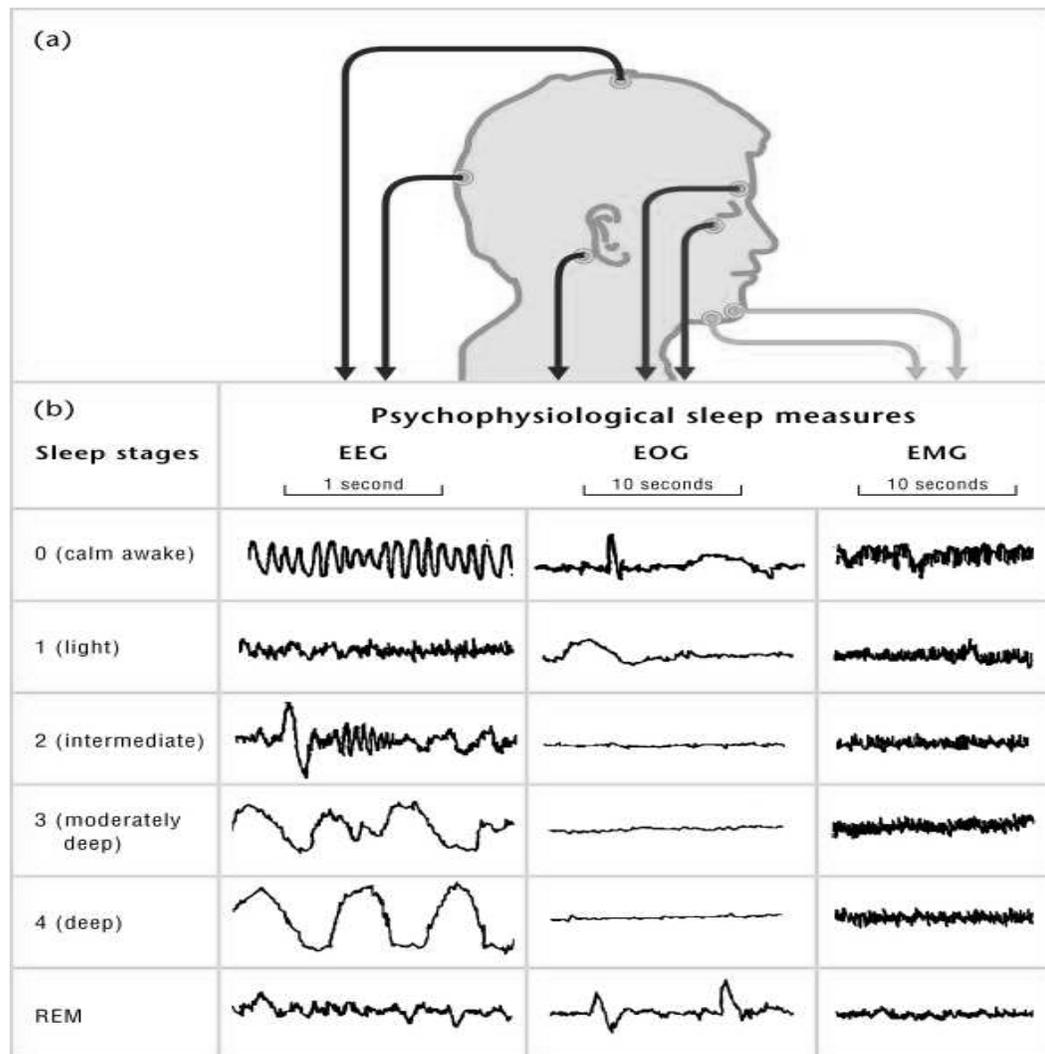


Figure 4.1 Psychophysiological Sleep Measures. Adapted from Thomas Higher Education 2007

The scientific study of sleep however commenced with the discovery of REM sleep in 1952 (Aserinsky & Kleitman, 1953). Following this discovery the interdisciplinary field of Hypnology established standardized empirical criteria for monitoring sleep in 1968 (Rechtschaffen & Kales, 1968), which further consolidated the understanding of nocturnal behaviours. Sleep is now divided into two types of sleep, non-rapid eye movement (NREM/orthodox/synchronised) sleep and rapid eye movement (REM/paradoxical /desynchronised) sleep (Stickgold, 2005). In NREM sleep, each sleep stage represents deeper levels of non-responsiveness to the external world, a state of progressive sensory deprivation. In addition, some contemporary researchers have made a further distinction within NREM sleep, such as light sleep (NREM sleep stage 1 & 2), and deep/slow wave sleep (NREM sleep stage 3 & 4) – (Bunde et al., 2000). Nevertheless, a sleep cycle of a healthy adult alternates throughout the night between NREM and REM sleep with certain sleep stages increasing as others decrease correspondingly (Walker & Stickgold, 2004). During sleep there are significant changes in EEG wave patterns which commonly refer to the amplitude (height) and the frequency (number of waves per second) of EEG waves - Figure 4.1.b. Moreover, all three sleep measures EEG, EMG and EOG are required to accurately differentiate between the sleep stages.

The main differences between the two types of sleep NREM and REM may be seen across the various variables identified in Table 4.1 which clarify the physiological and psychological differences experienced during the two major types of sleep.

Table 4.1 Differences between NREM and REM sleep

Variables	NREM	REM
Eye movements	absent	spiky, active, about 40 per minute
Heart rate	decreases	increases
Breathing rate	decreases	increases, becomes irregular
Brain waves	bigger and slower	active - similar to wake
Muscles	relaxed	paralysed
If awoken	report thoughts	report a dream
Mental activity (dreams)	flat, unemotional	vivid images, illogical, may be emotional
Sexual organs	relaxed	increased blood flow in penis (erection) and clitoris
Body movements	yes	no
Partial arousals (sleep walking, sleep talking)	yes	no

Adapted from Thomas Higher Education 2007

4.5 Sleep Architecture

A typical sleep cycle pertaining to a young adult extends for approximately 90 minutes, which comprises of the 4 NREM and REM sleep stages. Sleep onset begins with stage 1 (lightest sleep stage) of NREM sleep. This first sleep stage represents the transition between wakefulness and light sleep characterized by the disappearance of relaxed wakefulness (alpha waves) which are replaced by slower EEG theta waves. Subsequently, sleep transitions from stage 1 to stage 2 NREM sleep. The second stage is similar to stage 1, with the additional emergence of sleep spindles and K complexes, but sleep is still considered to be light. Subsequently, sleep transitions from stage 2 to stage 3 NREM (deep sleep). The third stage is characterized by 20-50% of (during the scoring period with) EEG delta waves, which are high in voltage activity (0.5 – 2.5

4.6 Physiological Constructs Confounded in Early Nightmare Definitions

The original definition of the nightmare experience as proposed by Jones (1931/1951) and Mack (1970) seemed to have confounded the following parasomnias:

- arousal disorders - ‘night-terrors’ and ‘somnambulism’
- a REM specific parasomnia - ‘sleep paralysis’ and
- ‘nightmare disorder’ (DSM-IV-TR, 2000).

Physiologically nightmares tend to occur during REM sleep which comprises approximately 20-25% of nightly sleep in (young) adults and are commonly experienced in the later part of the night (DSM-IV-TR, 2000; Hartmann, 1984) in particular non-trauma/idiopathic nightmares; with post-traumatic nightmares occurring in both REM sleep and other sleep stages specifically during N2 and sleep onset (Hartmann, 1984; Pagel, 2000, Ross, Ball, Sullivan & Caroff, 1989). REM sleep is further characterized by an increase of cerebral blood flow and temperature in the central nervous system, irregular and increase heart (tachycardia) and respiratory rhythms (tachypnea), inhibition of body movements and increase of dream recall upon awakening (Association of Sleep Disorder Centers, 1979). In contrast, night-terrors normally occur in deep sleep N3 (Hartmann, 1984) early in the sleep cycle (first 3 hours of sleep). Sleep walking episodes also occur early in the night, typically in deep sleep N3 in the first sleep cycle of the night (Broughton, 1968), however some researchers have found that they can also occur in N2 (Joncas et al. 2002). Sleep paralysis commonly occurs during sleep onset - hypnagogic form and/or awakening from sleep - hypnopompic form (DSM-IV-TR, 2000). Figure 4.3 illustrates the

occurrence of the more prominent parasomnias that were thought to be confounded in traditional nightmare definitions and the associated sleep stages where they have been most commonly observed.

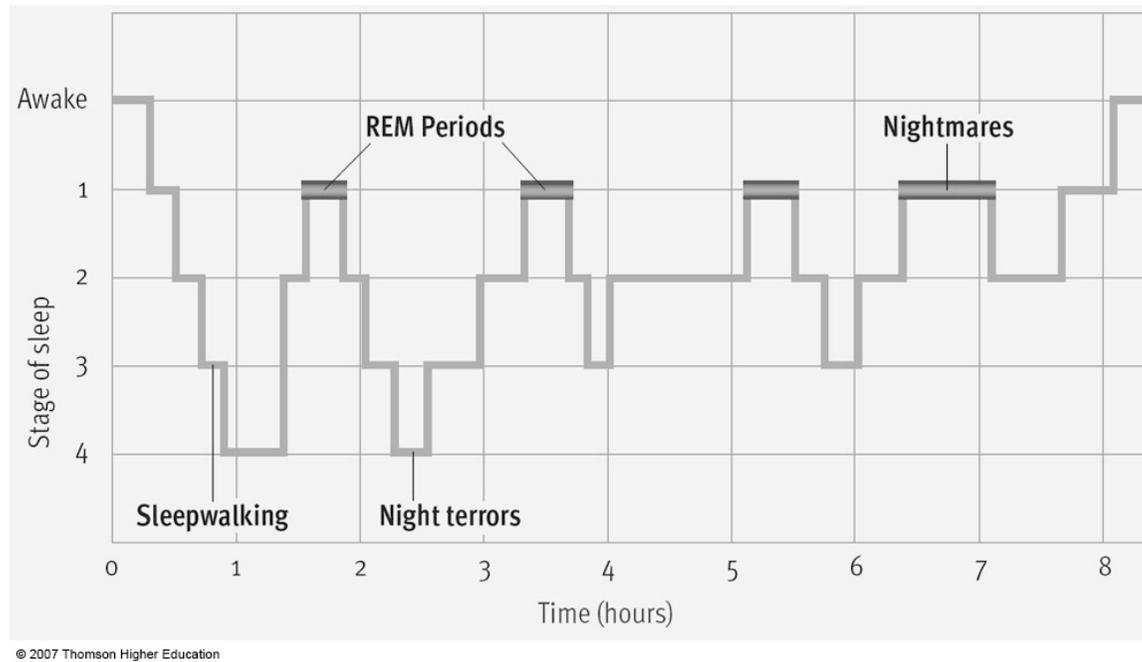


Figure 4.3 Sleep Stages and Corresponding Sleep Disorders - Thomas Higher Education 2007

All of these sleep disorders not only have physiological differences, they also have prominent psychological differences.

4.7 Psychological Constructs Confounded in Early Nightmare Definitions

Contemporary findings indicate that nightmare experiences elicit notable dysphoric emotional reactions such as fear, anxiety, and/or rage/anger (ICSD-2, 2005). These emotional states are experienced with high intensity and commonly lead to awakening the sleeper (Levin & Nielsen, 2007). Individuals upon awakening from the nightmare

are alert and have a clear recollection about the content of the nightmare (DSM-IV-TR, 2000, ICSD-2, 2005). Consequently some nightmare narratives tend to appear so realistic that nightmare sufferers may be prone to develop debilitating anxiety and consequently develop avoidance behaviours, such as avoiding certain stimuli that are reminders of the experience - like persons or places and/or sleep itself (Krakow, Hollified et al., 2000; Krakow & Zadra, 2006). During night-terror episodes in contrast, individuals experience extreme terror and/or fear, night terrors stem from slow-wave sleep and sufferers generally pierce the silence with a scream or cry. Individuals are usually difficult to arouse and upon awakening commonly have limited recollection of any dream mentation (DSM-IV-TR, 2000), but the concomitants associated with terror/fear are present nonetheless. Moreover, those witnessing an individual experiencing a night-terror such as a parent or bed partner may also be exposed to the terror/fear vicariously, due to the extreme vocal and motor behaviour related to a night-terror episode (Hartmann, 1984). The phenomenology of Somnambulism - sleep walking - is relatively self-explanatory, individuals whilst in deep sleep leave their beds and commence walking around usually in their immediate environment (i.e., bedroom, house), but sometimes can wander beyond their surroundings and go out of their house (Cao & Guilleminault, 2010). Occasionally they exhibit purposeful behaviours such as folding clothes or more hazardous behaviours such as operating machinery (Kales, Soldatos, Caldwell et al. 1980). Upon awakening individuals are commonly confused and have minimal recollection of the sleeping walking episode and report no daily dysfunction (ICSD-2, 2005).

In summary, there are physiological and psychological difference between nightmares, night-terrors and somnambulism. The development and progress of sleep medicine and associated advances in sleep technologies have made the differences between these sleep disturbances distinctly clear. Thus, with some certainty it can be stated that the type of nightmare discussed above occurs predominantly in REM sleep, arouses the dreamer from sleep, there is clear recollection of the dream content upon arousal and negative emotions are associated with the experience.

4.8 Nightmares Reported in Contemporary Literature

The variety of nightmares reported in the literature is numerous and thus may become relatively confusing when ascertaining the specific type or subtype of nightmare being discussed. For instance, nightmares have been defined and/or described as:

- idiopathic (non-trauma related) in nature that do not awaken the sleeper (Belicki & Belicki, 1982)
- idiopathic (non-trauma related) in nature that awaken the sleeper (Zadra & Donderi, 2000)
- trauma-related that resembles a trauma incident that do not awaken the sleeper (Krakow, Hollifield, Schrader et al., 2000)
- trauma-related that resembles a trauma incident that awaken the sleeper (Forbes, Phelps, McHugh et al., 2003)
- posttraumatic that replicate the trauma incident in great detail not associated with the development of PTSD (Davis, 2009)
- posttraumatic nightmares that replicate the trauma incident in great detail associated with PTSD (Davis, 2009)
- nightmares as a psychopathology: Nightmare disorder (DSM-IV-TR, 2000; ICSD2, 2005)
- nightmares as a symptom of underlying psychopathology other than PTSD such as Depression (Agargun et al., 2003)

The literature also identifies various terms that have been used when describing ‘frequent nightmares’, which has created some confusion and requires clarification. These terms have ranged from recurrent, repetitive and replicative nightmares. Table 4.2 elucidates the various terms that have been erroneously interchanged and provides the corresponding meaning/s.

Table 4.2

Terms Used	Meaning
Recurrent Nightmares	Recurrent nightmares refer to nightmares that have a thematic reoccurrence e.g being pursued, being attacked or falling (Spoormaker, 2008)
Repetitive Nightmares	Repetitive nightmares refer to nightmares that have dream elements that are repetitive e.g characters, settings or emotions (Laberge & Rheingold, 1990)
Replicative Nightmares	Replicative nightmares refer to nightmare narratives that replay the (exact) same dream sequence over again e.g PTSD nightmares - replay the traumatic incident (Barrett, 1996)

Most researchers tend to categorize nightmares into two main types, trauma related and non-trauma related in order to elucidate the different types reported, although this distinction is not the only dichotomy that has been reported in the literature. Other dichotomies used to differentiate between the types or subtypes of nightmares include nightmares as a primary psychopathology in comparison to nightmares as a secondary symptom (Zervas & Soldatos, 2005); and clinically based definitions in contrast to research based definitions (Levin & Nielsen, 2007). The use of the dichotomies is to practically account for all the nightmare experiences reported in the literature, however there is considerable overlap between the aforementioned dichotomies.

4.9 Trauma Related Dichotomy

Nightmares categorized under the trauma related dichotomy commonly refer to nightmare experiences that derive from either trauma exposure related causes or non-trauma exposure related causes (Table 4.3).

Table 4.3 Trauma Related Dichotomy

Trauma Related Nightmares				
<i>Trauma Exposure</i>		<i>Non-Trauma Related (Idiopathic)</i>		
<i>Non- PTSD</i>		<i>PTSD</i>		
<i>Non-Replicative</i>	<i>Replicative</i>	<i>Non-Replicative</i>	<i>Replicative</i>	
Memory elements of the trauma are recombined to form a nightmare narrative	The trauma is replicated in great detail	Memory elements of the trauma are recombined to form a nightmare narrative	The trauma is replicated in great detail	Organic related NMs e.g., epilepsy, dementia, Parkinson's disease, sleep apnoea, snoring, asthma, disorder breathing syndrome, insomnia, periodic leg movement, migraines, respiratory problems, cardiac disease Febrile Illnesses e.g., fever Drug related NMs e.g., intake and withdrawal Personality related e.g., thin boundary Stress related NMs e.g., personal/Occupational

4.9.1. Trauma-Related Nightmares

Trauma-related nightmares may be categorized into two main classes of post-trauma nightmares, non-PTSD nightmares and PTSD nightmares. This implies that trauma exposure may lead to the development of PTSD 3- 6 months after exposure with corresponding nightmares (Treatment Protocol Project, 2000), or it may not lead to the development of PTSD, but nightmares are present nonetheless. There is a further distinction between non-PTSD non-replicative nightmares and non-PTSD replicative nightmares. Non-replicative nightmares refer to the nightmare content that is not consistently repetitive, but may contain a combination of elements that pertain to the trauma exposure (Davis, 2009). On the other hand, replicative nightmares contain the

same nightmare narrative/script, which is repetitive in nature and is experienced frequently (Barrett, 1996; Rothbaum & Mellman, 2001). Non-replicative nightmares and replicative nightmares are also applicable to PTSD nightmares, where the nightmare narrative may either repeat segments of the trauma incident or repeat the entire incident in detail (Krakow et al., 2000).

It is imperative to reiterate that the presence of trauma related nightmares after trauma exposure does not immediately imply a PTSD outcome. An individual may be exposed to trauma and consequently have trauma related nightmares without developing PTSD (Davis, 2009). The majority of people who are exposed to trauma never develop PTSD; in fact, the most common response to trauma is resiliency - initially experiencing mild to moderate trauma related symptoms that fade promptly (Bonanno, 2005). Bonanno reports that approximately 10% - 30% of individuals exposed to trauma experience chronic problems, a further 5% - 10% experience a delayed response that may increase in severity over-time, 15% - 30% recover from moderate symptoms over-time and 35% respond with resiliency. Furthermore, it has been reported that the severity of trauma related nightmares is commonly high immediately after the exposure and progressively dissipates as the trauma integrates into existing schemas (Barrett, 1996). Although there appears to be distinctive differences between types or subtypes of trauma related nightmares, all nightmares related to trauma exposure reported in the literature are categorized as trauma nightmares without distinguishing nightmares as illustrated in Table 4.3.

In addition, there is another condition related to trauma exposure that can also elicit nightmares if it lasts a few days, that has been relatively neglected in the literature - Acute Stress Disorder (ASD). Acute Stress Disorder may be considered a temporary response to a traumatic incident, beginning within a few minutes of exposure and lasting a few hours or up to a few days (Treatment Protocol Project, 2000). However, in the DSM-IV-TR (2000) it is stipulated that ASD disturbances may last for a minimum of 2 days and a maximum of 4 weeks. Symptoms commonly include subjective numbing, disorientation, amnesia, reduced levels of consciousness, withdrawal, anxiety, depression and narrowing of attention. Despite the knowledge of this condition studies on trauma related nightmares seldom differentiate possible trauma related psychopathologies ASD and/or PTSD. Furthermore, most studies do not necessarily report whether trauma exposure was recent or non-recent. Recent trauma that leads to trauma related nightmares may apply to both ASD and PTSD in varying degrees, but this information is commonly unknown.

4.9.2 Non-Trauma Related Nightmares

In the non-trauma related or idiopathic category, nightmares have been reported with other conditions such as epilepsy (Silvestri & Bromfield, 2004), dementia (Merlino, et al., 2010), Parkinson's disease (Borek, Kohn & Friedman, 2006), sleep apnoea (Krakow, Haynes, Warner et al., 2004), snoring (Thoman, 1997), asthma (Kink & Quan, 1987), fever (Karacan, Wolff, Williams, Hirsch, & Webb, 1968), drug related nightmares, prescribed medication - (Hartmann, 1984), for example, intake and withdrawal of benzodiazepine and illegal drugs – cannabis (Bourne & Mills, 2004),

personality type (Hartmann, 1984) and stress (Coalson, 1995). All such nightmares are categorized as non-trauma related or sometimes idiopathic nightmares. However, the term idiopathic in pathology refers to unknown causes (Oxford Dictionary, 2010), but these nightmares are reported in conjunction with known correlates. Perhaps in the trauma category there should be three groups - post trauma, no trauma exposure and idiopathic nightmares.

4.10 Psychopathology Related Dichotomy

In the psychopathology dichotomy a differentiation is made between frequent nightmares as the primary psychopathology ‘Nightmare Disorder’ and frequent nightmares as symptoms of underlying psychopathologies (Table 4.4).

Table 4.4 Psychopathology Related Dichotomy

Psychopathology	
<i>Nightmares as a Psychopathology</i>	<i>Nightmares as a Symptom</i>
Parasomnia – Nightmare Disorder	PTSD NMs
	Schizo-spectrum disorders related NMs
	Depression related NMs
	Anxiety related NMs
	Dissociative Disorder
	Personality Disorders
	Borderline related NMs Anti-Social related NMs
	Bi-polar related NMs

4.10.1 Primary Psychopathology

The only primary psychopathology associated with nightmares in the DSM-IV-TR (2000) and ICSD-2 (2005) is Nightmare Disorder formerly described as Anxiety

Dreams Disorder. Nightmare Disorder will be discussed in detail in the section entitled clinical definition.

4.10.2 Secondary Psychopathology

Frequent nightmares as symptoms have been reported in various psychopathologies including PTSD (Krakow, Hollifield, Johnson, et al., 2001), Schizo-spectrum Disorders (Hartmann, 1984), Depression (Argangun et al., 2003), Anxiety Disorder (Ohayon et al., 1997), Personality Disorders – Borderline (Simor, Csoka & Bodizs, 2010) and Dissociative Disorder (Agargun, et al., 2003) and Bi-polar Disorder (Semiz, Basoglu, Ebrinc, & Cetin, 2008). The psychopathology most associated with nightmares is PTSD and nightmares are considered to be a hall mark of the condition (Harvey, Jones & Schmidt, 2003). PTSD has three symptom clusters, re-experiencing symptoms, hyperarousal symptoms and avoidance symptoms. Nightmares pertain to the re-experiencing cluster. Patients commonly report upsetting thoughts or memories relating to the traumatic incident, recurrent nightmares and flashbacks that commonly repeat the traumatic incident, associated feelings of high distress, and physiological responses such as - rapid heartbeat and perspiration. PTSD nightmares are commonly associated with individuals who have been exposed to severe trauma for instance individuals returning from a war zone (Barrett, 1996). PTSD nightmare scripts or storylines are reported as fixed and can remain unchanged for decades (Spoormaker, 2008) and are consequently considered the most extreme type of nightmare (Levin & Nielsen, 2007).

4.11 Clinical/Research related Dichotomy

In the clinical/research related dichotomy a differentiation was made between a clinically inspired definition and a research inspired definition (Table 4.5).

Table 4.5 Clinical/Research related Dichotomy

Clinical/Research		
<i>Clinical</i>		<i>Research</i>
Parasomnia – Nightmare Disorder	dsyphoric/bad dreams that arouse the sleeper	dsyphoric/bad dreams that do not arouse the sleeper

4.11.1 Clinical Definition

Clinical or diagnostic definitions of nightmares adhere to the definitions proposed by the American Psychiatric Association in the Diagnostic and Statistical Manual of Mental Disorders 4th Edition (DSM-IV-TR), and by the American Sleep disorder Association in the International Classification of Sleep Disorders 2nd Edition (ICSD-2).

Currently DSM-IV-TR (2000) defines Nightmare Disorder as:

- Repeated awakenings from the major sleep period or naps with detailed recall of extended and extremely frightening dreams, usually involving threats to survival, security, or self-esteem
- On awakening from the frightening dreams, the person rapidly becomes oriented and alert (in contrast to sleep terror disorder and some epilepsies)
- The dream experience, or the sleep disturbance resulting from the awakening, causes clinically significant distress or impairment in social, occupational, or other important areas of function
- The awakenings generally occur during the second half of the sleep period
- The nightmares do not occur exclusively during the course of another mental disorder (e.g., a delirium, posttraumatic stress disorder) and are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition

(DSM-IV-TR number 307.47)

The ICSD-2 (2005) defines nightmares as:

- Recurrent episodes of awakenings from sleep with recall of intensely disturbing dream mentation, usually involving fear or anxiety but also anger, sadness, disgust, and other dysphoric emotions
- Alertness is full immediately on awakening, with little confusion or disorientation
Recall of sleep mentation is immediate and clear
- Associated features may include:
Return to sleep after the episodes is typically delayed and not rapid
- Associated features may include:
The episodes typically occur in the latter half of the habitual sleep period
- Nightmares are distinguished from: seizure disorder, arousal disorders (sleep terrors, confusional arousal), REM sleep behaviour disorder, isolated sleep paralysis, nocturnal panic, posttraumatic stress disorder, acute stress disorder

(ICSD-2 number 307-47-0)

According to these clinical or diagnostic definitions nightmares are an independent primary psychopathology known as 'Nightmare Disorder'. For a positive diagnosis of Nightmare disorder, nightmares are experienced as a separate phenomenon without a confounding influence such as trauma or a comorbid psychopathology e.g. schizotypal personality. However, it is important to note that Krakow (2006) in a large sample of patients accessing two community sleep facilities found that the majority of those who reported nightmare complaints also reported co-existing psychiatric symptoms. This suggests that nightmare disorder is seldom diagnosed due to confounding disorders.

These clinical definitions have both commonalities and differences. Commonalities' include the waking criteria, dreams that awaken the sleeper, dysphoric dream mentation and affectivity, typically occur in the latter half of the night and do not occur exclusively during the course of another mental disorder. Notable difference on the other hand includes the range of affectivity experienced during dream mentation, DSM-

IV-TR reiterates that fear is the prominent emotion in ‘extremely frightening dreams’, while ICSD-2 includes a range of dysphoric emotions ‘fear or anxiety but also anger, sadness, disgust’. Another significant difference between these classificatory systems is the distress caused by the nightmare experience; in the DSM-IV-TR it is stated nightmares ‘causes clinically significant distress or impairment in social, occupational, or other important areas of function’, in contrast there is no discernable distress associated with the definition expounded by ICSD-2. Interestingly, neither the DSM-IV-TR nor ICSD-2 requires nightmares to stem from any particular sleep stage such as REM sleep, stage 2 NREM or sleep onset for a positive diagnosis.

These clinical or diagnostic definitions are in the realm of Parasomnias, which can be one of three types of primary sleep disorders (DSM-IV, 2000) identified as disruptive sleep related disorders and are divided into two major categories, primary and secondary Parasomnias. Primary Parasomnias are classified as sleep state disorders that are further distinguished by the sleep stage in which they occur. These sleep stages are differentiated between NREM (non-rapid eye movement) sleep/stage and REM (rapid eye movement) sleep/stage (ICSD-2, 2005). Nightmares are categorized as a primary Parasomnia and the DSM-IV-TR manual identifies four specific categories of primary Parasomnias which include; Nightmare Disorder (formerly known as dream anxiety disorder), Sleep Terror Disorder, Sleepwalking Disorder, and Parasomnia (not otherwise specified) (DSM-IV-TR, 2000).

Furthermore, by definition Parasomnias awaken the sleeper and consequently confound additional clinical distress associated with sleep disruption. Sleep disruption research indicates that these nocturnal arousals can be categorized as either transient (short-term) or chronic (long-term), specifically in regards to insomnia episodes (Roth & Roehrs, 2003). Sleep loss affects both physiological and psychological aspects of human functioning and performance. The effect of sleepiness accumulates over time decreasing the quality of life, productivity, and increases rates of accidents, and employment absenteeism (Roth & Ancoli-Israel, 1999 in Roth & Roehrs, 2003). Psychological consequences include impaired memory function, attention, vigilance and reaction time (Rosenthal, Roehrs, Rosen & Roth, 1993 in Roth & Roehrs, 2003). Furthermore, the greatest identified effect on human performance is sustaining attention which increases lapses (a period of non-responsivity) and is highly associated with the manifestation of ‘microsleeps’ (Roth & Roehrs, 2003). Thus, the additional detrimental effects of nightmares (that awaken the dreamer) appear to place nightmare sufferers in a considerably more functionally distressing predicament in comparisons dysphoric dreams that do not awaken the dreamer.

4.11.2 Research Definition

Nightmare operational definitions used in the research literature tend to predominantly vary between dysphoric/bad dreams that awaken the dreamer (Levin & Fireman, 2002; Zadra & Donderi, 2000) and dysphoric dreams that do not awaken the dreamer (Belicki, 1992; Blagrove & Haywood, 2006; Wood, Bootzin, Rosenhan, Nolen-Hoeksema & Jourden, 1992). Levin and Nielsen (2007) in their review of the

nightmare literature elucidate the distinction between the two operational definitions. The implication of this distinction directly influences the reliability of the theoretical construct of the phenomenon and prevalence of nightmare frequency. For instance, Zadra and Donderi (2000) conducted research where participants were required to distinguish between bad dreams (that do not awaken the dreamer) and nightmares (bad dreams that do awaken the dreamer). Interestingly, they found that bad dreams were considerably more prevalent than nightmares; in fact they were 4 times more prevalent. Thus, when the operational definition of nightmares is not clearly defined as ‘bad dreams that awaken the dreamer’, the validity and reliability of the subject matter is severely compromised. Hence, it seems imperative that definitional consistency is practiced while conducting research. Furthermore, it seems pivotal to the development of the field that the differences between nightmares and bad dreams are clearly stipulated in order to be able to integrate research findings. Levin and Nielsen (2007) suggest that nightmares and bad dreams seem to differ in phenomenological quantitative elements as opposed to phenomenological qualitative elements. That is, they propose that nightmares and bad dreams differ in intensity of affect load (daily stress factor) and imply that they seem to reflect the same phenomenon.

In order to explain the phenomenological quantitative difference between all types of dysphoric dreams including nightmares and bad dreams Levin and Nielsen (2007) offered a model of the typology of dreaming that includes normal dreaming, nightmares and replicative nightmares. This model illustrates the difference between all types of dysphoric dreams which are mediated via the intensity of affect load, affect

distress and trauma severity in order to clarify some of the confusion about the different types or subtypes of nightmares, particularly trauma related nightmares. The following diagram depicts the dream continuum.

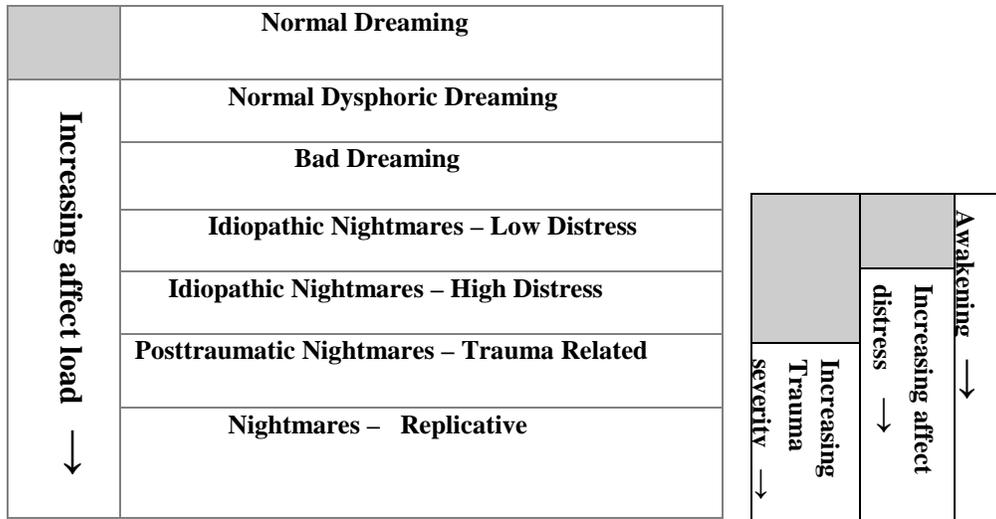


Diagram 4.1 (Levin & Nielsen, 2007 p.486)

According to this postulation dreams are on a continuum that commences with normal dreaming (positive imagery and affectivity) and ends with replicative nightmares, which are considered to be the most intense dream in the continuum. The mediating variable between the levels of intensity between dreams is affect load (daily stress). Levin and Nielsen (2007) posit that nightmares are different from bad dreams because they awake the individual due to the perceived intensity of the experienced imagery and affectivity in the dream. This intensity is mediated by the increasing affect load; however it is the presence of affect distress that determines whether the distress

experienced is high or low. That is, the trait factor coupled with increasing daily stress determines if the nightmare is experienced with high distress. Trauma related nightmares on the other hand, have the additional variable 'trauma severity'. The severity of the trauma exposure together with increasing affect load and affect distress determine if nightmares manifest as either trauma related or replicative post-traumatic nightmares.

4. 12 Definitive Elements of Nightmares

The literature elucidates various definitive elements that are exclusive to nightmares including:

- dream narratives that involve dysphoric imagery associate to corresponding dysphoric affectivity (predominantly anxiety and fear)
- dream narratives that commonly occur in REM and/or N2 sleep, with very few occurring during the transition between wakefulness and sleep
- dysphoric affectivity experienced in the dream are so intense or distressing that they causes awakening from sleep
- once awakening occurs distress associated with returning to sleep may be experienced
- daytime distress related to anxiety about sleeping may be experienced
- daytime distress manifested as day time dysfunction may be experienced

4.13 Summary and Conclusion

The study of nightmares as a discipline is still considered to be a relatively new science. The awareness of dream mentation extends to antiquity and a consensus definition in the literature still elude experts in the field to this very day; hence it is not surprising that a nightmare definition consensus between experts in the field has not reached consensus. The act of dreaming may be described as physiological (physical) in nature while the content of dreaming may be considered psychological in nature. Hence, given that this phenomenon encompasses both physiological as well as psychological components, may sometimes fragment current understanding instead of integrate the available information about dreaming.

Ongoing definitional concerns still abound and identified issues with contemporary nightmare definitions include, types and subtypes of nightmares, the inclusion of the waking criterion, subjective distress engender by them, the use clinical and research definitions, and the sleep stages in which nightmares are reported. Spoomaker (2008) suggests that clinical definitions in classificatory systems such as the DSM-IV-TR should probably differentiate between nightmares that awaken the sleeper and nightmares that do not, in order to include all types of dysphoric dreaming and clarify any present confusion.

Levin and Nielsen's (2007) depiction of the dream continuum provides a detailed understanding of normal dreaming, non-trauma and trauma related dreaming, making dreams (normal and dysphoric) quantitatively different, which is also applicable to

nightmare experiences. This model could be used to possibly dispel all fragmented or disjointed types of nightmares reported, furthermore by considering affect load and distress all types or subtypes of nightmares could be integrated. In addition, Barrett (1996) suggests that the incidents of trauma related nightmares commonly dissipate with the progression of time; severity lessens as healing and integration of the trauma experiences merge with other memories, which may also dispel some of the confusion.

After this thorough examination of the definition and description of the nightmare phenomenon - according to the available literature - nightmares may be defined as a physiologically distinct phenomenon from other sleep disorders and occur predominantly in REM and depending on the type of nightmare may also occur in N2. These dysphoric dreams involve both dysphoric imagery and affectivity which lead to arousals. Such dysphoric imagery and affectivity may be associated with sadness, anger or disgust however anxiety and/or fear are the most common affects. Consequences of such dreams may range from no distress to highly distressing to the point of influencing the emergence of avoidance behaviours, such as developing anxieties or phobias related to going to sleep and/or intervening with daily functioning the subsequent day/s, week/s, month/s or even year/s.

Chapter 5

Prevalence studies and Dilemmas

5.1 Introduction

Studies of the prevalence and frequency of nightmares are numerous in contemporary sleep medicine literature (Agargun, Kara et al., 2003; Belicki & Belicki, 1986; Bengtsson, Lennartsson, Lindquist, Noppa & Sigurdsson, 1980; Bixler, Kales, Soldatos, Kales & Healey, 1979; Chivers & Blagrove, 1999; Levin, 1994). Studies such as community based epidemiological research can be traced to early 20th century to the work of Blanchard (1926) who surveyed 300 children and adolescents attending a child guidance clinic. Blanchard found that 13% reported experiencing dreams classified as ‘feared dreams’ which later came to be known as ‘anxiety dreams’. Some years later Cason (1935) conducted an extensive study surveying participants for incidents of nightmares pertaining to the previous month. In this study Cason reported that 19% of the participants (college students) as having experienced nightmares sometime in the past.

Contemporary nightmare studies that report nightmare incidents conclude that nightmares are almost ubiquitous in the general population (Levin & Nielsen, 2007). Most studies have found that a large percentage of the samples surveyed report nightmare experiences. For instances, some large community based studies have found nightmare incidents to be reported by 75% to 83% of respondents (Belicki & Belicki, 1986; Levin, 1994). These estimates commonly include yearly, monthly and weekly

nightmare reports. However, periodic nightmare categorizations such as yearly nightmares, monthly nightmares and/or weekly nightmares have not always been reported in clear manner, which has made it difficult to ascertain an accurate frequency estimate. Furthermore, given the variety of cohorts (children, adolescents, young adults, middle aged and elderly) that have been surveyed, it is imperative that clear differentiations between these groups are made, since each cohort has reported different nightmare frequencies (Leung & Robson, 1993). A further distinction that should be made to determine accurate nightmare frequency estimates is between healthy (non-pathological/clinical), and pathological or psychopathological (clinical) populations.

5.2 Frequency and Prevalence Reports

Some studies report frequency rates (Belicki & Belicki, 1986) while others report prevalence rates (Zadra & Donderi, 2000) of nightmares. The difference between these two concepts - frequency and prevalence - appears to be based on the number of cases considered. For instance, frequency refers to the rate of occurrence (nightmares) within a given time period (monthly or weekly). In contrast, prevalence tends to refer to how many cases/individuals have the condition in any given year. This would include individuals that have lived with nightmares for an extended period and those who recently commenced experiencing nightmares. Unfortunately, the terms frequency and prevalence (rates) are often used interchangeably and clarification of the distinction between these terms is commonly not presented. This lack of distinction confounds the incidents reported thus making the accuracy of nightmare occurrences inconsistent.

5.3 Healthy Populations

Most studies of prevalence and/or frequency of nightmares reported in the literature have focused on healthy participants such as university students (Cason, 1935; Feldman & Hersen, 1967; Belicki & Belicki, 1982, 1986; Levin, 1994; Wood & Bootzin, 1990; Zadra & Donderi, 2000; Miro & Martinez, 2005). A healthy population can be considered to be a cohort that has not received a positive diagnosis of any pathology or psychopathology that may influence the experience of nightmare frequency or distress. This cohort may be considered as maintaining a functional lifestyle pertaining to educational or employment related activities, such as attending a mainstream school or university and/or holding down a job as well as maintaining functional interpersonal relationships.

5.3.1 Nightmare frequency estimates in Children

It has been reported that children tend to experience the most nightmares in comparison to other age groups (Snead & Bruch, 1983). In an early study, Woodward and Magnus (1949) surveyed 543 first graders and found that 141 (26%) reported having nightmares. In addition Salzarulo and Chevalier (1983) studied a sample of children between the ages of 2-12 years and found that 'nightmare problems' were experienced by 24% of 2-5 year olds, 41% of 6-10 year olds and 22% of 11-12 year olds. The current DSM-IV-TR (2000) reports that 10%-50% of children aged between 3-5 years' experience disturbing dreams, making this particular age group most vulnerable to nightmares in comparison to other healthy cohorts. However, the operational definition implied in the estimate reported in the DSM-IV-TR appears to confound bad dreams

and nightmares. Another interesting observation is that most of these studies do not necessarily indicate whether the nightmare reports were based on yearly, monthly or weekly incidents, or whether these reports were based on information provided by the children themselves or the children's parents/caregivers.

5.3.2 Nightmare frequency estimates in Adolescents

Estimates of prevalence or frequency related studies focused on healthy adolescents demonstrate that this cohort maybe the group that reports most nightmares apart from children. Vignau, Bailly, Duhamel, et al (1997) surveyed a random sample of adolescents with a mean age of 17 years found that 6.8% of the sample reported frequent nightmares. Another study surveying adolescents aged between 12 – 18 years found that 7.1% of adolescents reported experiencing nightmares often (Liu, Sun, Uchiyama, Shibui, Kim & Okawa, 2000). Abdel-Khalek (2006) studied a sample of students aged between 10-18 years found that between 6.1% - 17.6% reported nightmares. However, similar to the nightmare frequency estimates in studies investigating children, the integration of these findings is made unnecessarily complex because frequency definitions employed differ. It is also unclear whether these frequency reports refer to monthly or weekly nightmare incidents.

5.3.3 Nightmare frequency estimates in Young and Middle aged Adults

Contemporary nightmare frequency studies on young adults and middle aged adults ordinarily make the distinction between yearly, monthly and weekly incidences. Large epidemiological studies commonly report between 75%- 83% of samples report yearly incidents (Belicki & Belicki, 1986; Levin, 1994); a further 10% -29% of samples

reported monthly incidents (Belicki & Belicki, 1982; Miro & Martinez, 2005) and 2.9% - 5% of samples reported weekly incidents (Feldman & Hersen, 1967; Hublin, Kaprio, Partinen & Koskenvuo, 1999; Levin, 1994).

5.3.4 Nightmare frequency estimates in the Elderly

Frequency nightmare studies focused on elderly participants are rare in the literature and are even rarer when studying healthy elderly participants. One such study was conducted by Salvio, Wood, Schwartz and Eichling (1992) who reported the nightmare frequency in a healthy elderly sample. Salvio et al., studied 51 healthy elderly participants with a mean age of 65 years. It was found that approximately 15 nightmares experiences were reported on a yearly basis; just over 1 nightmare per month which was significant less than a college student control group used in the same study. It was also reported that the retrospective estimates were 10 times less (2.5% of the sample) than the prospective estimates of 25% of the sample.

5.4 Developmental Perspective: Frequency Progression

Nightmare frequency from a developmental perspective indicates that nightmare incidents tend to be high early on in life (3-5 and 6-9 years of age), then decrease slightly between (10-19 years of age) and then increase again (20-29 years of age) and subsequently begin to gradually decrease throughout the rest of the life span (Sandoval, Krakow, Schrader & Tandberg, 1997). Nielsen, Stenstrom and Levin (2006) conducted an enormous internet based study that surveyed 23,990 respondents (19,367 women and 4,623 men) and found that nightmare frequency recall slightly increased between

the age cohorts 10-19 years to 20-29 years and then decreased gradually to encompass the other age cohorts including 30-39 years, 40-49 years and finally to 50-59 years. On average it may be estimated that an ordinary 55 year old individual will have 1/3 of nightmares than an ordinary 25 year old individual. Hence, nightmare incidents tend to be very common in childhood through to young adulthood and subsequently decline with age (Levin & Nielsen, 2007).

5.5 Generalisability: Nightmare Frequency Studies

General population frequency studies that may be reliably generalised are minimal in the literature. Most frequency studies are based on university samples which are not necessarily an accurate presentation of the general population. However, as it will be shown later the reported estimates in university samples are remarkably similar to the general population estimates specifically when weekly nightmare frequencies are reported. Table 5.1 exclusively illustrates research findings pertaining to general population nightmare frequency estimates across three periodicities - weekly, monthly and yearly.

Table 5.1 General Population Nightmare Frequency

General Population Samples						
Nightmare definition	Retrospective Measurement					
	Weekly NMs	%	Monthly NMs	%	Yearly NMs	%
Bad Dreams with the waking criterion	Hublin, Kaprio, Partinen & Koskenvuo (1999)	2.9	Hublin, Kaprio, Partinen & Koskenvuo (1999)	10.1	Bixler, Kales, Soldatos, Kales & Healey (1979)	11.2
			Ohayon, Priest, Guillemin -ault & Caulet (2002)	7	Klink & Quan, (1987)	8.1
					Stepansky, Holzinger, Schmeister-Rieder, Saletu, Kunze, Zeitlhofer (1998)	4

It is noteworthy to stress that the literature review also found other studies that reported nightmare frequencies, however it was unclear whether the reported frequencies related to weekly, monthly or yearly estimates, thus were excluded from Table 5.1. Nevertheless, from the findings reported in Table 5.1 nightmare incidents in the general population may be divided into weekly nightmare reports of 2.9%, monthly nightmare reports between 7% - 10.1% and yearly nightmare reports between 4% - 11.2%.

5.5.1 University Samples

Most frequency or prevalence studies have been conducted on university samples. Zadra and Donderi (2000) stipulate that among university students 76% to 86% report at least one yearly nightmare (which comprises all three categories yearly, monthly and weekly reports), 8% to 29% report at least one monthly nightmare and 2% to 6% report at least one weekly nightmare. These estimates appear to be relatively consistent with the weekly and monthly frequency reported by general population studies but not with yearly nightmare reports. However, that is not surprising given that various studies in the literature have reported or very least implied general population estimates based on university samples.

Table 5.2 illustrates numerous studies on university samples that have reported nightmare estimates of weekly, monthly and yearly reports. It also categorizes the different measuring tools implemented in collecting the data, in particular retrospective and prospective metrics, which elicit different frequency estimates.

Table 5.2 University Sample Nightmare Frequency

Nightmare definition	University Samples									
	Retrospective Measurement				Prospective Measurement					
	Weekly NMs	%	Monthly NMs	%	Yearly NMs	%	Weekly NMs	%	Monthly NMs	Yearly NMs
Bad Dreams with the waking criterion	Feldman & Hersen (1967)	5.0	Cason (1935)	19.0	Levin (1994)	83.0	Levin & Fireman (2002)	40.0	Levin & Fireman (2002)	31.3
	Levin (1994)	5.0	Feldman & Hersen (1967)	24.0	Feldman & Hersen (1967)	47.0	3 week Log		3 weeks	
			Levin (1994)	15.0					Zadra & Donderi (2000)	47.0
			Zadra & Donderi (2000) (1month retro)	33.0					4 week Log	
Bad Dreams without the waking criterion	Miro & Martinez (2005)	8.2	Belicki & Belicki (1982)	10.0	Belicki & Belicki (1982)	26.0	Wood & Bootzin (1990)	21.4	Wood & Bootzin (1990)	47.0
			Miro & Martinez (2005)	29.9	Miro & Martinez (2005)	59.2	2 week Log		2 week Log	
			Belicki & Belicki (1986)	8.3						
			Wood & Bootzin (1990)	23.2						
			Wood & Bootzin (1990) (12m retro)							
		Wood & Bootzin (1990) (1month retro)	55.2							

The variation between nightmare frequency estimates reported in the literature both in retrospective and prospective studies are considerable. Studies that have implemented retrospective metrics show that between 1.9% - 8.2% of participants surveyed report weekly nightmares, between 8.3% - 55.2% report monthly nightmares and between 20.7% - 83% report yearly nightmares. The variations in frequency estimates reported in studies that have implemented prospective metrics are also considerable. For weekly nightmare estimates they range between 21.4% - 40%, and for monthly nightmare estimates range from 31.3% - 47%. Such discrepancies within retrospective studies, within prospective studies, and between retrospective and prospective studies suggest that there are intrinsic as well as extrinsic inconsistencies with the methodology implemented. So what are the true frequency estimates for weekly, monthly and yearly nightmares? Levin and Nielsen (2007) in the most recent nightmare literature review suggest that weekly estimates range between 4% - 10% and cross culturally (Canada, France, Iceland, Sweden, Belgium, Austria, Finland, Japan, Middle East and United States) appear to be robust with an estimate range of approximately 2% - 6%. Monthly estimate reports range from 8% - 29% and yearly estimate reports are approximately 85%.

Table 5.2 elucidates a couple of nightmare frequency constants across studies. Firstly, retrospective estimates are considerably lower than prospective estimates. Numerous researchers have consistently reiterated that retrospective studies underestimate nightmare frequency (Levin & Nielsen, 2007; Wood & Bootzin, 1990). Secondly, nightmares are extremely common in university samples perhaps more so than in

general population samples, however the difference appears to be minimal when considering weekly and monthly nightmare reports.

5.6 Gender Difference

Another relatively well established constant in the literature is that there appears to be a gender difference when reporting nightmare incidents, more women in general report nightmares in contrast to men (Levin & Nielsen, 2007). Numerous researchers have found on average that women report more nightmares (Cernovsky, 1984; Cuddy & Belicki, 1992; Feldman & Hersen, 1967; Hartmann, 1984; Hersen, 1971; Levin, 1989, 1994). Bixler, Kales, Soldatos et al. (1979) surveyed 1,006 Los Angeles Metropolitan residents on a range of disturbed sleep related issues. The survey focused on adults 18+ years. The sample was composed of 27.2% 18-30 year olds, 39.4% 31-50 year olds and 33.4% 51-80 year olds. Overall all, 56% of the sample were women and 44% were men. They found more women reported nightmares in comparison to men, in particular younger women. In another large epidemiologic study, Klink and Quan (1987) surveyed 2, 187 participants of the Tucson area on the prevalence of sleep disturbances and their relation to Obstructive Airways Disease. This sample comprised 42.4 % under 40 years of age, 30.2% between 40-64 year of age and 27.7% more than 64 years of age. In the total sample 56.8% were women and 43.2 were men. The researchers found that significantly more women (10.4%) reported nightmares in contrast to men (5.1%). However, it is important to note that some studies have also found no significant differences between genders, despite finding that more women report nightmares than men. Chivers and Blagrove (1999) examined individual differences in

people reporting nightmares, they studied 124 subjects with a mean age of 28.5 years. Overall 25.8% of the sample were men and conversely 74.2% were women. They found that men and women did not differ significantly, even though women did have a slightly higher nightmare incidence mean than men ($M = 1.7$ $SD = 2.2$ and $M = 1.3$ $SD = 1.8$ respectively). Zadra and Donderi (2000) studied the prevalence of nightmares and bad dreams, and their relationship to well-being, and they also found that there was no significant difference between men and women. In this study the researchers examined 89 participants, 23.6% were men and 76.4% were women with a mean age of 20.5 years.

Levin and Nielsen (2007) argued that the gender difference when reporting nightmares may be indicative of a greater and broader gender difference. In fact, many explanations have been proposed that according to Levin and Nielsen share elements of the concept of affect load and/or distress. They stress five possible explanations that provide insight into the dynamics of the observed difference/s between men and women. Firstly, they examined the tendency of women to report distressing incidents more readily and to a greater extent in contrast to men (Hartmann, 1984; Levin, 1994). Moreover, women have been found to report more symptoms associated with emotional disorders including anxiety and depression (Buss, 1988). Furthermore, in regards to dreams they have reported higher dream recall levels, vividness and more waking distress related to dream mentation (Belicki, 1992; Levin, 1994). Secondly, women are more vulnerable to the exposure of risk factors such as sexual and physical violence and abuse, emotional disorders, parasomnias and PTSD (DSM-IV-TR, 2000), which renders them vulnerable to elevated affect distress. Thirdly, the dynamics that

influence the emergence of depression in early adolescent girls (after 15 years of age) (Nolen-Hoeksema & Girgus, 1994) are also implicated in the processes that influences the experience of nightmare incidents that affect the female gender to a greater degree. Fourthly, the differences observed in coping styles (Nolen-Hoeksema, 1990) adopted by women and men. Women tend to adopt and practice the emotion-focused coping style more readily than the problem-focused coping style. The emotion-focused coping style involves pondering and contemplating personal emotional responses that tends to create a degree of difficulty in detaching from causes and consequences of emotional responses, thus affecting both affect load and distress. Finally, Levin and Nielsen point to biological differences in emotional brain processes between men and women, specifically due to episodic emotional memory and physiological responses to emotional stimuli (Bradley, Codispoti, Sabatinelli & Lang, 2001) which may directly be due to elevated affect distress.

5.7 Psychopathological Symptoms

The majority of research focused on nightmares and psychopathology in the literature report correlations between various psychopathological symptoms and nightmare incidents. For instance, anxiety symptoms have commonly been associated with the frequency of nightmares (Berquier & Ashton, 1992; Feldman & Hersen, 1967; Levin 1989; Roberts & Lennings, 2006; Nielsen et al., 2000) however, not necessarily anxiety disorder. Other related psychopathological symptoms include correlations with acute stress symptoms (Cernovsky, 1984); acute psychopathology symptoms (Chivers & Blagrove, 1999); depression symptoms (Miro & Martinez, 2005; Tanskanen,

Tuomilehto, Viinamaki, et al., 2001; Zadra & Donderi, 2000); neuroticism/neurotic symptoms (Berquier & Ashton, 1992; Blagrove et al., 2004; Claridge, Davis, Bellhouse & Kaptein, 1998; Zadra & Donderi, 2000); panic attacks (Schredl et al., 2001); and dissociative experiences (Berstein & Putnam, 1986; Levin & Fireman, 2002; Semiz, Basoglu, Ebrinc & Cetin, 2008). However, studies on psychopathological populations that have been formerly diagnosed are rare in the literature. The following section reviews some of these studies.

5.8 Clinical Populations

A clinical population in the context of this thesis includes both psychopathological populations such as individuals formally diagnosed with Nightmare Disorder, PTSD, Schizophrenia, Depression etc. and pathological populations such as individuals formally diagnosed with Parkinson's Disease, Epilepsy, Obstructive Sleep Apnea (OSA) etc.

5.8.1 Psychopathological Populations

Research focused on psychopathological populations and nightmare experiences seldom report nightmare frequencies, however there has been a plethora of studies that have researched various psychopathological disorders and associated nightmares, including PTSD (Kilpatrick, Resnick et al., 1998; Maher, Rego, Asnis..2006, Mellman, David, Bustamante, Torres, & Fins, 2001), Anxiety Disorder (Roberts & Lenning, 2006; Ohayon et al., 1997), Depression (Agargun, et al., 1998; Agargun et al., 2003; Levin & Fireman, 2002), Schizophrenia (Herz & Melville, 1980), Dissociative Disorder

(Agargun, et al., 2003), and Borderline Personality disorder (Agargun, et al., 2003; Semiz, Basoglu, Ebrinc, & Cetin, 2008).

The only psychopathology that considers nightmares as a primary condition is Nightmare Disorder formerly known as Dream Anxiety Attacks or Disorder (DSM-IV-TR, 2000). According to the DSM-IV-TR the prevalence of nightmares among the young adult population is a mere 3% and the ICSID- R list prevalence (for the same age cohort) at 1%. These estimates appear to refer to frequent nightmare experiences, however this information is not necessarily clear on whether it is weekly or monthly estimates that are reported. Another notable observation is that in the DSM-IV-TR it is stipulated that the estimate of 3% refers to problem nightmares, which implies that this estimate refers more commonly to individuals who have received treatment and does not necessarily refer to the actual frequency of nightmares in that population.

In all other psychopathologies the report of nightmares are considered to be a secondary symptom of an underlying primary condition. In fact, nightmare experiences are considered to be a hallmark of PTSD (Hartmann, 1984). Some studies have reported a prevalence rate as high as 71% (Maher, Rego & Asnis, 2006) while others have reported prevalence to range between 8 - 68% (Pagel, 2000) depending on the trauma severity, quality of health and coping skills of nightmare sufferers.

Research on Depression for instance has found a considerably high nightmare frequency rate that ranges between 74 – 84%. Agargun, Besiroglu, et al. (2007) studied 100 patients with major depressive disorder (MDD) found that 84% of the sample

reported having nightmares. However, the study did not clarify how often the reported nightmares were experienced. In an earlier study Besiroglu, Agargun and Inci (2005) surveyed 157 patients with major depressive disorder (MDD) and also found that a high percentage of patients in that sample reported nightmares, in total 74% of patients reported nightmares. But once again, it is unclear whether the nightmares reported were weekly, monthly or yearly.

Another psychopathology that is often associated with nightmares is Schizophrenia, although research literature on nightmare frequency or prevalence in this cohort is relatively scarce. Most reports of the relationship between nightmare experiences and schizophrenia come from clinical studies that do not systematically report nightmare frequencies but instead mention nightmare experiences reported by patients (Hartmann, 1984). Nevertheless, some studies give a slight indication of the probable frequency when examining the association between weekly nightmares frequency and schizophrenia. Hartmann, Russ, Van Der Kolk, Falke and Oldfield (1981) studied the personality of nightmare sufferers (individuals experiencing at least one nightmare per week) and found that from the 38 participants who were examined, 10.53% (n = 4) met the DSM-III criteria for schizophrenia and 15.79% (n = 6) met the criteria for schizotypal personality disorder. In another a related study conducted by Hartmann et al. that was reported in his book 'The Nightmare: Psychology and Biology of Terrifying Dreams' (1984) out of 12 participants who reported weekly nightmares, 16.67% (n = 2) met the criteria for a diagnosis of schizophrenia and 25% (n = 3) met the criteria for a diagnosis of schizotypal personality. From these studies under the category of schizo-spectrum disorders (which includes schizophrenia and schizotypal

personality) it may be deduced that from the 50 individuals who reported weekly nightmares, 30% (n = 15) also met a diagnosis for a schizophrenia-spectrum disorder.

Borderline Personality Disorder (BPD) has also been associated with nightmare incidents (Claridge, Davis, Bellhouse & Kaptein, 1998). Hartmann et al. (1981) reported that from the 38 subjects who reported weekly nightmares 24% (n = 9) also met the DSM III criteria for borderline personality disorder. Agargun, Kara, Ozer, Selvi, Kiran and Ozer (2003) studied 30 patients diagnosed with dissociative disorder and found that 47% (n = 8) of 17 patients with Nightmare Disorder also met a BPD diagnosis. In a more recent study, Simor, Csóka & Bódizs (2010) studied 23 subjects diagnosed with BPD and 23 age and gender matched healthy controls, and found that 52% (n = 12) of the BDP participants reported nightmares.

Another psychopathology that has been associated with nightmares in the literature is Dissociative Disorder (DD). In the study mentioned earlier Agargun, Kara et al. (2003) examined 30 patients diagnosed with dissociative disorder, with the aim of determining the presence of nightmare disorder in this sample. They found that 57% (n = 17) of the patients diagnosed with DD also met the DSM-IV criteria for nightmare disorder.

Although nightmares have been synonymous with anxiety, there are very few studies that examine the correlation between nightmares and 'anxiety disorder'. Those studies that have investigated this correlation commonly do not report nightmare frequency and are generally confounded with other psychopathologies, such as insomnia (Ohayon, Morselli & Guilleminault, 1997).

5.8.2 Pathological Populations

Many studies have also reported medical or organic correlations with nightmares such as temporal lobe epilepsy; Silvestri and Bromfield (2004) reported that 8.3% (n= 14) of the 168 patients seen the previous two years had reported nightmares. Patients with Parkinson's disease have also reported associations with the experience of nightmares (Partinen, 1997). Lees, Blackburn and Campbell (1998) surveyed 220 elderly patients with Parkinson's disease and 97.7% (n = 215) reported sleep disturbances, of which 48% (n = 103) experienced vivid dreams and nightmares. Another medical condition that has been consistently associated with nightmare incidents has been insomnia. Ohayon, Morselli and Guilleminault (1997) interviewed 5,622 respondents by phone and found that 18.7% (n = 1,049) suffered from insomnia, and from this total 18.3% reported nightmares (n = 192), in which women reported double the amount of nightmare experiences in comparison to men.

Obstructive sleep apnoea (OSA) is another condition that has been linked to nightmare incidents. Several researchers have proposed that nightmares arise due to the lack of oxygen (Janson, Gislason, Boman, Hetta & Roos, 1990; Klink & Quan, 1987; Wood, Bootzin, Quan & Klink, 1993). However, Schredl (2006) investigated nightmare frequency in patients with OSA. He administered a brief questionnaire to 323 patients with OSA and found that the mean monthly nightmare frequency was 1.34 (SD = 4.04) which was less than healthy controls who reported a mean monthly nightmare frequency of 1.61 (SD = 3.02). However, Pagel and Kwiatowski (2010) suggest that low nightmare frequencies reported may be attributed to the suppression of nightmare cognitive recall directly related to OSA effects.

5.9 Prevalence and Frequency estimate issues

This review has highlighted notable discrepancies between findings reported in the literature, for instance the frequency tables illustrates nightmare weekly, monthly and yearly prevalence reports vary considerably. Weekly nightmare reports vary from 2.9 % – 8.2 %, monthly nightmare reports vary from 8.3 % - 55.2% and yearly nightmare reports vary from 26% - 83%. As the tables illustrated there could be various reasons that may explain such discrepancies. For instance, some researchers have operationalised the definition of nightmares differently; commonly nightmares have been described as either dysphoric (bad) dreams that awaken the sleeper (Levin, 1994) or simply dysphoric dreams that do not awaken the sleeper (Miro & Martinez, 2005). It has been reported that bad dreams may be four times as frequent as nightmares: (Zadra & Donderi, 2000), which may distort true prevalence estimates and raise validity issues. Furthermore, most of the frequency studies have failed to distinguish between trauma related nightmares and non-trauma related nightmares (Levin & Nielsen, 2007). Posttraumatic nightmares do not immediately imply the development of PTSD but may be part of a posttraumatic stress reaction, simply being exposed to a traumatic incident can influence dream mentation (Barrett, 1996). From a trauma perspective, nightmares are very common (McNamara, 2008), hence this confounding variable may also distort frequency estimates.

Another possible explanation for such discrepancies may be due to the types of measuring tools or metrics implemented when gathering data, for instance Levin and

Nielsen (2007) draw attention to the variety measures that have been utilized to determine nightmare frequency. For instance they have included:

- Binary – Do you suffer from nightmares (yes / no)
- Nominal – How often do you recall a nightmare (never, rarely, sometimes, often)
- Ordinal - How often do you recall a nightmare (0 times/monthly, 1-2 times/monthly etc.

Such a variety of retrospective measures raise reliability issues which may also distort the accuracy of frequency estimates.

One of the main issues arising from nightmare frequency reports is the underrepresentation estimates yielded by retrospective metrics (Levin & Nielsen, 2007) and possibly the over-representation of nightmares yielded by prospective metrics (Hartmann, 1984). Researchers have suggested that retrospective nightmare metrics appear to underestimate nightmare reports when compared to prospective nightmare metrics. For instance, Wood and Bootzin (1990) presented evidence that from 220 students who kept or maintained prospective logs for two weeks, nightmares were reported up to four times as frequent as those reported by retrospective methods. These findings were later supported by Zadra and Donderi (2000), who reported that the 89 students studied who kept logs also reported a ratio of approximately 4:1 in nightmare incidents.

Levin and Nielsen (2007) state that the gold standard for reliable nightmare estimates are prospective metrics, keeping sleep logs. However, Bulkeley (1997) stressed that prospective studies may have the undesired effect of influencing both the dream content and dream frequency, which could well apply to keeping nightmare logs. Another

possible measurement strategy that has not been addressed thus far that could yield accurate nightmare frequency estimates is polysomnography. However various sleep studies have reported a 'lab effect' (Bulkey, 1997), where individuals that commonly report frequent nightmares in their home environment seldom report nightmares in an experimental environment (a sleep laboratory). Perhaps the gold standard of nightmare frequency could very well be the mean estimate of a combination of both retrospective and prospective measures.

5.10 Australian Estimates

In Australia the prevalence of nightmare experiences is currently unknown. At the time of writing this thesis the Australasian Sleep Association (2011) did not have a nightmare prevalence estimate; in fact there was no section that even mentioned nightmare disorder. The contiguous diagnosis to nightmare disorder in the Australasian Sleep Association website was Night Terror Disorder. Furthermore, the only Australian study that has reported nightmare frequency in the literature is the study conducted by Roberts, Lennings and Heard (2009) who surveyed 12-19 year old Australian high school students. They found that out of the 220 students who reported nightmare experiences an astounding 62.4% (n = 138) reported 1 – 2 weekly nightmares, 17.6% (n = 39) reported between 3 – 10 weekly nightmares and 3.2% (n = 7) reported more than 10 weekly nightmares. The reported nightmare frequency in this study was remarkably higher than counter-parts in other places of the world, for instance in contrast to Kuwait and China (Abdel-Khalek, 2006; Liu, Sim, Vchiyama, Shihui, Kim & Okawa, 2000).

5.11 Summary and Conclusion

There have been numerous studies that over the last two hundred years have reported nightmare frequency estimates. The earlier studies appear to have confounded nightmare reports pertaining to adolescents, young adults and older adults. Some of these studies do not necessarily clarify whether the nightmares reported were yearly, monthly or weekly incidents. Developmentally it seems to be well accepted that children tend to report the highest frequency, followed by adolescents, young adults, middle aged adults and finally elderly adults.

The literature review furthermore highlighted the large discrepancy between nightmare frequency estimates reported. This was found to be attributed to numerous reasons including operational nightmare definitions (dysphoric dreams that awaken the sleeper and those that do not), measuring tools implemented (binary, nominal etc), chronological age of groups surveyed (children, adolescents, young adults etc), groups sampled (pathological, nonpathological) and differential confounding diagnoses (nightmares and other pathological/psychopathological symptoms). Thus, consistency and reliability in gathering data pertaining to nightmare incident reports is lacking and this makes it difficult to completely integrate the findings thus far reported.

Finally, Australian nightmare estimates are virtually nonexistent with only one study reporting frequency rates for a sample of adolescents. Thus, the lack of nightmare frequency research in Australia is warranted particularly prevalence studies focused on the general population.

Chapter 6

Nightmare Formation Function and Interpretation

6.1 Introduction

Three foundational questions pertinent to any study of dreams relate to the formation, function and interpretation of dreams, or more specifically:

- how are dreams formed?
- what is the function of dreams? and
- what do dreams mean (if anything)?

Dreams are best understood by considering and examining the underlying neurological (brain regions/networks) and psychological (cognitive-emotional) correlates. From a neural perspective, technologies such polysomnagraphy, CT Scans, and MIR/fMIR have identified particular brain regions that are considerably more active during specific sleep stages that have been strongly associated with dreaming (Hobson, 2003; Hobson & McCarley, 1977). Studies of brain lesions have also assisted in identifying specific brain locations related to the excess of particular types of dreams or the cessation of dreaming altogether (Solms, 1997). Furthermore, the ingestion as well as the withdrawal of various drugs has also elucidated regions of the brain that are associated with dreaming or the lack of dreaming (Hartmann, 1984). Various theorists have speculated and postulated about the psychophysiology of dreaming, including Aserinsky and Kletmann (1956), Fisher, Byrnes and Edwards (1970), Hobson and McCarley (1977), Solms (1997), Domhoff (2000), Levin and Nielsen (2007) just to

name a few. For instance, physiologically for normal dreaming to occur the pontine region of the brain stem (Jouvet, 1962), the temporal limbic area and the ventromedial area that form part of the emotional brain, the medial limbic area, the inferior parital lobes and occipito temporal area (Solms, 1997). These brain regions are largely associated with REM sleep since it was believed that dreaming was specific to REM.

From a psychological perspective theorists that have speculated and postulated about the formation, function and interpretation of dreams include Freud (1900), Jung (1974), Mack (1970), Greenberg, Pearlman and Gampel (1972), Domhoff (2000) amongst others. According to Levin and Nielsen (2007) for normal dreaming to occur three cognitive-emotional components are required. A first component needed for a continuous dream narrative is 'memory activation', an individual is required to have availability of a range of memory elements during sleep, since dreams seldom include complete episodic memories (Fosse, Fosse, Hobson & Stickgold, 2003). A second component for a continuous dream narrative is 'memory element recombination'. Levin and Nielsen state that this mechanism was originally mentioned by both Freud (1900) and Jung (1974) and referred to it as condensation, where memory elements merge into a single image that forms part of the narrative. Dream reports often refer to characters that seem to have physical qualities of multiple persons in the dreamers waking life (Hall & Van de Castle, 1966). Finally, a third component of any continuous dream narrative is the experience of 'emotional states'. Emotions in dreams are ever-present and are definitive in any dream experience (Domhoff, 2000; Hall & Van the Castle, 1966, Hobson, 2003).

6.2 Nightmare Formation

Hypotheses about nightmare formation have been the most investigated in comparison to the function and interpretation of nightmares. Thus, nightmare formation will be thoroughly examined from both a physiological and psychological perspective separately.

6.3. Biology/Physiology of Nightmare Formation

Proponents that have advanced biological/physiological/neurological explanations for nightmare formation are relatively rare and only recently has a comprehensive neurological model of nightmare formation been proposed (Levin & Nielsen, 2007). Nevertheless, in a chronological order the following researchers and their postulations will be briefly reviewed, Hartmann and colleagues (1984), Solms (1997), and Levin and Nielsen (2007) in order to illuminate the most contemporary understandings pertaining to nightmare formation.

6.3.1 Hartmann

Hartmann (1984) tentatively highlighted various brain regions based on the work of Hobson and colleagues (1975), which he used to implicate in the formation of nightmares specifically REM nightmares. Therefore, these localizations were directly associated with REM sleep activation. His first reference was the reticular activating system which contains pathways that activate the cortex and is associated with sensory information and consciousness. He also implicated the lower brain region which regulates NREM and REM sleep. In particular, the raphe system located in the brain

stem that contains large neurons and discharges serotonin. Hartmann, also implicated the locus coeruleus, which contains norepinephrine neurons, he maintained that the norepinephrine systems were inactive during REM sleep, which was associated with the offset mode of REM sleep. Finally, he suggested that cholinergic neurons located in the frontotegmental field (cells) become active during the beginning of REM sleep. According to Hartmann, there appeared to be a reciprocal interaction between the cholinergic frontotegmental neurons, locus coeruleus and raphe neurons that regulate the onset and offset of REM sleep. Furthermore, this process was mediated via the “different patterns of activation of the forebrain by the brainstem, producing differences in the release of the biogenic amines or other transmitters in the forebrain” (p. 252) that are partly responsible for waking and dreaming consciousness. Thus, the release of acetylcholine - reduction of norepinephrine and serotonin constitute part of the biology of nightmares.

The other part of the biology of nightmares according to Hartmann (1984) was indirectly evident in the examination of drugs that increased the frequency of nightmares. Hartmann contended that four specific groups of medications were implicated namely – reserpine and related drugs, the beta-adrenergic blockers, 1-DOPA and related drugs, and the active cholinergic drugs. For example, reserpine is a medication that is widely administered as an antihypertensive as well as a tranquilizer, which is known to induce intense dreams and nightmares (Hartmann & Cravens, 1973). Hartmann attributed this to reduced levels of amines (forebrain norepinephrine and/or serotonin) in the brain (Hartmann, 1984). Another group of drugs that Hartmann

alluded to was beta adrenergic blockers, such as propranolol, which block certain effects of the sympathetic amines affecting the entire body, including the central nervous system. These drugs when first ingested have been reported to induce vivid dreams and nightmares (Frishman et al., 1979; Waal-Manning, 1979). The probable sequence of events in regards to the formation of nightmares is the blocking of nor-epinephrine or certain nor-epinephrine receptors. However, according to Hartmann the most interesting drug related to nightmare formation was the ingestion of 1-DOPA. The administration of 1-DOPA rapidly increases dopamine in the brain. Individuals ingesting large doses of 1-DOPA, such as patients with Parkinsonism, often experience notable psychological changes, including reports of unusually vivid dreams and nightmares. Hartmann reiterates that the link between nightmares and psychosis can be seen more clearly in the psychological consequences associated with 1-DOPA administration. Finally, the other groups of drugs that induce nightmares are cholinesterase inhibitors. Perhaps, the most studied neurotransmitter of both the central and peripheral nervous system is acetylcholine. In order to increase acetylcholine activity cholinesterase inhibitors are administered, subsequently these inhibitors obstruct the rapid obliteration of cholinesterase.

6.3.2 Solms

Solms' (1997) thorough examination of neurological patients with varying degrees of brain injuries and detailed review of the literature led him to propose that there two types of deficits related to the neurological ability to dream, 'cessation' and 'excesses'. Nightmare experiences were associated with 'excesses' of dreams and specific contours

of the brain. The brain regions that are crucial for dreaming according to the Solms are located in the higher parts of the brain, specifically within the cerebral hemispheres, not necessarily in the more primitive parts of the brain such as the brainstem as others had postulated (Hobson & McCarley, 1977). Two locations were identified, firstly just above the eyes deep white matter of the frontal lobes that contains a large fibre-pathway that transmits dopamine from the middle of the brain to the higher parts of the brain. The second is located just behind the ears in the grey cortex at the back of the brain called the occipital-temporal-parietal junction, which processes the highest levels of perceptual information.

Solms not only suggested regions of the brain that were necessary for dreaming, but he also identified regions of the brain that were not implicated in the dreaming process. The parts of the brain that were not implicated included the primary visual cortex, sensorimotor cortex and the dorsolateral prefrontal cortex. However, the most striking findings in relation of nightmare formation advanced by Solms were that forebrain lesions affected the ability to dream in varying degrees despite the brain stem being intact, and that injuries to the 'temporal lobe' increased repetitive nightmare experiences (Solms, 1997). In support of Foulkes' (1985) findings, Solms concluded that REM sleep was not sufficient for dreaming and dreams could in fact occur outside REM sleep. He also stated that temporal lobe seizures, which affected the temporal limbic region located in the higher forebrain instigated recurring stereotypical nightmares that were associated with complex partial epilepsy seizures (Kaplan-Solms & Solms, 2000), which may partly explain the association between epilepsy and

nightmares (Silvestri & Bromfield, 2004). Furthermore, these seizures commonly occurred in NREM sleep (Kellaway & Frost, 1983).

In an interesting study conducted by Penfield (1938) where an exposed brain of a conscious patient artificially stimulated the temporal limbic system and produced recurring nightmare narratives (Penfield & Rasmussen, 1955). Penfield and Erickson (1941) supported this finding in subsequent studies (Penfield & Rasmussen, 1955). Moreover, the limbic system seemed to play a causal role in the formation of recurring nightmares, since successful treatment via surgery or pharmacological management of the underlying seizure disorder alleviated and ameliorated recurring nightmares (Silvestri & Bromfield, 2004).

6.3.3 Levin and Nielsen

The most comprehensive physiological/biological model of nightmare formation to date comes from Levin and Nielsen (2007). The model is based on a broad spectrum of anatomical and functional evidence of brain correlates of emotion (Maquet, 2000), fear memory (LeDoux, 2000), PTSD (Ohman & Mineka, 2001), and normal human sleep and dreaming (Baylor & Deslauriers, 1985). Levin and Nielsen proposed a model that encompassed idiopathic, trauma related and pathological nightmares. They postulated that disruptions in the limbic, paralimbic, and prefrontal regions responsible for various emotional processes were associated with the formation of nightmares and related pathology. Thus, this model describes and explains the production of negative emotion

in the brain. The regions implicated that are pertinent to the function of this model include A (amygdala), which is associated with fear memory activation, MP (medial prefrontal cortex), which is associated with fear memory regulation, H (hippocampus), which is associated with fear context control and AC (anterior cingulate cortex), which is associated with the mediation of distress. Thus, the model is concisely known by the acronym AMPHAC network.

Levin and Nielsen (2007) stipulate that these four brain regions operate in a coordinated manner to generate the dysphoric experiences in dreams, which are associated with affect load and affect distress. For instance, for ordinary dreaming the hippocampus generates the dream context formation, which is mediated by the fear context control function in order to manage fear contexts. In turn, the amygdala and the medial prefrontal cortex generate the dream emotional expression, which is associated with fear memory activation in order to manage anomalies associated with physiological fear activation. This process is related to the identified function of dysphoric dreams, namely to extinguish fear memories. Finally, the anterior cingulate cortex manages the excess distress response in order not to disrupt sleep. During pathological dreaming any of these neural systems may be disrupted, which may lead to the manifestation of PTSD nightmares.

One probable set of interactions between these brain regions that explains the production of fear within the dream may be as follows:

“hippocampal contextual information is relayed in realistic (virtual) form via anterior hippocampus (aHip) to basal nucleus (B) of the amygdala (Am), where it is further processed

by central (Ce) nucleus. (2) Medial prefrontal cortex (mPFC) and dorsal (dACC) and rostral (rACC) anterior cingulate cortex afferents to lateral (L) and Ce amygdalar nuclei regulate the output of Ce neurons to induce extinction, to signal distress, and to maintain appropriate levels of fear. (3) The Ce nucleus signals brainstem (Br) and hypothalamus (Hy) circuits, producing (4) the autonomic and behavioral correlates of fear within the dream”

(Levin & Nielsen, p. 504)

6.4 Psychology of Nightmare Formation

Most ample explanations of nightmare formation advanced by researchers have been psychological in nature (Freud, 1900; Jones, 1931; Mack, 1970; Spoomaker, 2008; Lansky, 1995) with some proposing more comprehensive explanations that entail both neurological and psychological components (Domhoff, 2000; Hartmann, 1984; Levin & Nielsen, 2007). The following perspectives proposed by Hartmann (1984), Revonsuo (2000), and Levin and Nielsen (2007) will be briefly reviewed to elucidate the main contemporary psychological understandings that pertain to nightmare formation.

6.4.1 Hartmann

Hartmann’s (1984) explanation of nightmare formation, in particular REM sleep associated nightmares, was based on the psychological construct of ‘thin boundaries’. His research and observations led to him to conclude that individuals who experienced frequent nightmares had ‘thin boundaries of the mind’. Boundaries were characterized in two broad ways, first ‘thin’, ‘fluid’ or ‘permeable’ or ‘thick’, ‘solid’ or ‘rigid’. These individuals had thin boundaries that manifested in a number of ways that can be

characterized in a dichotomous manner. For instance, waking *vs.* sleeping, waking *vs.* dreaming, fantasy *vs.* reality, play *vs.* reality etc. As a result, having 'thin boundaries', causes individuals to be more sensitive and considerably more vulnerable to stressors and anxiety provoking stimuli. According to Hartmann the development of thin boundaries seems to begin at birth, he suggests that certain individuals may have a genetic predisposition to develop thin boundaries. In his study of chronic nightmare sufferers, Hartmann did not encounter common experiences early in life that were reported by 'all participants', implying that perhaps they had a genetic predisposition to experiencing nightmares. However, some nightmare sufferers did report that in the first two years of their lives, that they experienced a lack of support from their mothers in particular the lack of their mother's physical presence. The reasons for their mothers' absence were due to reasons such as maternal depression and/or the birth of a sibling. Thus, according to Hartmann, the psychological formation of nightmares is a derivative of personal characteristics that are either present at birth and/or are learned very early in life, which renders individuals vulnerable to anxiety provoking stimuli.

6.4.2 Revonsuo

Revonsuo (2000) postulated six propositions that provide an explanation for the biological function of dreaming. Within this construction dysphoric dreams and nightmares occur because they are specialized in the simulation of threatening events and were genetically inherited from our ancestors. The psychological formation of such dreams derives from the natural process intertwined in the biological formation and function of dreams. Nightmares are conceived to be a common occurrence that

pertains to the evolutionary development of consciousness and ultimately threat avoidance skills.

The psychological formation of nightmares is not a result of purely pathological causes, but instead of the survival tendencies that require rehearsals of threat avoidance behaviours during dreaming. According to Revonsuo (2000) this tendency to cognitively rehearse responses elicited in dreams of threatening events, enhances the biological survival of the individual via psychological processes such as imagery experienced whilst asleep. Thus, the formation of nightmares - from a psychological perspective - according to this construction is mediated via these cognitive processes but, stems from the biological and genetic make-up intrinsic in every individual.

6.4.3 Levin and Nielsen

Levin and Nielsen (2007) offer a more detailed and extensive psychological explanation of the formation that seems to build on Hartmann's construct of thin boundaries, and accounts for both non-trauma and trauma related nightmares. The constructs of affect load, daily variation of emotional pressure and affect distress, a disposition to experience events with distressing and highly reactive emotions are central to psychological explanation of nightmare formation. Another important concept is the cross-state continuity hypothesis that postulates that similar structures and processes, which are involved in the production of nightmares, may also be involved in the manifestation of pathological symptoms while awake. Thus, non-trauma nightmares are formed when affect load

“is elevated by daytime emotional concerns and memory demands, leading to resistance of the fear extinction process, a tendency to reproduce complete fear memories and an excess of response elements during dreaming. Nightmare distress is produced as a result of genetic disposition or prior factors, such as abuse, neglect, or trauma. Distress may be mediated by hyperarousal during sleep and may lead to pathological consequences during and after nightmares (nightmare distress) or during the daytime (e.g., conditioned emotional expectations” (p. 497)

According to model of typology of dreaming propose by Levin and Nielsen (2007) based on the increase of three variables affect load, affect distress and trauma severity (how severe the reaction to trauma exposure), different types of nightmares will be formed/occur. For instance, non-trauma related nightmares (low in distress) occur when there is only an increase in affect load, whereas non-trauma related nightmares (high in distress) occur when there is increase in affect load and affect distress. Post-traumatic nightmares (trauma related) occur when there is an increase in affect load, affect distress and trauma (response) severity; and post-traumatic nightmares (replicative) occur when there is a dramatic increase in affect load, affect distress and trauma (response) severity. The interplay between affect load, affect distress and trauma severity determines the type of nightmare experienced. Interestingly, according to Levin and Nielsen the presence of nightmares (any nightmare that awakens the dreamer) represents a failure of the function of dreams; to extinguish fear based memories and emotions, which in some respects resembles Freud’s original explanation of nightmares as a failure of the censoring system.

6.5 Summary

There appears to be various etiological constructions in regards to nightmare formation. The physiological knowledge of the formation of nightmares has greatly increased since the empirical study of dreams began. Proponents have speculated about the regions of the brain that give rise to nightmare experiences for some-time and have been able to identify specific regions. Hartmann was the first to propose localised areas that pertained to REM nightmares, including the reticular activating system, the raphe system, the locus coeruleus and cholinergic neurons in the frontotegmental field. Hartmann also examined drugs implicated in the formation of the nightmares. Solms' most notable findings were that forebrain lesions affected the ability to dream whilst the brain stem remained intact and injuries to the 'temporal lobe' increased repetitive nightmares. Finally, Levin and Nielsen proposed a physiological network that covered four brain regions that were implied in generating dysphoric experience in dreams. These regions included the amygdala, medial prefrontal cortex, hippocampus and anterior cingulate cortex.

The psychological knowledge of the formation of nightmares largely concentrates on inherent components such as personality characteristics or evolutionary structures. Hartmann's research focused on the development of 'thin boundary personalities' that rendered individuals vulnerable to experiencing stimuli (neutral to most people) as overly anxious. Revonsuo on the other hand reiterated that dysphoric dreaming including nightmares are a part of the evolutionary process inherent in all individuals. People are meant to dream about negative events in order to develop threat avoidance

skills. Finally, Levin and Nielsen proposed two important constructs in the formation of nightmares, affect load and affect distress, as well as exposure to trauma and the severity of the response. The two constructs represent trait and state like factors that uniquely interplay with trauma severity to form both non-trauma related and trauma related nightmares.

6.6 Nightmare Function

Early understandings of the function/s of nightmares were difficult to decipher due to the notion that nightmares were believed to stem from diabolical sources (Jones, 1931/1951). Nightmares were considered a phenomenon that was entirely detrimental to the sufferer (Mack, 1970). Therefore, nightmares appeared not to have a function at all; moreover nightmares were an experience that people in general aimed to avoid. This difficulty was particularly evident in the work of Jones, Freud and Mack. For instance, Freud's (1920) Wish Fulfilment Theory highlighted the inherent difficulty in ascertaining the function of a nightmare due to wish fulfillment aspect of the theory. The real intricacy was in trying to rationalize why an individual would wish to have a nightmare, if the experience was vastly horrid and troublesome? Jones, Freud and Mack described nightmares as representations of a type of malfunction of the dream process or a disease of the mind which was considered an aberration of the human condition.

Relatively contemporary hypotheses/theories such as those proposed by Hartmann (1999) and Revonsuo (2000), are based on findings that challenge the previously held beliefs. Hartmann, for example, proposed a very interesting view, that nightmares

could be considered the most useful of dreams, in fact they could be viewed as the paradigmatic dream – it represents what is present in all dreams. He stated that studying the ‘classic nightmare’ (dysphoric non-traumatic nightmare) as opposed to PTSD repetitive nightmare, was in fact the perfect starting point when examining dreams. According to Hartmann, nightmares were not ‘failed dreams’ as proposed by other researchers (Kramer, 1991), but represented what dreams do in fact symbolize, the ‘dominant emotion’ of the dreamer. Dreams are contextualizations of the emotional concern/s of the dreamer, therefore given that nightmares are commonly associated with dysphoric emotions/affectivity which can be considered as the dominant emotion, the connection with the contextual image (CI) ‘ being attacked, confronted by a wild beast, overcome by a tidal wave’ can be clearly observed. It was in this sense that Hartmann claimed that nightmares were the most useful of dreams; they could paradigmatically represent the process that occurs in all dreams.

The function of idiopathic nightmares according to Hartmann (1999), tentatively speaking, is emotional ‘adaptation’. Other theorists, such as Cartwright (1991) and Barrett (1996) have also shared the view that dreams have an adaptation function, particularly post traumatic nightmares. For example, when an individual experiences a trauma there is often a progression of adaptive steps that seem to aim to integrate the traumatic experience into the autobiographical memory of the individual. This is often observed overtime in the change that occurs in nightmare content/narrative. The nightmare narrative begins to integrate other memories of the individual’s life and progressively when the nightmare is re-experienced or spoken about becomes less

intense. In this way nightmares can elucidate the integration/healing mechanism inherent in all individuals. As a result Hartmann offers another basic-quasi biological function pertaining to nightmares, in that dreams may serve a therapeutic function; individuals are exposed to aversive stimuli in a very safe place – the dream world.

Perhaps the most notable advocate of the function of dreams, in particular dysphoric dreams such as nightmares apart from Levin and Nielsen (2007) is Revonsuo (2000). He asserted that all individuals have predominantly dysphoric dreams (bad dreams and nightmares) because the biological function of such dreams is to sustain the survival of the species. The evolving dreaming brain over the millennia has simulated threatening events for the purpose of rehearsing threat avoidance skills in the dream state that are transferable to a non-dreaming state. In this way individuals would develop resiliency that would assist them in everyday life. Within this model, nightmares by definition tend to provide the ideal scenario that enables the practice of skills necessary for survival in a secure and safe place, within the dreaming brain. Moreover, the brain simulates the most dangerous threats in the individual's environment. This is why; dysphoric dreams as opposed to other types of dreams may represent the manner in which individuals are programmed to dream.

From this evolutionary perspective it may be argued that dysphoric dreams simply serve the function of survival. The brain and mind during wakefulness and sleep are consistently on guard of what is harmful both physically and psychologically (Hobson, 2000), hence they are in a state of hyperawareness/hyper-vigilance in order to identify

any stimuli that can threaten the physical body and the mind, in particular the 'sense of self' - ego. The brain and mind during wakefulness and sleep are programmed to be hyper alert to threatening stimuli, hence negative affectivity during sleep and dreaming abound in comparison to positive emotions and affectivity.

Nightmares have also been considered to be a coping mechanism for stress. Cartwright (1996) examined participants that were in the process of divorcing and the sample was separated by those who reported being depressed and those non-depressed. The individuals who reported being depressed and had dreams that incorporated their ex-spouses, reported better adjustment to the divorce in contrast to those individuals who were depressed but failed to incorporate their ex-spouses in dreams. Cartwright asserted that these findings indicate that incorporating prevalent stressors in dreams may assist in managing stressors better. Support for Cartwright's assertions can be found in the study conducted Picchioni et al (2002) who examined 412 participants to determine if nightmares served as a coping resource for managing stress. The variables of interest included nightmare frequency and intensity, daily and life stressors, social support and coping. They found that the overall pattern of the results were that there was a significant relationship between nightmares and stress; and concluded that nightmares may provide a mechanism that assists in effectively managing stress.

6.6.1 Summary

The proposed functions of nightmares have included a therapeutically orientated function -where individuals are confronted with aversive stimuli in a safe environment; biologically based function – where individuals can practice threat avoidance skills in a safe environment; and stress reduction function – where nightmares serve as coping mechanism for stress. It appears that some nightmares may in fact have a function and aiming to eliminate or ameliorate them represents an interjection that is not warranted.

6.7 Nightmare Interpretation

The concept of ‘interpretation’ in the dream literature has been an interest of scholars for centuries. Since the prologue of the Sigmund Freud’s *Interpretation of dreams*, the topic has been debated in different circles from lay to scientific-circles (Bulkeley, 1997). Freud’s approach has been described as a qualitative method of interpreting dreams, until Hall and Van De Castles’ ‘content analysis’ which was described as the quantitative method of interpreting dreams (Domhoff, 2000).

Contemporary interpretations of nightmare experiences can be extricated from almost all the theories and perspectives that focus on the subject. Hartmann investigated nightmare narratives and believed that nightmares like dreams could lend themselves to interpretation (Hartmann, 1984). He examined various nightmare themes in the subjects with life-long nightmares and although the nightmare narratives were not repetitive they did share a common component, which was identified as a sense of ‘helplessness’ (Hartmann, 1984). Hartmann reiterated that perhaps the most common

nightmare theme involved being chased either by a beast, gang or malignant being/s. Moreover, he claimed that any dream content or imagery resembled the dreamer's dominant emotion at the time of dreaming (Hartmann, 1998). Thus, nightmares could be interpreted as representing the most pressing emotional concern attributable to the dreamer's contemporary affairs. Siegel and Bulkeley (1998) provided further support when examining children's nightmares, and concluded that all nightmares contained vital information pertaining to emotional challenges the child was presently facing. Furthermore, it was reiterated that nightmares could be interpreted as warning signs of 'lingering psychological conflicts', very much like a vaccine rather than a poison; a notion that was also implied by Foa, Rothbaum and Steketee, (1993) who claimed that nightmares represented 'unfinished business'.

Another way of interpreting nightmares is by focusing on the possible predictive qualities of the presences of such a dream. For instance, it was thought that frequent long term nightmares appeared to be indicative of the beginning of a psychotic episode or psychosis. Stone (1979) claimed that specific dream narratives such as dreaming of self-mutilation/fragmentation or the dreamer's death were indicative of the onset of psychosis. Other researchers that have shared this view include Mack, (1970), and Detre and Jarecki, (1971).

Researchers have also found that the presence of nightmares predicted higher levels of suicide ideation (Bernet et al., 2005). Bernet and colleagues investigated a total of 176 clinical outpatients treated for depression; they were examined for frequency and severity of nightmare symptoms, and suicide ideation. Bernet et al. concluded that

nightmares appeared to constitute a unique risk factor for elevated suicidality in this population. Other studies that investigate the relationship between nightmares and suicidality include Agargun and colleagues (1998, 2007), and Agargun and Cartwright (2003) who also found associations between individuals with depression, reports of nightmares and suicidal ideation and attempts. Agargun et al (1998) found that depressed patients with repetitive nightmares were more likely to be considered suicidal in comparisons to depressed patients without repetitive nightmares.

6.7.1 Summary

Proposed nightmare interpretation have included the most pressing emotional concern of the dreamer such as a sense of 'helplessness', representation of lingering psychological conflicts, and predictive qualities such as the onset of psychosis or suicidality in pathological populations. Hence, it appears that nightmares may well be interpreted; however any interpretation requires caution given that there are various types of nightmares and depending on the type of nightmare interpretation will vary.

Chapter 7

Treatments

7.1 Introduction

Proposed treatments or remedies for nightmares have been numerous throughout the history of the nightmare phenomenon. Avoiding bad wine and/or not consuming food late in the evening were common remedies offered to those who suffered the dreaded nightmare (Jones, 1931/1951). From a medical perspective according to early interpretations, patients were instructed to avoid specific sleeping postures, in particular sleeping on their back (supine position) since it was strongly associated with eliciting nightmare experiences. These early understandings have now been supported by contemporary findings, specifically the connection between sleep apnoea (which is worse in the supine position) and the occurrence of nightmares (Krakow, Lowry, Germain et al., 2000). Alternatively, having a reliable monitor such a bed partner who could awaken the nightmare sufferer when experiencing a nightmare was also highly desirable (Bond, 1753).

Contemporary treatments for nightmares in the literature are abundant specifically when reviewing the treatments for PTSD nightmares; however nightmare treatment can be categorized into 3 main classes - psychodynamic therapy, cognitive-behavioural therapy and drug therapy. Psychodynamic treatments include hypnotherapy (Kennedy, 2002; Kingbury, 1988; Spiegel, 1988, 1989) and psychodynamic psychotherapy (Kellert & Beail, 1997; Roth, Dye & Lebowitz, 1988). Cognitive behavioural

therapies, include brief cognitive-behavioural techniques, such as desensitization techniques (Davis & Wright, 2005), imagery rehearsal therapy - IRT (Bishay, 1985; Krakow & Neidhardt, 1992; Marks, 1978), lucid dreaming therapy - LDT (Spoormaker & van de Bout, 2003) and exposure, relaxation and rescripting therapy - ERRT (Davis, 2009). Drug treatment/ therapy commonly involves prescription of drugs such as Prozosin (Raskind, Dobie, Kanter, Petrie, Thompson & Peskind, 2000; Taylor, Lowe & Thompson, 2006) and Aripiprazole (Lambert, 2006) both of which have been used in drug therapy treatment for recurrent nightmares.

7.2 Problem Nightmares

It is important to make reference to the notion that treatments for nightmares are commonly provided for individual with 'problem nightmares', nightmares that have become recurrent, dysfunctional and detrimental to the individual. A common phrase that is often used in the literature to indicate a problem with nightmares is 'nightmare sufferer' (Nielsen et al., 2010; Pietrowsky & Köthe, 2003; Germain & Nielsen, 2003; Lancee, Spoormaker & Van Den Bout, 2010; Berquier & Ashton, 1992; Levin, 1990). However, many of these studies do not necessarily provide information on what is considered or constitutes a nightmare sufferer. This could refer to the frequency of nightmares, for instance weekly or monthly incidents or the nightmare distress engendered by these experiences at an intra-personal or interpersonal level. The studies also do not clarify whether the nightmares represent symptoms of an underlying psychopathology or represent a primary psychopathology. Erman (1987) provides some insight related to this issue, only when nightmare experiences become recurrent and

hence disruptive to every day functioning an individual may be considered a nightmare sufferer. Thus, according to Erman it is the 'recurrence' of the experience that leads to daily disruption that makes it problematic. From a sleep medicine perspective in the ICSD-2 it is stated that it is the recurrent arousals from sleep and/or associated distress due to the dream experience, particularly in returning to sleep that is problematic. Nightmare pathology is related to the chronic recurrence of these experiences and should be clearly differentiated from transient nightmare experiences. However, neither the DSM-IV-TR nor the ICSD-2 address what is considered a chronic condition for diagnostic purposes.

There is a developing corpus of work that seems to suggest that in order to identify the problematic element/s of nightmares or nightmare pathology there needs to be a distinction made between nightmare frequency and nightmare distress (Belicki, 1992; Levin & Nielsen, 2007). Nightmare frequency is evident, in that it refers to the number of incidents experienced on either a weekly or monthly basis. Moreover individuals suffering from nightmares commonly report either weekly or monthly incidents (Hartmann, 1984). It is rare to find individuals that report suffering from nightmares and also report bi-monthly or yearly incidents.

Various psychometric tools have been employed to determine the frequency of these incidents, including retrospective measures such as Nightmare Frequency Questionnaire NFQ (Krakow, et al., 2000) which surveys at the actual number of nightmares as well as the number of nights with nightmares. Other contemporary frequency measures include, retrospective metrics such as the SLEEP-50 (Spoormaker, Verbeek, van den Bout, & Klip, 2005) and prospective metrics such as different types

of dream logs (Levin & Fireman, 2002; Wood & Bootzin, 1990; Zadra & Dondori, 2000).

Nightmare distress, on the other hand refers to the distress experienced during the following day that is directly related to nightmare incidents. Nightmare sufferers commonly report increased stress and fatigue when recalling nightmares the following day, this could manifest in personal, work or mental health issues (Haynes & Mooney, 1975; Hersen, 1971; Krakow & Neidhardt, 1992). Furthermore, Krakow, Hollifield et al. (2000) have stipulated that chronic nightmare sufferers can adopt sleep-preventing behaviours “such as fear of the bed and bedroom; fear of going to sleep; and fear of returning to sleep, following an awakening from a bad dream, and sleep-antagonistic behaviours, such as watching television and keeping the lights on in the bedroom; [and] irregular sleep schedules” (p. 590). These sleep-preventing behaviours appear to be more directly related to the intensity of nightmares in reference to imagery and affectivity experienced during the nightmare than nightmare distress.

Psychometric tools that measure nightmares distress includes Nightmare Effects Survey (NES) which examines adverse effects of nightmares on sleep, work, relationships, daytime energy, school, mood, sex life, diet, mental health, physical health and leisure activities (Belicki, Chambers & Ogilvie, 1997). Other retrospective measures include Nightmare Distress Scale (Belicki, 1992) and prospective measures of nightmare distress such as keeping nightmare logs (Germain & Nielsen, 2003; Levin & Fireman, 2002).

It is considered that both nightmare frequency and nightmare distress determine the severity of nightmare pathology however, waking psychopathology has been found to have a stronger correlation with nightmares distress than nightmare frequency (Levin & Nielsen, 2007). Belicki (1992) conducted a study on a sample of 85 participants to determine correlations between nightmare frequency, nightmare distress and nightmare pathology. Belicki's results strongly supported the hypothesis that nightmare distress was significantly correlated with nightmare pathology. In fact, correlational significance was observed between various psychopathological symptoms and nightmare distress but not nightmares frequency.

7.3 Treatment Objectives

It is also important to provide a clear description of what is meant by nightmare treatment or more specifically what would be considered feasible treatment objectives? Are treatments meant to eliminate, ameliorate or analyze nightmare experiences? Most of the therapeutic treatments aforementioned aim to eliminate nightmare frequency, as lessening the frequency of either the symptom or cause that is troublesome, is considered therapeutically viable (Belicki, 1992). Thus, eradicating or reducing nightmare frequency is deemed the main therapeutic objective (Halliday, 1987). However, not all nightmare treatments aim to eliminate nightmare frequency (Siegel & Bulkeley 1998), in fact some treatments aim to analyze nightmares for the purpose of interpretation (Roth, Dye & Lebowitz, 1988). Other treatments aim to deal with the nightmare distress as opposed to frequency (LaBerge & Rheingold, 1990). Thus altering the nightmare narrative in order to recreate a pleasant dream is the objective.

Treatment objectives may be further complicated when nightmares are confounded with other disorders, such as REM Behaviour Disorder RBD. Thus, treating therapists need to be mindful of differential diagnoses that may compromise treatment outcomes. In addition, to complicate treatments options further it does depend on whether nightmares are considered from the psychiatric or sleep medicine perspective.

7.4 Treatment for Nightmares considered a Symptom

The effectiveness of nightmare treatments found in the literature depends on whether nightmares are considered a symptom of an underlying psychopathology (psychiatric perspective) or a psychopathology in its own right (sleep medicine perspective). When nightmares are considered a symptom, treatment is commonly targeted at the underlying psychopathology (Krakow et al., 2000) the presumed instigating root cause. The expectation of this approach is that the nightmare experiences will be eliminated or at least ameliorated as a result of treating the cause, which is a reasonable and plausible medical or psychological objective (Treatment Protocol Project, 2000). Nightmares in the literature are robustly associated with PTSD; in fact nightmares are sometimes the most prominent symptom of the psychopathology (DSM-IV-TR, 2000). The focus of psychotherapeutic treatment for PTSD is generally on facilitating the ‘integration’ of the trauma experience into the individual’s autobiographical memory (Davis, 2009). This can be achieved by the use of various techniques including desensitization (exposure therapies), altering thoughts associated with the trauma (CBT’s), or analyzing subconscious material related to the traumatic event (psychodynamic/analytical approaches). Emotional processing theory, for instance,

asserts that correction to the pathological elements of the fear structure that develop due to trauma exposure should result in successful therapy (Foa & Kozak, 1986). All these therapeutic strategies target the presumed instigating cause of the development of PTSD, the traumatic experience.

Nightmares have also been associated with depression (Agargun, Besiroglu, et al., 2007). Treatment for depression involves targeting physical symptoms such as sleep disturbance, appetite disturbances and weight loss; cognitive symptoms such as excessive self-criticism, feelings of worthlessness, and suicidal ideation; and finally behavioural symptoms such as loss of motivation, social withdrawal, apathy and indifference (Treatment Protocol Project, 2000). Depending on the type of depression (biological – melancholic or non-biological non-melancholic) and related symptoms a treatment plan can involve physical treatments (e.g., anti-depressants) or a combination of physical and psychological treatments (e.g., anti-depressants in conjunction with psychotherapy). Commonly major/clinical depression is treated by the use of both drug therapy and psychotherapy as part of a treatment plan supervised by a clinician (Treatment Protocol Project, 2000).

Nightmares have also been robustly associated with Borderline personality disorder (Semiz, Basoglu et al., 2008; Simor, Csóka & Bódizs, 2010). The complexity of the nature of this condition can make treatment difficult, because there are no typical presenting complaints. However, commonly individuals may present with a variety of mental complaints such as, anxiety, depression or psychosis. Treatment for this

condition is generally long term and therapist normally set very clear boundaries that provide the opportunity to manage crises as they occur when providing treatment for individuals with this condition (Treatment Protocol Project, 2000). Examples of potential crises may include threats of violence and/or suicide.

7.5 Treatment for Nightmares considered a Psychopathology

When nightmares are considered a psychopathology such as Nightmare Disorder, treatment is specifically directed at the nightmare experience itself, with the aim of eliminating or at least decreasing the frequency of nightmares, hence such treatments have been referred to 'direct nightmare treatment'. There is also a growing body of evidence that suggests sleep disturbances, including nightmares, are more than simply a secondary symptom to PTSD (Spoormaker & Montgomery, 2008). In fact, it has been observed that following some cognitive behavioural treatments residual nightmares have persisted (Belleville, Guay & Marchand, 2011). Therefore, the presence of nightmares may be indicative of a core feature. Halliday (1987) conducted one of the earliest reviews on direct nightmare treatments and four classes of treatment were identified. These four classes of treatments include 1) Analytic and Cathartic techniques, 2) Story-line alteration procedures, 3) Face and conquer approaches, and 4) Related behavioural techniques. Analytic and Cathartic techniques are founded on the Psychodynamic perspective, whereby dreams (nightmares) are perceived to reflect repressed anxieties and conflicts, therefore therapeutic focus is on making the unconscious material/content conscious for the purpose of analysis and catharsis (discharge of pent-up emotions and/or socially unacceptable affectivity). By exploring

the nightmare in a contained setting, clients are able to experience a safe emotional release (Hartmann, 1991). Story-line alteration procedures on the other hand aim to alter the nightmare narrative by changing some aspect of the story-line via a prehypnic suggestion. This is commonly achieved by selecting a dream scene and altering that dream scene to benefit the dreamer (Krakow et al., 2000). In Face and conquer approaches, clients are instructed to use affirmations that empower them so they do not escape the uncomfortable scene but instead remain and face (confront) the anxiety/fear provoking stimuli. This lucid dreaming approach enables dreamers to control the content of the nightmare. By facing the dreaded anxiety associated with the dream scene, the client will be able to conquer or master their fear (Halliday, 1987). Finally in related behavioural techniques clients learn to relax and systematically expose themselves in a relaxed state to anxiety/fear provoking nightmare scenes. The technique ultimately conditions the client to experience relaxation in the presence of uncomfortable states such as anxiety, fear, anger or sadness (Treatment Protocol Project, 2000). By classically conditioning relaxation to specific nightmare scenes, the dysphoric states associated with these scenes will be ameliorated.

Of the classes/types of treatments mentioned by Halliday (1987) related behavioural techniques as well as story line alteration procedures have been the most investigated (Krakow et al., 2000). For instance, the Treatment Protocol Project (2000) in Australia identifies the behavioural related technique 'systematic desensitization' as the best current treatment for recurrent nightmares. Of the story line alteration techniques, Imagery Rehearsal Therapy (IRT) has been the most investigated and according to Spoomaker, Schredl and van den Bout (2006) it has become the treatment of choice

for direct nightmare therapy. Levin and Nielsen (2007) also identify IRT as the preferred treatment for recurrent nightmares.

Historically story-line alteration techniques can be traced to the writings referencing the discovery of the 'Senoi technique' or 'Senoi Dream theory' in the 1960's, which evolved into a separate movement known as the 'dream work movement' (Domhoff, 2003). The Senoi Dream theory as described by Stewart (1951) alludes to the notion that individuals may learn to manipulate their dreams to reduce fear and increase pleasure. These techniques derived from a peaceful culture of aboriginal people from the mainland of Malaysia, identified by dream researchers as 'the Senoi' in the 1930's (Garfield, 1974). According to Stewart's writings, the main source/authority on the Senoi culture, these people placed great importance on their dreams as a basis for their intellectual and social interests; this focus on dreams appeared to have assisted them in solving major communal problems, such as violent crimes, economic conflict and had largely eliminated insanity, neurosis and psychogenic illness (Stewart, 1951). Early anthropologists claimed that the unusual level of health and happiness was directly associated with the way the Senoi people used and interpreted their dreams. It was also claimed that dream discussion and interpretation occupied a large portion of the Senoi people's daily lives. It began during breakfast when parents would inquire and discuss dreams with their children, often praising them for their participation. Dream discussions continued during the village council, where men and women shared their dreams in large groups. It is believed that the Senoi people adhered to three main principles when experiencing dreams which included:

1. Always confront and conquer danger in dreams
2. Always move towards pleasurable experiences in dreams
3. Always make your dreams have a positive outcome and extract a creative product from them

(Garfield, 1974 p. 84).

However, despite these novel claims Stewart's work has been surrounded by controversy and claims of exaggerations and fabrications surfaced (Domhoff, 2003). Nevertheless, regardless of whether the Senoi dream theory was based on elements of fabrication or not, the Senoi people were said to be first people who practice this innovative way of using dreams (Domhoff, 2003). Thus these principles may be considered the theoretical underpinnings of the framework of the imagery and cognitive restructuring (story-line alteration technique/s) paradigm. The assumptions made by this paradigm include the following:

1. Nightmares are dreams, and dreams are stories individuals tell or recount to themselves during sleep, making them the author and editor of their dreams
2. Hence, nightmares may be manipulated or edited by focusing and targeting them as learned behaviors
3. Since, dreaming concerns and conceptions appear to be a continuation of waking concerns and conceptions, working with waking imagery and affiliated variables influences dreaming imagery and variables

(Krakow, Hollifield, Johnson et al. 2001)

Commonly in IRT a kind of story-line alteration technique informed by the early work of Bishay (1985) and Marks (1978), clients or patients do not discuss the content of their nightmare experiences or the possible cause, but simply follow a three step procedure, firstly the client/patient is instructed to change the nightmare any way they wish, thus they select a scene from the nightmare experience secondly, writing down a new ending to the nightmare experience, and thirdly, mentally rehearsing the new ending several times a day for approximately 5-20 minutes. For example, a Vietnam veteran who survived two helicopter crash, had a recurrent nightmare of helplessly free falling to his presumed death for more than 20 years. By implementing an alteration technique he was able to change this recurrent nightmare. Instead of helplessly free falling he imagined himself soaring like an eagle, his favourite bird, to a resting place of tranquillity that faced the east in order to observe a beautiful sunrise (Coalson, 1995).

Krakov appears to be the main advocate for the implementation of IRT in nightmare treatment, with numerous published research studies on the subject (Krakov et al. 1992, Krakow et al. 1993, Krakow et al. 1994, Krakow et al. 1996, Krakow et al. 1997, Krakow et al. 2000, Krakow et al. 2001, Krakow et al. 2002, Krakow & Zadra, 2006). In fact, Krakow and his research team claim to have established many firsts in the fields of sleep medicine, including ‘the first randomized controlled study to demonstrate that a cognitive-imagery technique can successfully decrease chronic nightmares without medication or (traditional) psychotherapy’ (www.sleep-treatment.com/Maim-aboutdrkrakow.htm). Furthermore, Krakow et al., (2000) have reported that the

implementation of IRT has also ameliorated daytime anxiety, depression and poor sleep.

7.5.1 Benefits of Direct Treatments

Direct nightmare treatments may also be implemented when nightmares are in fact symptoms of an underlying psychopathology such as PTSD. Krakow, Hollifield, Schrader et al. (2000) conducted IRT for chronic nightmares of sexual abuse survivors with PTSD. A total of 169 female participants with weekly nightmares were randomly divided into the experimental (n=87) and control groups (n=89). It was found that there were significant improvements not only in nightmare incidents (decrease in the number of nightmares and number of night with nightmares per week), but also in the quality of sleep and PTSD severity. These findings provided further support that direct nightmare treatments could not only be beneficial in ameliorating nightmare experiences but also in ameliorating effects of other associated correlates such as anxiety, depression, poor sleep and PTSD symptoms (Kellner, Neidhardt, Krakow, & Pathak, 1992; Krakow, Kellner, Pathak, & Lambert, 1995; Neidhardt, Krakow, Kellner & Pathak, 1992).

7.6 Australian Nightmare Treatments

In Australia contemporary treatments for problem nightmares currently available include systematic desensitization (SysD), imagery rehearsal therapy (IRT) and clinical hypnosis. The Treatment Protocol Project (2000) promotes an 8 week desensitization muscle relaxation program based on the principles of systematic desensitization. Management guidelines are divided by corresponding weeks, in weeks 1-2 patients

learn progressive muscle relaxation and are instructed to write down the nightmare/s they are experiencing. In weeks 3-4 patients are instructed to practice daily imagination techniques. During this period patients are also instructed to practice muscle relaxation on a nightly basis prior to falling asleep. In weeks 5-8 patients are instructed to practice the imaginal desensitization on a weekly basis (once a week), however if nightmares are persistent patients are instructed to practice more often. The guidelines suggest that once the program has been completed and if patients continue to report nightmares they are instructed to practice on an ongoing basis until the desensitization technique is effective.

Forbes and colleagues (2001) implemented IRT on a group of 12 Vietnam veterans with combat related nightmares. The pilot study was conducted as part of the completion of a comprehensive inpatient treatment program for combat-related Post Traumatic Stress. Patients attended an initial assessment to determine suitability. The treatment began with an explanation of imagery rehearsal as an intervention, in which alterations to the nightmare narrative were made in order to promote mastery or control. Once this was achieved patients were required to rehearse the new scenario implementing imaginal techniques. Patients completed sleep and nightmare diaries for 1 week pre-treatment, throughout the treatment phase, and for the week prior to the 3-month follow-up. Self-report inventories were completed immediately prior to treatment, following treatment and at 3-month follow-up. Treatment comprised weekly group sessions, 1.5 hours in duration for 6 weeks. During this time patients received an initial explanation of imagery rehearsal as an intervention, subsequently they selected

their target nightmare, and wrote it down in detail. Hence, exposure was a considerable part of this intervention, since patients transcribed their nightmare in significant detail and then engaged in a group discussion of potential changes to each other's nightmares, before each individual selected what aspect to change in their own nightmare. The nightmare script was rewritten accordingly, and read to the group. Participants were then instructed to rehearse this altered script in imagination, each night prior to sleep. In the final two sessions, participants were able to fine-tune modifications to their nightmare script. In the subsequent two years Forbes et al. (2003) conducted another IRT study on 12 Vietnam veterans with combat related nightmares but this time they conducted both a 3 and 12 month follow-up.

Finally, Kennedy (2002) implemented clinical hypnosis as treatment for a patient diagnosed with Nightmare Disorder. The patient was a 37 year old female who reported experiencing between 3-4 nightmares each week. These nightmares had commenced two years prior and coincided with the separation from her husband of ten years. Kennedy conducted four sessions; in the first session (two weeks after the initial consultation) the patient presented a nightmare log that she kept for the previous two weeks, which confirmed the frequency of the nightmare incidents. During this session a rationale, explanation and assessment of hypnotizability was also provided. In the second session (a week later) the induction and deepening procedure were taped recorded, in order for the patient to take the recording home and listen to it every night just prior to retiring to bed. The induction procedure was based on Spiegel's eye-roll technique and progressive muscle relaxation. During this session the patient was informed that she could control her own dreams including nightmares and different

suggestions were provided e.g. “replay[ing] her nightmare as if it was on a TV screen and mak[ing] a change to the ending that allowed her to have complete control” (p. 129). In the third and fourth sessions the patient was given a suggestion during hypnosis for general wellbeing. Finally, telephone follow-up calls were made every second week for a period of three months.

7.7 Efficacious Psychotherapeutic Elements of Nightmare Treatments

The psychotherapeutic elements in nightmare treatments that have been implicated as being efficacious include systematic exposure to the nightmare, rewriting scenes of the nightmare narrative, relaxation, suggestion via hypnosis and altering the nightmare via lucidity. Marks (1978) theorized that there were three active components of effective behavioural-cognitive nightmare treatments. These included rehearsal of nightmares via ‘exposure’ to the nightmare content, ‘abreaction’ that releases emotional tension associated with the nightmare and acquiring a sense of ‘mastery’ over the nightmare narrative/s. Bishay (1985) on the other hand asserted that the most important therapeutic component according to his observations was acquiring a sense of mastery over the dysphoric experience. Obtaining a sense of mastery over nightmares seems to empower nightmare sufferers and assists in developing the belief that they can overcome dysphoric experiences in dreams (Germain et al., 2004). Thus, Bishay argued that altering any aspect of the narrative during the nightmare which led to a sense of mastery was considered to be more efficacious than exposure and/or abreaction. This suggestion was further supported by Krakow et al. (2000) who also observed that developing a sense of mastery was paramount in alleviating chronic

nightmares. Furthermore, Krakow et al. reiterated that IRT instructions involved avoiding rehearsals of old nightmares and discouraged discussion of traumatic nightmare content. In fact, Krakow and Zadra (2006) state that IRT has been conceptualized as targeting two therapeutic components, “nightmares as a learned sleep disorder” (p. 48) and “nightmares as symptom of a damaged imagery system” (p. 49).

It is also noteworthy to stress that different variants of the IRT methodology have been successfully implemented on a variety of presenting problems and groups. Most studies that research IRT implement slightly different procedures. Some have provided a single session intervention for individual cases for patients with chronic nightmares (Germain & Nielsen, 2003). Some have provided 1 or 2 hours of therapy contact time for survivors of sexual assault diagnosed with PTSD in a group setting (Kellener, Neidhardt, Krakow & Pathak, 1992) while others have provided an extended 8 or 9 hours of therapeutic contact time for soldiers exposed to combat also diagnosed with PTSD (Krakow & Zadra, 2006). Furthermore, IRT has also been utilized successfully in with children with recurrent nightmares (St-Onge, Mercier & Koninck, 2009). This suggests that behavioural-cognitive nightmare treatments could be quite easily tailored to meet specific treatment needs.

7.8 Summary

Some nightmare experiences may be considered problematic and require treatment, while others are not necessarily considered problematic and treatment is not warranted. Problem nightmares are experiences that have become recurrent and dysfunctional to

daily life. For these kinds of nightmares there are various techniques available that have proven to be efficacious. There are various types of treatments that derive from various paradigmatic perspectives, including psychodynamic techniques, cognitive-behavioural techniques and pharmacological therapy. However, despite the variety of treatment options the treatment of choice according to recent literature is imagery rehearsal therapy (IRT). However, the treatment of choice in Australia is a systematic desensitization based technique.

The interesting aspect about the various techniques that have been implemented as nightmare treatments is that it appears that nightmare therapy can be tailored to the patient/client's treatment needs. The literature indicates that researchers have implemented variants of established techniques with good results, hence identifying efficacious elements of established techniques and applying those elements can be extremely beneficial to nightmare sufferers.

Chapter 8

Method

8.1 First Study - Survey

The purpose of the first study was twofold; firstly, it was designed to investigate the frequency of nightmare incidents/experiences (idiopathic and trauma related), sleep quality, and PTSD symptoms in a sample of university students; secondly, it was designed to identify participants who reported weekly nightmare experiences for recruitment purposes for the second study – treatment phase.

The purpose of the second study was also twofold; firstly, to trial a brief storyline alteration nightmare technique (SLAT). Secondly, to compare SLAT to a variant of the Systematic Desensitization technique currently the treatment of choice in Australia according to the World Health Organization Collaborating Centre for Mental Health and Substance Abuse Management Guidelines in Australia (Treatment Protocol Project, 2000).

8.1.1 Participants

The participants were 440 students from Victoria University, 115 men and 325 women aged between 18 – 34 years ($M = 20.47$, $SD = 2.61$). The age range for men was between 18 – 32 years ($M = 20.41$, $SD = 2.88$) and the age range for women was between 18 – 34 years ($M = 20.48$, $SD = 2.51$). The selection criteria for the first study

required students to be currently enrolled at Victoria University.

The participants were enrolled in various courses including Psychology, Nursing, Midwifery, Engineering, Chinese Medicine, Commerce and Liberal Arts. They were at various stages of their academic programs (including first year, second year, third year, fourth year, Masters and PhD levels). All participants were volunteers.

The method of recruitment entailed strategically placing advertisements for participants around different campuses. This was achieved by placing printed advertisements on numerous notice boards in different campuses and faculties. An e-advertisement was also placed on the university website and was circulated during the period of recruitment. Finally, randomly designated large lecture classes were addressed by the student researcher for recruitment purposes.

8.1.2 Materials for the First Study

The materials for the first study consisted of a participant information pack comprised information for research participants, a consent form, an expression of interest form, the Nightmare Frequency Questionnaire (NFQ), additional questions regarding the type of nightmare/s reported, the Pittsburg Sleep Quality Index (PSQI), and the PSQI Addendum for PTSD (PSQI-A-PTSD).

8.1.3 Participant Information Pack for the First Study

The participant information pack for the first study included information about

nightmare experiences, information about the project procedure, contact details of the proponents of the research project and contact details of psychological support if required (Appendix 1). It also contained a consent form (Appendix 2) and an expression of interest form to participate in the second study (Appendix 3).

8.1.4 Nightmare Frequency Questionnaire (NFQ)

The NFQ is a retrospective measure that is standard for this type of research and it assesses the frequency of the nights with nightmares (and disturbing dreams) per unit of time (i.e., weekly, monthly and/or yearly) and at the same time, the number of nightmares in a given interval (Krakow et al., 2000). Respondents however, were instructed to only consider and report nightmare experiences which were defined as ‘bad dreams that wake you up’ (Appendix 4).

The NFQ has only two items that respondents are required to answer in order to determine the frequency of nights with nightmares and the frequency of actual nightmares. The NFQ requires respondents to select only 1 category (yearly, monthly or weekly) and only 1 numeric unit (i.e., 1, 2, 3 etc.) within that category for the number of nights with nightmares. The NFQ also requires respondents to select only 1 category (yearly, monthly or weekly) and only 1 numeric unit (i.e., 1, 2, 3 etc.) within that category for the number of actual nightmares. Respondents are required to report the frequency of nightmare experiences for the previous 3 months. Test-retest reliability data yielded weighted kappa coefficients of .90 (95% CI, .83-.97) for actual nightmare experiences and .85 (95% CI, .74-.95) for nights with nightmares (Krakow et

al. 2002).

The scoring procedure for the NFQ entails counting the number of nights with at least one nightmare experience and actual nightmares separately, to determine the frequency of actual nightmares and nights with nightmares. A participant may only report one night with nightmares in a given interval, i.e., weekly or monthly, but report multiple nightmares during that interval. For example, a respondent may state that they have 3 nightmares in 3 nights (1 nightmare per night) or 3 nightmares in a single night, thus reporting more than 1 nightmare does not automatically imply the corresponding number of nights.

Note: Participants were required to estimate the frequency of nightmares. No nightmares = no nightmares reported (considering the previous 3 months). Yearly nightmares = between 1-11 nightmares reported under the 'yearly' category/unit of time (considering the previous 3 months). Monthly nightmares = between 1-3 nightmares reported under the monthly category/unit of time (considering the previous months). Weekly nightmares = at least 1 nightmare per week reported under the weekly category/unit of time (considering the previous months). Thus, if a respondent reports 1 nightmare per week, then the yearly estimate can be calculated to be (1 x 52 weeks =) 52 nightmares per year.

8.1.5 Additional Questions in the NFQ pertaining to the Type of Nightmare/s

Reported

Participants were required to report the type of nightmares experienced – trauma related

nightmares (content of nightmares relate to a traumatic personal experience – trauma was defined as sudden or unexpected events that were considered abnormal and elicited strong reactions) and non-trauma related or idiopathic nightmares (content of nightmares does not relate to a traumatic personal experience - Appendix 4)

8.1.6 Pittsburg Sleep Quality Index (PSQI)

The PSQI is a self-administered retrospective questionnaire that is a standard measure, which assesses sleep quality and disturbances over a period of 1-month. The PSQI contains 19 items that yields an overall global score ranging from 0 – 21. Seven components are generated from the 19 items in order to calculate the overall global PSQI score. The PSQI is specifically designed to measure sleep duration and latency, and the frequency and severity of particular sleep related problems. An additional 5 items applicable to respondents with room-mates/partners are also included in the PSQI, but these items are not part of the calculations to determine the overall global score. Test-retest for the overall global score yielded a reliability of .85, and test-retest for the PSQI components yielded reliabilities ranging from .65 to .84 (Buysse, Reynolds et. al., 1989) - (Appendix 5)

Scoring procedure for PSQI entails calculating 7 components and summing all components to yield an overall global score. For example, component 1 is calculated by examining question 6 and assigning the corresponding score of 0, 1, 2, or 3 to the corresponding likert scales. Component 2 is calculated by examining question 2 and 5a

and assigning the corresponding score of 0, 1, 2, or 3 to the corresponding likert scales, once summed up they are given a corresponding score between 0-3. Component 3 is calculated by examining question 4 and assigning the corresponding score of 0, 1, 2, or 3 to the corresponding likert scales. Component 4 is calculated by examining questions 1, 3 and 4. Firstly the number of hours spent in bed is calculated by examining the response to question 1 and the response to question 3, and dividing them by the response to question 4, subsequently the score is multiplied by 100. The percentage score is then assigned a corresponding score between 0-3 etc. A global PSQI score of 5 or above indicates clinically significant sleep disturbance/s, thus indicating that the respondent is a poor sleeper (Buysse, Reynolds et. al., 1989).

8.1.7 PSQI Addendum for PTSD (PSQI-A)

The PSQI-A is a retrospective measure that consists of 7 items focused on the frequency of 7 disruptive nocturnal behaviours (DNB – hot flashes, general nervousness, traumatic nightmares, non-traumatic anxiety, non-traumatic bad dreams, night-terrors without awakening, and acting out dreams such as [screaming, running or kicking]) that are commonly reported by post-traumatic stress disorder (PTSD) patients. Each item is rated on a 0–3 scale referring to frequency of each disturbance, where 0 = not in the past month, 1 = less than once a week, 2 = once or twice a week, and 3 = three or more times a week. The global score range of the PSQI-A is between 0-21. An additional 3 items are included for clinical and informative purposes only and are not part of the calculations to determine the global PSQI-A score. Internal consistency for the 7 items yielded a Cronbach’s alpha = .85 and convergent validity

with PTSD scores were positively and significantly correlated $r = .53, p < .007$ and $r = .56, p < .001$. Respondents are required to report the frequency of DNB for the previous month (Appendix 5).

Scoring procedures for the global PSQI-A score entails summing up the scores of all 7 items. Each item is rated on 0-3 likert scales corresponding to the frequency of the specific DNB. A global PSQI-A score of 4 or above yielded a sensitivity of 94%, a specificity of 82%, and a positive predictive value of 93% for discriminating participants with PTSD symptoms from those without PTSD symptoms (Germain, Hall, Krakow, Shear, & Buysse, 2005).

8.1.8 Procedure for the First Study

All the methods of recruitment - printed advertisements, e-advertisement and addressing large lecture classes yielded participants for the first study. Participants who were recruited via the printed or e-advertisement contacted the student researcher via phone and/or text/SMS. Other participants emailed their expression of interest. Those participants who contacted the researcher were given the option of picking up a hard-copy of the survey from a designated location or receive an e-copy via email correspondence. All participants were instructed to return the completed survey within a week. Participants in large lecture classes indicated their willingness to participate by raising their hand after the class was addressed by the student researcher. They were initially required to read and sign the consent form for the first study, subsequently they were instructed to recall and report to the best of their knowledge the number of nights

with nightmare experiences and the actual nightmare experiences they had in the previous three months. They were also required to identify the type of nightmares experienced – trauma related or idiopathic. Those participants in the lecture theaters received a hard copy of the survey and were given time to complete the survey (15 mins) on the spot and once completed the surveys were collected. The first study was conducted over a period of 6 months, which included recruitment, survey administration and data collection. A total of 96 participants were recruited via the printed advertisements, a further 23 participants were recruited via the e-advertisements and 321 participants were recruited via the large lecture classes address.

8.2 Second Study – Treatment Phase

8.2.1 Participants

The participants for the treatment phase included 20 students from Victoria University, 9 men and 11 women aged between 18 – 31 years ($M = 21.6$ and $SD = 3.4$). The age range for men was between 19 - 31 years ($M = 22.6$, $SD = 4.9$) and the age range for women was between 18 – 26 years ($M = 21.3$, $SD = 2.9$). The selection criteria for the second study required participants to have:

- a current Victoria University student enrolment
- reported at least one nightmare experience per week in the first study survey
- completed the expression of interest form to participate in the second study

The method of recruitment for the second study entailed identifying participants from the first study who reported at least one nightmare experience per week and had

completed the expression of interest form to participate in the second study. Subsequently, from the information provided in the expression of interest form, an invitation was extended to these participants to partake in the second study. The incentives for the second study included, receiving information about nightmare experiences including descriptions, types and treatments, as well as receiving a free treatment CD.

8.2.2 Materials for the Second Study

The battery of questionnaires for the second study included a consent form, the NFQ, the PSQI, the Nightmare Effects survey (NES), Posttraumatic Diagnostic Scale (PDS) and the Profile of Mood States (POMS-37 item). Participants also received either the Story-line Alteration Technique (SLAT) CD or the Systematic Desensitization (SysD) CD.

8.2.3 Consent Form

The consent form for the second study provided an invitation for volunteers to participate in the second part of the research project, information about nightmare experiences, information about the project design, contact details of psychological support if required and contact details of the proponents of the research project (Appendix 6).

8.2.4 Nightmare Effects Survey (NES)

The NES is a self-report questionnaire consisting of 11 items focused on assessing adverse effects of nightmare experiences on sleep, work, relationships, daytime energy, school, mood, sex life, diet, mental health, physical health and leisure activities (Krakow, Hollifield et al., 2000; Belicki, Chambers, & Ogilvie, 1997). Each item is rated on 0-4 likert scales, where 0 = not at all, 1 = slightly, 2 = moderately, 3 = very much, and 4 = a great deal. The score range for the NES is between 0-44. The NES also includes an initial binary item that questions whether respondents 'believe' that nightmares affect other aspects of their lives. A correlation of $r = .70$ between the NES and the Nightmare Distress Questionnaire (NDQ) was found, which has an internal consistency of (.83-.88) for an 13-item scale that evaluates the degree of distress caused by nightmare experiences (Belicki et al. 1997) - (Appendix 7).

The scoring procedure for the NES entails summing up all 11 items which generates a total score. Any score obtained from the NES indicates impairment due to nightmares and the higher the score the more impairment it reflects.

8.2.5 Posttraumatic Diagnostic Scale (PDS)

The PDS is a retrospective self-administered assessment that measures post-traumatic stress symptoms and consists of 49 items. It contains a trauma screening question plus 17 items, each corresponding to the DSM-IV-TR diagnostic criteria for PTSD. Each of the 17 items is rated on 0-3 likert scales, where 0 = Not at all or only one time, 1 = Once

a week or less/once in a while, 2 = 2 to 4 times a week/half of the time and 3 = 5 or more times a week/almost always. The score range for the PDS is between 0-51. The initial validation study for the PDS yielded a Cronbach's alpha = .91. Test-retest reliability data of the overall severity score = .74. (Foa, Riggs, Dancu, Rothbaum, & Olasov, 1993). A subsequent investigation on validity and reliability found that the total-score Cronbach's alpha = .92 and test-retest reliability = .83 (Foa, Cashman, Jaycox, & Perry 1997). The PDS also demonstrated concurrent and convergent validity with other measurement tools for psychopathology. The PDS requires respondents to report their symptoms for the previous month (Appendix 8).

The scoring procedure for the PDS entails summing up items 22 to 38 (17 items) and obtaining a total score. This total score represent a total severity score. If any item is scored 1 or higher, a symptom is consider to be present. A total severity score of 15 or higher is indicative of a positive screening for the PDS. However, symptom severity ratings are between 1 – 10 mild, 11–20 moderate, 21–35 moderate to severe and >36 severe. Please note in order to meet the DSM-IV-TR criteria for PTSD a respondent must also meet a range of items in sections B (re-experiencing), C (avoidance), and D (increased arousal) of the DSM-IV-TR classification system.

8.2.6 Profile of Mood States (POMS-37 item / POMS-SF)

The POMS-37 / POMS-SF (short version) is a self-report questionnaire consisting of 37 items that measures subjective emotional and mood states. The 37 items consist of adjectives that describe positive and negative emotional and mood states. Each item is

rated on 0 – 4 likert scales, where 0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, 4 = extremely. Six mood components/subscales are yielded from the 37 items in order to calculate the overall total POMS score. These six mood subscales include Tension-Anxiety (6 items), Depression-Dejection (8 items), Anger-Hostility (7 items), Vigor-Activity (6 items), Fatigue-Inertia (5 items) and Confusion-Bewilderment (5 items). Internal consistency reliability for all the components have generated a Cronbach's alpha range = .76 - .95. Correlation between the components and the total score in POMS and POMS-SF was 0.84 (Curran, Andrykowski & Studts, 1995). Internal consistency for the original Profile of Mood States (POMS) yielded a Cronbach alpha range from 0.63 to 0.96 and a test-retest reliability data have been found to range from .43 - .53 (McNair, Lorr & Droppleman, 1971). The POMS-37 requires respondents to report their subjective emotional and mood states for the previous week (Appendix 9).

Scoring procedure for the POMS-37 entails calculating the 6 subscales/components and using the total of each subscale to calculate an overall POMS-37 score. For subscale 1 'Tension-Anxiety' items (1, 10, 15, 16, 22, 27) are summed to obtain the subscale score. For subscale 2 'Depression-Dejection' items (4, 8, 12, 14, 20, 23, 28, 33) are summed to obtain the subscale score. For subscale 3 'Anger-Hostility' items (2, 7, 11, 19, 21, 25, 31) are summed to obtain the subscale score. For subscale 4 'Vigor-Activity' items (5, 9, 13, 24, 32, 35) are summed to obtain the subscale score. For subscale 5 'Fatigue- Inertia' items (3, 18, 26, 29, 37) are summed to obtain the subscale score. For subscale 6 'Confusion- Bewilderment' items (6, 17, 30, 34, 36) are summed

to obtain the subscale score. Once all the subscales are calculated, the total for subscale 4 is subtracted from the sum of subscales 1, 2, 3, 5, 6 to obtain an overall score for the POMS-37. The higher the overall score for the POMS-37 the greater the mood disturbance it reflects.

8.2.7 Story-Line Alteration Technique (SLAT)

The idea of introducing a new brief treatment arose from observations made during clinical consultations with clients experiencing recurrent nightmares. The principle supervisor observed that simple instructions given to manage nightmares appeared to be efficacious in decreasing nightmare frequency and intensity. The technique implemented was merely to inform clients that personal items could be integrated in dream scenarios. In addition, clients were instructed to find a personal item that they felt could empower them during the dysphoric experience and simply retire to bed with the item. This technique was consequently analysed to ascertain the possible therapeutic elements at play and the corresponding paradigms that could perhaps explain the therapeutic success.

A literature reviewed revealed that it appeared that the following principles/paradigms and /or models could theoretically explain the observations made, imagery and cognitive restructuring (Krakow, Hollifield, Johnson et al., 2001), suggestion hypnosis (Kennedy, 2002) and lucid dreaming (Lagerbe & Rheingold, 1990). It was decided that the intervention would be delivered on a C.D to enable participants to listen to the technique prior to retiring to bed as well as examine a brief nightmare treatment in a self-help format.

The C.D content included the following:

1. information on the nature of the dreaming (Dreams are personal narratives)
2. elements of classical conditioning (association to Power Item concept of the SLAT)
3. elements of lucidity (becoming aware during the dream that a resource was available)
4. elements of mastery (opportunity to overcome threaten stimuli), and
5. the power of suggestion and belief (that we are authors and editors of our personal dream narratives) could provide a powerful combination that could have notable therapeutic benefits

Thus, the theoretical underpinnings of the treatment are founded on the notion that nightmares are stories individuals tell themselves during sleep, which makes individuals the authors, editors and participants of their own dreams. Hence, nightmares may be manipulated or edited as learned behaviours by simple suggestions that instruct individuals to consciously participate in their own dreams. The SLAT treatment consists of a brief storyline alteration technique on a CD (approximately 4 mins in duration) and the content of the CD is the following:

1. The CD provides a brief explanation of Parasomnias
2. Systematic exposition
3. Simple instruction/s to enable participants to edit their nightmare by adding an empowering variable such as a symbolic material-object that is accessible during the nightmare experience via a suggestion that symbolizes the ability to overcome the threat (Appendix 10 contains the actual content of the SLAT CD)

8.2.8 Systematic Desensitization (SysD)

The SysD treatment consists of a brief exposure treatment on a C.D (approximately 4 mins in length):

1. The CD provides an explanation of the systematic desensitization

- procedure
2. Systematic exposition
 3. Instructions to enable participants to apply the SysD procedure to their own nightmare experience. (Appendix 11 contains the actual content of the SysD CD)

8.2.9 Qualitative Data

The current study was designed to implement predominantly quantitative data analysis; however participants in the treatment phase were required to respond to the question ‘According to your experience, what was the most therapeutically effective aspect of the treatment?’ The qualitative data will be analyzed by employing thematic analysis (Hawe et al., 1990) and subsequently coded to ascertain percentages. This data will assist in identifying therapeutic elements in the SLAT and SysD treatments.

8.2.10 Procedure for the Second Study

Participants who met the criteria for the second study (reported at least one nightmare per week) and completed the expression of interest form in the first study survey, were contacted via phone or email and formally invited to participate in the second phase of the research project within two weeks of completing the survey. The participants who accepted the invitation to partake in the second study were randomly assigned to either the experimental or comparison groups. Subsequently they were forwarded hard-copies of the pre-treatment measures separately. Participants were further instructed to fill in the pre-treatment measures and return the completed measures to the student researcher. Consequently the treatment CD’s were forwarded to a designated postal address or collected from the student researcher. All participants were merely instructed

to listen to the CD for seven consecutive nights – e.g. “Listen to the CD for 7 consecutive nights and follow the instructions on the CD”. No other instructions (e.g. prepping) were given. Participants did not come in contact with each other at any time.

The second study originally had six phases which included a six month follow-up, however when the participants were contacted (emailed/phoned) to participate in the follow-up measures very few participants were in positions to participate. Only three participants completed the follow-up measures. Three participants were reported to be overseas, eleven participants did not respond to several contact attempts, and three participants had moved to other universities and declined to complete the follow-up. Hence, the second study was limited to 4 phases.

Phase 1: Formal invitation were forwarded to participants who met the selection criteria for the second study.

70 participants met the selection criteria and were invited to partake in the second study, 41 expressed interest, 30 commenced the study however only 20 completed it.

Phase 2: Participants were randomly assigned to the experimental or comparison groups and administered pre-treatment measures.

Treatment group SLAT	Comparison group SysD
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Phase 3: Treatment group received SLAT treatment CD while the comparison group received SysD treatment CD. Both groups were instructed to listen to the CD’s for the first week (7 days).

Treatment group received SLAT	Comparison group received SysD
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Phase 4: Both groups were administered post-treatment measures.

Treatment group	Comparison group
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8.2.11 Study Design for the Second Study

A mixed split plot design (within and between measures design) was employed (Table 1). The two independent groups (treatment and comparison), received pre- and post-treatment measures where the treatment group received the SLAT treatment CD and comparison group the SysD treatment CD.

Table 8.1 Study Design for the Second Study

	1 week	3 months	1 week
Groups	Pre-Treatment Measures	Type of Treatment	Post-Treatment Measures
Experimental Group n= 11	NFQ PSQI NES POMS-37 PDS	SLAT	NFQ PSQI NES POMS-37
Comparison Group n= 9	NFQ PSQI NES POMS-37 PDS	SysD	NFQ PSQI NES POMS-37

The data was collected over a period of four months in total. Pre-treatment measures were conducted and completed over a period of one week. The treatment C.D's were distributed and participants were instructed to listen to the CD's for a period of one week (7 consecutive nights). Three months lapsed before post-treatment measures

were conducted in order to be consistent with the NFQ requirements - report nightmare frequency for the previous three months - and to determine if the treatments were effective over an extended period. The post-treatment measures were also conducted and completed over a period of one week.

8.2.12 Independent Variable

The independent variable was treatment assignment:

- Experimental group – SLAT treatment
- Comparison group – SysD treatment

8.2.13 Dependent Variables

The dependent variables included:

- NFQ
- PSQI
- NES
- POMS

Treatment Outcomes (decrease/cessation of nightmare experiences /other related symptoms)

Chapter 9

Results

9.1 Introduction

The analysis of the data was divided into two sections. Section one presents the findings of the first study ‘Nightmares, Sleep Quality and PTSD symptoms Survey’ and section two presents the findings of the second study ‘Treatment Phase’. The data for both studies were systematically analyzed. The data analyses for the first study were performed in four phases:

1. Descriptive examination of the total sample based on the three main metrics Nightmare Frequency Questionnaire (NFQ), Pittsburgh Sleep Quality Index (PSQI); Pittsburgh Sleep Quality Index Addendum (PSQI-A-PTSD) and the corresponding components or items of each metric – to ascertain the frequency of nightmares and nights with nightmares, poor sleep and PTSD symptoms across the entire sample and examine the first two hypotheses
2. Analyses of the NFQ, PSQI and PSQI-A-PTSD and corresponding components or items – as a function of gender (men contrasted with women) – to ascertain significant differences in nightmare frequency, poor sleep and PTSD symptoms between men and women and examine the third hypothesis
3. Analyses of the NFQ and PSQI-A-PTSD and corresponding items – as a function of sleep (good sleepers contrasted with poor sleepers) - to ascertain

significant differences in nightmares frequency and PTSD symptoms between good and poor sleepers

4. Analyses of the NFQ and PSQI and corresponding or items – as a function of significant PTSD symptoms (presence of PTSD symptoms contrasted with absence of PTSD symptoms) – to ascertain significant differences in nightmare frequency and quality of sleep between participants who reported significant PTSD symptoms and participants who reported non-significant PTSD symptoms
5. Analyses of the NFQ, PSQI and PSQI-A-PTSD and corresponding components or items – as a function of the type of nightmare/s reported (trauma contrasted with idiopathic contrasted with trauma and idiopathic) – to ascertain significant differences in nightmare frequency, quality of sleep and PTSD symptoms between participants who exclusively reported trauma related nightmares, idiopathic nightmares and participants who reported both trauma related and idiopathic nightmares, as well as examine the fourth hypothesis

The data analyses for the second study will be performed in three phases:

1. Descriptive analyses for the treatment sample and as a function of treatment assignment – to ascertain a description of the entire treatment sample based on the metrics employed
2. Comparison of treatment groups at baseline in reference to the following variables - Age, NFQ (Nightmares and Nights with nightmares), PSQI Global

Score, PDS Total Score, NES Total Score and Items, and POMS-37 Total Score and Components – to ascertain internal validity between the treatment groups (SLAT and SysD)

3. Descriptive and inferential analyses of the data specific to the hypotheses pertaining to the second study - to examine the hypotheses for the second study

9.2 Data preparation

All analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 17 Statistics for Windows Academic Patches, SPSS inc. Appropriate measures were taken to ensure the accuracy of data entry, identification of missing values and outliers. Assumptions for normality, linearity and homoscedasticity were tested (Tabachnick & Fidell, 2001). Data that violated assumptions tests for normality, linearity and/or homoscedasticity were either transformed or non-parametric statistical analyses were implemented.

Twenty-eight participants were excluded from the first study because they failed to complete relevant parts of the survey. Additional examination of the missing data showed that eight participants did not indicate their gender and/or age; a further 12 did not indicate whether or not they experienced nightmares in the nightmare frequency questionnaire (NFQ) and 11 participants that were excluded from the study due to incomplete sections of the Pittsburgh sleep Quality Index (PSQI). These exclusions reduced the number of participants to 440 in total. It was also noted that the PDS post-treatment metric in the second study was completed correctly by only five out of the 20

participants; hence this information was excluded from post-treatment analyses. Finally, only four participants returned completed six month follow-up measures in the second study, therefore follow-up statistical analyses were also excluded.

9.3 Hypothesized Findings

The first study had four hypotheses; the first two hypotheses pertained to weekly and monthly nightmare frequency predictions. It was hypothesized that over 10% of the sample would report weekly nightmares and between 8% and 30% of the sample would report monthly nightmares. The administration of the Nightmare Frequency Questionnaire (NFQ) ascertained weekly and monthly nightmare percentage estimates (exclusively) since respondents are required to report either weekly, monthly or yearly nightmares exclusively. The third hypothesis predicted that significantly more women than men would report yearly, monthly and weekly nightmare experiences. A series of Chi Square and *t* –tests analyses were conducted to ascertain significant differences in distributions and means between men and women in reporting nightmare experiences. Finally the fourth hypothesis predicated that trauma-related nightmares would be more prevalent than idiopathic nightmares in participants who report weekly or monthly nightmares. MANOVA analyses were conducted to determine significant differences between participants who reported weekly and/or monthly trauma-related nightmares and participants who reported weekly and/or monthly idiopathic nightmares.

9.4 First Study: Nightmare, Sleep Quality and PTSD symptoms Survey

Table 1 provides a summary of the percentage of yearly, monthly and weekly nightmares, nights with nightmares; and significant scores for the PSQI and PSQI-A-PTSD.

Table 9.1

Frequency of Nightmares, Number of Nights with Nightmares and Significant scores for Poor Sleepers (SigPSQI) and Presence of PTSD symptoms (SigPSQI-A-PTSD)

	<i>N</i> = 440	
	<i>n</i>	%
No NMs	47	10.68
Yearly NMs	189	42.95
Monthly NMs	134	30.45
Weekly NMs	70	15.90
No Nights with NMs	48	10.90
Yearly Nights with NMs	191	43.40
Monthly Nights with NMs	138	31.36
Weekly Nights with NMs	63	14.31
Sig PSQI	317	72.00
Sig PSQI-A-PTSD	159	36.14

Note: NMs = Nightmares.

A total of 89.3% (*n* = 393) of the sample reported nightmares. This comprised yearly, monthly and weekly estimates, of which 43% (*n* = 189) exclusively reported at least one nightmare a year, 30.5% (*n* = 134) exclusively reported at least one nightmare a month and 15.9% (*n* = 70) exclusively reported at least one nightmare a week.

Overall 89.1% (*n* = 392) of the sample reported nights with nightmares. This was comprised yearly, monthly and weekly estimates, of which 43.1 % (*n* = 191) exclusively reported at least one night with at least one nightmare a year, 31.4% (*n* = 138) exclusively reported at least one night with at least one nightmare a month and

14.3% (n = 63) exclusively reported at least one night with at least one nightmare a week.

Table 1 also summarizes the percentage of poor sleepers (sigPSQI) and the presence of significant PTSD symptoms (sigPSQI-A-PTSD) among the sample. A total of 72% (n = 317) of the sample met the significant criteria for the PSQI indicting poor sleep and 36.1% (n = 159) of the sample met the significant criteria for the PSQI-A-PTSD indicting the presence of significant PTSD symptoms.

9.5 Analyses between Men and Women

9.5.1 Frequency of Nightmares Reported by Men and Women

Table 9.2 presents the percentage of yearly, monthly and weekly nightmares reported and Pearson's Chi-Square analyses as a function of gender. The results indicate that no significant differences were observed between the distributions of men and women across the three periodicities – yearly, monthly and weekly.

Table 9.2

Frequencies of Yearly, Monthly and Weekly nightmares and Pearson's Chi Square Analyses for Men and Women

	Combined (N=440)		Men (n = 115)		Women (n = 325)		χ^2	df	P
	n	%	n	%	n	%			
No NMs	47	10.68	23	20.00	24	7.38			
Yearly NMs	189	42.95	46	40.00	143	44.00	.30	1	.58
Monthly NMs	134	30.45	30	26.09	104	32.00	1.02	1	.31
Weekly NMs	70	15.90	16	13.91	54	16.62	.39	1	.53

*Significant at the .05 level.

Overall 80% (n = 92) of men and 92.6% (n = 301) of women reported nightmares. Yearly nightmares were reported by 40% (n = 46) of men in comparison to 44% (n = 141) of women. A Pearson's Chi-Square analysis indicated that the difference between the distribution of men and women was not significant, $\chi^2 (1, n = 189) = .30, p = .58$. Monthly nightmares were reported by 26% (n = 30) of men and 32.6% (n = 104) of women. A Pearson's Chi-Square analysis showed that the distribution of men and women was not significant, $\chi^2 (1, n = 134) = 1.02, p = .31$. Weekly nightmares were reported by 13.9% (n = 16) of men and 16.6% (n = 54) of women. A Pearson's Chi-Square analysis indicated that the distribution of men and women was also not significant, $\chi^2 (1, n = 70) = .39, p = .53$.

9.5.2 Frequency of Nights with Nightmares Reported by Men and Women

Table 9.3 shows the percentage of yearly, monthly and weekly nights with nightmares reported and Pearson's Chi-Square analyses as a function of gender. The results again indicate that there were no significant differences observed between the distributions of men and women across the three periodicities – yearly, monthly and weekly.

Table 9.3

Frequency of Yearly, Monthly, and Weekly Nights with Nightmares and Pearson's Chi-Square Analyses for Men and Women

	Combined (N=440)		Men (n=115)		Women (n=325)		χ^2	Df	p
	n	%	n	%	N	%			
No Nights	48	10.90	23	20.00	25	7.69			
Yearly Nights	191	43.40	47	40.86	144	44.30	.19	1	.66
Monthly Nights	138	31.36	30	26.10	108	33.23	1.36	1	.25
Weekly Nights	63	14.31	15	13.04	48	14.77	.15	1	.70

*Significant at the .05 level.

In total 80% (n = 92) of men and 92.3% (n = 300) of women reported at least one night with at least one nightmare. Yearly nights with a least one nightmare were reported by 40.86% (n = 47) of men and 44.3% (n = 144) of women. A Pearson's Chi-Square analysis indicated that the difference between the distribution of men and women was not significant, $\chi^2(1, n = 191) = .19, p = .66$. Monthly nights with a least one nightmare were reported by 26.10% (n = 30) of men and 33.23% (n = 104) of women. A Pearson's Chi-Square analysis showed that the distributions of men and women was not significant, $\chi^2(1, n = 138) = 1.36, p = .25$. Weekly nights with a least one nightmare were reported by 13.04% (n = 15) of men and 14.77% (n = 48) of women. A Pearson's Chi-Square analysis showed that there was no significant difference between the distribution of men and women, $\chi^2(1, n = 138) = 1.36, p = .25$.

9.5.3 Mean Number of Nightmares Reported by Men and Women

Table 9.4 shows the mean number of yearly, monthly and weekly nightmares reported by men and women and *t*-tests analyses as a function of gender. The results indicate that no significant differences were observed between men and women across the three periodicities – yearly, monthly and weekly.

Table 9.4

Mean number of Yearly, Monthly, and Weekly Nightmares and Independent Groups t-test for Men and Women

	Men (n=115)			Women (n=325)			<i>Mdiff</i>	<i>T</i>	<i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>			
Yearly	46	3.04	1.79	143	3.59	2.35	.55	-1.37	.17
Monthly	30	1.86	.86	106	1.98	.97	.12	.58	.56
Weekly	16	3.81	5.17	54	2.85	1.76	.96	.73	.48

Note: For the weekly category the equality of variance was violated.
Mdiff = Mean difference.

*Significant at the .05 level.

On average men reported 3.04 nightmares a year while women on average reported 3.59 nightmares a year. The mean difference was .55 and an independent groups *t*-test showed that no significant difference was observed, $t = -1.37$, $df = 187$, $p = .17$. Men reported an average of 1.86 nightmares a month, whereas women reported an average of 1.98 nightmares a month. The mean difference was .12 and the independent *t*-test showed that no significant was observed, $t = .58$, $df = 132$, $p = .56$. Men on average reported 3.81 nightmares a week and women on average reported 2.85 nightmares a week. The mean difference was .96 and an independent groups *t*-test showed that no significant difference was observed, $t = .73$, $df = 15.94$, $p = .48$. However, it is important to note the *SD* for men who reported weekly nightmares was 5.17, while for women it was 1.76.

9.5.4 Mean Number of Nights with Nightmares Reported by Men and Women

Table 9.5 shows the mean number of yearly, monthly and weekly nights with nightmares reported by men and women and *t*-tests analyses as a function of gender. The results again indicate that no significant differences were observed between the average nights with at least one nightmare reported by men and women across the three periodicities – yearly, monthly and weekly.

Table 9.5

Mean number of Yearly, Monthly, and Weekly Nights with Nightmares and Independent Groups t-test for Men and Women

	Men			Women			<i>Mdiff</i>	<i>T</i>	<i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>			
Yearly	47	2.91	1.80	144	3.51	2.45	.46	-1.54	.12
Monthly	30	1.77	.82	108	1.85	.83	.08	-.50	.62
Weekly	15	2.67	2.16	48	2.54	1.30	.13	.21	.83

Note: For the weekly category the equality of variance was violated.

Mdiff = Mean difference.

*Significant at the .05 level.

Men reported an average of 2.91 nights with at least one nightmare a year in comparison to women who reported an average of 3.51 nights with at least one nightmare a year. The mean difference was .46 and an independent groups *t*-test found that no significant difference was observed, $t = -1.54$, $df = 189$, $p = .12$. Men reported an average of 1.77 nights with at least one nightmare a month; in contrast women reported an average of 1.85 nights with at least one nightmare a month. The mean difference was .08 and the independent *t*-test showed that no significant difference was observed, $t = -.50$, $df = 136$, $p = .62$. Men on average reported 2.67 nights with at least one nightmare a week and women on average reported 2.54 nights with at least one nightmare a week. The mean difference was .13 and an independent groups *t*-test showed that no significant difference was observed, $t = .21$, $df = 17.30$, $p = .83$.

9.5.5 Frequency of Significant PSQI and PSQI-A-PTSD Global Scores for Men and Women

Table 9.6 summarizes the percentage of participants who met the significant criteria for the PSQI and PSQI-A-PTSD, and Pearson's Chi square analyses as a function of gender. The results indicate that no significant differences were observed between the distributions of men and women who met the significant criteria for the PSQI and PSQI-A-PTSD.

Table 9.6

Frequency of Participants with Significant PSQI Global and PSQI-PTSD Global Scores and Pearson's Chi Square Analyses for Men and Women

	Men		Women		χ^2	df	P
	n	%	N	%			
Sig PSQI	79	68.70	238	73.20	.24	1	.63
Sig PSQI-A-PTSD	34	29.60	133	40.90	2.97	1	.08

*Significant at the .05 level.

Table Key

SigPSQI = Significant PSQI Global Score (Poor Sleepers)

SigPSQI-PTSD = Significant PSQI-PTSD Global Scores (Presences of Post-Traumatic Stress Disorder Symptoms)

Overall 72% (n = 317) of participants met the significant criteria for the PSQI indicating poor sleep. This comprised 68.7% (n = 79) of men and 73.2% (n = 238) of women. A Pearson's Chi-Square analysis revealed that the difference between the distribution of men and women was not significant, $\chi^2 (1, n = 317) = .24, p = .63$. A total 37.9% (n = 167) of the sample met the significant criteria for the PSQI-A-PTSD indicating the presence of significant PTSD symptoms. Of this total 29.6% (n = 34) of men and 40.9% (n = 133) of women reported significant PTSD symptoms. A Pearson's Chi-Square analysis showed that the difference between the distribution of men and women was not significant, $\chi^2 (1, n = 167) = 2.97, p = .08$.

9.5.6 Multivariate MANOVA Analyses for PSQI Global Score and PSQI Components for Men and Women

A significant effect was observed for men and women on the combined dependent variable Sleep Quality, $F(7, 432) = 3.36, p < .01$; Wilks' Lambda = .95 ; partial $\eta^2 = .05$; however, the effect size was small in magnitude. Table 9.7 provides a summary of the

PSQI's components for the sample as function of gender. The results indicate significant differences were observed in two components at different alpha levels.

Table 9.7

Multivariate MANOVA Analyses for the PSQI Components for Men and Women

	Combined (N=440)		Men (n=115)		Women (n=325)		F	df	p	η^2
	M	SD	M	SD	M	SD				
SSQ	1.18	.69	1.14	.72	1.20	.68	.66	1	.42	.002
SL	1.41	1.01	1.43	.97	1.40	1.02	.10	1	.75	.0005
D	.60	.74	.49	.73	.64	.74	3.50	1	.06	.008
HSE	.48	.79	.26	.53	.56	.85	12.24**	1	.001	.027
SDist	1.30	.52	1.18	.45	1.32	.54	6.21*	1	.01	.014
USM	.19	.59	.26	.71	.17	.54	2.03	1	.16	.005
DD	1.35	.80	1.34	.82	1.35	.78	.02	1	.89	.0005

*** Significant at the .001 level.

** Significant at the .01 level.

* Significant at the .05 level.

η^2 = Partial Eta Squared

Table Key

SSQ = Subject Sleep Quality (Component 1)

SL = Sleep Latency (component 2)

D = Duration (Component 3)

HSE = Habitual Sleep Efficiency (Component 4)

SDist = Sleep Disturbance (Component 5)

USM = Use of Sleep Medication (Component 6)

DD = Daytime Dysfunction (Component 7)

A multivariate MANOVA analysis showed a significant difference between men and women for component 4 - Habitual Sleep Efficiency $F(1,438) = 12.24, p = .001$, partial $\eta^2 = .03$, however the effect size was very small in magnitude. A significant difference between men and women was also observed for component 5, Sleep disturbance, $F(1,438) = 6.21, p = .01$, partial $\eta^2 = .014$, but again the effect size was very small in magnitude.

9.5.7 Multivariate MANOVA Analyses for PSQI-A-PTSD Global Score and Items for Men and Women

A significant effect was found for men and women on the combined dependent variable PTSD symptoms, $F(7, 432) = 2.66, p < .05$; Wilks' Lambda = .96 ; partial $\eta^2 = .04$;

however, the effect size was small in magnitude. Table 9.8 shows the means, standard deviations and MANOVA results for the items on the PSQI-A-PTSD as a function of gender. The results also indicate significant differences in two components at different alpha levels.

Table 9.8

Multivariate MANOVA Analyses for the PSQI-A-PTSD Items for Men and Women

	Combined (N=440)		Men (n=115)		Women (n=325)		F	df	p	η^2
	M	SD	M	SD	M	SD				
HF	.39	.69	.32	.66	.49	.70	1.67	1	.20	.004
GN	.72	.87	.50	.79	.81	.88	10.48**	1	.001	.023
TNMs M	.55	.82	.53	.83	.56	.81	.09	1	.77	.0005
SANTR	.44	.74	.37	.72	.47	.75	1.62	1	.20	.004
BDNTR	.64	.81	.46	.76	.71	.81	8.10*	1	.005	.018
NT	.16	.44	.10	.36	.18	.47	2.19	1	.14	.005
AOD	.33	.64	.32	.71	.33	.62	.01	1	.91	.0005

*** Significant at the .001 level

** Significant at the .01 level

* Significant at the .05 level.

η^2 = Partial Eta Squared

Table Key

HF = Hot Flashes (Item 1a)

GN = General Nervousness (Item 1b)

TNMs M = Trauma Nightmares/Memories (Item 1c)

SANTR = Severe Anxiety Not Trauma Related (Item 1d)

BDNTR = Bad Dreams Not Trauma Related (Item 1e)

NT = Night-Terrors (Item 1f)

AOD = Acting Out Dreams (Item 1g)

A significant difference between men and women was observed for item (1b) General Nervousness $F(1,438) = 10.48$, $p = .001$, partial $\eta^2 = .02$, but, the effect size was quite small in magnitude. A significant difference between men and women was also observed for item (1e), Bad Dreams Not Trauma Related, $F(1,438) = 8.10$, $p = .005$, partial $\eta^2 = .018$, although the effect size was also very small in magnitude.

9.6 Analyses between Good and Poor Sleepers

9.6.1 Mean Number of Nightmares Reported by Good and Poor Sleepers

Table 9.9 presents the means, standard deviations and *t*-tests analyses for participants who reported yearly, monthly and weekly nightmares as a function of good and poor sleepers. The results indicate that no significant differences were observed between the average nightmares reported by good and poor sleepers across the three periodicities – yearly, monthly and weekly.

Table 9.9

Mean number of Yearly, Monthly and Weekly Nightmares and t-tests analyses for Good and Poor Sleepers

	Good Sleepers			Poor Sleepers			<i>Mdiff</i>	<i>T</i>	<i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>			
Yearly	67	3.25	2.34	122	3.57	2.17	.32	-.92	.36
Monthly	35	1.86	.81	99	1.92	.87	.06	-.37	.71
Weekly	7	1.70	.95	63	3.20	2.96	1.51	-1.33	.19

*Significant at the .05 level

Good sleepers reported an average of 3.25 nightmares a year while poor sleepers reported an average of 3.57 nightmares a year. The mean difference was .32 and an independent groups *t*-test showed that difference between good and bad sleepers was not significant, $t = -.92$, $df = 187$, $p = .17$. Good sleepers reported an average of 1.86 nightmares a month, whereas poor sleepers reported an average of 1.92 a month. The mean difference was .06 and the independent groups *t*-test showed that difference between good and poor sleepers was not significant, $t = -.37$, $df = 132$, $p = .71$. Good sleepers on average reported 1.7 nightmares a week and poor sleepers on average reported 2.96 nightmares a week. The mean difference was 1.5 and an independent groups *t*-test showed that the difference between good and poor sleepers was not significant, $t = -1.33$, $df = 68$, $p = .19$.

9.6.2 Mean Number of Nights with Nightmares Reported by Good and Poor Sleepers

Table 9.10 shows the means, standard deviations and *t*- tests results for participants who reported yearly, monthly and weekly nights with nightmares as a function of good and poor sleepers. The results again indicated that no significant differences were observed between the average nights with nightmares reported by good and poor sleepers across the three periodicities – yearly, monthly and weekly.

Table 9.10

Mean number of Yearly, Monthly and Weekly Nights with Nightmares and t-tests analyses for Good and Poor Sleepers

	<i>n</i>	Good Sleepers		Poor Sleepers			<i>Mdiff</i>	<i>T</i>	<i>p</i>
		<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>			
Yearly	68	3.10	2.31	123	3.51	2.32	.41	-1.17	.24
Monthly	36	1.75	.81	102	1.86	.83	.11	-.70	.48
Weekly	5	1.81	1.10	58	2.64	1.55	.84	-1.20	.24

*Significant at the 0.05 level

Good sleepers reported an average of 3.1 nights with at least one nightmare a year in comparison to poor sleepers who reported an average of 3.51 nightmares a year. The mean difference was .41 and an independent groups *t*-test found that difference between good and poor sleepers was not significant, $t = -1.17$, $df = 189$, $p = .24$. Good sleepers reported an average of 1.75 nights with at least one nightmare a month, while poor sleepers reported an average of 1.86 nights with at least one nightmare a month. The mean difference was .11 and the independent groups *t*- test showed that difference between good and poor sleepers was not significant, $t = -.70$, $df = 136$, $p = .48$. Good sleepers on average reported 1.8 nights with at least one night nightmares a week while poor sleepers on average reported 2.64 nights with at least one nightmare a week. The mean difference was .84 and an independent groups *t*- test showed that the difference between good and poor sleepers was not significant, $t = -1.20$, $df = 61$, $p = .24$.

9.6.3 Multivariate MANOVA analyses for PSQI-A-PTSD Items for Good and Poor Sleepers

A significant effect was observed between good and poor sleepers on the combined dependent variable PTSD symptoms $F(7, 432) = 56.44, p < .0005$; Hotelling's Trace = .09; partial $\eta^2 = .48$, and the effect size was medium in magnitude. Table 9.11 provides a summary of the MANOVA analyses for the PSQI-A-PTSD items as a function of quality of sleep. The results indicated significant differences in various components at different alpha levels.

Table 11

Multivariate MANOVA Analyses for the PSQI-A-PTSD Global Score and Items for Good and Bad Sleepers

	Combined (N=440)		Good (n = 123)		Poor (n = 317)		F	df	p	η^2
	M	SD	M	SD	M	SD				
HF	.39	.69	.19	.47	.47	.74	15.74***	1	.0005	.04
GN	.72	.87	.46	.63	.83	.93	16.30***	1	.0005	.04
TNMs M	.55	.82	.31	.56	.64	.88	15.36***	1	.0005	.03
SANTR	.44	.74	.20	.47	.54	.81	19.46***	1	.0005	.04
BDNTR	.64	.81	.44	.67	.72	.84	11.22**	1	.001	.03
NT	.16	.44	.08	.30	.19	.48	5.01*	1	.026	.01
AOD	.33	.64	.26	.54	.35	.68	1.87	1	.172	.004

*** Significant at the .001 level

** Significant at the .01 level

* Significant at the .05 level

η^2 = Partial Eta Squared

Table Key

PSTD Symp = PTSD Symptoms

HF = Hot Flashes (Item 1a)

GN = General Nervousness (Item 1b)

TNMs M = Trauma Nightmares/Memories (Item 1c)

SANTR = Severe Anxiety Not Trauma Related (Item 1d)

BDNTR = Bad Dreams Not Trauma Related (Item 1e)

NT = Night-Terrors (Item 1f)

AOD = Acting Out Dreams (Item 1g)

Analysis of each individual dependent variable showed that item 1(a) Hot flushes, item 1(b) General Nervousness, item 1(c) Trauma Nightmares/Memories, item 1(d) Severe Anxiety not Trauma related and item 1(e) Bad Dreams not Trauma related were

significant. A significant difference between good and poor sleepers was observed for item 1(a) Hot Flushes, $F(1,438) = 15.74$, $p = .0001$, partial $\eta^2 = .04$, however the effect size was very small in magnitude. A significant difference between good and poor sleepers was observed for item 1(b) General Nervousness, $F(1,438) = 16.30$, $p = .0001$, partial $\eta^2 = .04$, but the effect size was very small in magnitude. A significant difference between good and poor sleepers was observed for item 1(c) Trauma Nightmares/Memories, $F(1,438) = 15.36$, $p = .0001$, partial $\eta^2 = .03$, but the effect size was very small in magnitude. A significant difference between good and poor sleepers was observed for item 1(d) Severe Anxiety not Trauma related, $F(1,438) = 19.46$, $p = .0001$, partial $\eta^2 = .04$, but the effect size was very small in magnitude. A significant difference between good and poor sleepers was observed for item 1(e) Severe Anxiety not Trauma related, $F(1,438) = 11.22$, $p = .001$, partial $\eta^2 = .03$, but the effect size was very small in magnitude. Finally a significant difference between good and poor sleepers was observed for item (1f), night-terrors, $F(1,438) = 5.01$, $p = .026$, partial $\eta^2 = .004$ but the effect size was also very small in magnitude.

9.7 Analyses between Participants with Significant PTSD Symptoms and Participants with Non-Significant PTSD Symptoms

9.7.1 Mean number of Nightmares for Participants with Significant PTSD Symptoms and Participants with non-Significant PTSD Symptoms

Table 9.12 presents the means, standard deviations and t - tests analyses for participants who reported yearly, monthly and weekly nightmares as a function of the presence and absence of significant PTSD symptoms. The results indicate a significant difference was observed for monthly nightmare reports.

Table 9.12

Mean number of Yearly, Monthly and Weekly Nightmares and t-tests analyses for Participants with Significant PTSD Symptoms and Participants with non-Significant PTSD Symptoms

	Presence PTSD (n = 152)			Absence PTSD (n = 241)			<i>Mdiff</i>	<i>T</i>	<i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>			
Yearly	39	3.92	2.68	150	3.33	2.09	.59	-1.47	.14
Monthly	56	2.25	.81	78	1.65	.79	.60	-4.26**	.0005
Weekly	57	3.33	3.05	13	1.92	1.32	1.41	-1.63	.11

**Significant at the .001 level

Participants with significant PTSD symptoms reported an average of 3.92 nightmares a year while participants with non-insignificant PTSD symptoms reported an average of 3.57 nightmares a year. The mean difference was .59 and an independent groups *t*-test found that difference was not significant, $t = -1.47$, $df = 187$, $p = .14$. Participants with significant PTSD symptoms reported an average of 2.25 nightmares a month whereas participants with non-insignificant PTSD symptoms reported an average of 1.65 nightmares a month. The mean difference was .60 and the independent groups *t*-test showed that the difference was significant, $t = -4.26$, $df = 132$, $p = .0005$; with a medium effect size for Cohen's $d = .75$. Participants with significant PTSD symptoms reported an average of 3.33 nightmares a week while participants with non-insignificant PTSD symptoms reported an average of 1.92 nightmares a week. The mean difference was 1.41 and an independent groups *t*-test showed that the difference was not significant, $t = -1.63$, $df = 68$, $p = .11$.

9.7.2 Mean number of Nights with Nightmares for Participants with Significant PTSD Symptoms and Participants with non-Significant PTSD Symptoms

Table 9.13 presents the means, standard deviations and *t*-analyses results for participants who reported yearly, monthly and weekly nights with nightmares as a

function of the presence and absence of significant PTSD symptoms. The results again indicate a significant difference was observed for monthly nightmare reports.

Table 9.13

Mean number of Yearly, Monthly and Weekly Nights with Nightmares and t-tests analyses for Participants with Significant PTSD Symptoms and Participants with non-Significant PTSD Symptoms

	Presence PTSD (n = 152)			Absence PTSD (n = 240)			<i>Mdiff</i>	<i>T</i>	<i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>			
Yearly	39	3.54	2.81	152	3.15	2.01	.39	-.96	.34
Monthly	61	2.13	.76	77	1.60	.80	.53**	-3.98	.0005
Weekly	52	2.67	1.56	11	2.09	1.38	.58	-1.15	.26

**Significant at the .001 level

Participants with significant PTSD symptoms on average reported 3.54 nights with nightmares per year in comparison to participants with non-insignificant PTSD symptoms who reported an average of 3.15 per year. The mean difference was .39 and an independent groups *t*-test found that difference between the presence and absence of PTSD symptoms in this category was not significant, $t = -.96$, $df = 189$, $p = .34$. Participants with significant PTSD symptoms reported an average of 2.13 nights with nightmares a month while participants with non-insignificant PTSD symptoms reported an average of 1.60 nightmares a month. The mean difference was .80 and the independent groups *t*-test showed that difference was significant, $t = -3.98$, $df = 136$, $p = .0005$; with a medium effect size for Cohen's $d = .68$. Participants with significant PTSD symptoms reported an average of 2.67 nights with nightmares a week in contrast participants with non-insignificant PTSD symptoms reported an average of 2.09 nights with nightmares a week. The mean difference was .58 and an independent groups *t*-test found that difference was not significant, $t = -1.15$, $df = 61$, $p = .26$.

9.7.3 Multivariate MANOVA analyses for PSQI Global Score and PSQI Components for Participants with Significant PTSD Symptoms and Participants with non-Significant PTSD Symptoms

A significant effect was observed between the presence and absence of significant PTSD symptoms on the combined dependent variable Sleep Quality $F(7, 431) = 16.16$, $p < .0005$; Hotelling's Trace = .30; partial $\eta^2 = .23$, although the effect size was small in magnitude. Table 9.14 presents the means, standard deviations and MANOVA analyses for the PSQI components as a function of the presence and absence of significant PTSD symptoms. The results indicate significant differences were observed across all components at different alpha levels.

Table 9.14

Multivariate MANOVA Analyses for the PSQI Components for Participants with Significant PTSD Symptoms and Participants with non-Significant PTSD Symptoms

	Combined (N=440)		Presence PTSD (n = 159)		Absence PTSD (n = 281)		F	df	p	η^2
	M	SD	M	SD	M	SD				
SSQ	1.18	.69	1.46	.71	1.02	.63	43.58**	1	.0005	.09
SL	1.41	1.01	1.66	1.00	1.27	.99	15.92**	1	.0005	.04
D	.60	.74	.81	.87	.48	.63	20.28**	1	.0005	.04
HSE	.48	.79	.66	.93	.38	.68	13.42**	1	.0005	.03
SDist	1.29	.52	1.55	.57	1.14	.43	76.15**	1	.0005	.15
USM	.19	.59	.31	.76	.12	.47	10.63*	1	.001	.02
DD	1.35	.80	1.69	.79	1.16	.73	49.90**	1	.0005	.10

** Significant at the .001 level

* Significant at the .01

η^2 = Partial Eta Squared

Table Key

GSc = Global Score

SSQ = Subject Sleep Quality (Component 1)

SL = Sleep Latency (component 2)

D = Duration (Component 3)

HSE = Habitual Sleep Efficiency (Component 4)

SDist = Sleep Disturbance (Component 5)

USM = Use of Sleep Medication (Component 6)

DD = Daytime Dysfunction (Component 7)

Significant differences were observed across all the components. A significant difference was observed for component 1, Subject Sleep Quality, $F(1,438) = 43.58$, $p =$

.0001, partial $\eta^2 = .09$, however the effect size was small in magnitude. A significant difference was observed for component 2, Sleep Latency, $F(1,438) = 15.92$, $p = .0001$, partial $\eta^2 = .04$, but the effect size was very small in magnitude. A significant difference was observed for component 3 Duration, $F(1,438) = 20.28$, $p = .0001$, partial $\eta^2 = .04$, however the effect size was again very small in magnitude. A significant difference was observed for component 4 Habitual Sleep Efficiency, $F(1,438) = 13.42$, $p = .0001$, partial $\eta^2 = .03$, however the effect size was very small in magnitude. A significant difference was observed for component 5, Sleep Disturbance, $F(1,438) = 76.15$, $p = .0001$, partial $\eta^2 = .15$, although the effect size was small in magnitude. A significant difference was observed for component 6, Use of Sleep Medication, $F(1,438) = 10.63$, $p = .0001$, partial $\eta^2 = .02$, however the effect size was very small in magnitude. Finally a significant difference was observed for component 7, Daytime Dysfunction, $F(1,438) = 20.28$, $p = .0001$, partial $\eta^2 = .04$, but the effect size was very small in magnitude.

9.8 Analyses between Participants who exclusively reported Idiopathic, Trauma, and both Trauma and Idiopathic Nightmares

9.8.1 Frequency of Different Types of Nightmares Reported

Table 9.15 provides a summary of the frequency and percentage of participants who exclusively reported trauma-related nightmares, idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmares.

Table 9.15

Frequency of Trauma, Idiopathic, and combined Trauma and Idiopathic Nightmares reported

Variable	Combined (n = 250)	
	n	%
Trauma NMs	53	21.20
Idiopathic NMs	89	35.60
Trauma & Idiopathic	108	43.20

Note: 143 participants did not indicate whether their nightmares were trauma or idiopathic in nature.

A total of 12.2% (n = 53) of participants exclusively reported trauma-related nightmares and 35.6% (n = 89) of participants exclusively reported idiopathic nightmares. A combined total of 43.2% (n = 108) of participants reported both trauma-related and idiopathic nightmares.

9.8.2 Frequency of Yearly, Monthly and Weekly Trauma and Idiopathic Nightmares Reported

Table 9.16 summarizes the frequency of yearly, monthly and weekly trauma-related, idiopathic and combined trauma and idiopathic nightmares reported.

Table 9.16

Frequency of Yearly, Monthly and Weekly Nightmares as a Function of Nightmare Type

	Trauma NMs (n = 53)		Idiopathic NMs (n = 89)		Trauma & Idiopathic NMs (n = 108)	
	n	%	n	%	n	%
Yearly	32	60.38	30	33.71	22	20.37
Monthly	16	30.19	41	46.07	44	40.73
Weekly	5	9.43	18	20.22	42	38.90

From the participants who exclusively reported trauma-related nightmares, 60.4% (n = 32) reported yearly trauma-related nightmares. A further 30.2% (n = 16) reported monthly trauma-related nightmares and 9.4% (n = 5) reported weekly trauma-related

nightmares. From the participants who exclusively reported idiopathic nightmares, 33.7% (n = 30) reported yearly idiopathic nightmares. In addition, 46.1% (n = 41) reported monthly idiopathic nightmares and 20.2% reported weekly idiopathic nightmares. From the participants who reported trauma-related and idiopathic nightmares, 20.4% (n = 22) reported yearly nightmares, 40.7% (n = 44) reported monthly nightmares and 38.9% (n = 42) reported weekly nightmares.

9.8.3 Multivariate MANOVA Analyses for Nightmare Type

Table 9.17 presents MANOVA analyses for participants who exclusively reported trauma-related nightmares, idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmares. The results indicate that significant differences were observed for yearly and weekly nightmares.

Table 9.17

Multivariate MANOVA Analyses for Yearly, Monthly and Weekly Nightmares as a function of Nightmare Type

	Trauma NMs (n = 53)		Idiopathic NMs (n = 89)		Trauma & Idiopathic NMs (n = 108)		F	df	p	η^2
	M	SD	M	SD	M	SD				
Yearly	2.02	2.31	1.61	2.73	.75	1.70	6.78	2	.001**	.05
Monthly	.62	1.06	.75	.98	.93	1.24	1.43	2	.241	.01
Weekly	.28	.91	.51	1.42	1.32	2.64	6.61	2	.002**	.05

**Significant at the .01 level

A significant effect was observed between participants, who reported yearly trauma-related, idiopathic, and trauma-related and idiopathic nightmares ($F(2, 247) = 6.78, p = .001$, partial $\eta^2 = .05$). Utilizing the Bonferroni *post-hoc* test, significant differences were observed between participants who exclusively reported yearly trauma-related nightmares and participants who reported both trauma-related and idiopathic

nightmares ($p = .003$); and between participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmares ($p = .025$). However, the effect size was very small in magnitude ($\eta^2 = .05$)

A significant difference was not observed for participants who exclusively reported monthly trauma-related and idiopathic nightmares, and both trauma-related and idiopathic nightmares $F(2, 247) = 1.43, p = .241$, partial $\eta^2 = .01$. However, a significant difference was observed between participants who reported weekly trauma-related nightmares, weekly idiopathic nightmares, and both trauma-related and idiopathic nightmares ($F(2, 247) = 6.61, p = .002$, partial $\eta^2 = .05$). Employing the Bonferroni *post-hoc* test, significant differences were observed between participants who exclusively reported trauma-related nightmares and participants who reported both trauma related and idiopathic nightmares ($p = .006$); and between participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmare groups ($p = .012$). However, the effect sizes were very small in magnitude ($\eta^2 = .05$)

9.8.4 Multivariate MANOVA Analyses for PSQI Global score and PSQI components for Nightmare Type

A significant difference was observed between participants who exclusively reported trauma-related nightmares, idiopathic nightmares, and between participants who reported both trauma-related and idiopathic nightmares on the combined dependent variable Sleep Quality $F(2, 247) = 9.56, p = .0005$, partial $\eta^2 = .072$. Utilizing the Bonferroni *post-hoc* test significant differences were found between participants who

exclusively reported trauma-related nightmares and participants who reported both trauma-related and idiopathic nightmare groups ($p = .002$); and between participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmare groups ($p = .001$).

Table 9.18 shows MANOVA analyses for the PSQI components for participants who exclusively reported trauma-related nightmares, idiopathic nightmares and both trauma-related and idiopathic nightmares. The results indicate that significant differences were observed for Subject Sleep Quality, Duration, Habitual Sleep Efficiency, Sleep Disturbance and Daytime Dysfunction at different alpha levels.

Table 9.18

Multivariate MANOVA Analyses for the PSQI Global Score and Components as a function of Nightmare Type

	Trauma (n = 53)		Idiopathic (n = 89)		Trauma & Idiopathic (n = 108)		<i>F</i>	<i>df</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
SSQ	1.23	.64	1.21	.68	1.45	.70	3.66*	2	.027	.029
SL	1.43	1.10	1.40	.96	1.66	1.00	1.78	2	.170	.014
D	.64	.79	.44	.62	.88	.91	7.56*	2	.001	.058
HSE	.34	.73	.58	.82	.70	.94	3.20*	2	.043	.025
SDist	1.20	.52	1.37	.51	1.57	.57	9.73***	2	.0005	.073
USM	.19	.48	.16	.45	.33	.83	2.01	2	.137	.016
DD	1.40	.69	1.35	.77	1.65	.82	4.26*	2	.015	.033

*** Significant at the .001 level

** Significant at the .01 level

* Significant at the .05 level

η^2 = *Partial Eta Squared*

Table Key

SSQ = Subject Sleep Quality (Component 1)

SL = Sleep Latency (component 2)

D = Duration (Component 3)

HSE = Habitual Sleep Efficiency (Component 4)

SDist = Sleep Disturbance (Component 5)

USM = Use of Sleep Medication (Component 6)

DD = Daytime Dysfunction (Component 7)

A significant difference was observed for component 1 Subject Sleep Quality, ($F(2, 247) = 3.66, p = .027, \text{partial } \eta^2 = .029$). Employing the Bonferroni *post-hoc* test a significant differences was found between participants who exclusively reported trauma related nightmares and participants who reported both trauma related and idiopathic nightmare groups ($p = .01$). A significant difference was also observed for component 3, Duration, $F(2, 247) = 7.56, p = .001, \text{partial } \eta^2 = .058$. The Bonferroni *post-hoc* test found a significant difference between participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmares ($p = .0005$).

A significant difference was also observed for component 4, Habitual Sleep Efficiency, $F(2, 247) = 3.20, p = 0.43, \text{partial } \eta^2 = .025$. Employing the Bonferroni *post-hoc* test a significant differences was found between participants who exclusively reported trauma-related nightmares and participants who reported both trauma-related and idiopathic nightmare groups ($p = .036$). A significant difference was observed for component 5, Sleep Disturbance, $F(2, 247) = 9.73, p = .0005, \text{partial } \eta^2 = .073$. Employing the Bonferroni *post-hoc* test a significant differences was found between participants who exclusively reported trauma-related nightmares and participants who reported both trauma-related and idiopathic nightmare groups ($p = .0001$). A significant difference was also observed for component 7, Daytime Dysfunction, $F(2, 247) = 4.26, p = .015, \text{partial } \eta^2 = .033$. Utilizing the Bonferroni *post-hoc* test a significant difference between participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmare groups ($p = .023$)

9.8.5 Multivariate MANOVA Analyses for PSQI-A-PTSD Global score and PSQI-A-PTSD Items for Nightmare Type

A significant difference was observed between participants who exclusively reported trauma-related nightmares, idiopathic nightmares and participants who reported trauma-related and idiopathic nightmares on the combined dependent variable significant PTSD symptoms $F(2, 247) = 32, p = .0005, \text{partial } \eta^2 = .206$. Employing the Bonferroni *post-hoc* test significant differences were found between participants who exclusively reported trauma-related nightmares and participants who reported both trauma-related and idiopathic nightmare nightmares ($p = .0005$), and between participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmares ($p = .0005$).

Table 9.19 presents the means, standard deviations and MANOVA results for the PSQI-A-PTSD items for participants who exclusively reported trauma-related nightmares, idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmares.

Table 9.19

MANOVA Analyses for the PSQI-A-PTSD Global Score and Items as a function of Nightmare Type

	Trauma (n = 53)		Idiopathic (n = 89)		Trauma & Idiopathic (n = 108)		<i>F</i>	<i>df</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
HF	.34	.65	.52	.72	.57	.81	1.76	2	.174	.014
GN	.91	.90	.70	.79	.98	1.01	2.43	2	.090	.019
TNMs M	1.30	.57	.01	.11	1.49	.70	202.06***	2	.0005	.621
SANTR	.47	.89	.48	.77	.80	.83	4.58*	2	.011	.036
BDNTR	.02	.12	1.26	.51	1.46	.70	130.96***	2	.0005	.515
NT	.09	.29	.18	.47	.38	.65	6.32**	2	.002	.049
AOD	.35	.68	.36	.61	.57	.86	2.59	2	.077	.021

*** Significant at the .001 level

** Significant at the .01 level

*Significant at the .05 level

$\eta^2 = \text{Partial Eta Squared}$

Table Key

PSTD Symp = PTSD Symptoms

HF = Hot Flushes (Item 1a)

GN = General Nervousness (Item 1b)

TNMs M = Trauma Nightmares/Memories (Item 1c)

SANTR = Severe Anxiety Not Trauma Related (Item 1d)

BDNTR = Bad Dreams Not Trauma Related (Item 1e)

NT = Night-Terrors (Item 1f)

AOD = Acting Out Dreams (Item 1g)

A significant difference was observed for item 1 (c) Trauma Nightmares/Memories $F(2, 247) = 202.1, p = .0001, \text{partial } \eta^2 = .62$. Utilizing the Bonferroni *post-hoc* test significant differences were found between participants who exclusively reported trauma-related nightmares and participants who exclusively reported idiopathic nightmares ($p = .0005$) and participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmares ($p = .0005$).

A significant difference was observed for Item 1(d) Severe Anxiety Not Trauma Related ($F(2, 247) = 4.58, p = .011, \text{partial } \eta^2 = .036$). The Bonferroni *post-hoc* test found a significant difference between participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmare nightmares (.025).

A significant difference was observed for Item 1(e) Bad Dreams Not Trauma Related ($F(2, 247) = 130.96, p = .0005, \text{partial } \eta^2 = .515$). Employing the Bonferroni *post-hoc* test significant differences were found between participants who exclusively reported-trauma related nightmares and participants who exclusively reported idiopathic nightmares ($p = .0005$); participants who exclusively reported trauma-related nightmares and participants who reported both trauma-related and idiopathic nightmare

nightmares (.0005); and participants who exclusively reported idiopathic nightmares and participants who reported both trauma-related and idiopathic nightmares (.032).

A significant difference was also found for item 1(f) Night-Terrors ($F(2, 247) = 131$, $p = .0001$, partial $\eta^2 = .52$). Utilizing the Bonferroni *post-hoc* test a significant difference was found between participants who exclusively reported trauma related nightmares and participants who reported both trauma related and idiopathic nightmare groups ($p = .004$).

9.9 Second Study: Treatment Phase

Participants were randomly allocated to either the treatment group (Storyline Alteration Technique [SLAT]) or comparison group (Systematic Desensitization [SysD]). Both groups were administered the Nightmare Frequency Questionnaire (NFQ), Pittsburgh Sleep Quality Index (PSQI), Nightmare Effects Survey (NES), Posttraumatic Diagnostic Scale (PDS) and Profile of Mood States (POMS-37 item / POMS-SF).

9.10 Hypothesized Findings

The second study had four hypotheses; the first hypothesis predicted that participants who received the SLAT treatment over-time (pre-post) would experience a significant decrease in nightmare frequency. A Wilcoxon matched-pairs signed ranks test was employed to ascertain the SLAT treatment efficacy overtime. The second hypothesis predicted that participants who received SysD over-time (pre-post) would experience a significant decrease in nightmare frequency. A Wilcoxon matched-pairs signed ranks

test was implemented to determine the SysD treatment efficacy overtime. The third hypothesis predicted that participants who received the SLAT treatment would report significantly less nightmares in comparison to participants who received the SysD post-treatment. A Mann-Whitney *U-test* was conducted to ascertain significant differences between the efficacy of the SLAT and SysD treatments. Finally, the fourth hypothesis predicted that participants who received the SLAT treatment would report better outcomes on the other sleep related metrics (sleep quality, negative nightmare effects and emotional states) in comparison to participants who received the SysD treatment. Mann-Whitney *U-tests* was conducted to ascertain significant differences between the efficacy of the SLAT and SysD treatments across the designated variables – sleep quality, negative nightmare effects and emotional moods/states of participants.

9.11 Descriptive Analyses of the Treatment Sample

9.11.1 Means and Standard Deviations for the Treatment Sample

Table 9.19 presents a summary of the means and standard deviations for the following variables Age, Nightmares, Nights with Nightmares, Sleep Quality, Nightmare Effects, PTSD symptoms and Mood States for the combined sample and as a function of treatment assignment.

Table 9.19

Means and Standard Deviations for the Variables in the Treatment Sample

Variable	Combined (20)		SLAT (11)		SysD (9)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	21.50	3.35	22.30	3.70	20.70	3.00
NMs	3.15	1.73	3.27	2.20	3.00	1.00
Nights NMs	2.80	1.40	2.81	1.66	2.78	1.10
PSQI Global Score	7.95	3.22	7.90	3.60	8.00	2.83
NES Total Score	15.39	8.22	15.45	8.90	15.33	7.53
PDS Total Score	12.28	12.45	13.45	8.70	11.11	16.20
POMS – 37 Total Score	39.92	28.77	39.18	31.18	40.66	25.36

The mean age for the treatment sample was 21.50 years ($SD = 3.35$). The range for age was 5 with a minimum age of 19 and maximum of 24 years. Participants reported a weekly nightmare mean of 3.15 ($SD = 1.73$) and a weekly nights with nightmares mean of 2.8 ($SD = 1.4$). The range for nightmares was 6 with a minimum of 1 and maximum of 7 nightmares per week. For nights with nightmares the range was 5, with a minimum of 1 and maximum of 6 nights per week.

Figure 9.1 illustrates the percentage of participants who met the significance criteria for the PSQI in the sample and as a function of treatment assignment.

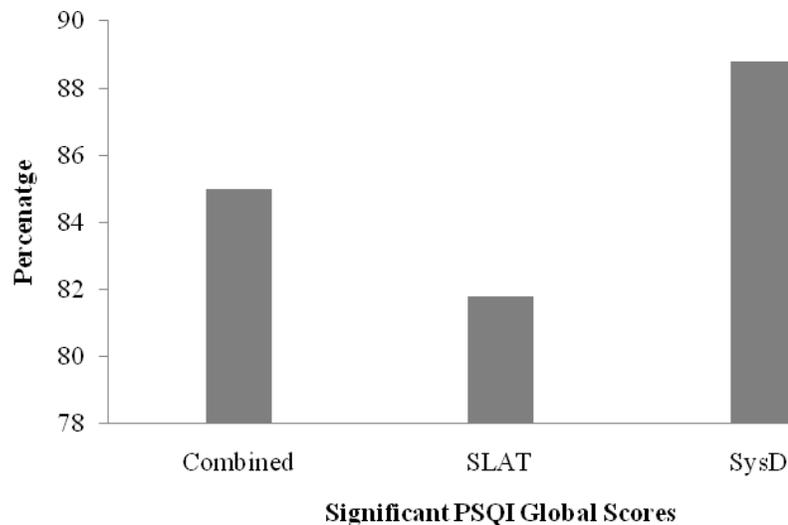


Figure 9.1. Significant PSQI global scores as a function of treatment

Overall, 85% (n = 17) of participants in the treatment phase met the criteria of significance for the PSQI Global Score. This comprised 81.8% (n = 9) of participants in the SLAT treatment group and 88.8% (n = 8) of participants in the SysD comparison group.

The Nightmare Effects Survey (NES) found that 65% (n = 13) of participants believed that nightmares affected other parts of their lives. In addition 100% (n = 20) of participants reported associated effects related to nightmare incidents.

Figure 9.2 illustrates the percentage of participants who met the significance criteria for the PDS in the sample and as a function of treatment assignment.

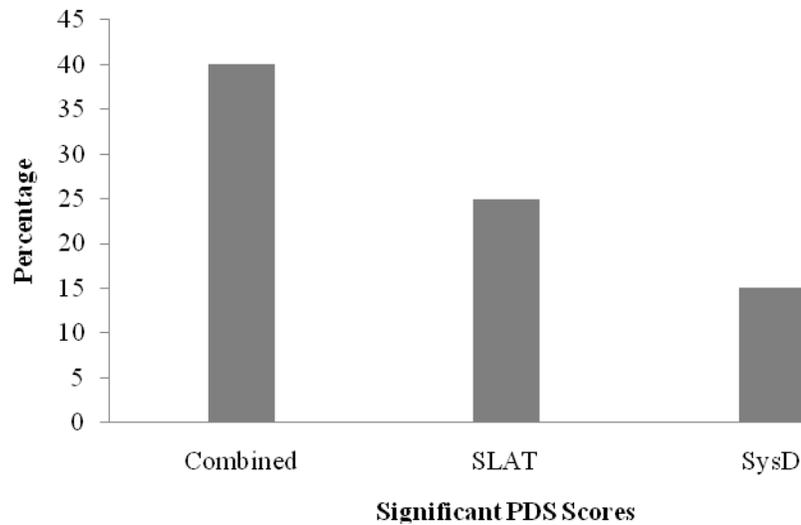


Figure 9.2. Significant PDS scores as a function of treatment

The PDS shows that 75% (n = 15) of the sample reported PTSD symptoms, and 40% (n = 8) had a positive screening for the PDS. A total of 25% (n = 5) in the SLAT treatment group and 15% (n = 3) in the SysD comparison group had a positive screening for the PDS.

The POMS-37 found that 90% (n = 18) of the sample were experiencing mood disturbance pre-treatment. This comprised 90.90% (n = 10) of participants in the SLAT treatment group and 88.88% (n = 8) of participants in the SysD comparison group.

9.12 Inferential Analyses at Baseline

9.12.1 Independent Groups T-Tests for Age, NFQ, PSQI Global Score, NES Total Score and POM-37 Total Score as a function of Treatment

Table 9.20 shows pre-treatment analyses for the following variables Age, NFQ, PSQI Global Score, NES Total Score, PDS Total Score and POM-37 Total Score as a function of treatment.

Table 9.20

Means and Independent Group T-Test analyses for Age, NFQ, PSQI Global Score, NES Total Score and POM-37 Total Score as a function of Treatment Assignment

	SLAT (11)		SysD (9)		Mdiff	t	df	P
	M	SD	M	SD				
Age	22.30	3.72	20.72	3.00	1.61	.97	18	.35
NFQ NMs	3.27	2.20	3.00	1.00	.27	.37	14.55	.72
NFQ Nights w NMs	2.81	1.66	2.78	1.10	.03	.06	18	.95
PSQI Global Score	7.91	3.60	8.00	2.83	1.00	-.06	18	.95
NES Total Score	15.45	8.91	15.33	7.53	.12	.03	18	.98
PDS Total Score	13.45	8.70	11.11	16.21	2.34	.41	18	.68
POMS-37 Total Score	39.18	32.18	40.66	25.36	1.48	-.11	18	.91

* Significant at the .05 level

No significant differences were observed pre-treatment between the SLAT and SysD groups for the variables examined.

Table 9.21 shows the mean, standard deviations and independent group t -test analyses for NES components pre-treatment as a function of treatment assignment

Table 9.21

Mean number of Nightmare Effects and t-test analyses as a function of Treatment

	Combined (20)		SLAT (11)		SysD (9)		Mdiff	t	df	P
	M	SD	M	SD	M	SD				
SNA	1.95	.89	2.18	.87	1.67	.87	.51	1.32	18	.20
WNA	1.35	1.04	1.54	1.03	1.11	1.05	.43	.93	18	.37
RNA	1.55	1.19	1.09	.83	2.11	1.36	.88	-2.06	18	.054
DTENA	1.70	1.17	1.54	1.21	1.89	1.17	.35	-.64	18	.53
SNA	1.40	1.05	1.54	.93	1.22	1.20	.32	.68	18	.51
MNA	2.15	.93	1.91	.83	2.44	1.01	.53	-1.30	18	.21
SLNA	.60	.99	.73	1.19	.44	.73	.46	.62	18	.54
DNA	.75	.91	.82	1.08	.67	.71	.37	.36	18	.72
MLNA	1.95	1.28	1.90	1.22	2.02	1.41	.01	-.15	18	.88
PHNA	.95	1.01	.91	1.14	1.01	.87	.04	-.20	18	.85
LANA	1.05	1.15	1.27	1.19	.78	1.09	.49	.96	18	.35

* Significant at the .05 level

Table Key

- SNA = Sleep Negatively Affected
- WNA = Work Negatively Affected
- RNA = Relationships Negatively Affected
- DTENA = Daytime Energy Negatively Affected
- SNA = School Negatively Affected
- MNA = Mood Negatively Affected
- SLNA = Sex Life Negatively Affected
- DNA = Diet Negatively Affected
- MLNA = Mental Life Negatively Affected
- PHNA = Physical Health Negatively Affected
- LANA = Leisure Activities Negatively Affected

No significant differences were observed pre-treatment between the SLAT and SysD groups for all the NES components.

Table 9.22 shows the mean, standard deviations and independent group t -test analyses for POMS-37 subscales pre-treatment as a function of treatment.

Table 9.22

Means for the Profile of Mood States Total Scores and Subscales and independent group t-test analyses as a function of Treatment

	Combined (20)		SLAT (11)		SysD (9)		Mdiff	t	df	p
	M	SD	M	SD	M	SD				
Tension	10.81	5.27	11.18	6.88	10.33	4.27	.85	.32	18	.75
Depression	10.30	8.49	10.09	8.35	10.56	9.15	.47	-.12	18	.91
Anger	9.00	6.99	9.27	7.36	8.67	6.93	.60	.19	18	.85
Fatigue	7.35	4.42	7.82	4.73	6.78	4.21	1.04	.51	18	.61
Confusion	10.40	5.21	10.18	6.26	10.67	3.90	.49	-.20	18	.84
Vigor	7.02	4.63	6.81	4.58	7.22	4.97	.41	-.19	18	.85

* Significant at the .05 level

No significant differences were observed between treatments for the POMS-37 subscales. Overall at baseline the SLAT and SysD groups were not significantly different in any of the variables examined thus internal validity may be considered assumed.

9.13 Pre-Post treatment Analyses for NFQ NMs, PSQI Global, NES and POM-37

9.13.1 Wilcoxon matched-pairs signed ranks analyses for the NFQ NMs, PSQI Global, NES and POM-37

Table 9.23 presents the pre- and post- treatment Wilcoxon matched-pairs signed ranks tests analyses for the NFQ NMs, PSQI Global, NES and POM-37.

Table 9.23

Median, Interquartile range and Wilcoxon matched-pairs signed ranks tests as a function of Treatment (Pre-Post)

	SLAT (11)						SysD (9)					
	Pre		Post		Mdiff	P	Pre		Post		Mdiff	p
	Mdn	IQR	Mdn	IQR			Mdn	IQR	Mdn	IQR		
NFQ NMs	3	5	0	1	3	.005**	3	0	2	2	1	.13
PSQI	7	6	5	2	2	.007**	7	4.51	6	4.51	1	.08
NES	17	17	9	14	6	.20	14	12.50	9	10	5	.09
POMS	32	53	22	43	11	.11	37	30.52	13	49	24	.06

** Significant at the .01 level

Mdn = Median Mdiff = Median Difference
IQR = Interquartile Range

Significant differences were observed for the NFQ NMs and the PSQI Global score in the SLAT treatment group. The median difference between pre- and post- treatment for the NFQ NMs in the SLAT treatment group was 3 and a Wilcoxon matched-pairs signed ranks test found that the difference was statistically significant ($z = -2.82, p < .01$). For the PSQI Global scores the median difference between pre and post treatment was 2 and a Wilcoxon matched-pairs signed ranks test also found that the difference was significant ($z = -2.72, p < .01$).

9.13.2 Qualitative Analysis

Participants were also required to comment on the most therapeutic element in the treatments employed. From the participants assigned to the SLAT treatment, 80.81 % ($n = 9$) reported that the most effective element in the treatment was the information/knowledge that dreamers were the authors and editors of their dreams (including nightmares). From the participants assigned to the SysD treatment, 66.67% ($n = 6$) reported that the most effective element in the treatment was the relaxation technique.

9.14 Post treatment Analyses for the NFQ NMs, PSQI Global Score, NES Total Score and POM-37 Total Score as a function of Treatment

9.14.1 Mann-Whitney U-test Analysis for the NFQ

Figure 9.3 illustrates the median difference post-treatment comparison between the SLAT and SysD treatment groups.

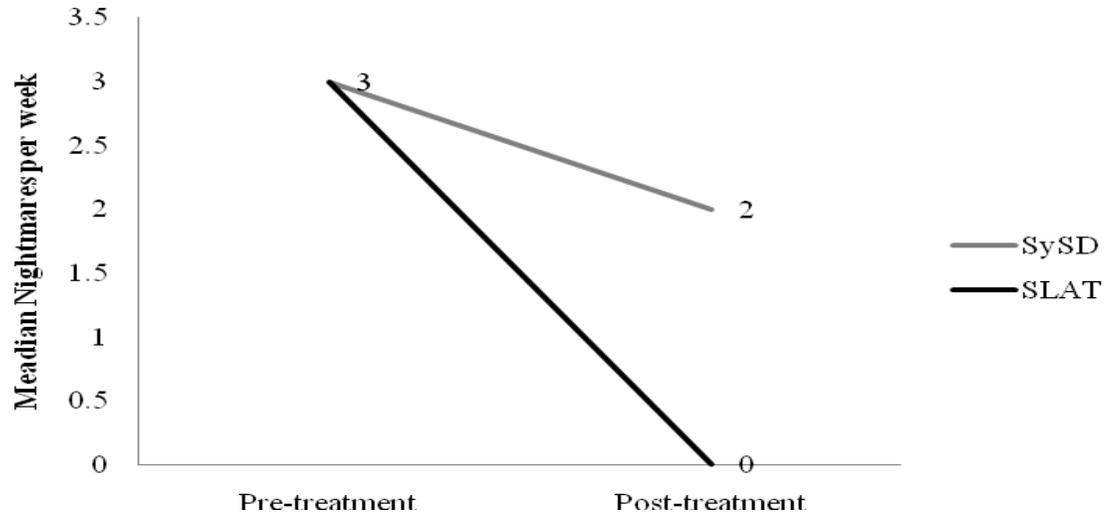


Figure 9.3. Post-treatment analysis for the NFQ NMs as a function of Treatment

The median difference post-treatment was 2 nightmares per week and a Mann-Whitney *U*-test found the difference was statistically significant ($U = 13.0$, $N1 = 11$, $N2 = 9$, $p = .004$, one-tailed). Nevertheless, both the SLAT and SysD groups reported a decrease in nightmare frequency; however the SLAT treatment group median post treatment was zero nightmares in contrast to the SysD comparison group median post treatment was 2 nightmares.

9.14.2 Mann-Whitney *U*-test Analysis for the PSQI Global Scores

Figure 9.4 illustrates the PSQI global score post-treatment median comparison between the SLAT and SysD groups.

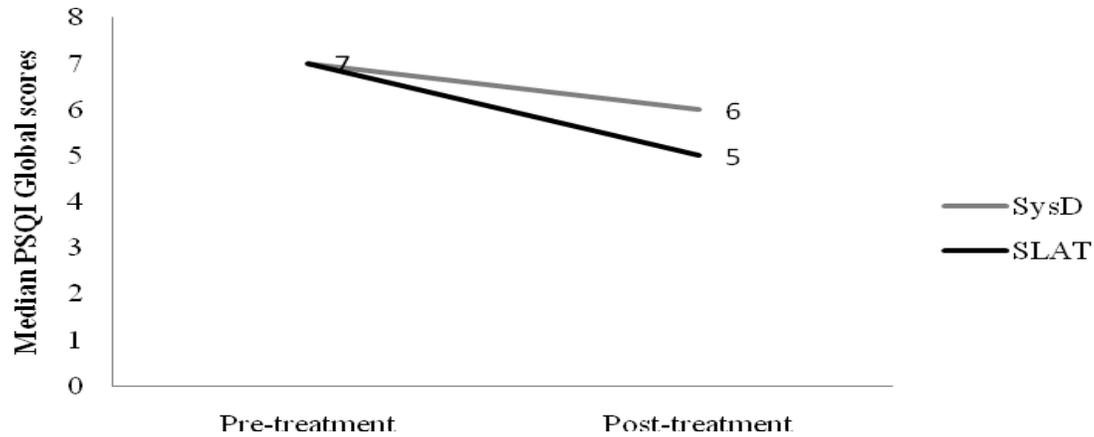


Figure 9.4 Post-treatment analysis for the PSQI Global Scores as a function of Treatment

The median difference between the SLAT and SysD groups post-treatment was 1 and a Mann-Whitney *U*-test found the difference was not statistically significant ($U = 28.0$, $N1 = 11$, $N2 = 9$, $p = .112$, one-tailed). However, both the experimental and comparison groups reported a decrease in the median PSQI global scores. The SLAT group reported a larger decrease in the median PSQI global score in comparison to the SysD group 2 and 1 respectively.

9.14.3 Mann-Whitney *U*-test Analysis for the NES Total Scores

Figure 9.5 presents the NES total score post-treatment median comparison between the SLAT and SysD groups.

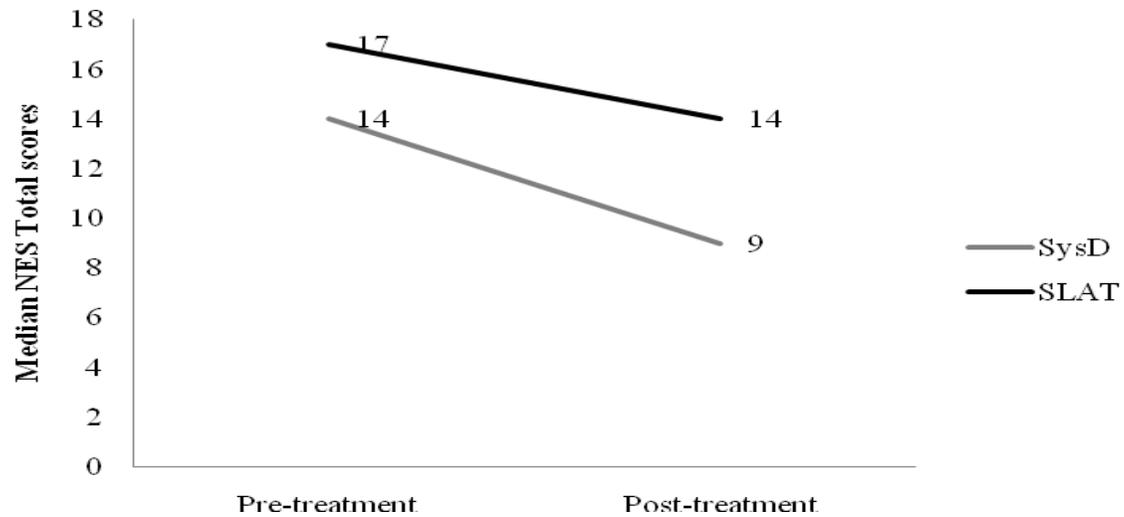


Figure 9.5. Post-treatment analyses for the NES Total Scores as a function of Treatment.

The median difference post-treatment between the SLAT and SysD groups was 5 and a Mann-Whitney *U-test* found the difference was not significant ($U = 47.5$, $N1 = 11$, $N2 = 9$, $p = 0.882$, one-tailed). Nonetheless, both groups reported a decrease in the NES total score median; however the SysD group reported a greater decrease in the NES total score median post-treatment 5 in contrast to the SLAT group 3.

9.14.4 Mann-Whitney *U-test* Analysis for the POMS-37

Finally figure 9.6 illustrates the POMS-37 total score post-treatment comparison between the SLAT and SysD groups.

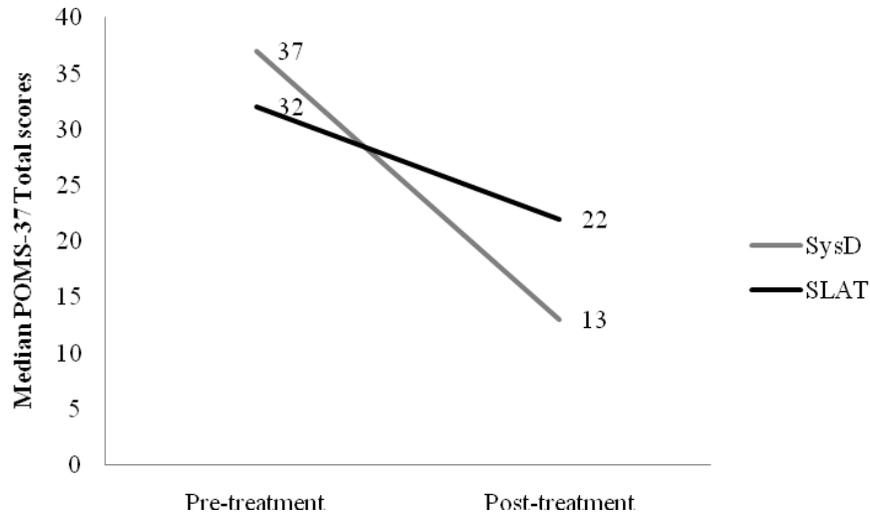


Figure 9.6 Post-treatment analysis for the POMS Total Scores as a function of Treatment

The median difference between the SLAT and SysD groups was 9 and a Mann-Whitney *U*-test found that this difference was not significant ($U = 43.0$, $N_1 = 11$, $N_2 = 9$, $p = .06$, one-tailed). Again both groups reported a decrease in the median POMS-37 total score post-treatment; however the SysD group reported a considerably lower median POMS-37 total score 13 in comparison to the SLAT group 22.

Chapter 10

Discussion

First Study

The first study 'Nightmares, Sleep Quality and PTSD symptoms Survey' proposed four hypotheses which will be addressed and discussed in the following sections.

10.1 First Hypothesis

The first hypothesis for the first study predicted that more than 10% (Levin & Nielsen, 2007; Nielsen & Zadra, 2000) of the sample ($n > 44$) would report weekly nightmares. It was found that 15.9% of the sample ($n = 70$) reported at least one nightmare a week. Hence the first hypothesis was supported. This finding is consistent with Levin and Nielsen's (2007) contention that the weekly nightmare frequency range of 4% - 10% reported in retrospective contemporary studies is conservative. Nightmare studies that have used the same (nightmare) operational definition (bad/dysphoric dreams that awaken the sleeper) and have surveyed similar samples (university cohorts) and have implemented similar metrics (retrospective instruments); have consistently found that 5% of samples report weekly nightmares (Feldman & Hersen, 1967; Levin, 1988; 1994). For instance, Feldman and Hersen (1967) surveyed 1,317 students and under the 'frequent' category (at least once a week), 5% ($n = 64$) reported at least one nightmare per week. In addition, Levin (1994) surveyed 3,433 students who responded to the question; 'How often do you recall a nightmare?' found that 4% reported recalling at least one nightmare per week, with an additional 1% recalling more than one nightmare per week.

Miro and Martinez (2005) also surveyed a similar cohort and employed the same retrospective metric - NFQ as the current study; found that 8.2% reported weekly nightmares. Although the current study employed the NFQ - unlike Miro and Martinez's (2005) study participants were specifically instructed to report nightmares, bad/dysphoric dreams that awaken the sleeper. The purpose of this instruction was to differentiate between the more frequently reported bad dreams (Zadra & Donderi, 2000) in contrast to the less frequently reported nightmares; in order to ascertain a more accurate weekly estimate of the actual subject matter 'nightmares'. Nevertheless, despite the difference between the operational definitions employed by Miro and Martinez, and the current study – the difference is almost double of the weekly frequency estimate reported - 15.9% in contrast to 8.2%.

The consensus in the nightmare frequency literature is that retrospective nightmare frequency studies have drastically underestimated the actual prevalence of nightmares (Levin & Nielsen, 2007; Wood & Bootzin, 1990; Zadra & Donderi, 2000). Moreover the wide variability reported by the numerous frequency studies reviewed in the current thesis also indicates that the actual prevalence of nightmares has not been accurately estimated. Wood and Bootzin (1990) in their ground breaking work were the first to point out that the prospective nightmare frequency results were considerably higher (2.5 times higher when estimating the mean annual nightmare frequency) than the results reported via the retrospective metrics employed in the same study. Wood and Bootzin found that 47% (n = 103) of the 220 university participants, reported one nightmare experience in the two week period that nightmare logs were maintained.

Analyzing the Wood and Bootzin data in greater detail 21.4% of participants reported two or more nightmares during the same period, which could be indicative of the weekly nightmare estimate (one nightmare per week), however Wood and Bootzin do not allude to this observation. Nonetheless, support for these findings was provided by Zadra and Donderi (2000) who found similar results in a sample of 103 university students. But instead of maintaining a two week log, students were required to maintain a four week log. Zadra and Donderi concluded that nightmares were in fact more prevalent than previously believed and claimed that their findings extended the work of Wood and Bootzin. Furthermore, Levin and Nielsen point out that a variety of variables may be contributing to the underestimation of nightmare frequencies reported by retrospective studies besides the discrepancies attributed to the nightmare definitions and metrics employed. These variables include the ‘range of emotions in nightmare operational definitions’, ‘affect distress’ associated with the experience, ‘age range’ of cohorts studied, ‘gender ratio’ of cohorts studied’ and related ‘clinical pathology and/or psychopathology’ including symptomatology amongst participants surveyed.

The high weekly estimate observed in the current study may be explained by a number of additional observations. From the 70 participants who reported weekly nightmares 81.4% (n = 57) also reported significant PTSD symptoms and 67% (n = 47) reported trauma related nightmares (these statistics includes participants who exclusively reported trauma related nightmares and participants who reported both trauma related and idiopathic nightmares). These findings indicate that exposure to trauma was prevalent in participants who exclusively reported weekly nightmares and two-thirds of

this sample also reported trauma related nightmares. The high prevalence of trauma exposure is not unexpected since the Australian Centre for Posttraumatic Mental Health (2011) estimates that up-to 65% of Australians in the general population are likely to experience an event that is considered traumatic. In addition, Gold (2008) contends that the exposure to trauma is not as rare as once thought. In a nationally representative community sample as part of the U.S National Co-morbidity Survey, more than 60% of men and more than 50% of women reported exposure to at least one incident that met the narrower definition of trauma employed in the DSM-III-R (Kessler, Sonnega, Bromt, Hughes & Nelson, 1995). In another study Vrana and Lauterbach (1994) surveyed a sample of university students for trauma exposure and found that 84% of participants had been exposed to traumatic events. The current study as mentioned above found that 81.4% of participants who reported weekly nightmares also met the significance criteria for the PSQI-Addendum for PTSD. These findings support the consensus that trauma exposure is prevalent in the community thus it would seem that the present environmental climate is conducive to stimulating trauma related reactions and responses such as experiencing trauma related nightmares.

Another observation that may elucidate the elevated trauma exposure in the sample relates to the effects of exposure to natural disasters. A portion of the data collected for the current study was gathered during (before and after) the occurrence of the 'Black Saturday' bushfires in the state of Victoria Australia on February 7th 2009. Wood, Bootzin, Rosenhan, Nolen-Hoeksema and Jourden (1992) in a systematic evaluation of the effects of a natural disaster (1989 San Francisco Earthquake) on nightmare content and frequency, found that college students geographically closer to the event reported

approximately double the frequency of nightmares. Furthermore, it was stated that during the three weeks that students maintained logs (after the incident), considerable numbers of students in all 3 groups reported at least one nightmare experience, with groups closer to the earthquake epi-centre reporting greater frequency rates 53.6%, 64.9% and 74.3% respectively. Such findings further support the long-held view that exposure to trauma related incidents influence the frequency of nightmares experienced after the event (Barrett, 1996), specifically nightmares related to the actual event (Wood et al., 1992). The media coverage of ‘Black Saturday’ bushfires was intense and the news became global in a matter of hours, directly affecting thousands if not millions of Australians, specifically Victorians. The author of this thesis had first-hand (front line) experience when providing psychological relief for victims of the ‘Black Saturday’ bushfires. In fact, even the author experienced a nightmare related to bushfires (possibly experiencing an episode of a vicarious trauma response) during the time psychological assistance was provided.

These observations may provide insight in regards to the elevated weekly nightmare frequency reported however, the current study is not the only Australian study that has found an elevated weekly nightmare frequency in a sample of students. Robert, Lennings and Heard (2009) also reported a notably higher weekly frequency in an Australian adolescent cohort. Roberts, Lennings and Heard surveyed 625 high school students aged 12 - 19 years and found that 29.44% reported weekly nightmares. An astonishing 22.08% (n = 138) reported 1 – 2 weekly nightmares, 6.24% (n = 39) reported between 3 – 10 weekly nightmares and 1.12% (n = 7) reported more than 10 weekly nightmares – multiple nightmares at any given night. Studies conducted in

other places of the world focused on similar cohorts, have reported considerably less nightmare frequency estimates. For example, in a study on the prevalence and correlates of sleep problems in Chinese schoolchildren it was found that 7.1% of students aged between 12-18 years reported having nightmares often (Liu, Sim, Vchiyama, Shihui, Kim & Okawa, 2000). In another study of Kuwaiti students aged between 10-18 years of age it was found that the percentages for nightmares frequencies ranged between 6.1% for students aged 18 years to 17.6% for students aged 13 years, for the preceding month (Abdel-Khalek, 2006). Although these studies did not necessarily report weekly nightmares, the Australian nightmare frequency estimate for this cohort seems to be considerably higher, specifically given that monthly nightmare frequencies commonly exceed weekly nightmare frequencies (Levin & Nielsen, 2007).

Robert, Lennings and Heard's (2009) study did not allude to any natural or other type of disaster occurring during data collection as the current study but reported elevated weekly nightmare frequencies nonetheless. Thus, it seems that future research is warranted in order to provide insight that pertains to the tendency of Australian students to report elevated weekly nightmare frequencies. However, despite employing a retrospective metric, the finding of the current study is relatively consistent with prospective findings that have surveyed similar cohorts and used a similar nightmare operational definition, thus making it the first retrospective nightmare frequency study on young adults that has found weekly estimates above 10% and closer to prospective nightmare frequency estimates.

10.2 Second Hypothesis

The second hypothesis predicted that between 8 – 30% (Belicki & Belicki, 1982; Bixler, Kales, Soldatos, Kales, & Healy, 1979; Haynes & Mooney, 1975; Levin, 1994; Miro & Martinez, 2005; Ohayon et al., 1997) of the sample would report monthly nightmares (n = 35 - 132) and the present study found that 30.9% of the sample (n = 136) reported at least one nightmare per month. The difference between the hypothesized frequency range and observed frequency was minimal when considering the highest estimated parameter of 30% reported in the literature, thus the second hypothesis may be considered partially supported. Moreover, this finding is consistent with the findings reported by Miro and Martinez (2005) that surveyed 147 students and reported that 29.9% of their sample experienced monthly nightmares. Furthermore, the finding of the present study does fall within the range other studies that have reported (15 - 33% monthly nightmares) using the same operational nightmare definition as the present study but employing different retrospective metrics (Cason, 1935; Feldman & Hersen, 1967; Levin, 1994; Zadra & Donderi, 2000). In another study Nielsen, Zadra, Simard et al. (2003) administered the typical dreams questionnaire (TDQ) to 1,181 Canadian students across three university campuses in three cities, and found that 79.3% (n = 936) of participants reported that in a typical month the average number of recalled nightmares was 1.97 ± 3.40 , approximately one nightmare every two weeks which is also consistent with the findings of the present study, which found an average of $1.92 \pm .92$ nightmares per month.

10.3 Third Hypothesis

The third hypothesis predicted that more women would report nightmare experiences (Cernovsky, 1984; Cuddy & Belicki, 1992; Feldman & Hersen, 1967; Hartmann, 1984; Hersen, 1971; Levin, 1989, 1994; Levin & Nielsen, 2007) across the three designated periodicities, yearly, monthly and weekly. The present study found that more women in comparison to men reported yearly, monthly and weekly nightmares respectively. However, Chi Square analyses found the differences between the distribution of men and women across the three periodicities were not significant. Therefore, this hypothesis was not supported.

The literature indicates that mixed findings have been found regarding gender differences when reporting nightmares. For instance, Belicki and Belicki (1986); Feldman and Hersen (1967); and Levin (1994) have found that the difference in nightmare reports between genders have been statistically significant. Feldman and Hersen (1967); and Levin (1994) used the same operational nightmare definition (waking criteria), surveyed similar samples (university students) and employed similar retrospective metric as the current study. However, the main difference between Belicki and Belicki's study, and Feldman and Hersen's; as well as Levin's studies, was the employment of the non-waking criteria. Conversely, studies that have found no significant difference between men and women when reporting nightmare frequencies include Chivers and Blagrove (1999), Miro and Martinez (2005), Wood and Bootzin (1990), and Zadra and Dondori (2000); but these studies have nevertheless

found that more women report nightmares in comparison to their counterparts, which is consistent with the current study.

Hartmann (1984) stresses that gender differences in reporting nightmare experiences may be due to the willingness of women in discussing frightening experiences such as nightmares, in comparison to men. Men may not perceive sharing such experiences as particularly masculine; hence refrain from reporting any such incidents. Levin (1994) also suggested that the willingness to report nightmares needs to be considered as a probable confounding variable. However, women also report more emotional symptoms pertaining to anxiety and depression (DSM-IV-TR, 2000; Buss, 1988). Thus, it is unclear whether it is the unwillingness of men to share such experiences or whether it is other variables. Levin and Nielsen (2007) stress that the gender differences in reporting nightmare incidents may be suggestive of a broader gender difference. They stress various possible explanations for this observation. For instance, women tend to report elevated levels of dream recall, vividness and more waking distress related to dreams (Belicki, 1992; Levin, 1994). A notable gender difference pertains to women being more vulnerable to risk factors such as sexual and physical violence and abuse, emotional disorders, as well as parasomnias and PTSD (DSM-IV-TR, 2000). It has also been found that women tend to adopt and practice emotion-focused coping styles more readily than the problem-focused style adopted by men (Nolen-Hoeksema, 1990). This particular coping style involves pondering and contemplating personal emotional responses for a considerably longer period which creates a degree of difficulty in being able to detach from the consequences of

emotional responses elicited. Levin and Nielsen contend that inherent biological differences in emotional brain processes between men and women (Bradley, Codispoti, Sabatinelli & Lang, 2001) could be the underlying mediating variable that may explain and account for the variance between genders when reporting nightmares.

The variables identified in the literature that potentially influence the nightmares reported by men and women are numerous. The present study found that although more women reported nightmares than men the differences were not significant. Therefore, in the light of this finding the importance of the variables identified in the literature as potentials influences become minimal. Having stated that, it is difficult to ascertain why women report more nightmares but it is perhaps safe to contend that women have a tendency to be more sensitivity (*per se*) than men. This broad gender difference may be the common thread between all the reasons offered for gender difference in reporting nightmares.

10.4 Fourth Hypothesis

The fourth hypothesis predicted that participants who reported frequent (monthly and weekly) nightmares would report significantly more trauma related nightmares in contrast to those who reported idiopathic nightmares. Original analyses indicated that trauma related nightmares were reported by a considerable number of participants; however a closer inspection of the data revealed that a considerable number of these same participants also reported idiopathic nightmares. Thus, in order to determine true

frequency rates of each type of nightmare reported, the fourth hypothesis will consider participants who exclusively reported trauma related or idiopathic nightmares in this discussion.

From the participants who reported monthly nightmares and indicated the type of nightmare experienced (n = 101), 15.8% (n = 16) reported trauma related nightmares and 40.6% (n = 41) reported idiopathic nightmares. However, 43.6% (n = 44) of this sample reported both trauma related and idiopathic nightmares. Similarly, from the participants who reported weekly nightmares and indicated the type of nightmare experienced (n = 65), 7.7% (n = 5) reported trauma related nightmares, 27.7% (n = 18) reported idiopathic nightmares, but 64.6% (n = 42) reported both trauma related and idiopathic nightmares. The fact that the largest percentage of participants in each category (monthly 43.6% and weekly 64.6%) reported both types of nightmares complicates the results and hence should be tentatively accepted.

It is also noteworthy to stress that some participants failed to indicate the type of nightmares reported. For instance, from the 393 participants who reported yearly, monthly or weekly nightmares, 13.5% (n = 53) reported trauma related nightmares, 22.6% (n = 89) reported idiopathic nightmares, 27.5% (n = 108) reported both trauma related and idiopathic nightmares, and 36.4% (n = 143) did not indicate the type of nightmares reported. Nevertheless, based on the available data MANOVA analyses did not find significant differences between participants who reported weekly and monthly trauma related nightmares and those who reported weekly or monthly idiopathic nightmares. Thus the fourth hypothesis was not supported.

Significant differences however, were observed between participants who reported both types of (weekly) nightmares and those who reported exclusively (weekly) trauma related and idiopathic nightmares separately. These findings cannot be directly compared to other research findings in the literature due to the lack of studies that have investigated community based samples and distinguished between the incidents of trauma and/or idiopathic nightmares (Levin & Nielsen, 2007).

From the available data however, it can be deduced that trauma related nightmares tend to be more prevalent as reported frequency decreases. For instance, the yearly trauma related nightmares reported were 60.4% (n = 32), in contrast to 30.2% (n = 16) of monthly nightmare reports and 9.4% (n = 5) of weekly nightmare reports. Thus, trauma related nightmares do not seem to be associated with the frequency of nightmare reports in this community based sample, which may be considered inconsistent with previous studies that have reported a high correlation between nightmare incidents and trauma exposure (Barrett, 1996). However, it remains unknown if the trauma related nightmares reported in the present study were based on recent or non-recent trauma exposure, and whether they were replicative or non-replicative or merely part of post-trauma stress reaction/response (DSM-IV-TR, 2000). Furthermore, if all participants who reported trauma related nightmares, regardless whether they also reported idiopathic nightmares were considered in the analysis, the implications would be vastly different. For instance, from the participants who exclusively reported yearly nightmares 28.6 % reported trauma related nightmares and 71.4% reported idiopathic nightmares. From the 136 participants who exclusively

reported monthly nightmares, 44% reported trauma related nightmares and 56% reported idiopathic nightmares. From the 70 participants who exclusively reported weekly nightmares, 67% reported trauma related nightmares, and 33% reported idiopathic nightmares. Thus, from these findings it can be deduced that trauma related nightmares tend to be more prevalent as reported frequency increases. For instance, yearly trauma related nightmares reports were 28.6%, in contrast to 44% of monthly reports and 67% of weekly reports. Thus, from these observations trauma related nightmares seem to be closely associated with frequent nightmare reports in community based samples, which lends some support to the fourth hypothesis.

Literature on trauma related nightmares at present remains relatively unclear about these variables (Davis, 2009), in fact as discussed in chapter four trauma related nightmares tend to be amalgamated together without differentiating the kind of trauma related nightmare – replicative, non-replicative, associated with PTSD or ASD (Acute Stress Disorder), and/or non-associated with PTSD or ASD (trauma stress reaction). Furthermore, the current study appears to indicate that there is a difference between individuals who experience both trauma related and idiopathic nightmares from those who exclusively experience trauma related nightmares or idiopathic nightmares. MANOVA analysis showed significant differences across an array of variables between the group of participants who reported both types of nightmares and the group who exclusively reported trauma related nightmares and the group who exclusively reported idiopathic nightmares respectively. Hartmann (1984) also found that different groups of individuals experienced different types of nightmares including life-long nightmares, post trauma nightmares and night-terrors.

Conversely, when considering participants who exclusively reported idiopathic nightmares; nightmares (n = 89) appear to follow a complicated trend, 33.7% (n = 30) of participants reported yearly incidents, 46.1% (n = 41) of participants reported monthly incidents, and 22.2% (n = 18) of participants reported weekly incidents. Thus, participants who reported monthly incidents reported the most idiopathic nightmares in contrast to those who reported yearly or weekly nightmare incidents. However, if all participants who reported idiopathic nightmares, regardless whether they also reported trauma related nightmares were considered in the analysis, the implications again would be different. For example, idiopathic nightmares appear to follow the opposite trend, they tend to be more prevalent in infrequent nightmare reports as opposed to frequent nightmare reports, 71.4% for yearly incidents 56% for monthly incidents, and 33% for weekly incidents.

Researchers have very recently begun to distinguish between trauma related and idiopathic nightmares, therefore literature on the frequency and trends of reporting idiopathic nightmares is relatively nonexistent. Nevertheless, Hartmann (1984) does provide some insight into the characteristics of life-long nightmare sufferers who may be considered as individuals who reported idiopathic nightmares, since Hartmann differentiated between this group and those who comprised the post trauma nightmare group. Furthermore, life-long nightmare sufferers seem to reflect individuals with Nightmare Disorder. Moreover, individuals who reported life-long nightmares were found to be more sensitive to experiencing events with greater susceptibility associated with stress and/or anxiety. Therefore, they were prone to experience otherwise non-

stressful stimuli as highly stressful, suggesting that any given event could be processed as anxiety provoking. Could this group (trauma related and idiopathic nightmare group) represent a distinct group of individuals similar to the lifelong nightmare group reported by Hartmann or could it represent individuals with characteristics similar to lifelong nightmare sufferers that have been exposed to recent trauma? The present study did conduct analyses pertaining to the available variables as a function of these groups. It was found that participants who reported both trauma related and idiopathic nightmares were significantly poorer sleepers, experienced significantly more sleep disturbance, and had significantly more PTSD symptoms than participants who exclusively reported trauma related nightmares and participants who exclusively reported idiopathic nightmares separately. These findings seem to indicate that the group of individuals who reported both types of nightmares could be a distinct group and future research could clarify whether a qualitative or quantitative difference exists between these groups.

10.5 Limitations of the First Study

Some limitations of the current study may seem quite obvious given the nature of the sample 'university students' and the implementation of 'retrospective metrics' to determine the frequency of nightmares. Surveying university students limits the generalisability of the findings and the use of 'retrospective metrics' has been identified as under estimating nightmare frequency (Levin & Nielsen, 2007). Two main points can be stressed here, firstly generalising the findings to the greater population was never an aim of the present study. Upon undertaking this project it was evidently clear that generalisability of the findings would be limited due to the sample employed. This

was evident for the following reasons - firstly university samples are not representative of the wider community. Not all members of the wider community are commonly between the ages of 18 – 32 per se and have the intellectual capacity prevalent amongst this cohort. Furthermore, the higher prevalence of nightmare frequency in this cohort may be indicative of a healthier way of emotional processing given that they are possibly still maturing. This is perhaps something future researchers could consider when studying this cohort.

The survey administered was intended to serve a number of functions including the notion that it would provide ‘a sounding’ for the potential nightmare frequency in an Australian sample of young adults, since research of this nature is lacking. In addition given the elevated nightmare frequency reported by Roberts and Lennings (2006) pertaining to adolescents 12- 18 years of age, it became evident that research on nightmares frequency in Australia is warranted.

Following in the historical footsteps of the early and contemporary researchers, university/college samples have served and still serve as a rich source of potential and easily recruitable participants for research purposes. In fact, when researching the literature it was found that there is an overwhelming amount of studies that employed university samples in comparison to non-university samples. The identified ratio was approximately 4:1. Unfortunately, various researchers when conducting literature reviews on nightmare frequency and/or prevalence estimates appear to amalgamate findings based on university samples with findings based on the general population. The lack of clarification in terms the kinds of samples employed would appear to

confound true nightmare frequency estimates; however this does not seem to be the case for weekly nightmares. Interestingly weekly nightmare frequency estimates in university samples have been relatively similar to the general population estimates. For instance Feldman and Hersen (1967) and Levin (1994) found that 5% of university students reported weekly nightmares in contrast Hublin, Kaprio, Partinen and Koskenvuo (1999) and Haynes and Mooney (1975), found that general population samples reported weekly estimates that ranged between 2.9% to 6%. Thus, weekly nightmare frequency estimates in university samples could possibly represent relatively accurate estimates in the general population, although the current study did find an elevated weekly nightmare frequency which is inconsistent with previous retrospective findings.

In terms of monthly nightmare frequency estimates however notable discrepancies have been reported between university and general population samples, Levin (1994), and Feldman and Hersen (1967) found a range between 15% to 24% while Ohayon, Priest, Guilleminault and Caulet (2002), and Hublin, Kaprio et al. (1999) found a general population range between 7% to 10.1%. This trend is also seen for yearly nightmare reports where larger discrepancies have been noted, Feldman and Hersen, and Levin reported a range between 47% to 83% in university samples in comparison Klink and Quan (1987), and Bixler, Kales, Soldatos, Kales and Healey (1979) reported a range between 8.1% to 11.2% in general population samples.

The other notable limitation of the present study is the employment of retrospective metrics to determine nightmare frequency. There is a continual dilemma within the nightmare literature that pertains to nightmare metrics employed to determine frequency estimates. It is argued that retrospective metrics provide inaccurate estimates of nightmare frequency (Robert & Zadra, 2008; Wood & Bootzin, 1990; Zadra & Donderi, 2000). Levin and Nielsen (2007) contend that investigators have traditionally used retrospective questionnaires which have been found to underestimate the actual nightmare frequency by as much as 3 to 10 times based on prospective studies (Salvio, Wood, Schwartz & Eichling, 1992; Wood & Bootzin, 1990). This is predominantly attributed to memory recall inaccuracy (Schredl, 2002). Furthermore, Levin and Nielsen add that “daily home logs have supplanted retrospective questionnaires as the gold standard for nightmare frequency estimation” (p.484). However, some researchers have also argued that prospective logs have inherent problems, for instance maintaining a nightmare log may heighten the awareness of nightmares and increase the frequency of these dysphoric dreams (Schredl, 2002). Moreover, Robert and Zadra contend that there is only partial support for the notion that retrospective self-reports underestimate nightmare frequency in comparison to daily logs. In addition, other researchers such as Neidhardt, Krakow, Kellner, et al. (1992) found that participants with frequent nightmares were unwilling to keep nightmare logs which could become problematic for researchers employing prospective metrics.

10.6 Implications

The implications of the present study are intriguing, the main finding illustrates that there appears to be a higher frequency rate for weekly but not monthly or yearly nightmares in Australian academic samples, evidenced by the findings of the current study and supported by the work conducted by Roberts and colleagues. These studies reported considerably higher weekly estimates than similar cohorts in different parts of the world. The rationale for this finding however requires some cautious examination given the high frequency of trauma exposure and trauma related nightmares reported. Specific cohorts that experience weekly nightmares include lifelong nightmare sufferers (Hartmann, 1984), individuals with major psychopathologies such as depression (Agargun et al., 2000; Hartmann, 1984) and individuals exposed to recent trauma (Barrett, 1996; Davis, 2008). Other researchers have found that weekly nightmare incidents are correlated with a higher frequency of general psychopathology (Berlin, Litovitz, Diaz & Ahmed, 1984; Levin, 1998; Levin & Nielsen, 2007, 2009). However, it may be considered highly unlikely that the sample surveyed would be predominantly lifelong nightmare sufferers or individuals with major psychopathologies due the nature of the sample recruited. However, that does not discount that notion that perhaps many of these participants could have characteristics or symptoms related to lifelong nightmare sufferers or psychopathologies making them vulnerable to experience a greater frequency rate of weekly nightmares.

Conceivably the elevated weekly frequency found in the current study may be related to the high percentage of participants who reported significant PTSD symptoms which may have influenced the report of nightmares in general. Australia is prone to experiencing natural disasters and such experiences may significantly influence dream narratives as found in PTSD research (Davis, 2009). The high frequency of weekly nightmares reported may reflect the direct or indirect post-traumatic reactions which may be considered a plausible rationale for the findings. Researchers (Barrett, 1996; Krakow et al., 2000) have proposed that nightmares after trauma exposure appear to serve the beneficial function for those more vulnerable in assisting re-integration via systematically re-exposing the individual to the traumatic incident. Once nightmares commence to integrate and comprise individual's autobiographical memories, nightmares related to the traumatic incident begin to change in storyline and occur less frequently. It is imperative to reiterate that incidents of post-traumatic nightmares do not immediately imply a PTSD or ASD outcome, but rather may reflect a post-trauma stress reaction that appears to be relatively common in the general population when exposed to trauma (Barrett, 1996). It is also noteworthy to stress that the most common response to trauma is resiliency. Bonanno (2005) reports 35% of individuals exposed to trauma respond with resiliency, 15%-30% recover from moderate symptoms over-time, 5%-10% experience a delayed response that may increase in severity over-time, and approximately 10%-30% of individuals exposed to trauma experience chronic problems.

Another notable finding pertains to the present study identifying three nightmare groups that reported a combination of two different types of nightmares, those who exclusively reported trauma related nightmares or idiopathic nightmares and those who reported both types of nightmares. Researchers in the past have identified different groups of individuals who experience different types of nightmare related experiences including – lifelong nightmares, post-trauma nightmares and night terrors (Hartmann, 1984; Hartmann et al. 1981). However, the present study appears to have identified another group who specifically report nightmare incidents pertaining to the two main categories of nightmares reported in the literature – trauma related and idiopathic. This group may reflect individuals who share characteristics pertinent to vulnerability who have been exposed to recent trauma. More specifically, there may be groups of individuals who are more vulnerable - have thin boundaries (Hartmann, 1984), are high in affect distress (Levin & Nielsen, 2007), or are high in neuroticism (Spoormaker, 2008) which commonly experience nightmares but in addition have been exposed to recent trauma, that has influenced and perhaps confounded the types of nightmares experienced – thus report both trauma related and idiopathic nightmares. However, this remains as mere speculation at this point but does serve as subject matter that warrants further investigation.

Given the high weekly nightmare frequency observed in the current study in addition to the work of Roberts and colleagues, as well as the lack of nightmare related information in the Australasian Sleep Association (ASA) website; a national Australian nightmare frequency estimate is clearly warranted. Future research in Australia should

aim to replicate the findings reported in the current study as well as those reported by Roberts and colleagues.

10.7 Summary

The main finding of the current study was the high weekly nightmare frequency reported in the sample despite employing a retrospective metric. This finding was predominantly explained by the high prevalence of significant PTSD symptoms reported in the sample, particularly participants who reported weekly nightmares. However further examination is required to ascertain a thorough understanding of the direct association between these variables. Another main finding pertains to the frequency of the different types of nightmares reported. Both trauma-related and idiopathic nightmares were prevalent in the sample. Finally an intriguing finding relates to the identification of a group of individuals who reported both types of nightmares, which were significantly different in a number of variables examined in contrast to the other two groups of participants who exclusively reported a specific type of nightmare.

Chapter 11

Discussion

Study 2

The second study ‘Treatment Phase’ proposed four hypotheses which will be addressed and discussed in the following sections.

11.1 First Hypothesis

The first hypothesis for the second study predicted that participants who were administered the SLAT treatment over-time (pre-post) would experience a significant decrease in nightmare frequency. This hypothesis was supported, a Wilcoxon matched-pairs signed ranks test found that the SLAT group pre-treatment reported a median/average of 3 nightmares per week and reported a median/average of 0 nightmares per week post-treatment (3 months later). Thus the SLAT treatment was effective in reducing weekly nightmares.

Given that the SLAT treatment is a pilot treatment literature on this specific type/kind of treatment is non-existent. However, comparisons can be made with other types/kinds of story-line alteration techniques reported in the literature which have proven therapeutically efficacious (Halliday, 1987). The better known story-line alteration techniques that have received empirical support in eliminating or ameliorating nightmares are Imagery Rehearsal Therapy IRT (Germain et al., 2004; Forbes et al., 2001; Forbes et al., 2003; Kellner, Neidhardt, Krakow & Pathak, 1992; Krakow et al., 1995, 1996, 2000; Krakow et al., 2001; Kroese & Thomas, 2006) and

Lucid Dreaming Therapy LDT (Spoomaker, van den Bout & Meijer, 2003; Zadra, 1996; Zadra & Pihl, 1997).

The SLAT treatment adopted key elements that comprise the premise of both IRT and LDT- as well as aspects of hypnotherapy for nightmares. The key element adopted from the IRT paradigm relates to educating participants about the formation of dysphoric dreams including that dream narratives stem from inherent fears, thus as authors and editors of these narratives they were able to alter storylines at will. The key element adopted from the LDT paradigm pertained to participants becoming conscious (lucid within the dream) and realizing that a resource such as the Power Item (PI) was available during the dream state, which enabled them to alter any aspect of the dream narrative. This was achieved via a pre-hypnotic suggestion which comprised the content of the SLAT treatment CD, similar to the suggestion procedure employed by Kennedy (2002) when administering hypnotherapy for nightmare disorder.

IRT and LDT focus on altering dream content in order to dissipate or lessen dysphoric affectivity elicited by nightmares. However, the main difference between these treatments seems to reflect the method employed in achieving this objective. IRT's alteration emphasis is on the client/patient selecting a nightmare scene and 'writing' a new scene, which is cognitively rehearsed on a daily basis (Krakow, Hollifield et al., 2000). Henceforth, a dream scenario/segment is preselected, altered in the waking state (rewritten on paper during the day) and cognitively rehearsed several minutes daily. In contrast, LDT focuses on learning lucid dreaming techniques/exercises in order to

become lucid in dreams; and once lucidity is achieved nightmares can be altered in constructive ways (Spoormaker, van den Bout & Meijer, 2003). Thus, the main difference between how these therapeutic treatments alter nightmare content seems to relate to the state (awake or asleep) where the actual alteration procedure takes place. For IRT the alteration procedure occurs during the day, conversely for LDT the alteration procedure occurs during the dream itself. Accordingly, it appears that greater levels of conscious control are inherent when implementing IRT as opposed to LDT merely because individuals perform the alteration procedure during the day. Nevertheless, despite the treatment implemented any recurrent dream can be altered in the desired way which often leads to a sense of control and consequently a sense of mastery, a key element/ingredient identified in efficacious story-line alteration techniques (Bishay, 1985).

LDT seems appropriate for both recurrent and non-recurrent nightmares since the theme of problematic nightmares is irrelevant when altering the dream content. However, difficulties with the implementation of LDT may arise when learning to achieve lucidity in dreams. Literature on lucid dreaming indicates that this may not be a simple skill to master and individuals who achieve lucidity following LDT procedures commonly do so sporadically, unless they are accomplished lucid dreamers (Lagerge, 1980). Under this construction to achieve the level of lucidity that may be therapeutically viable may take a considerable length time which may be demoralizing for nightmare sufferers who have lived with the condition for an extended period of

time. Furthermore, the inability to promptly achieve lucidity in dreams may affect motivation to persist with the treatment.

The process involved in implementing the SLAT treatment is simple and the duration of treatment is extremely minimal, which is perhaps the most prominent advantage. Furthermore, theoretically SLAT may be applied to both recurrent and non-recurrent nightmares, because it does not rely on pre-selecting nightmare scenes and/or is not a skill that requires mastering. In fact, it has proven to be a technique that is promptly applied with good results. In addition the SLAT treatment technique is a nightmare treatment that is based on a self-help concept where participants have the opportunity to listen to the CD (four minutes in length) as often as required in order to comprehend the treatment procedure in the comfort of their own home.

The main difference between IRT and SLAT is the duration in terms of preparation and practice. For instance IRT requires daily practice (5-20 mins) of the new storyline selected in contrast the SLAT treatment duration is approximately 4 mins in length with the additional time to select a PI (Power Item) to incorporate into the nightly routine.

In order to comprehensively compare these treatments, theoretical constructs pertaining to each aspect of the treatments have to be diligently examined and the validity of effective outcomes in eliminating nightmares needs to be thoroughly investigated, which is was not an aim of the present thesis. Furthermore, the findings of the present study are preliminary and warranted validation via future research.

11.1.1 Limitations of SLAT

A plausible concern that may be perceived as a limitation pertinent to SLAT treatment is the notion that it may promote dependency on the object selected as the ‘power item’ PI in a similar way a young child may develop dependency on a security blanket. Participants were required to select an item that was incorporated into their nightly routine, whereby they would either wear it, place it under their pillow or bed, depending of the item selected. Thus, a level of dependency on the PI was expected however it was also expected that when the nightmare/s was/were eliminated the PI would also be gradually eliminated from the nightly routine. Nevertheless, in case that dependency develops individuals would be instructed to commence a systematic detachment procedure from the PI that would include gradual weaning until the PI was no longer part of the nightly routine.

Another feasible concern is the lack of supervision inherent in all self-help techniques. The instructions on the treatment CD are simple, however it is unknown if participants austerey followed the procedure. Moreover, the lack of supervision may also compromise motivation to complete the treatment as proposed, specifically if nightmare sufferers already experience lack of motivation. Perhaps another concern that may be considered a limitation pertains to the probable unwillingness of older participants to use a PI. Some older individuals may consider incorporating a PI to their nightly routine as rather childish and may express reluctance to follow instructions. This concern may be addressed by instructing participants to select a PI that is inconspicuous and/or considered more appropriate for a person their age.

11.2 Second Hypothesis

The second hypothesis for the second study predicted that participants in the comparison group receiving the SysD treatment over-time (pre-post) would also experience a significant decrease in nightmare frequency. This hypothesis was not supported; a Wilcoxon matched-pairs signed ranks test found that the difference overtime was statistically not significant. The comparison group pre-treatment reported a median/average of 3 nightmares per week and following the treatment (post-treatment) reported a median/average of 2 nightmares per week. The fact that a decrease in nightmare frequency was observed is consistent with the literature and supports the efficacy of systematic desensitization as a nightmare treatment (Kellner, Neidhardt, Krakow & Pathak, 1992; Miller & DiPilato, 1983). Cellucci and Lawrence (1978) compared three groups who reported frequent nightmares – one group was administered systematic desensitization, another group served as a discussion placebo and the third group as a control. The systematic desensitization treatment was found to be significantly more effective in reducing nightmares in contrast to the other two groups.

The treatment protocol project which promotes an 8 week desensitization muscle relaxation program is the treatment of choice in Australia (Treatment Protocol Project, 2000). However, the SysD treatment implemented in the present study was a variant of the treatment promoted by the Treatment Protocol Project. The SysD treatment was designed to be practiced for one week – participants were instructed to listen to the treatment CD for seven consecutive nights, as opposed to the 8 weeks recommended.

Hence this therapeutic technique was also a pilot treatment, the first of its kind, a systematic desensitization nightmare treatment in a self-help format CD. Therefore, prior research pertaining to this specific type of treatment and the method of delivery is non-existent in the literature, which makes it difficult to directly compare the findings of the present study.

Nevertheless the SysD treatment had promising results in various areas of functioning and warrants further research. For instance, participants in the comparison group also reported various beneficial effects including feeling more relaxed and vigorous, which is relatively common when systematic desensitization procedures are implemented. Kennedy (2002) states that researchers have suggested that the efficacious therapeutic element in various nightmare strategies may centre on reduced arousal – which may be directly attributed to the relaxation exercises, learnt during systematic desensitization procedures. Furthermore, this proposal is consistent with the suggestion that the frequency of nightmares is influenced by the presence of anxiety. In fact, it has been hypothesized that nightmares may have an anxiety-reducing effect (Haynes & Mooney, 1975) and researchers have also contended that nightmares may be a coping mechanism for stress (Picchioni et al., 2002).

Perhaps part of the reason that the second hypothesis was not supported was due to the fact that the SysD treatment CD was a pilot treatment and was not thoroughly tested before implementation in the present study, despite having beneficial effects in a clinical case study facilitated by the author. Systematic desensitization is an intricate

process and commonly clients/patients receiving the treatment are guided during the implementation of the technique via direct supervision which may encompass a few sessions in order to have the desired effect (Miller & DiPilato, 1983; Treatment Protocol Project, 2000). In contrast the SysD treatment CD required participants to learn and implement the instructions provided in the SysD CD procedure for merely one week.

11.2.1 Limitation of SysD

The main limitations of the SysD treatment relates to inherent restrictions of self-help programs/treatments, which refer to the lack of supervision participants' receive throughout the program/treatment. The present study required participants to austere follow the instruction on the C.D, such as learning to relax, constructing a nightmare fear hierarchy and finally pairing relaxation states with anxiety inducing images related to the nightmare. Thus, the present study relied on participants to competently complete all the required steps which some participants may have found easier to accomplish than others. Hence, participants were instructed to contact the researchers for guidance and/or assistance if difficulties with any aspects of the procedure were encountered. However, participants assigned to the SysD treatment group did not contacted the researchers for assistance or support with any of the tasks on the SysD CD, suggesting that the instructions were adhere to without notable difficulty.

11.3 Third Hypothesis

The third hypothesis for the second study predicted that participants who were administered the SLAT treatment would report significantly less nightmares in contrast

to participants who were administered the SysD treatment. As expected this hypothesis was supported. The experimental group post-treatment reported a median/average 0 nightmares and the control group post-treatment reported a median/average of 2 nightmares. A Mann-Whitney *U*-test found that the difference between the SLAT and SysD groups post treatment was statistically significant. Given that the present study was a pilot study, literature on these specific techniques as mentioned earlier is non-existent. However, it is noteworthy to stress that the central hypothesis of the second study was to compare the efficacy of the SLAT treatment in eliminating nightmare frequency to a variant of the treatment of choice systematic desensitization (SysD) according to the Treatment Protocol Project (2000).

An examination of the similarities and difference between SLAT and SysD treatments would be of benefit since both treatments were effective in eliminating nightmare frequency. This examination would also assist in identifying the key therapeutic elements that ameliorated nightmare frequency in each group. The main procedural similarities between the SLAT and SysD treatments included:

- duration, the content instruction in each treatment lasted approximately 4 mins
- both treatments (content) were presented on a CD
- the instructions in each CD required participants to make preparations (e.g. SLAT treatment CD instructed participants to look for a power-item [PI], listen to suggestions on the CD, and have PI accessible when going to sleep; conversely the SysD treatment CD instructed participants to learn and practice relaxation exercises, construct a personal nightmare fear/anxiety hierarchy, and pair-up the relaxation state with fear/anxiety state elicited by nightmares).

Conceptually the main similarities include empowering participants in order to face fear provoking stimuli. The process of empowerment for the SLAT treatment occurs whilst listening to the treatment CD and for SysD treatment during the classical condition/pairing-up procedure. Both treatments aim to expose subjects to the threat in a manner that resources - PI for the SLAT treatment and hierarchical control for the SysD treatment - are available to manage the threat during either the dream or during the classical conditioning procedure.

The main procedural difference between the SLAT and SysD treatments relate to the preparation participants were instructed to carry out. The SLAT group was instructed to complete perhaps simpler and considerably less tasks in contrast to the SysD group. The simplistic nature of the SLAT treatment allowed participants to possibly grasp the treatment requirements more promptly; in contrast the SysD treatment instructions were considerably more intricate and the preparation would have been longer. This difference may have contributed to the variance in ameliorating the frequency of nightmares, since participants in the comparison group had more tasks to complete and may have thus, encountered more obstacles that interrupted the efficacious completion of treatment.

Therapeutically (conceptually) the main difference between the SLAT and SysD treatments was the method employed to empower participants. The SLAT treatment aimed to empower clients via the suggestion that the PI was accessible during the dream and could be accessed at will. In contrast the SysD treatment aimed to empower

clients via the knowledge that they could interject and remove themselves from any stimuli that becomes emotionally unmanageable.

11.4 Fourth Hypothesis

Finally it was hypothesized that participants who were administered the SLAT treatment would report significantly better outcomes in the other treatment measures including sleep quality (PSQI), negative nightmare effects (NES), and mood states (POMS-37) in contrast to participants who were administered the SysD treatment overtime (pre-post treatment). This hypothesis was partly supported; Mann-Whitney *U*-tests found a significant difference between treatments for sleep quality however for negative nightmare effects and mood states significant differences were not observed.

The global PSQI scores post-treatment for both the SLAT and SysD treatments decreased, indicating that sleep quality improved overtime, regardless of the treatment administered. The median score for the SLAT pre-treatment was (7) and post-treatment (5). In contrast the median score for the SysD pre-treatment was (7) and post-treatment (6). However, participants who were administered the SLAT treatment reported better quality of overall sleep than participants who were administered the SysD treatment. Furthermore, the difference between the SLAT and SysD post-treatment was statistically significant. This finding is consistent with various studies that have also found ameliorating effects on other variables like anxiety, depression and overall sleep quality after the implementation of cognitive behavioural techniques for nightmares (Kellner, Neidhardt, Krakow & Pathak, 1992; Krakow, Kellner, Pathak & Lambert, 1995; Neidhardt, Krakow, Kellner & Pathak, 1992).

These results indicate that the SLAT treatment was effective in improving overall quality of sleep. In fact, the SLAT treatment was more effective in contrast to the SysD treatment in improving sleep - within (overtime) and between (treatment comparisons). Krakow, Hollifield et al. (2000) studying the efficacy of IRT in a randomized controlled study of sexual assault survivors with PTSD found that nightmares, sleep quality and PTSD symptoms significantly improved amongst 169 female participants who reported considerable sleep disturbances. Furthermore, it may be argued that the improvement of sleep may be attributed to the decrease in nightmare experiences, since eliminating a dream that disrupts sleep would naturally improve sleep.

The total NES scores overtime for both treatments also decreased indicating that the effects of nightmares on waking distress were ameliorated. However, the difference between the SLAT and SysD treatments was not significant. For the SLAT treatment the median score pre-treatment was (17) and post-treatment (14). In contrast the SysD treatment median score pre-treatment was (14) and post-treatment (9). Despite neither treatment completely eliminated the effects of nightmares – perhaps due to the fact that the nightmares were not eliminated entirely from either group, these findings are therapeutically meaningful given that there appears to be a consensus in the literature that therapists should concentrate more on nightmare distress as opposed to nightmare frequency when managing problem nightmares (Krakow & Zadra, 2006). Research indicates that nightmare frequency and nightmare (waking) distress are different constructs (Belicki, 1992) suggesting that individuals may experience monthly nightmares that are high in distress, thus more problematic, or weekly nightmares that

are low in distress, thus less problematic (Krakow & Zadra, 2006). Furthermore, it has been suggested that nightmare distress is a better predictor of psychopathology in comparison to nightmares frequency (Blagrove, Farmer & Williams, 2004; Levin & Fireman, 2002; Schredl, Landgraf & Zeiler, 2003). Moreover, Krakow and Zadra suggest that decrease in nightmare frequency tends to improve sleep quality, while decrease in nightmares distress dissipates psychopathological symptoms.

The total POMs-37 scores overtime for both treatments also decreased suggesting that the measures of subjective emotional and mood states improved overtime. For the SLAT treatment the pre-treatment median score was (32) and post-treatment median score was (22). In contrast the SysD treatment median score pre-treatment was (37) and post-treatment (13). However, the difference between the SLAT and SysD treatments for the POM's 37 post-treatment was not significant, despite the considerable variance post-treatment. In support of these findings, researchers have observed that techniques which reduce arousal mitigates tonic levels of anxiolytic effects also reduce other aspects of functioning (Kennedy, 2002) such as emotional and mood states.

Overall when comparing the results post-treatment between the SLAT and SysD treatments, the findings indicate that the only significant difference observed was for the PSQI – quality of sleep. However, it is important to note that both treatments were effective in lessening total scores across all three variables, sleep quality, nightmare effects and subjective emotional/mood states. This suggests that the self-help

treatments on CD were efficacious in ameliorating negative effects related to nightmare incidents and warrant further investigation. Another interesting observation pertains to the SLAT treatment which obtained better outcomes for nightmare effects and subjective emotional/mood states in comparison to the SLAT treatment. Kennedy (2002) suggests that this could be due to the reduced arousal via the relaxation; however there could be various reasons that may explain this observation including “the successful treatment of any aspect of a problem may lead to increased expectations that the overall therapy will be helpful in addressing other problem areas...successful treatment of a problem may have an impact on other important areas of functioning” (p.112).

11.5 Limitations of the Second Study

The main limitation in the present study pertains to the few participants that took part in the second study. Parametric statistics were intended to be used for the main analyses however the low number of participants influenced the statistical power of the analyses, hence nonparametric statistics were employed. This predicament limits generalizability of the findings; however the present study did not intend to generalize the results given that it was a pilot study, thus further research is warranted particularly with greater numbers of individuals who experience frequent nightmares in order to validate the efficacy of the treatment.

Another notable limitation related to the low numbers of participants in the second study pertains to lack of a placebo control group. Given that the comparison was made

between two treatments based on established paradigms/models e.g systematic desensitization and story line alteration approach, the addition of a placebo would have made the study more robust. Thus, a comparison between the SLAT, SysD and a placebo control groups would have enabled statistically better comparisons to be made between treatments. The original design included a placebo control group however given the low numbers of participants in the second study it was decided not to include a placebo control group.

From the 70 participants who reported weekly nightmare experiences in the first study and were formally invited to partake in the second study, 41 expressed initial interest, however 30 commenced the trials but only 20 participants (less than a third of the overall participants who reported weekly nightmares) completed the study. Furthermore, the dropout rate of participants who commenced the study was notable, with over 30% dropping out. Krakow, Hollifield, Schrader et al. (2000) when studying sexual assault survivors with PTSD nightmares also experienced a considerable dropout rate during the 3 month follow, 46% of 91 participants did not complete the follow-up study. The interpretation offered for the high drop rate pertained mainly to the nature of the population under investigation, which are known for failing to complete research and clinical studies (Rothbaum et al., 1992; Binder, 1981). Nevertheless, this could also be indicative of the therapeutic difference between nightmare frequency and nightmare distress and their association to problem nightmares and psychopathology. Some individuals who experience frequent nightmares do not seek professional assistance and simply accept their predicament (Hartmann, 1984). Nightmare

frequency alone appears not to indicate that a problem exists, however it is paramount to note that nightmares disrupt sleep and frequent sleep disruption would eventually cause dysfunction like insomnia. Nevertheless, numerous research studies have highlighted what seems to be an established difference between nightmare frequency and nightmare distress (Levin & Nielsen, 2007). Some research studies suggest that nightmare distress better predicts psychopathology (Krakow et al., 2000) thus nightmare distress appears to be more associated with problem nightmares. However, frequent sleep disruption would cause insomnia related concerns, which supports the idea that nightmares frequency and distress are two dimension of the nightmares phenomena that perhaps need to be addressed separately when managing problem nightmares.

Another notable limitation pertains to expounding the therapeutic element in the SLAT treatment since participants were instructed to alter the nightmares without stipulating exactly what aspect of nightmares should be altered. Hence, this information remains unknown, that is, what aspect of the nightmare was altered? However, the instruction to alter any aspect of the nightmare is consistent with the IRT procedure (Krakow, Hollifield, Schrader et al., 2000). Patients receiving IRT are commonly instructed to alter nightmares anyway they wish, thus Krakow et al. have also encountered some uncertainty in regards to the extent participants altered their nightmares. Specific instruction of what aspect to alter, for example the sequence of the narrative, actions or communications in dream was not provided, hence some participants may have made minor alterations then again others may have made major alterations.

Another limitation of the present study was the lack of monitoring progress in terms of confounding variables that may have interacted with the treatment's efficacy. In the present study the post-treatment measures were administered three months after the implementation of the treatment, which in retrospect may have incorporated inherent issues. Nevertheless this was consistent with the time frame inherent in the Nightmare Frequency Questionnaire (NFQ). The NFQ solicits respondents to base their responses on the previous three months (Krakow, Hollifield, Schrader et al., 2000), hence in order not to confound the respondents post-treatment nightmare frequency estimate with the pre-treatment nightmare frequency estimate, as well as, to determine if the SLAT treatment was therapeutically effective over a period of three months it was decided that this time frame was appropriate. Nevertheless participants were required to provide information relating to the most therapeutic element in each treatment they believed assisted them in eliminating or ameliorating their nightmares frequency. Approximately 81% of participants in the SLAT group reported that it was the information that nightmares were a by-product of their cognitive processes - they were the authors and editors of their dreams, including nightmares – was considered to be the most effective therapeutic element or instruction. This implies that education or suggestion may be a key element in empowering individuals to manage problem nightmares. This, in turn, may challenge erroneous or dysfunctional beliefs related to the cause of nightmares. For instance, the psychiatric view stresses that nightmares represent a symptom of a deeper psychological problem (Foa, Rothbaum & Steketee, 1993; Hartman, 1984; Lansky, 1995; Mack, 1974) therefore the expectation that

treating nightmares may be more complex than unlearning a learned problematic behaviour.

11.6 Implications

The implications of these self-help treatment findings are potentially revolutionary. The present study has provided some evidence that self-help treatments can be therapeutically effective in managing nightmare frequency and distress. These approaches could potentially revolutionize the way nightmares are treated and managed. Having the option of obtaining a CD that gives simple instructions and listening to it a few nights in order to eliminate or alleviate nightmare frequency and distress – as well as improving sleep quality – would be of great benefit to nightmare sufferers.

What is more clinically compelling is the idea that simple instructions and suggestions seem to eliminate nightmare frequency and ameliorate nightmare distress. Perhaps challenging individuals' expectations or held beliefs about nightmares and related aetiology may have served to empower individuals to accept responsibility and alter or eliminate nightmare narratives altogether. Furthermore, these findings support the simple approach adopted by IRT researchers and practitioners, which is imbedded in the cognitive restructuring paradigm. As alluded earlier, IRT is a simple treatment that has proven therapeutically efficacious in adults (Krakow et al., 2000), children (Simard & Nielsen, 2009; St-Onge, Mercier & De Koninck, 2009) and people with mild cognitive disability (Peirce, 2006).

Furthermore, IRT's protocol has included single 3-hour sessions (Kellner et al., 1992; Krakow, Kellner et al., 1995; Krakow & Neidhardt, 1992) to three sessions - two 3-hour sessions and 1-hour session in consecutive weeks (Krakow, Hollifield, Schrader et al., 2000), which seems to further illustrate the simplistic nature and flexibility of the approach. Thus, nightmare treatments do not need to be complex and lengthy in order to be therapeutically effective. Bishay (1985) contends that mastery is the key element in efficacious story-line alteration techniques, logically then it must follow that acquiring a sense of mastery over dreams and nightmares leads to a sense of empowerment. Mastering a task such as dream alteration leads to personal empowerment, that is, the knowledge and certainty that one is able to influence one's environment including dream environment at will. Conceivably, this sense of empowerment may be the therapeutic ingredient that directly challenges the sense of helplessness that is common in chronic nightmare sufferers (Hartmann, 1984).

11.7 Summary

The main objective of the second study was to trial a brief story-line alteration technique (SLAT) in participants with frequent nightmares. Other objectives included comparing the SLAT treatment with a variant of the treatment of choice in Australia SysD treatment and ascertain if such treatments also had ameliorating effects on other nightmare related variables such as sleep quality. The current study found that the SLAT treatment was effective in significantly reducing nightmares, ameliorating nightmare distress as well as significantly improving sleep quality. The identified

therapeutic element in the SLAT treatment appears to be the empowerment acquired via the knowledge that participants were the authors and editors of their dreams which may have directly challenged the sense of helplessness apparent in frequent nightmare sufferers.

The employment of a self-help format also provided some evidence that nightmare treatment delivered via CD's may be therapeutically efficacious, which has the potential of revolutionizing the manner in which nightmare treatments are implemented. However, these findings need to be considered with caution since very few participants comprised the sample. Furthermore, the monitoring progress procedure needs to be reviewed in order to further clarify variables that may have influenced the therapeutic outcomes.

Chapter 12

Theoretical Review Chapter

The subject matter of this thesis is intriguing however it is a relatively new science and as a result, there are still numerous aspects of the nightmare phenomena that need further clarification; particularly, in regards to the definition, aetiology, prevalence, function, interpretation and management. The current study proposed to contribute to the knowledge base pertaining to nightmare prevalence and management in Australia, principally by shedding some light on nightmare frequency in a sample of young adults and providing some insight into treatment options based on self-help formats. The following sections will discuss the aforementioned aspects of the nightmare phenomena in light of the key findings of the current study. It also aimed to elucidate future research necessary to clarify disagreements amongst researchers and integrate the plethora of findings in the literature.

12.1 Clinical Perspective

Nightmares from a clinical perspective may be considered the main pathology in the realm of the dream phenomena; however this appears to be dependent on a number of variables. The presence of nightmares seems to have been misunderstood and perhaps continues to be misconstrued. Some have described nightmares as the one of most profoundly horrid maladies that affect individuals (Jones, 1931.1951) yet others as the most useful of dreams that could be experienced (Hartmann, 1999). From the available literature it can be deduced that nightmares may be considered healthy or unhealthy –

in a similar way that stress can either be good stress or bad stress. Healthier nightmares tend to be transient and are common in the general population (Hartmann, 1984). These nightmares tend to correlate with daily stress associated with variables such as personal or occupational stressors/traumas, ingestion or withdrawal of drugs, and febrile illnesses (Barrett, 1996; Cartwright, 1996; Hartmann, 1984). These kinds of nightmares are often non-recurrent and related distress is usually low in intensity (Davis, 2009). In contrast, unhealthy nightmares tend to be frequent, recurrent, resistant to change and/or chronic; and are usually related to pathological variables such as severe trauma exposure, organic pathology and/or psychopathology (Barrett, 1996; Davis, 2009; Hartmann, 1984). Generally, these kinds of nightmares are highly distressing and affect most areas of daily functioning.

It is unusual to contend that nightmares may be healthy since nightmares are commonly associated with profoundly dysphoric experiences. The 'negative' aspect about having any type of nightmare, is that although the psychology (mental structures) of the dream are either fictitious or activations of past memories, the mind in the dream state is unable to distinguish reality from fiction. Therefore, the physiological and emotional reactions to those mental structures are very real to the dreamer. Physiologically the body gets ready to deal with a perceived threat; hence the autonomic system is activated with mild increases experienced in heart rate (tachycardia), respiration rate (tachypnea) and perspiration (diaphoresis). In nightmares there is a sense of on-going helplessness that accompanies the dreamer, a sense that the dreamer's worst fears or anticipations may be realized. It is as though, the brain and mind work against the

dreamer to expose them to dyphoric imagery and affectivities pertaining to personalized negative anticipations, until the dreamer becomes so uncomfortable that he/she escapes by arousing from sleep. The consequences of these night-time experiences affect numerous behaviours related to sleep and other aspects of individuals' waking life that cause distress in intrapersonal and interpersonal realms. These negative effects may be temporary, transient, short-term and/or long term.

12.2 Definitional Issues

The contemporary definitional dilemma identified in the literature pertains mainly to psychologically related constructs. These relate to the range of emotions experienced during the dream and the applicability of the 'waking criteria'; although there appears to be some confusion regarding which particular sleep states elicit nightmares. Nightmares are commonly associated with REM sleep; however, nightmares have also been reported from other sleep stages (Davis, 2009; Hartmann, 1984).

Physiologically most nightmare researchers concur that nightmares predominantly occur in REM sleep (Levin & Nielsen, 2007), but this seems to apply primarily to idiopathic nightmares and some trauma-related nightmares. Idiopathic nightmares have been explicitly associated with longer REM sleep (Hartmann, 1984) that occur late in the sleep cycle between 5-7am. These types of nightmares rarely involve body movement primarily due to REM sleep atonia. When nightmares are considered a primary condition such as Nightmare Disorder, nightmares are specific to REM sleep (DSM-IV –TR, 2000, ICSD-2, 2005), which appears to be synonymous with

Hartmann's description of lifelong nightmare sufferers. In contrast, trauma-related nightmares are not specific to REM sleep, since they have also been reported from N2 (Davis, 2009; Hartmann, 1984) and occur early in the sleep cycle between 1-3am. Since trauma related nightmares can occur during N2, body movements can be expected during these nightmare experiences (Pagel, 2000).

Hartmann further contends that there are other related phenomena that have been reported such as daymares and hypnagogic nightmares that occur during the day or transitions between wakefulness and sleep and *vice versa*. These two experiences are quite rare and tend to be related to certain sleep disorders, but can occur in the absence of any sleep disorder in normal subjects. Daymares for instance are daydreams which become 'nightmarish' to the point of frightening and arousing the daydreamer from the daydream. Conversely hypnagogic and hypnopompic hallucinations are similar to REM nightmares but tend to occur upon falling asleep or during waking from sleep, respectively (Hartmann, 1984). This specific nightmare (vivid hallucination) may often, but not necessarily be associated with the presence of narcolepsy. Therefore, researchers need to physiologically differentiate the various kinds of nightmares or nightmare like experiences that individuals are reporting. These may include; REM nightmares, N2 nightmares, and hypnagogic and/or hypnopompic nightmares.

Distinguishing between different types nightmares; such as nightmares that occur early/late in the night, during the transitions to and from sleep, during N2 and/or during REM sleep would be useful to clinician treating problem nightmares. The clinical implications of having such information available would assist clinicians managing

problem nightmares in providing tailored interventions that could make the difference between effective and ineffective treatment. REM nightmares would be clinically managed differently from N2 nightmares and hypnogogic/hypnopompic nightmares. Future research could focus on clarifying the physiologically different kinds of nightmares that are reported; perhaps by employing a detailed check-list that seeks to gather information pertaining to the time of occurrence such as - initiating sleep, early in the sleep cycle, late in the sleep cycle or awakening in the morning. This information would provide researchers and clinicians insight into whether nightmares are specific to particular sleep stages without having to conduct a polysomnography. Furthermore, it could elucidate the type/s of nightmare reported - exclusively trauma related, exclusively idiopathic or both trauma related and idiopathic in nature. The implication of this additional information would enable more specialized treatments and better therapeutic outcomes.

Psychologically nightmares are considered dreams that gradually become dysphoric in imagery and affectivity, to the point of arousing the dreamer from sleep. The experience engendered by them may have lasting psychological effects during the night, the subsequent day, weeks, months or sometimes years. Systematically, analysing the phenomena reveals that there seems to be four psychological criteria/dimensions that are definitive of nightmares:

- the kind or type of images and affectivity experienced during the dream
- the intensity of the images and affectivity experienced during the dream
- the immediate distress following awakening and returning to sleep
- the distress experienced the following day/s, week/s, month/s or year/s

Firstly, the kind or types of images related to nightmares are dysphoric or negative in nature. It appears that these images elicit dysphoric affect states (since anxiety is not an emotion), however some contend that it is the other way around, affect states elicit the dysphoric imagery, thus nightmare narratives contextualize the dominant affect state of the dreamer (Hartmann, 1999). Nevertheless, these dysphoric imagery or narratives depend on whether nightmares are trauma related or idiopathic in nature. Trauma related nightmares normally replicate a traumatic experience with its associated affect states which eventually integrates other memories into the dream and alters the narrative, unless the nightmare becomes fixed and continuously replays images and affect states (Barrett, 1996). Thus, an individual may initially experience a detailed replicative nightmare about some personal trauma such as a car accident, which gradually begins to change via the integration of other personal memories. Idiopathic nightmares in contrast, may include a myriad of narratives, including being chased by malignant beings or gangs, physically or emotionally hurt in some way, and/or being overwhelmed by some occurrence such as a tidal wave or beasts (Hartmann, 1996). Affect states reported during nightmares include rage, sadness, disgust and grief; although the most commonly reported states at a ratio of 3 to 1 are anxiety and/or fear (Zadra, Duval, Begin et al., 2004). Thus, the most accepted affect states in nightmare definitions include acute anxiety and/or fear (Nielsen & Zadra, 2000).

Secondly, the intensity of the images and affect states experienced during the dream directly relates to the 'waking criteria'. It is presumed that when emotional states become so intense, thus uncomfortable, dreamers or more specifically the sense of

'self/ego' in dreams escapes by arousing the dreamer from sleep (Zadra & Dondori, 2000). However, this sequence of events remains questionable since various researchers have found that waking from a dysphoric dream does not immediately imply affect intensity (Levitan, 1978, 1980; Zadra & Dondori, 1993, 2000). Furthermore, the activation of the fight/flight/freeze response during sleep physiologically arouses individuals which can cause awakening from the dream. Thus, physiological arousal is probably the waking stimulus. Nevertheless, the waking criterion is considered the most accepted nightmare definition (Levin & Nielsen, 2007), that is, negative dreams that lead to anxiety tend to arouse dreamers from sleep. Nightmares commonly follow a dream narrative that progressively becomes so negative that causes anxiety and sleep is disrupted. However, some researchers claim that this description is considerably narrow and dysphoric dreams need not awaken the dreamer to be considered nightmares (Spoormaker, Schredl & van den Bout, 2005). This view refers mainly to the idea that bad dreams also significantly affect individuals in negative ways in subsequent days, weeks, months or years despite not disrupting sleep (Blagrove, Framer & Williams, 2004). In addition, nightmare distress, which has been found to more accurately predict psychopathology (Belicki, 1992; Blagrove, Farmer & Williams, 2004) appears not to be specifically related to the 'waking criteria'. Nevertheless, Levin and Nielsen (2007) contend that all kinds of disturbed dreaming – bad dreams that do not awaken the sleeper and different types of nightmares – are in fact phenotypic variants of an underlying genotype, dysphoric dreaming. Furthermore, Levin and Nielsen “suggest that the consequences of these variants are largely dictated by waking responses to the imagery e.g. distress” (p.483).

Thirdly, immediate distress following awakening from a nightmare and returning to sleep, relates to developing specific behaviours that are contra-productive to good sleep hygiene. Frequent disruption of sleep from nightmares may become an independent disorder regardless of aetiology. Hence, frequent sleep disruption due to nightmares may produce symptoms similar to psycho-physiological insomnia, a learned behavioural response (Krakow, Hollifield, Schrader et al., 2000). In addition, avoidant behaviours may also develop, such as fear of returning to sleep, sleep antagonistic behaviours like keeping the lights on, and/or developing schemas related to being a poor sleeper (Haynes & Mooney, 1975).

Fourthly, distress experienced the following day is directly 273, the nightmare distress construct (Levin & Nielsen, 2007). The nightmare distress construct pertains to diminished functioning the following day(s) due to increased stress, fatigue, and concerns about mental health. Furthermore, nightmare distress leads to impairment in areas of function such as in social and occupational (DSM-IV-TR, 2000), which can be on-going if left untreated.

12. 3 Aetiological Issues

The aetiology of nightmares is complex; according to the empirical literature, nightmares may arise from a variety of causes including trauma, stress, personality, medications, febrile illnesses, organic, genetic and/or familial factors (Leung & Robson, 1993). Having such an array of causes makes nightmare aetiology considerably intricate. Thus, establishing direct causes of nightmare incidents would

provide insight for theoretical constructions and more importantly clinical management if treatment is warranted.

The type of nightmare experienced often suggests the probable aetiology. Trauma-related nightmares have the most easily identifiable cause, trauma exposure (Hartmann, 1984; Davis, 2009; Domhoff, 2000). Literature on trauma exposure (Barrett, 1996; Schwartz & Perry, 1994) suggests that when individuals are exposed to trauma the habitual response involves a post-trauma reaction. This reaction or response commonly pertains to the release of stress hormones that elicit behavioral responses such as hyper-vigilance and emotional reactivity (van der Kolk & Saporta, 1991). Post-trauma nightmares pertain to re-experiencing of traumatic experiences, which manifests during sleep, but can also intrude during wakefulness (e.g. flash back experiences). These nightmares appear to be part of the brain's response in trying to make sense of the traumatic experience in some individuals. The purpose of this process may be to integrate traumatic experiences, a relatively uncommon situation in contrast to ordinary daily experiences, into individual's existing schemas. It is believed that the frequent re-exposure of the traumatic experience during nightmares may mediate the integration process, which, in turn, ameliorates hyper-vigilance and emotional reactivity. The integration process becomes evident when nightmare narratives begin to change and incorporate other memories and schemas from the individuals' memory. In this sense post-trauma nightmares may be a useful healthy response in some people who would otherwise encountered chronic problems. This is because the nightmares may serve the function of re-establishing psychological homeostasis. However, when an individual's

reaction to the presences of post-trauma nightmares involves continued hyper-vigilance and avoidance behaviours nightmares tend to become fixed (unchanging) and chronic. Consequently, nightmares become debilitating and counter-productive, hence may contribute to the development and maintenance of PTSD (Barrett, 1996; Davis, 2009).

Conversely, individuals who report frequent idiopathic nightmares may have an array of variables that could be contributing to the presence of the phenomena. This could involve a familial history, chronic stress, poor sleep hygiene, ingestion/withdrawal of drugs, and/or febrile illness. Thus, employing a thorough intake procedure protocol seems to be paramount in ascertaining idiopathic nightmare aetiology. Furthermore, it is plausible that individuals who report frequent idiopathic nightmares may have confounding causes that contribute to the presence of the phenomena – familial history, stress, poor sleep hygiene etc. It is also feasible to consider trauma exposure (recent and/or early) as another possible confounding variable that may contribute as well as complicate the aetiology of different types of nightmares. Davis (2009) contends that the available research that has examined the distinctions between idiopathic and trauma related nightmares is not necessarily clear, particularly in regards to the content of nightmares. Some trauma exposed children for instance report nightmares after traumatic incidents, which do not relate to the actual trauma. Unfortunately, literature on confounding aetiological variables of nightmares is lacking and is definitely warranted; since it is highly unlikely that most nightmare sufferers would have a single contributing cause given the myriad of aetiological variables.

The findings of the present study indicate that a considerable number of participants reported exclusively trauma related and exclusively idiopathic nightmares and a significant number also reported both types of nightmares. Depending on the data analyses (inclusion or exclusion of participants who reported both types of nightmares) different conclusions were reached. Nevertheless, it was found that a high number of participants reported both significant trauma exposure symptoms and trauma-related nightmares, which is consistent with the notion that trauma exposure is relatively common in the general population (Gold, 2008). The mere expectation or anticipation of life threatening events may considerably influence reactions and responses to those expectations. Hence, the aetiology of this kind of nightmare is linear and easily identifiable (Hartmann, 1984), however the aetiology of the idiopathic nightmares reported in the current study were unknown, given that data pertaining to the content of idiopathic nightmares were not collected.

Perhaps the most plausible approach in comprehensively understanding the aetiology of the various nightmare experiences reported in the literature is to ascertain a common denominator between the myriad of causes. Levin and Nielsen (2007) imply that there appears to be two constructs that can illuminate a common thread between the array of causes reported in the literature, affect load and affect distress. These constructs relate to a trait-like factor and a state-like factor, respectively. Hence, individuals who experience frequent nightmares appear to be high in affect load and thus have an inherent predisposition to experience stimuli more intensely, which seems to affect how they manage emotional surges or reactions to experiences. These experiences may

range in affect distress from objectively low stress/anxiety provoking stimuli to high stress/anxiety provoking stimuli. Regardless of whether an individual is low or high on affect load, there are certain stimuli or experiences that substantially affect most individuals (e.g., loss of a significant relationship). Therefore, understanding the levels of affect load and affect distress of any individual who reports experiencing frequent nightmares may significantly contribute to nightmare aetiology construction and clinical management of problem nightmares.

12. 4 Prevalence Issues

Issues with nightmare frequency and prevalence are well documented in the literature, however relatively large discrepancies between and within cohorts continue to be reported suggesting that consistency in research methodology is still lacking. Most studies that report nightmare frequency or prevalence estimates survey healthy cohorts, including; children, adolescents and adults (young, middle aged and elderly). Each developmental cohort has reported slightly different frequency estimates, with the children reporting the highest estimate, followed by adolescents, young adults, middle aged adults and finally elderly adults. Thus, from a developmental perspective, it appears that nightmare frequency is prominent during early life and progressively decreases with age. However, there are very slight discrepancies present during significant developmental milestones that appear to influence nightmare frequency such as puberty and reaching adulthood (Kales, Soldatos & Kales, 1987; Nielsen, Stenstrom & Levin, 2006). Although, it is relatively well accepted that children tend to experience the most nightmares (DSM-IV-TR, 2000), some contend that children

dream very little (Foulkes, 1985) and nightmares are not prominent at all in this age group (Agargun, Cilli, Sener et al., 2004; Simard, Nielsen, Tremblay et al., 2008). Issues with establishing an accurate nightmare frequency for children include children's misperception of the concept of nightmares and dependence on significant caregivers' reports, which may reflect concerns regarding validity and reliability.

Periodicity of nightmare frequency in terms of weekly, monthly and yearly reports also produces differences in estimates. Various studies have reported relatively large discrepancies in monthly 8% - 29% (Zadra & Donderi, 2000) and yearly 26% - 83% (Belicki & Belicki, 1982; Levin, 1994) estimates, however weekly reports have been more consistent. Various contemporary studies across the world (Belicki & Belicki, 1982; Ohayon et al., 1997; Stepansky et al., 1998; Feldman & Hersen, 1967; Levin, 1994) have reported similar estimates ranging from 2% - 6% which is consistent with the moderately severe category in the International Classification of Sleep Disorder Revised (1997) classification system. Due to the high variation of reported frequencies, it seems that the collaborations of various researchers in different parts of the world employing the same operational definition (whether it includes the waking criterion or not), using the same frequency metrics (retrospective or prospective or both) is clearly warranted. This would enable researchers to integrate future findings and provide some clarity in terms of nightmare frequency and prevalence within the field.

The current study found interesting results pertaining to the frequency of nightmares, in particular weekly nightmares and types of nightmares reported. It reported that 15.9%

of the sampled experienced weekly nightmares, over three times higher than the weekly frequency reported in the literature by studies surveying similar cohorts and employing a similar operational definition and metric. This finding however is consistent with the contention that frequent nightmares have been drastically under-estimated in the literature (Levin & Nielsen, 2007), primarily due to the lack of differentiation between nightmare distress and frequency, unclear operational definitions and kind of metrics implemented. The current study provided a clear distinction between nightmare distress and frequency, as well as a clear operational definition but it did employ a retrospective metric, which may have compromised the frequencies reported. However, this may only be applicable to non-frequent nightmares such as yearly nightmares since Robert and Zadra (2008) found that measurement of frequent nightmares such as weekly nightmares via retrospective methods is reliable and the retrospective metric employed in the current study allowed participants to report exclusively yearly, monthly or weekly nightmares.

Robert and Zadra (2008) conducted a study on the impact of retrospective and prospective metrics on nightmare and bad dream frequency, and found no significant difference between a 1-month estimate from retrospective and prospective metrics. This finding provides support for the notion that weekly nightmare frequency measured via retrospective metrics may be reliable, given that the primary concern with inaccurate retrospective reports is due to memory failure/s (Beaulieu-Prevost & Zadra, 2005). Nevertheless, both monthly and yearly estimates were relatively consistent with reports found in the literature, which in retrospect is perhaps expected given the wide range of

estimates reported in these two periodicities – monthly and yearly nightmares. Yet some intriguing questions pertaining to weekly estimates in Australian adolescents and young adults in educational institutions remain. The current study is not the only research that has reported considerably higher weekly nightmares in contrast to similar cohorts from other places in the world. Roberts, Lennings and Heard (2009) also reported higher than expected weekly nightmares in contrast to similar cohorts. Thus future nightmare frequency research is clearly warranted in Australia given the findings of the current study and Roberts, Lennings and Heard's study. The present study served as a sounding of the potential nightmare frequency in young Australian adults and ideally it promotes further investigation since the general population nightmare prevalence remains unknown.

The current study also found interesting results regarding the type of nightmares reported, in particular trauma related and idiopathic nightmares. Most research studies that report nightmare frequencies fail to distinguish between trauma related and idiopathic nightmares (Levin & Nielsen, 2007). The current study did make the distinction between these types of nightmares and found that some participants reported trauma related nightmares exclusively, others reported idiopathic nightmares exclusively and a significant number reported both types of nightmares. From the participants who indicated the type of nightmare reported ($n = 250$), 21.20% ($n = 53$) exclusively reported trauma related nightmares, 35.60% exclusively reported idiopathic nightmares; and 43.20% reported both types of nightmares. Categorizing these different types of nightmares into periodicities of yearly, monthly and weekly reports;

from the participants who exclusively reported trauma related nightmares (n = 53), 60.38 % (n = 32) reported yearly nightmares, 30.19% (n = 16) reported monthly nightmares, and 9.43% (n = 5) reported weekly nightmares. Conversely, from the participants who exclusively reported idiopathic nightmares (n = 89), 33.71 % (n = 30) reported yearly nightmares, 46.07% (n = 41) reported monthly nightmares, and 20.22% (n = 18) reported weekly nightmares. Interestingly, from the participants who reported both trauma related and idiopathic nightmares (n = 108), 20.37 % (n = 22) reported yearly nightmares, 40.73% (n = 44) reported monthly nightmares, and 38.90% (n = 18) reported weekly nightmares.

From these findings it can be deduced that trauma related nightmares were more prominent in yearly reports followed by monthly reports and finally weekly reports. Idiopathic nightmares on the other hand were more prevalent in monthly reports followed by yearly reports and finally weekly reports. Intriguingly, for participants who reported both types of nightmares, nightmares were more prevalent in monthly reports followed weekly reports and finally yearly reports.

Perhaps the most intriguing finding from the first study is the notion that participants who reported both types of nightmares could represent a distinct group of individuals within the population of individuals who report nightmares. Numerous significant differences were observed between participants who reported both types of nightmares and participants who exclusively reported one type of nightmare. Significant difference were observed for yearly and weekly nightmares, global sleep quality, subjective sleep quality, duration of sleep, habitual sleep efficiency, sleep disturbance, daytime

dysfunction, PTSD symptoms, trauma nightmares and memories, severe anxiety not trauma related, bad dreams not trauma related and night terrors. Future research focused on the different types of nightmares reported could perhaps examine personality characteristics with an aim to ascertain if in fact individuals who report both types of nightmares have a distinct personality constellation. Hartmann (1984) reached a similar conclusion after administering a battery of measures to individuals who had life-long nightmares and were found to be a distinct group from those who reported post-trauma nightmares and night-terrors.

12. 5 Function Dilemmas

Proposed nightmare functions have encountered considerably more problems than other aspects of the nightmare phenomena such as nightmare formation. Nevertheless, the discussion of the function of any phenomenon commonly relates to the formation of that phenomenon, thus function and formation are often closely intertwined.

Perhaps the most productive function of trauma-related nightmares appears to relate to the post-trauma response or reaction (Barrett, 1996). When exposed to trauma some individuals respond with hyper-vigilance, emotional reactivity, and the recurrent presence of cognitions or mentation related to the specific traumatic experience (Davis, 2009). Post-trauma nightmares seem to be part of the brain's response, in trying to process an incident that has threatened to overwhelm an individual's coping capacity, via re-experiencing the traumatic material in order to integrate the experience into the individual's autobiographical memory. This function seems to work considerably well

since most individuals recover from trauma exposure (Bonanno, 2005). However, it is noteworthy to state that a small percentage of people seem to be unable to recover spontaneously after exposure without the assistance and/or intervention of professionals such as therapists or clinicians.

Perhaps the most productive function of some idiopathic nightmares could be stress reduction. It has been postulated that nightmares may help alleviate stress since nightmares have been found to be caused by stressors (Berger, Hunter & Lane, 1971; Cartwright, 1991; Wood, Bootzin, Rosenhan, Nolen-Hoeksema & Jourdan, 1992). Research findings indicate nightmares assist in coping with stress via incorporating current stress-inducing incidents into dream narratives (Cartwright, 1990). Therefore, via this process, contemporary stressors, appear to be managed, and consequently ameliorated during the dream experience itself, in a similar way that the post-trauma response/reaction functions - via re-exposure that aims to dissipate emotional intensity.

From a clinical perspective it has been postulated that the presences of nightmares may be therapeutic. Nightmares expose individuals to dysphoric imagery and emotions in a very safe place, in the dream world where it is presumed to be safe from harm. Hartmann (1999) contends that dreams in general may function like psychotherapy where connections can be made in an environment that is free from consequential problems. This could represent the brain's natural tendency to systematically desensitize individuals' from stimuli that provoke strong emotional reactions, which may simultaneously assist in developing resiliency. Correspondingly, Levin and

Nielsen (2007) posit that dysphoric dreams, but not nightmares extinguish fear-based memories that developed in earlier life in order to promote psychological adaptation and wellbeing.

It appears that only when nightmares are recurrent, chronic and fixed such as some PTSD nightmares, they have no function and are counter-productive. However, such PTSD nightmares are relatively uncommon in contrast to the other types and kinds of nightmares and represent a minority of individuals exposed to extreme trauma (Barrett, 1996). Another type of nightmares that may also have no specific function could be pathology or psychopathology related nightmares. These nightmares commonly stem from dysfunctional cognitions and perceptions related to the pathology or psychopathology that exacerbate the condition.

12. 6 Interpretation Dilemmas

Function and interpretation seem to be closely intertwined since any proposed function pertaining to nightmares will influence any interpretation or implication of the presence of the dream. Thus, the interpretation may follow closely the functions proposed. Nevertheless, when discussing the probable interpretation of nightmares, another dichotomy that can be useful - healthy and unhealthy nightmares.

Healthy nightmares relate to post-trauma reaction nightmares, stress related nightmares and perhaps drug-related nightmares. The presence of trauma related nightmares appears to be indicative of the brain's natural response to trauma exposure; hence it is a healthy response to an overwhelming incident. The presence of stress related

nightmares seems to suggest that it is brain's way of alleviating stress by managing stressors in the dream world. Some have proposed that nightmares can be interpreted and function like a vaccine (Siegel & Bulkeley, 1998) to assist individuals in building defenses against potentially damaging psychological stimuli. Therefore, these kinds of nightmare can be interpreted as warning signs of 'lingering psychological conflicts' that promote bolstering coping skills.

In contrast, unhealthy nightmares predominantly relate to fixed and unchanging nightmares or psychopathological nightmares. Any interpretation of such nightmares may be meaningless, perhaps only indicating that the individual experiencing nightmares is having considerable complications with the condition whilst awake and asleep. However, researchers have found that in one psychopathology, clinical depression, patients' reports of nightmares was highly predictive of suicidal ideation (Agargun & Cartwright, 2003; Bernet et al., 2005). Thus, in clinically depressed patients the presence of nightmares could be interpreted as a risk factor for suicide.

12. 7 Management Options

It is pivotal to note that from the available empirical literature it may be stipulated that the majority of nightmares do not appear to warrant an intervention or treatment. The majority of nightmares according to the various perspectives discussed in this thesis may serve some function. Trauma-related nightmares for instance seem to occur in order to assist individuals make sense of an experience that was overwhelming via the process of re-exposure, which potentially leads to integration of the experience.

Conversely, idiopathic nightmares depending on aetiology may occur to reduce stress, deal with personal and sensitive material and/or build resiliency.

The nightmares that warrant treatments are problematic – recurrent, fixed, highly distressing and significantly affect functional areas of sleep and waking behaviours. Once it is deemed that specific nightmares necessitate an intervention the next step involves determining the type of intervention; psychoanalytic, behavioural and/or pharmacological. All these types of treatments appear to lead to the elimination of the dream, but this is achieved in considerably different ways. Psychoanalytic intervention aims to analyze associations of nightmare content in order to access subconscious material that elicits the nightmare, however this may take considerable lengths of time. Behavioural interventions encompass both systematic desensitization techniques and cognitive techniques that focus on re-learning to manage or alter the nightmare content in significantly less time. Finally, pharmacological interventions seem to alter REM sleep, in order to disrupt REM nightmares thus impeding the occurrence of the dream; however non-REM nightmares are unsuitable for this course of treatment.

Although the therapeutic objective of all nightmare treatments is to eliminate the experience, some interventions provide more benefits than simply eliminating dysphoric dreams. For instance, pharmacological interventions have proven to be effective in assisting individuals eliminating nightmares, but do not provide the added benefits inherent in other interventions. Other treatments like behavioural interventions and perhaps some psychoanalytic interventions also promote growth via the message

that nightmares can be analyzed or altered in desired ways. This seems to promote not only a sense of mastery but also personal development. Furthermore, cognitive behavioural treatments have proven to assist in reducing anxiety, depression, PTSD symptoms and improve sleep (Krakow et al., 2000). Alternatively, individuals with problem nightmares that may not respond well to a specific treatment may benefit from a combination of treatments for instance pharmacological and cognitive-behavioural treatments, similar to a treatment plans offered to patients with clinical/chronic depression.

The present study found that self-help interventions were not only effective in eliminating nightmare frequency and ameliorating nightmare distress, but also in improving moods as well as sleep. Both the SLAT and SysD treatments proved beneficial across all the variables examined and were easily incorporated into participants life styles. The therapeutic element in the SLAT treatment was identified by the participants receiving the SLAT treatment as the knowledge imparted relating to the notion that the nightmare narratives could be altered at will. Unfortunately, participants did not indicate whether it was the information at the beginning of the CD that stated “Because nightmares are dreams and dreams are narratives or stories we tell ourselves while we are asleep, we are both the authors as well as editors of our nightmares. That is, we can easily change them” or the suggestion in point 2 “Pick-up your power -item and hold it with both of your hands and listen to the following instructions: ‘This item you are holding represents all the power you will ever need to overcome any threat during your nightmare experience. As soon as you feel threatened in

your dream, you will be able to access your 'power item'. By doing so you will be empowered to overcome (e.g. escape by flying away, or disappearing or destroying) your threat instantly'. Anytime you want to access your 'power-item', all you need to do is 'think of it' and it will be at your disposal. You can overcome any threat during your dreams by simply thinking of your power-item". Nevertheless, it appears that the expectation of being able to change and control dreams was the key ingredient, according to the participants.

This finding promotes the idea that education fulfills a prominent role in alleviating negative consequences associated with problem nightmares. Thus, this is reflective of the key element/ingredient in effective alteration techniques since empowering individuals experiencing problem nightmares provides a basis for mastery over the dream environment; which has been identified as the main therapeutic element in alteration techniques. However, in the current study a simple suggestion that nightmares could be altered at will seemed to be sufficient to significantly ameliorate nightmare frequency.

The concept of introducing a new story line alteration treatment for problematic nightmares arose from clinical observations during consultations with patients requesting professional intervention. These observations included simple instructions that entailed giving clients/patients the expectation that they could change and control their dreams quietly easily. This in turn seemed to establish a belief that empowered them to bring about a desired change.

The literature review elucidated the probable theoretical models or principles of these paradigms that could offer a rationale regarding the efficacy of the technique. These theoretical models/paradigms were identified as imagery and cognitive restructuring (Krakow, Hollifield, Johnson et al., 2001), suggestion-hypnosis (Kennedy, 2002) and lucid dreaming (Laberge & Rheingold, 1990). The imagery and cognitive restructuring model provided the insight relevant to the notion that images and cognitions could be restructured. This notion was also applicable to cognitions whilst asleep that manifested as dreams. By either adding or subtracting a dream element, the dream or nightmare could be restructured thus altered. The suggestion-hypnosis model provided insight relevant to the notion that by giving a suggestion, whilst the participant held the power-item, the client could link or associate the empowering suggestion to the physical item. Thus by having the power-item in their possession while retiring to bed and initiating sleep, they would have a sense of empowerment due to the knowledge that they could access their power-item at will, which could assist them in dealing with their threat. Finally, the lucid dreaming model provided the insight relevant to notion that during dreams it is possible to become aware that dreaming is occurring and thus be able to manipulate the dream narrative. This possibility sets the foundation for a sense of mastery. By being able to control the dream or nightmare, the nightmare sufferer would become the master of the dream, hence they could alter the nightmare anyway they desired.

The simplicity of the SLAT treatment makes it appropriate for different age groups, children, adolescents and adults. Children could easily integrate it to their nightly bedtime routine with the assistance of caregiver. In fact, the caregiver could play a vital

role in the intervention since they already have a relationship, ideally a trusting and loving relationship, with the child. The caregiver could listen to the CD and provide the information and suggestion to the child. This could even be more powerful coming from a trusting caregiver. Moreover, given that the SLAT treatment does not include re-exposure elements (retelling the nightmare) it would also be safe for individuals with chronic replicative PTSD nightmares. Thus, it would seem that the SLAT treatment could be appropriate for all types of nightmares and cohorts. However, further investigation regarding the therapeutic elements of the SLAT treatment (for the purpose of clarification) is warranted. Furthermore, studies' examining the treatment as it applies to the various cohorts that report nightmares are also warranted.

12. 8 Conclusion

The findings of the first study support the notion that nightmares are relatively common in community based samples, an idea that is well accepted in the literature. The majority of the sample 89.30% reported nightmares in the recent past, with 42.95% of participants exclusively reported yearly nightmares, 30.45% of participants exclusively reported monthly nightmares, and 15.90% of participants exclusively reported weekly nightmares. These figures represent the first nightmare frequency estimates for young adults in a large community base sample in Australia.

The primary hypothesis in the first study was supported - over 10% of the sample reported weekly nightmares. Researchers have speculated for a while that retrospective metrics have drastically underestimated frequent nightmare incidents in young adults

based largely on the prospective findings; however no retrospective study to the author's knowledge has reported more than 10% of weekly nightmare incidents until now. Although the first study employed relatively stringent parameters to define and measure nightmares, the frequency of incidents across the three periodicities yearly, monthly and weekly were prevalent.

The current study also appears to be the first study to report the frequencies of trauma related and idiopathic nightmares in a large community based sample. Researchers have commonly reported nightmare frequencies or prevalence; however have failed to distinguish between the types of nightmares reported. From the participants who identified the type of nightmare reported in the first study, 21.20% exclusively reported trauma related nightmares, 35.60% exclusively reported idiopathic nightmares; and 43.20% reported both types of nightmares.

It was also found that the group of participants who reported both types of nightmares was significantly different from those who exclusively reported trauma related and idiopathic nightmares across an array of variables; suggesting that this group may also form a distinct group of individuals within the population of individuals who report nightmares, similar to life-long nightmare sufferers.

The primary hypothesis for the second study was also supported; the pilot treatment SLAT significantly reduced nightmare frequency overtime and was significantly more effective than the SysD treatment. Furthermore, the SLAT treatment also significantly improved sleep quality over time and in contrast to the SysD treatment. The literature

revealed that nightmare treatments could be altered and tailored to meet specific needs of individuals suffering from nightmares and the second study was consistent with this assertion. The SLAT treatment comprised principles of imagery and cognitive restructuring, suggestion/hypnosis and lucid dreaming. However, in essence the treatment is extremely simple and the knowledge/information that nightmares could be altered at will was identified by participants as the most therapeutic element in the treatment. Perhaps the most intriguing finding of the second study is that psychological nightmare treatments in self-help formats can be effective in reducing nightmare frequency, ameliorate night distress and improving sleep.

The current thesis provided a number of pioneering findings including the first nightmares frequency estimates for young adults in Australia, the first nightmare estimates for trauma related and idiopathic nightmares in a large community based sample and the first therapeutically effective pilot nightmare treatment in a self-help format presented on a CD in Australia. The implication of these findings elucidate some important aspects about the nightmare phenomenon in Australia, prevalence of the different types of nightmares and key elements identified as therapeutically effective in a self-help format. However, it is important to stress that these findings are preliminary and future research is warranted particularly research that focuses on ascertaining nightmare frequency estimates across the Australian population and controlled studies that investigate self-help nightmare treatments on larger samples of frequent nightmare sufferers.

References

- Abdel-Khalek, A. M. (2006). Nightmares: Prevalence, Age and Gender Differences among Kuwait Children and Adolescents. *Sleep and Hypnosis*, 8(1), 33-40.
- Agargun, M. Y., Besiroglu, L., Cilli, A. S., Gulec, M., Aydin, A., Inci, R., & Selvi, Y. (2007). Nightmares, suicide attempts, and melancholic features in patients with unipolar major depression. *Journal of Affective Disorders*, 98, 267–270.
- Agargun, M. Y., & Cartwright, R. (2003). REM sleep, dream variables and suicidality in depressed patients. *Psychiatry Research*, 119, 33-39.
- Agargun, M. Y., Cilli, A. S., Sener, S., Bilici, M., Ozer, O. A., Selvi, Y., & Karacan, E. (2004). The prevalence of parasomnias in preadolescent school-aged children: A Turkish sample. *Sleep*, 27, 701–705.
- Agargun, M. Y., Cilli, A. S., Kara, H., Tarhan, N., Kincir, F., & Oz, H. (1998). Repetitive and frightening dreams and suicidal behavior in patients with major depression. *Comprehensive Psychiatry*, 39, 198–202.
- Agargun, M. Y., Kara, H., Ozer, O. A., Selvi, Y., Kiran, U., & Ozer, B. (2003). Clinical importance of nightmare disorder in patients with dissociative disorders. *Psychiatry and Clinical Neurosciences*, 57, 575–579.
- Agargun, M. Y., Kara, H., Ozer, O. A., Selvi, Y., Kiran, U., & Kiran, S. (2003). Nightmares and dissociative experiences: The key role of childhood traumatic events. *Psychiatry and Clinical Neurosciences*, 57, 139–145.
- American Academy of Sleep Medicine, (1997), *International Classification of Sleep Disorders (ICSD-R)*. Roschester, Minn: Allen Press Inc.
- American Academy of Sleep Medicine. (2005). *International Classification of Sleep Disorders: Diagnostic and coding manual* (2nd ed.). Westchester, IL: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Antrobus, J.S.(1991). Dreaming: Cognitive processes during cortical activation and high afferent thresholds. *Psychological Review*, 98, 96-121.
- Aserinsky, E., & Kleitman, N. (1953). Regularly occurring periods of eye motility and concurrent phenomena during sleep. *Science*, 118, 273-274.

Association of Sleep Disorders Centers, Sleep Disorder Classification Committee, H. P. Roffwarg (1979). *Diagnostic Classification of Sleep and Arousal Disorders* (1st ed.). *Sleep*, 2, 99-121.

Australasian Sleep Association, 2011. Viewed 20th August 2011.
www.sleepaus.on.net/executive.php

Barrett, D. (1996). *Trauma and dreams*. Cambridge, MA: Harvard University Press.

Baylor, G. W., & Deslauriers, D. (1985). *Dreams, Nature, function and a method of study*, Montreal Canada: University of Montreal.

Beauchemin, K., & Hays, P. (1995). Dreaming away depression: the role of REM sleep and dreaming in affective disorders. *Journal Affect Disorders*, 41,125-133.

Beaulieu-Prévost, D. & Zadra, A. (2005) Dream recall frequency and attitude towards dreams: A reinterpretation of the relation. *Journal of Personality and Individual Differences*, 38, 919-927

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: Penguin.

Belicki, K. (1992). Nightmare frequency versus nightmare distress: Relations to psychopathology and cognitive style. *Journal of Abnormal Psychology*, 101, 592–597.

Belicki, K., & Belicki, D. (1982). Nightmares in a university population. *Sleep Research*, 11,116-119.

Belicki, K., & Belicki, D. (1986). Predisposition for nightmares: A study of hypnotic ability, vividness of imagery, and absorption. *Journal of Clinical Psychology*, 42, 714–718.

Belicki, K., Chambers, E., & Ogilvie, R. (1997). Sleep quality and nightmares. *Sleep Research*, 26, 637.

Belleville, G., Guay, S., Marchand, A. (2011). Persistence of sleep disturbance following cognitive-behavior therapy for posttraumatic stress disorder. *Journal of Psychosomatic Research*, 70(4), 318-327.

Bengtsson, C., Lennartsson, J., Lindquist, O., Noppa, H., & Sigurdsson, J. (1980). Sleep Disturbance, Nightmares and Other Possible Central Nervous Disturbances in a Population Sample of Women, with Special Reference to Those on Antihypertensive Drugs. *European Journal of Clinical Pharmacology*, 17, 173-177.

Berger, H. (1929). Uber elektrenkephalogram des menschen. *Arch Psychiat Nervenky*, 87, 527-570.

- Berger, L., Hunter, Ian., & Lane, R. W. (1971). *The effect of stress on dreams*. Oxford, England: International Universities Press
- Berlin, R. M., Litovitz, G. L., Diaz, M. A., & Ahmed, S. W. (1984). Sleep disorders on a psychiatric consultation service. *American Journal of Psychiatry*, *141*, 582–584.
- Bernert, R. A., Joiner, T. E., Jr., Cukrowicz, K. C., Schmidt, N. B., & Krakow, B. (2005). Suicidality and sleep disturbances. *Sleep*, *28*, 1135–1141.
- Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of a dissociation scale. *Journal of Nervous and Mental Disease*, *174*, 727–735.
- Berquier, A., & Ashton, R. (1992). Characteristics of the frequent nightmare sufferer. *Journal of Abnormal Psychology*, *101*, 246–250.
- Besiroglu, L., Agargun, M. Y., & Inci, R. (2005). Nightmares and terminal insomnia in depressed patients with and without melancholic features. *Psychiatry Research*, *28*, 285-287.
- Binder, K. L. (1981). Difficulties in follow-up of rape victims. *American Journal of Psychotherapy*, *35*, 534-541.
- Bishay, N. (1985). Therapeutic manipulation of nightmares and the management of neurosis. *British Journal of Psychiatry*, *147*, 67-70.
- Bixler, E. O., Kales, A., Soldatos, C. R., Kales, J. D., & Healy, S. (1979). Prevalence of sleep disorders in the Los Angeles metropolitan area. *American Journal of Psychiatry*, *136*, 1257–1262.
- Blagrove, M., Farmer, L., & Williams, E. (2004). The relationship of nightmare frequency and nightmare distress to well-being. *Journal of Sleep Research*, *13*, 129–136.
- Blagrove, M., & Haywood, S. (2006). Evaluating the awakening criterion in the definition of nightmares: how certain people are judging whether a nightmare woke them up? *Journal of Sleep Research*, *15*, 117-124.
- Blanchard, P.A. (1926). A study of subjective matter and motivation of children's dreams. *Journal of Abnormal and Social Psychology*, *21*, 24-37.
- Bonanno, G. A. (2005). Resilience in the Face of Potential Trauma, Current Directions in Psychological Science 3135-138
 Bonanno, G. A. (2005). Resilience in the Face of Potential Trauma. *Current Directions in Psychological Science*, *14*(3), 135-138.
- Bond, J. (1753). *An essay on the Incubus, or Nightmare*. Wilson and Durham, London.

- Borek, L.L., Kohn, R., & Friedman, J. H. (2006). Mood and sleep in Parkinson's disease. *Journal of Clinical Psychiatry*, *67*(6), 958-63
- Bourguignon, E. E. (1954), Dreams and Dream Interpretation in Haiti. *American Anthropologist*, *56*, 262–268.
- Bourne , R. S., & Mills, G. H. (2004). Sleep disruption in critically ill patients – pharmacological considerations. *Anaesthesia*, *59*(4), 374–384.
- Bradley, M. M., Codispoti, M., Sabatinelli D., & Lang, P. (2001). Emotion and Motivation II: Sex Differences in picture processing. *Emotion*, *1*, 300-319.
- Braun, A. R., Balkin, T. J., Wesensten, N. J., Carson, R. E., Varga, M., Baldwin, P., et al. (1997). Regional cerebral blood flow throughout the sleep–wake cycle: An H₂ 15O PET study. *Brain*, *120*, 1173–1197.
- Broughton, R. J. (1968). Sleep disorders: Disorders of arousal? Enuresis, somnambulism, and nightmares occur in confusional states of arousal, not in “dreaming sleep”. *Science*, *159*, 1070–1078.
- Bulkeley, K. (1997). *An introduction to the psychology of dreaming*. Westport, Conn: Praeger.
- Bunde, A., Havlin, S., Kantelhardt, J. W., Penzel, T., Peter, J. H., & Voigt, K. (2000). Correlated and Uncorrelated Regions in Heart-Rate Fluctuations during Sleep. *Physical Review Letters*, *85*, 3736–3739
- Buss, A. (1988). *Personality: Evolutionary heritage and human distinctiveness*. Hillsdale, NJ: Erlbaum.
- Buyse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Research*, *28*(2), 193-213.
- Cao, M., & Guilleminault, C. (2010). Families with sleepwalking. *Sleep Medicine*, *11*(7), 726-734
- Cartwright, R. (1991). Dreams that work: The relation of dream incorporation to adaptation to stressful events. *Dreaming*, *1*, 3–9.
- Cartwright, R. (1996). Dreams and adaptation to divorce. In D. Barrett (Ed.), *Trauma and dreams*. Cambridge, MA: Harvard University Press.
- Cason, H. (1935). The nightmare dream. *Psychological Monographs*. *46* (5, Whole No. 209).

- Cellucci, A. J., & Lawrence, P. S. (1978). Individual differences in self-reported sleep variable correlations among nightmare sufferers. *Journal of Clinical Psychology, 34*, 721–725.
- Cernovsky, Z. Z. (1984). Life stress measures and reported frequency of sleep disorders. *Perceptual and Motor Skills, 58*, 39–49.
- Chambers, E., & Belicki, K. (1998). Using sleep dysfunction to explore the nature of resilience in adult survivors of childhood abuse or trauma. *Child Abuse Negl, 22*, 753-758.
- Chivers, L., & Blagrove, M. (1999). Nightmare frequency, personality, and acute psychopathology. *Personality and Individual Differences, 27*, 843–851.
- Claridge, G. K., Clark, K., & Davis, C. (1997). Nightmares, dreams, and schizotypy. *British Journal of Clinical Psychology, 36*, 377–386.
- Claridge, G., Davis, C., Bellhouse, M., & Kaptein, S. (1998). Borderline personality, nightmares, and adverse life events in the risk for eating disorders. *Personality and Individual Differences, 25*, 339–351.
- Coalson, B. (1995). Nightmare help: Treatment of trauma survivors with PTSD. *Psychotherapy, 32*, 381–388.
- Coren, S. (1994). The prevalence of self-reported sleep disturbances in young adults. *International Journal of Neuroscience, 79*, 67–73.
- Crick, F. (1994) *The astonishing hypothesis*. Scribners.
- Cuddy, M. A., & Belicki, K. (1992). Nightmare frequency and related sleep disturbance as indicators of a history of sexual abuse. *Dreaming, 2*, 15-22.
- Curran, S. L., Andrykowski, M. A., & Studts, J. L. (1995). Short form of the Mood States (POMS-SF): Psychometric information, *Psychological Assessment, 7*, 80-83.
- Daiches, D. (1968). *The King James Version of the English Bible: An Account of the Development and Sources of the English Bible of 1611 With Special Reference to the Hebrew Tradition*. Hamden, Conn: Archon Books.
- Davis, J. L. (2009). *Treating Post-Trauma Nightmares: A Cognitive Behavioural Approach*. NY, Springer Publishing Company, LLC.
- Davis, J. L., & Wright, D.C. (2005). Case series utilizing exposure, relaxation, and rescripting therapy: impact on nightmares, sleep quality, and psychological distress. *Behavior Sleep Medicine, 3*(3), 151-157.

Dement, W., & Kleitman, N. (1957). The relation of eye movements during sleep to dream activity: An objective method for the study of dreaming. *Journal of Experimental Psychology*, *53*, 339-346.

Detre, T. P., & Jarecki, H. G. (1971). *Modern Psychiatry Treatment*. Philadelphia: J. B. Lippincott.

Domhoff, G. W. (1993). The repetition of dreams and dream elements: A possible clue to a function of dreams. In A. Moffitt, M. Kramer, & R. Hoffman (Eds.), *The Functions of Dreams* (pp. 293-320). Albany, NY: SUNY Press.

Domhoff, G. W. (1996). *Finding meaning in dreams: A quantitative approach*. New York: Plenum Press.

Domhoff, G. W. (2000). *Moving Dream Theory Beyond Freud and Jung.*, Viewed 19th January 20011. www.dreamresearch.net

Domhoff, G. W. (2000). The repetition of dreams and dream elements: A possible clue to a function of dreams? In A. Moffitt, M. Kramer, & R.Hoffmann (Eds.), *The functions of dreaming* (pp. 293–320). Albany: SUNY Press.

Domhoff, G. W. (2001). A new neurocognitive theory of dreams. *Dreaming*, *11*, 13-33

Domhoff, G. W. (2003). *The Scientific Study of Dreams: Neural Networks, Cognitive Development, and Content Analysis*. Washington: American Psychological Association Press.

Domhoff, G.W. (2003). *Senoi Dream Theory: Myth, Scientific Method, and the Dreamwork Movement*, Viewed 13th November 20010. www.dreamresearch.net

Dunn, K. K., & Barrett, D. (1988). Characteristics of nightmare subjects and their nightmares. *Psychiatric Journal of the University of Ottawa*, *13*, 91–93.

Ehlers, A., & Clark, D. M. (2000). A cognitive model of post-traumatic stress disorder. *Behaviour Research and Therapy*, *38*, 319-345.

Ehlers, A., & Steil, R. (1995). Maintenance of intrusive memories in posttraumatic stress disorder: A cognitive approach. *Behavioural and Cognitive Psychotherapy*, *23*, 217-249.

Erman, M. K. (1987). Dream anxiety attacks (nightmare). *Psychiatric Clinics of North America*, *10*, 667-674.

Feldman, M. J., & Hersen, M. (1967). Attitudes toward death in nightmare subjects. *Journal of Abnormal Psychology*, *72*, 421–425.

- Fennig, S., Salganik, E., & Chayat, M. (1992). Psychotic episodes and nightmares: A case study. *Journal of Nervous and Mental Disease, 180*, 60.
- Fisher, C., Byrne, J., Edwards, A., & Kahn, E. (1970). A psychophysiological study of nightmares. *Journal of the American Psychoanalytic Association, 18*, 747–782.
- Fisher, C., Byrne, J. V., & Edwards, A. (1968). NREM and REM nightmares. *Psychophysiology, 5*, 221-222.
- Fisher, C., Kahn, E., Edwards, A., Davis, D. M., & Fine, J. (1974). A psychophysiological study of nightmares and night terrors: 3. Mental content and recall of stage 4 night terrors. *Journal of Nervous and Mental Disease, 158*, 174–188.
- Flanagan, O. (1997) Prospects for a unified theory of consciousness or what dreams are made of. In J.D. Cohen, & J.W. Schooler (Eds.), *Scientific approaches to consciousness*. Lawrence Erlbaum Associates.
- Foa, E., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report of lost traumatic Sleep Disorder: The Posttraumatic Diagnostic Scale. *Psychological Assessment, 9*, 445-451.
- Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin, 99*, 20–35.
- Foa, E. B., Rothbaum, B. O., & Steketee, G. S. (1993). Treatment of rape victims. *Journal of Interpersonal Violence, 8*(2), 256-276.
- Forbes, D., Phelps, A. J., & McHugh, T. (2001). Treatment of Combat-Related Nightmares Using Imagery Rehearsal: A Pilot Study. *Journal of Traumatic Stress, 14*(2), 433-442.
- Forbes, D., Phelps, A. J., McHugh, A. F., Debenham, P., Hopwood, M., & Creamer, M. (2003). Imagery Rehearsal in the Treatment of Posttraumatic Nightmares in Australian Veterans with Chronic Combat-Related PTSD: 12-Month Follow-Up Data. *Journal of Traumatic Stress, 16*(5), 509-513.
- Fosse, M. J., Fosse, R., Hobson, J. A., & Stickgold, R. J. (2003). Dreaming and episodic memory: A functional dissociation? *Journal of Cognitive Neuroscience, 15*, 1–9.
- Foulkes, D. (1962). Dream reports from different stages of sleep. *Journal of Abnormal and Social Psychology, 65*, 14-25.
- Foulkes, D. (1979). Home and laboratory dreams: Four empirical studies and a conceptual reevaluation. *Sleep, 2*, 233-251.

- Foulkes, D. (1982). REM-dream perspectives on the development of affect and cognition. *Psychiatric Journal of the University of Ottawa*, 7, 48–55.
- Foulkes, D. (1985). *Dreaming: A cognitive–psychological analysis*. Hillsdale, New Jersey: Erlbaum.
- Foulkes, D. (1999). *Childrens’ Dreaming and the development of Consciousness*. Harvard University Press.
- Freud, S. (1976). *The interpretation of dreams*. New York: Penguin Books. (Original work published 1900).
- Freud, S. (1920). *Beyond the pleasure principle*. London: Hogarth Press.
- Freud, S. (1940). *An Outline of Psychoanalysis*. Wiltshire: Redwood Press Ltd.
- Frishman, W., Davis, R., Strom, J., Elkayam, U., Stampfer, M., Ribner, H., Weinstein, J., & Sonnenblick, E. (1979). Clinical pharmacology of the new beta-adrenergic blocking drugs. Part 5. Pindolol (LB-46) therapy for supraventricular arrhythmia: a viable alternative to propranolol in patients with bronchospasm. *American Heart Journal*, 98 (3), 393–398.
- Fryer, J. C. J. (2009). Is a purpose of REM sleep atonia to help regenerate intervertebral disc volumetric loss?, *J Circadian Rhythms*, 7, 1. doi: 10.1186/1740-3391-7-1
- Garfield, P. (1974). *Creative Dreaming*. New York: Ballantine Books.
- Germain, A., Krakow, B., Faucher, B., Zadra, A., Nielsen, Y., Hollifield, M., et al., (2004). Increased mastery elements associated with imagery rehearsal treatment for nightmares in sexual assault survivors with PTSD. *Dreaming*, 14, 195-206.
- Germain, A., Hall, M., Krakow, B., Shear, M. K., & Buysse, D. J. (2005). A brief Sleep Scale for Posttraumatic Stress Disorder: Pittsburgh Sleep Quality Index Addendum for PTSD, *Journal of Anxiety Disorders*, 19, 233-244.
- Germain, A., & Nielsen, T. (2003). Impact of Imagery Rehearsal Treatment on Distressing Dreams, Psychological Distress, and Sleep Parameters in Nightmare Patients, *Behavioral Sleep Medicine*, 1(3), 140-154.
- Germain, A., & Nielsen, T. A. (2003). Sleep pathophysiology in PTSD and idiopathic nightmare sufferers. *Biological Psychiatry*, 54, 1092–1098.
- Gold, S. N. (2008). The relevance of trauma to general clinical practice. *Psychological Trauma: Theory, Research, Practice, and Policy*, 5(1), 114-124.

Goleman, D. (1984). Do Dreams Really Contain Important Secret Meaning? *Science*, New York Times, Science Desk.
http://health.nytimes.com/gst/health/healthsearch.html?WT.z_gsac=0&term=psychiatry&sort=newest&page=76

Greenberg, R., Pearlman, C. A., & Gampel, D. (1972). War neuroses and the adaptive function of REM. *British Journal of Medical Psychology*, 45(1), 27-33.

Haberlandt, K. (1997). *Cognitive Psychology* (2 ed). Boston: Allyn and Bacon.

Halliday, G. (1987). Direct psychological therapies for nightmares: a review. *Clinical Psychological Review*, 7, 501-503.

Hall, C. S., & Van de Castle, R. (1966). *The content analysis of dreams*. New York: Appleton-Century-Crofts.

Hartmann, E. (1967). *The Biology of Dreaming*. Springfield, Charles C. Thomas.

Hartmann, E. (1970). "A note on the nightmare." In E. Hartmann (Ed.), *Sleep and Dreaming* (pp 192-197). Boston, Little, Brown & Co.

Hartmann, E. (1973). "Functions of sleep". In U. Jovanovic (Ed.), *The Nature of Sleep* (pp 238-251). Stuttgart, Gustav Fisher.

Hartmann, E. (1978). *The Sleeping Pill*. New Haven, Yale University Press.

Hartmann, E. (1984). *The nightmare: The psychology and the biology of terrifying dreams*. New York: Basic Books.

Hartmann, E. (1991). *Boundaries in the mind: A new psychology of personality*. New York: Basic Books.

Hartmann, E. (1995). Dreaming connects: A hypothesis on the Nature and Function of Dreaming Based on Dreams Following Trauma. *Sleep Research*, 24, 147.

Hartmann, E. (1996). Outline for a theory on the nature and functions of dreaming. *Dreaming*, 6, 147-160.

Hartmann, E. (1998). *Dreams and nightmares: The new theory on the origin and meaning of dreams*. New York: Plenum.

Hartmann, E. (1999). The nightmare is the most useful dream. *Sleep and Hypnosis*. 1, 199-203.

- Hartmann E, & Cravens, J. (1973). The effects of long-term administration of psychotropic drugs on human sleep: I. Methodology and the effects of placebo. *Psychopharmacologia*, 33, 153-167.
- Hartmann, E., Russ, D., van der Kolk, R., Falke, R., & Oldfield, M. (1981). A preliminary study of the personality of the nightmare sufferer: Relationship to schizophrenia and creativity? *American Journal of Psychiatry*, 138, 794-797.
- Harvey, A. G. (2002). A cognitive model of insomnia. *Behaviour Research and Therapy*, 40, 869-893.
- Harvey, A. G., Jones, C., & Schmidt, A. D. (2003). Sleep and posttraumatic stress disorder: A review. *Clinical Psychology Review*, 23, 377-407.
- Hathaway, S. R., & McKinley, J. C. (1942). *Minnesota Multiphasic Personality Inventory*. Minneapolis: University of Minnesota Press.
- Haynes, S. N., & Mooney, D. K. (1975). Nightmares: Etiological, theoretical, and behavioral treatment considerations. *Psychological Record*, 25, 225-236.
- Hersen, M. (1971). Personality characteristics of nightmare sufferers. *Journal of Nervous and Mental Disease*, 153, 27-31.
- Hersen, M. (1972). Nightmare behavior: A review. *Psychological Bulletin*, 78, 37-48.
- Herz, M. & Melville, C. (1980) Relapse in schizophrenia. *American Journal of Psychiatry*, 137, 801-812.
- Hobson, J. A., Pace-Schott, E., & Stickgold, R. (1999). Dreaming and the brain: Towards a cognitive neuroscience of conscious states. *Behavioral and Brain Sciences*, 23, 793-842.
- Hobson, J. A., McCarley, R. W., & Wyzinski, P. W. (1975). Sleep cycle oscillation: Reciprocal discharge by two brainstem neuronal groups. *Science*, 189, 55-58.
- Hobson, J. A., & McCarley, R. W. (1977). The brain as a dream state generator: An activation-synthesis hypothesis of the dream process. *American Journal of Psychiatry*, 134, 1335-1348.
- Hobson, J. A., (2003) *Dreaming: An Introduction to the Science of Sleep*. Oxford University Press, USA.
- Hobson, J. A. (1988). *The dreaming brain: How the brain creates both the sense and the nonsense of dreams*. New York: Basic Books.
- Hobson, J. A. (1999). *Dreaming as delirium*. Boston: MIT Press.

- Hobson, J. A., & Silvestri, R. (1999). Sleep and its disorders. In A. M. Nicholi (Ed.) *The Harvard guide to Psychiatry* (3rd ed., pp. 155-167). Cambridge, MA: Harvard University Press.
- Holzman, P., Proctor, L. R., & Hughes, D. W. (1973). Eye tracking patterns in schizophrenia. *Science*, *181*, 179-81.
- Hublin, C., Kaprio, J., Partinen, M., & Koskenvuo, M. (1999). Nightmares: Familial aggregation and association with psychiatric disorders in a nationwide twin cohort. *American Journal of Medical Genetics*, *88*, 329–336.
- Hufford, D. J. (1982). *The terror that comes in the night: an experience-centered study of supernatural assault traditions*. Philadelphia: University of Pennsylvania Press.
- Hunt, H. T. (1991). Dreams as literature/science of dreams: An essay. *Dreaming*, *1*(3), 235-242.
- Janson C., Gislason, T., Boman, G., Hetta, J., & Roos, B. E. (1990). Sleep disturbances in patients with asthma. *Respiratory Medicine*, *84*(1), 37-42.
- Johnson, S., & Walker, J. (1755). *A Dictionary of the English Language*. London: Richard Bentley.
- Joncas, S., Zadra, A., Paquet, J., & Montplaisir, J. (2002). The value of sleep deprivation as a diagnostic tool in adult sleepwalkers. *Neurology*, *58*, 936–940.
- Jones, E. (1931/1951). *On the nightmare*. New York: Liveright.
- Jouvet, M. (1962). Recherche sue les structures nerveses et lea mecanismes responsables des differentes phases du sommeil physiologique. *Archives Italiennes de Biologie*, *100*, 125-206.
- Jung, C. (1974). *Dreams*. Princeton, NJ: Princeton University Press.
- Jung, C. (1963). *Memories, Dreams, Reflections*. New York: Pantheon.
- Kales, A., Soldatos, C. R., Caldwell, A. B., Kales, J. D., Humphrey II, F. J., Charney, D. S., & Schweitzer, P. K. (1980). Somnambulism: Clinical Characteristics and Personality Patterns. *Archives of General Psychiatry*, *37*(12), 1406-1410.
- Kales, A., Soldatos, C. R., & Kales, J. D. (1987). Sleep Disorders: Insomnia, Sleepwalking, Night Terrors, Nightmares, and Enuresis. *Ann Intern Med*, *106*, 582-592.
- Kaplan-Solms, K., & Solms, M. (2000). *Clinical Studies in Neuro-Psychoanalysis*. London: Karnac Books.

Karacan, S. M., Wolff, S. W., Williams, R. L., Hirsch, C. J., & Webb, W. B. (1968). The effects of fever on sleep and dream patterns. *Psychosomatics*, 9, 331-339.

Kellaway, P., & Frost, J. D. Jr. (1983): Biorhythmic modulation of epileptic events. In T. A. Pedley and BS Meldrum (Eds.), *Recent Advances in Epilepsy* (pp. 139-154). Churchill Livingstone, Edinburgh.

Kellert, S., & Beail, N. (1997). The treatment of chronic post-traumatic nightmares using psychodynamic-interpersonal psychotherapy: A single-case study. *British Journal of Medical Psychology*, 70(1), 35-49.

Kellner, R., Neidhardt, E. J., Krakow, B. J., & Pathak, D. (1992). Changes in chronic nightmares after one session of desensitization or rehearsal of instructions. *American Journal of Psychiatry*, 149, 659-663.

Kennedy, G. A. (2002). A Review of Hypnosis in the Treatment of Parasomnias: Nightmare, Sleepwalking, and Sleep Terror Disorders. *Australian Journal of Clinical and Experimental Hypnosis*, 30(2), 99-155.

Kessler, R. C., Sonnega, A., Bromt, E., Hughes, M., & Nelson, C. B. (1995). Post-traumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52, 1048–1060.

Kilpatrick, D. G., Resnick, H. S., Freedy, J. R., Pelcovitz, D., Resick, P., Roth, S., et al. (1998). Posttraumatic stress disorder field trial: Evaluation of the PTSD construct? Criteria A through E. In T. A. Widiger, A. J. Frances, H. A. Pincus, R. Ross, M. B. First, W. Davis, & M. Kline (Eds.), *DSM-IV sourcebook* (Vol. 4, pp. 803–846). Washington, DC:American Psychiatric Association.

Kingbury, S. J. (1988). Strategic psychotherapy for trauma: Hypnosis and trauma in context. *Journal of Traumatic Stress*, 5(1), 85-95.

Kjaer, T. W., Law, I., Wiltschiøtz, G., Paulson, O. B., & Madsen, P. L. (2002). Regional cerebral blood flow during light sleep – a H₂¹⁵O-PET study. *Journal of Sleep Research*, 11(3), 201-207.

Klink, M., & Quan, S. (1987). Prevalence of reported sleep disturbances in a general adult population and their relationship to obstructive airways disease. *Chest*, 91, 540–546.

Knudson, R. M., & Minier, S. (1999). The on-going significance of significant dreams: The case of the bodiless head. *Dreaming*, 9, 235-245.

Krakow, B. (2006). Nightmare complaints in Treating-Seeking Patients in Clinical Sleep Medicine Setting: Diagnostic and Treatment Implications, *SLEEP*, 29(10), 1313-1319.

Krakov B., Hauswald, M., Tandberg, D., & Sklar, D. (1994). Floating nights: a five year experience with an innovative schedule in a university emergency department. *American Journal of Emergency Medicine*, 12(5):517-520.

Krakov, B., Haynes, P. L., Warner, T. D., Santana, E., Melendrez, D., Johnston, L., Hollifield, M., Sisley, B. N., Koss, M., & Shafer, L. (2004). Nightmares, insomnia, and sleep-disordered breathing in fire evacuees seeking treatment for posttraumatic sleep disturbance. *Journal Trauma Stress*, 17(3), 257-68.

Krakov, B., Hollifield, M., Johnson, L., Koss, M., Schdrader, R., Wagner, T. D., Tandberg, D., Lauriello, J., McBride, L., Cutchen, L., Cheng, D., Emmons, S., Germain, A., Melendrez, D., Sandoval, D., & Prince, H. (2001). Imagery Rehearsal Therapy for Chronic Nightmares in Sexual Assault Survivors with Posttraumatic Stress Disorder: A Randomized Control Trial. *JAMA*, 286(5), 537-545.

Krakov, B., Hollifield, M., Schrader, R., Koss, M., Tanberg, D., Lauriello, J., McBride, L., Warner, T. D., Cheng, D., Edmond, T., & Kellner, R. (2000). A Controller Study of Imagery Rehearsal for Chronic Nightmares in Sexual Assault Survivors with PTSD: A Preliminary Report. *Journal of Traumatic Stress*, 13, 589-609.

Krakov, B., Johnston, L., Melendrez, D., Hollifield, M., Warner, T. D., Chavez-Kennedy, D., & Herlan, M. J. (2001). An open trial of Evidence-Based Cognitive Behaviour Therapy for Nightmares and Insomnia in Crime Victims with PTSD. *American Journal of Psychiatry*, 158, 2043-2047.

Krakov, B., Kellner, R., Neidhardt, J., & Pathak D. (1993). Imagery rehearsal treatment of chronic nightmares: with a thirty month follow-up. *Journal of Behavior Therapy and Experimental Psychiatry*, 24(4), 325-330.

Krakov, B., Kellner, R., Parthak, D., & Lambert, L. (1995). Imagery rehearsal treatment for chronic nightmares. *Behaviour Research Therapy*, 33, 837-843.

Krakov, B., Kellner, R., Pathak, D., & Lambert L. (1996). Long term reductions in nightmares treated with imagery rehearsal. *Behavioural and Cognitive Psychotherapy*, 24, 135-148.

Krakov, B., Lowry, C., Germain, A., Gaddy, L., Hollifield, M., Koss, M., Tandberg, D., Johnston, L., & Melendrez, D. (2000). A retrospective study on improvements in nightmares and post-traumatic stress disorder following treatment for co-morbid sleep-disordered breathing. *Journal of Psychosomatic Research*, 49(5), 291-298.

Krakov, B., & Neidhardt, E. J. (1992). *Conquering bad dreams and nightmares. A guide to understanding, interpretation, and cure*. New York: Berkeley Books.

Krakov, B., Schrader, R., Tandberg, D., Hollifield, M., Koss, M. P., Yau, C. L., & Cheng, D. T. (2002). Nightmare frequency in sexual assault survivors with PTSD. *Journal of Anxiety Disorders, 16*, 175–190.

Krakov, B., Tandberg, D., Cutchen, L., McBride, L., Hollifield, M., Lauriello, J., Schrader, R., Yau, C., & Cheng, D. (1997). Imagery Rehearsal Treatment of Chronic Nightmares in PTSD: Controlled Study. *Sleep Research, 26*:245-251.

Krakov, B., & Zadra, A. (2006). Clinical management of chronic nightmares: Imagery rehearsal therapy. *Behavioral Sleep Medicine, 4*, 45-70.

Kramer, M. (1991). The nightmare: A failure in dream function, *Dreaming, 1*(4), 277-285.

Kroese, B. S., & Thomas, G. (2006). Treating chronic nightmares of sexual assault survivors with an intellectual disability—two descriptive case studies. *Journal of Applied Research in Intellectual Disability, 19*(1), 75-80.

Kumar, S., Bhatia, M., & Behari, M. (2002). “Sleep disorders in Parkinson's disease,” *Movement Disorders, 17*(4), 775–781.

LaBarre, W. (1975). Anthropological perspectives on hallucination and hallucinogens. In: L. J. West and R. K. Siegel (Eds.), *Hallucinations: Behavior, Experience, and Theory* (pp. 9-52). New York: John Wiley & Sons.

LaBerge, S. (1985). *Lucid dreaming*. Los Angeles: J. P. Tarcher.

LaBerge, S. (1980a). Lucid dreaming: An exploratory study of consciousness during sleep. (Doctoral dissertation, Stanford University, 1980). (University Microfilms International No. 80-24,691).

LaBerge, S. (1980b). Lucid dreaming as a learnable skill: A case study. *Perceptual and Motor Skills, 51*, 1039-1042.

LaBerge, S., & Rheingold, H. (1990). *Exploring the World of Lucid Dreaming*, New York,: Ballentine Books.

Lambert, M. T. (2006). Aripiprazole in the management of post-traumatic stress disorder symptoms in returning Global War on Terrorism veterans. *International Clinical Psychopharmacology, 21*(3), 185-187.

Lancee, J., Spoormaker, V. I., & van Den Bout, J. (2010). Nightmare frequency is associated with subjective sleep quality but not with psychopathology. *Sleep and Biological Rhythms, 8*(3), 187-193.

- Lansky, M. R. (1995). *Posttraumatic nightmares: Psychodynamic explorations*. Hillsdale, NJ: The Analytical Press.
- LeDoux, J. E. (2000). Emotion circuits in the brain. *Annual Review of Neuroscience*, 23, 155–184.
- Lees, A. J., Blackburn, N. A., & Campbell, V. L. (1998). The night-time problems of Parkinson's disease. *Clinical Neuropharmacology*, 6, 512-519.
- Leung, A. K. C., & Robson, W. L. M. (1993). Nightmares, *Journal of the National Medical Association*, 85(3), 233-235.
- Levin, R. (1989). Relations among nightmare frequency and ego strength, death anxiety, and sex of college students. *Perceptual and Motor Skills*, 69, 1107-1113
- Levin, R. (1990). Ego boundary impairment and thought disorder in frequent nightmare sufferers. *Psychoanalytic Psychology*, 7, 529–543.
- Levin, R. (1994). Sleep and dreaming characteristics of frequent nightmare subjects in a university population. *Dreaming*, 4, 127–137.
- Levin, R. (1998). Nightmares and schizotypy. *Psychiatry*, 61, 206–216.
- Levin, R., & Fireman, G. (2002). Nightmare prevalence, nightmare distress, and self-reported psychological disturbance. *Sleep*, 25, 205–212.
- Levin, R., & Nielsen, T. A. (2007). Disturbed dreaming, posttraumatic stress disorder, and affect distress: A review and neurocognitive model. *Psychological Bulletin*, 133, 482–528.
- Levin, R., & Nielsen, T. A. (2009). Nightmares, Bad Dreams, and Emotion Dysregulation: A Review and New Neurocognitive Model of Dreaming. *Current Directions in Psychological Science*, 18(2), 84-88.
- Levin, R., & Raulin, M. L. (1991). Preliminary evidence for the proposed relationship between frequent nightmares and schizotypal symptomatology. *Journal of Personality Disorders*, 5, 8–14.
- Levitan, H. L. (1978). The significance of certain dreams reported by psychosomatic patients. *Psychotherapy and Psychosomatics*, 30, 137—149.
- Levitan, H. L. (1980). The dream in traumatic states. In J. M. Natterson (Ed.), *The dream in clinical practice* (pp. 271-281). New York: Jason Aronson.

- Liu, X., Sun, Z., Uchiyama, M., Shibui, K., Kim, K., & Okawa, M. (2000). Prevalence and correlates of sleep problems in Chinese schoolchildren. *Sleep, 23*, 1053-1062.
- Mack, J. E. (1970). *Nightmares and human conflict*. Boston: Little, Brown.
- Mackenzie, N. (1965). *Dreams and Dreaming*. NY: The Vanguard Press.
- Maher, M. J., Rego, S. A., & Asnis, G. M. (2006). Sleep disturbances in patients with post-traumatic stress disorder: epidemiology, impact and approaches to management. *CNS Drugs, 20*(7), 567-90.
- Maquet, P. (2000). Functional neuroimaging of normal human sleep by positron emission tomography. *Journal of Sleep Research, 9*, 207–231.
- Maquet, P., Schwartz, S., Passingham, R., & Frith, C. (2003). Sleep-related consolidation of a visuomotor skill: Brain mechanisms as assessed by functional magnetic resonance imaging. *Journal of Neuroscience, 23*, 1432–1440.
- Marks I. Rehearsal relief of a nightmare. *Br J Psychiatry* 1978; 135: 461-5.
- McNair, D. M., Lorr, M., & Droppleman, L. F. (1971). *Manual for the Profile of Mood States*. San Diego, CA: Educational and Industrial Testing Services.
- McNamara, P. (2008). *Nightmares: the science and solution of those frightening visions during sleep*. Praeger Published, An imprint of Greenwood Publishing, Inc.
- Mellman, T. A., David, D., Bustamante, V., Torres, J., & Fins, A. (2001). Dreams in the acute aftermath of trauma and their relationship to PTSD. *Journal of Traumatic Stress, 14*, 241–247.
- Merlino, G., Piani, A., Gigli, G. L., Cancelli, I., Rinaldi, A., Baroselli, A., Serafini, A., Zanchettin, B., & Valente, M. (2010). Daytime sleepiness is associated with dementia and cognitive decline in older Italian adults: A population-based study. *Sleep Medicine, 11*(4), 372-377.
- Miller, W. R., & DiPilato, M. (1983). Treatment of nightmares via relaxation and desensitization: A controlled evaluation. *Journal of Consulting and Clinical Psychology, 51*(6), 870-877.
- Miro, E., & Martinez, M. P. (2005). Affective and Personality Characteristics in Function of Nightmare Prevalence, Nightmare Distress, and Interference Due to Nightmares. *Dreaming, 15*(2), 89-105.
- Morgan, C. D., & Murray, H. A. (1935). A method of investigating fantasies: The Thematic Apperception Test. *Archives of Neurology and Psychiatry, 34*, 289–306.

Neidhardt, E. J., Krakow, B., Kellner, R., & Pathak, D. (1992). The beneficial effects of one treatment session and recording of nightmares on chronic nightmare sufferers. *Sleep, 15*, 470–473.

Nielsen, T.A., Laberge, L., Tremblay, R., Vitaro, F., & Montplaisir, J.(2000). Development of disturbing dreams during adolescence and their relationship to anxiety symptoms. *Sleep, 23*,727–736.

Nielsen , T. A., & Levin, R. (2007). Dreams, Dreaming Theories and Correlates of Nightmares, *Encyclopedia of Neuroscience, 3*, 663-669.

Nielsen, T. A., Paquette, T., Solomonova, E., Lara-Carrasco, J., Popova, A., & Levrier, K. (2010). REM sleep characteristics of nightmare sufferers before and after REM sleep deprivation. *Sleep Medicine, 11*(2), 172-179.

Nielsen, T. A., Stenstrom, P., & Levin, R. (2006). Nightmare frequency as a function of age, gender and September 11, 2001: findings from an Internet Questionnaire. *Dreaming, 16*, 145–58.

Nielsen, T. A., & Zadra, A. (2000). Dreaming disorders. In M. Kryger, N. Roth & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (3rd ed., pp. 753–772). Philadelphia: Saunders.

Nielsen, T. A., Zadra, A. L., Simard, V., Saucier, S., Stenstrom, P., Smith, C., & Kuiken, D. (2003). The typical dreams of Canadian university students. *Dreaming, 13*, 211–235.

Nolen-Hoeksema, S. (1990). *Sex differences in depression*. Stanford, CA: Stanford University Press.

Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin, 115*, 424–443.

Ohayon, M. M., Morselli, P. L., & Guilleminault, C. (1997). Prevalence of nightmares and their relationship to psychopathology and daytime functioning in insomnia subjects. *Sleep, 20*, 340–348.

Ohayon, M. M., Priest, R. G., Guilleminault, C., & Caulet, M. (2002). The prevalence of depressive disorders in the United Kingdom. *Biological Psychiatry, 45*(3), 300-307.

Ohman, A., & Mineka, S. (2001). Fears, phobias and preparedness: Toward an evolved module of fear and fear learning. *Psychological Review, 108*, 483–522.

Oxford Dictionary, 2010

<http://blog.editage.com/?q=oxford-dictionary-of-english-3rd-edition>

Pagel, J. F. (2000). Nightmares and Disorders of Dreaming, *American Family Physician*, 61, 2037-2042.

Pagel, J. F., Blagrove, M., Levin, R., States, B., Stickgold, B., & White, S. (2001). Definitions of dream: A paradigm for comparing field descriptive specific studies of dream. *Dreaming*, 11, 195–202.

Pagel, J. F., & Kwiatkowski, C. (2010). The Nightmares of Sleep Apnea: Nightmare Frequency Declines with Increasing Apnea Hypopnea Index. *Journal of Clinical Sleep Medicine*, 6(1),69-73.

Partinen, M. (1997). Sleep disorder related to Parkinson's disease. *Journal of Neurology*, 244 [Suppl 1], S3-S6.

Peirce, J. T. (2006). Efficacy of Imagery Rehearsal Treatment Related to Specialized Populations: A Case Study and Brief Report. *Dreaming*, 16(4), 280-285.

Penfield, W., & Rasmussen, T. (1955). *The Cerebral Cortex in Man*. NY: Macmillan.

Picchioni, D., Goeltenleucher, B., Green, D. N., Convento, M. J., Crittenden, R., Hallgren, M., & Hicks, R. A. (2002). Nightmares as a coping mechanism for stress. *Dreaming*, 12, 155–169.

Pietrowsky, R., & Kothe, M. (2003). Personal boundaries and nightmare consequences. *Dreaming*, 13, 245–254.

Putnam, H. (1962/1975). *Dreaming and Depth Grammar, in Mind, Language and Reality: Philosophical Paper*. Cambridge: Cambridge University Press.

Rachman, S. (1980). Emotional Processing. *Behaviour Research and Therapy*, 18, 51-60.

Raskind, M. A., Dobie, D. J., Kanter, E.D., Petrie, E.C., Thompson, C.E., & Peskind, E.R. (2000). The alpha-1 adrenergic antagonist prazosin ameliorates combat trauma nightmares in veterans with posttraumatic stress disorder. *Journal Clinical Psychiatry*, 6, 129-133.

Rechtschaffen, A., & Kales, A. (Eds) (1968). *A manual of standardized terminology, techniques and scoring system for sleep stages of human subjects*. Washington: Public Health Service, U.S. Government Printing Office

Revonsuo, A. (1999). Neuroscience and the Explanation of Psychological Phenomena. *Behavioral and Brain Sciences*, 22 (5), 847-849.

Revonsuo, A. (2000a). The reinterpretation of dreams: An evolutionary hypothesis of the function of dreaming. *Behavioral and Brain Sciences*, 23, 877–901.

Revonsuo, A. (2000b) Did Ancestral Humans Dream for Their Lives? *Behavioral and Brain Sciences*, 23(6), 1063-1082.

Revonsuo, A. (2001). Dreaming and the Place of Consciousness in Nature. *Behavioral and Brain Sciences*, 24(5), 1000-1001.

Revonsuo, A. (2005). The Contents of Consciousness During Sleep: Some Theoretical Problems. *Behavioral and Brain Sciences*, 23(6), 995-996.

Revonsuo, A., & Valli, K. (2000). *Dreaming and Consciousness – Testing the Threat Simulation Theory of the Function of Dreaming*. Psyche, 6. <http://psyche.cs.monash.edu.au/v6/psyche-6-08-revonsuo.html>

Robbins, P. R., & Houshi, F. (1983). Some observations on recurrent dreams. *Bulletin of the Menninger Clinic*, 47(3), 262-265.

Robert, G., & Zadra, A. (2008). Measuring nightmare and bad dream frequency: Impact of retrospective and prospective instruments. *Journal of Sleep Research*, 17, 132-139.

Roberts, J., & Lennings, C. J. (2006). Personality, psychopathology and nightmares in young people. *Personality and Individual Differences*, 41(4), 733-744.

Roberts, J., Lennings, C.J., & Heard, R. (2009). Nightmares, Life Stress and Anxiety: An Examination of Tension Reduction. *Dreaming* 19(1), 17-29.

Rolls, E. T., & Treves, A. (1998). *Neural Networks and Brain Function*. Oxford: Oxford.

Rorschach, H. (1921/1927). *Rorschach Test – Psychodiagnostic Plates*. Cambridge, MA: Hogrefe Publishing Corp.

Ross, D. (1955). *Aristotle, Parva Naturalia, A revised text with introduction and commentary*. Oxford University Press.

Ross, R. J., Ball, W. A., Sullivan, K. A., & Caroff, S. N. (1989). Sleepdisturbance as the hallmark of posttraumatic stress disorder. *American Journal of Psychiatry*, 146, 697-707.

Roth, S., Dye, E., & Lebowitz, L. (1988). Group therapy for sexual assault victims. *Psychotherapy*, 25(1), 82-93.

Roth, T., & Roehrs, T. (2003). Insomnia: Epidemiology, characteristics, and consequences. *Clinic Cornerstone*, 5(3), 5-12.

- Rothbaum, B. O., Foa, E. B., Riggs, D. S., Murdock, T., & Walsh, W. (1992). A prospective examination of posttraumatic stress disorder in rape victims. *Journals of Traumatic Stress, 5*, 455-475.
- Rothbaum, B. O., & Mellman T. A. (2001). Dreams and Exposure Therapy in PTSD, *Journal of Traumatic Stress, 14*(3), 481-490.
- Rotter, J. (1966). Generalized expectancies for internal vs. external control of reinforcement. *Psychological Monographs. General and Applies, 80*, 1-28.
- Salvio, M. A., Wood, J. M., Schwartz, J., & Eichling, P. S. (1992). Nightmare prevalence in the healthy elderly. *Psychology and Aging, 7*, 324-325.
- Salzarulo, P., & Chevalier, A. (1983). Sleep problems in children and their relationship with early disturbances of the waking-sleeping rhythms. *Sleep, 6*, 47-51.
- Schenck, C. H., Bundlie, S. R., Ettinger, M. G., & Mahowald, M. W. (1986). Chronic behavioral disorders of human REM sleep: a new category of parasomnia. *Sleep, 9*(2), 293-308.
- Sandoval, D., Krakow, B., Schrader, R., & Tandberg, D. (1997). Adult Nightmare Sufferers: Can They be Identified and Treated in Childhood? *Sleep Research, 26*: 256.
- Schindler, F. E. (1980). Treatment by systematic desensitization of a recurring nightmare of a real life trauma. *Journal of Behavior Therapy and Experimental Psychiatry, 11*, 53-54.
- Schneider, A., & Domhoff, G. W. (1995, updated 2000). *The Quantitative Study of Dreams* [Web site]. Available: <http://www.dreamresearch.net/>.
- Schredl, M. (2002). Questionnaires and Diaries as Research Instruments in Dream Research: Methodological Issues, *Dreaming, 12* (1), 17-26.
- Schredl, M., Landgraf, C., & Zeiler O. (2003). Nightmare frequency, nightmare distress and neuroticism. *North Am J Psychology, 5*: 345-50.
- Schredl, M., & Pallmer, R. (1998). Geschlechtsspezifische Unterschiede in Angsttraumen von Schulerinnen und Schulern [Gender differences in anxiety dreams of school-aged children]. *Praxis der Kinderpsychologie und Kinderpsychiatrie, 47*, 463-476.
- Schredl, M., Schmitt, J., Hein, G., Schmoll, T., Eller, S., & Haaf, J. (2006). Nightmares and oxygen desaturations: is sleep apnea related to heightened nightmare frequency? *Sleep and Breathing, 10*(4), 203-209.

- Schredl, M., Kronenberg, G., Nonnell, P., & Heuser, I. (2001). Dream recall, nightmare frequency, and nocturnal panic attacks in patients with panic disorder. *The Journal of nervous and mental disease, 189*(8), 559-62.
- Schreuder, J., Kleijn, W., & Rooijmans, H. (2000). Nocturnal re-experiencing more than forty years after war trauma. *Journal of Traumatic Stress, 13*, 453-463.
- Schwartz, E. D., & Perry, B. D. (1994). The post-traumatic response in children and adolescents. *Psychiatric Clinics of North America, 17*(2), 311-326.
- Seif, B. (1985). Clinical hypnosis and recurring nightmares: A case report. *American Journal of Clinical Hypnosis, 27*(3), 166-168.
- Seligman, M., & Yellen, A. (1987). What is a dream? *Behaviour Research and Therapy, 25*, 1-24.
- Semiz, U., Basoglu, C., Ebrinc, S., & Cetin, M. (2008). Nightmare disorder, dream anxiety, and subjective sleep quality in patients with borderline personality disorder. *Psychiatry and Clinical Neurosciences, 62*(1), 48-55.
- Shakespeare, W. (1914), "Sonnet 18". In W. J. Craig, *The Oxford Shakespeare: the complete works of William Shakespeare*. Oxford: Oxford University Press.
- Siegel, A., & Bulkeley, K. (1998). *Dreamcatching: Every parent's guide to exploring and understanding children's dreams and nightmares*. New York: Three Rivers.
- Silber, M. H., Ancoli-Israel, S., Bonnet, M. H., et al. (2004). The Visual Scoring of Sleep in Adults. *Journal of Clinical Sleep Medicine, 3*(2), 121-131.
- Silvestri, R., & Bromfield, E. (2004). Recurrent nightmares and disorders of arousal in temporal lobe epilepsy. *Brain Research Bulletin, 63*(5), 369-376.
- Silvestri, R., DeDomenico, P., Mento G. et al. (1995). Epileptic seizures in subjects previously affected by disorders of arousals. *Journal of Clinical Neurophysiology Clinic, 25*, 19-27.
- Simard, V., & Nielsen, T. (2009). Adaptation of imagery rehearsal therapy for nightmares in children: A brief report. *Psychotherapy: Theory, Research, Practice, Training, 46*(4), 492-497.
- Simard, V., Nielsen, T. A., Tremblay, R. E., Boivin, M., & Montplaisir, J. Y. (2008). Longitudinal study of bad dreams in preschool children: Prevalence, demographic correlates, risk and protective factors. *Sleep, 31*, 62-70.

- Simor, P., Csóka, S., & Bódizs, R. (2010). Nightmares and bad dreams in patients with borderline personality disorder: Fantasy as a coping skill? *The European Journal of Psychiatry*, *24* (1), 24 doi: 10.4321/S021361632010000100004
- Snead, R. W. & Bruch, W. M. (1983). Social and emotional problems in childhood. In H. M. Maurer (Ed), *Pediatrics* (p. 169), Churchill Livingstone, New York.
- Snyder, F. (1970) The phenomenology of REM dreaming. In: H. Madow & L.H. Snow (Eds.) *The psychodynamic implications of the physiological studies on dreams* (pp. 124-151). Springfield, Illinois: Charles C. Thomas.
- Solms, M. (1997). *The neuropsychology of dreams*. Mahwah, NJ: Erlbaum.
- Spiegel, D. (1988). Dissociation and hypnosis in posttraumatic stress disorder. *Journal Trauma Stress*, *1*, 17-33.
- Spiegel, D. (1989). Hypnosis in the treatment of victims of sexual abuse, *Psychiatry Clinic North America*, *12*, 295-305.
- Spoormaker, V. I. (2008). A Cognitive Model of Recurrent Nightmares. *International Journal of Dream Research*, *1*(1), 15-22.
- Spoormaker, V. I., & Montgomery, P. (2008). Disturbed sleep in post-traumatic stress disorder: Secondary symptom or a core feature. *Sleep Medicine Reviews*, *12*(3), 169-184.
- Spoormaker, V. I., Schredl, M., & van den Bout, J. (2005). Nightmares: from anxiety symptom to sleep disorder. *Sleep Medicine Reviews*, invited paper.
- Spoormaker, V. I., & van den Bout, J. (2006). Lucid dreaming treatment for nightmares: a pilot-study. *Psychotherapy and Psychosomatics*, *75*, 389-394.
- Spoormaker, V. I., van den Bout, J., & Meijer, E. J. G. (2003). Lucid dreaming treatment for nightmares: a series of cases. *Dreaming*, *13*, 181-186.
- Spoormaker, V. I., Verbeek I, van den Bout J, Klip EC (2005). Initial validation of the SLEEP-50 questionnaire. *Behavior Sleep Medicine*, *3*(4), 227-246.
- Stepansky, R., Holzinger, B., & Schemeiser-Rieder, A. (1998). Austrian dream behavior: Results of a representative population survey. *Dreaming*, *8*, 23-30.
- Stewart, C. (2004). Introduction: Dreaming as an Object of Anthropological Analysis, *Dreaming*, *14*(2-3), 75-82.
- Stewart, K. R. (1951). Dream Theory in Malaya. *Complex*, *6*, 21-33.

Stickgold, R. (2005). Why we dream. In M. H. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (4th ed., pp. 579–587). Philadelphia: Saunders.

Stone, M. H. (1979). Dreams of fragmentation and of the death of the dreamer: A manifestation of vulnerability to psychosis. *Psychopharmacology Bulletin*, *15*, 12–14.

St-Onge, M., Mercier, P., & De Koninck, J. (2009). Imagery rehearsal therapy for frequent nightmares in children. *Behavioral Sleep Medicine*, *7*(2):81-98.

Strauch, I., & Meier, B. (1996). *In search of dreams: Results of experimental dreams research*. Albany: State University of New York Press.

Sutton, J. (2009). Dreaming. In P. Calvo & J. Symons (Eds.), *Routledge Companion to the Philosophy of Psychology* (pp. 522-542). London: Routledge

Tabachnick, B. G., & Fidell, L.S. (2001). *Using multivariate statistics* (4th ed). Needham Heights, MA: Allyn & Bacon.

Tanskanen, A., Tuomilehto, J., Viinamaki, H., et al. (2001). Nightmares as predictors of suicide. *Sleep*, *24*, 844–847.

Tarnow, E. (2003). "How Dreams And Memory May Be Related". *Neuro-Psychoanalysis* *5* (2), 177–182.

Taylor, F. B., Lowe, K., Thompson, C., McFall, M. M ; Peskind, E.R., Kanter, E.D., & Allison, N. (2006). Daytime prazosin reduces psychological distress to trauma specific cues in civilian trauma posttraumatic stress. *Biology Psychiatry*, *59*(7), 577-581.

Thoman, E. B. (1997). Snoring, nightmares, and morning headaches in elderly women: A preliminary study. *Biological Psychology*, *46*(3), 275-284.

Thompson, D. F., & Pierce, D. R. (1999). Drug-induced nightmares. *Annals of Pharmacotherapy*, *33*, 93–98.

Thomas Higher Education 2007.
Health, Mind & Body -- Disorders & Diseases -- Sleep Disorders
Publisher: Boston, MA : Thomson Higher Education, 2007.

Treatment Protocol Project (2000). *Management of Mental Disorders (Third Edition)*. Sydney: World Health Organization Collaborating Centre for Mental Health and Substance Abuse.

- Valipour, A., Lothaller, H., Rauscher, H., Zwick, H., Burghuber, O. C., & Lavie, P. (2007). Gender-related differences in symptoms of patients with suspected breathing disorders in sleep: A clinical population study using the Sleep Disorders Questionnaire, *Sleep, 30*(3), 312-319.
- Valli, K., Revonsuo, A., Palkas, O., et al. (2005). The threat simulation theory of the evolutionary function of dreaming: Evidence of dreams of traumatized children. *Consciousness and Cognition, 14*(1), 1888-218.
- Van de Castle, R. (1994). *Our dreaming mind*. New York: Ballantine Books.
- van der Kolk, B. A., & Saporta, J. (1991). The biological response psychic trauma: Mechanisms and treatment of intrusion and numbing. *Anxiety Research, 4*, 199-212.
- Vrana, S., & Lauterbach, D. (1994). Prevalence of traumatic events and post-traumatic psychological symptoms in a nonclinical sample of college students. *Journal of Traumatic Stress, 7*, 289-302.
- Vignau, J., Bailly, D., Duhamel, A., et al. (2007). Epidemiologic study of sleep quality and troubles in French secondary school adolescents, *Journal of Adolescent Health, 21*(5), 343-350.
- Vogel, G. (1978). An alternative view of the neurobiology of dreaming. *American Journal of Psychiatry, 135*, 1531-1535.
- Waal-Manning, H. J. (1979). Atenolol and three nonselective beta-blockers in hypertension, *Clinical Pharmacological Therapy, 25*, 8-18.
- Walker, M. P., & Stickgold, R. (2004). Sleep dependent learning and memory consolidation. *Neuron, 44*, 121-133.
- Weider, A., Wolff, H., Brodmann, K., Mittelman, B., & Wechsler, D. (1944). NY: *The Cornell Index*. Psychological Corporation.
- White, R. J. (1990). *The Interpretation of Dreams* (2nd ed), Torrance, CA: Original Books.
- Wolpe, J., & Lang, P. J. (1964). A fear survey schedule for the use in behavior therapy. *Behavior Research and Therapy, 2*, 27-30.
- Wood, J. M., & Bootzin, R. R. (1990). The prevalence of nightmares and their independence from anxiety. *Journal of Abnormal Psychology, 99*, 64-68.
- Wood, J. M., Bootzin, R., Quan, S. F., & Klink, M. E. (1993). Prevalence of nightmares among patients with asthma and chronic obstructive airways disease. *Dreaming, 3*, 231-241.

Wood, J. M., Bootzin, R. R., Rosenhan, D., Nolen-Hoeksema, S., & Jourden, F. (1992). Effects of the 1989 San Francisco earthquake on frequency and content of nightmares. *Journal of Abnormal Psychology, 101*, 219–224.

Woodward, R. H., & Magnus, A. R. (1949). *Nervous Traits Among First Grade Children in Butler County Schools*. Los Angeles, California Test Bureau.

Woodward, S. H., Kaloupek, D. G., Streeter, C. C., Martinez, C., Schaer, M., & Eliez, S. (2006). Decreased anterior cingulate volume in combat related PTSD. *Biological Psychiatry, 59*, 582–587.

www.apa.org/library/intguide/sp/settlement.htm#stats

Web Image: Fuseli (1781) - the Detroit Institute of Arts, Detroit.
<http://www.dia.org/>

www.sleep-treatment.com/Maim-about-drkrakow.htm

Zadra, A. L. (1996). Recurrent dreams: Their relation to life events. In D. Barret (Ed.) *Trauma and dreams* (pp. 231-247). Cambridge, MA, US: Harvard University Press.

Zadra, A., Desjardins, S., & Marcotte, É. (2006). Evolutionary function of dreams: A test of the threat simulation theory in recurrent dreams, *Consciousness and Cognition, 15*(2), 450-463.

Zadra, A., & Donderi, D. C. (1993). Variety and intensity of emotions in bad dreams and nightmares. *Canadian Psychology, 34*, 294.

Zadra, A., & Donderi, D. C. (2000). Nightmares and bad dreams: Their prevalence and relationship to well-being. *Journal of Abnormal Psychology, 109*, 273–281.

Zadra, A., Duval, M., Begin E., et al. (2004). *Content analysis of nightmares*. Paper presented at APSS 18th annual Meeting, Philadelphia PA.

Zadra, A. L., & Pihl, R. O. (1997). Lucid dreaming as a treatment for recurrent nightmares. *Psychotherapy and Psychosomatics, 66*, 50-55.

Zervas, I. M., & Soldatos, C. R. (2005). Nightmares: Personality dimensions and psychopathological attributes. *International Review of Psychiatry, 17*(4), 271-276.

Appendices

Appendix 1

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

You are invited to participate

You are invited to participate in a research project entitled **“A survey of nightmare frequency and intensity in an Australian University sample and treatment with a storyline alteration technique”**

Project explanation

Nightmare experiences are considered to be the most common form of disturbed dreaming. Occasional nightmares are frequent in the general population. However, weekly nightmares affect 4%-10% of individuals (by conservative estimates) and given that the Australian population is 21 million, 840,000 - 2,100, 000 people are estimated of being affected by nightmares in this country. However, Australian estimates of weekly nightmares are unknown due to lack of research in this area.

Nightmare experiences may occur for various reasons including exposure to trauma or having mental disorders such as psychosis (e.g. schizophrenia). Other reasons include taking or withdrawing from certain medications such as anti-depressants, and/or having a specific personality type such as thin boundary personality type.

Individuals suffering from weekly nightmares may experience significant distress during the night as well as during the day. Night-time distress may be experienced as an inability to return to sleep after awakening from the nightmare experience and if left untreated may lead to insomnia. Day-time distress may be experienced as episodes of tiredness, negatively affecting one's ability to focus and concentrate.

The aim of this research-study is to conduct two distinct but related studies. The first study will focus on determining the frequency of nightmares in a sample of university students using a survey-questionnaire. The second study will introduce and trial an alternative treatment (story-line alteration technique on a C.D.) to the current practice (systematic desensitization technique).

What will I have to do?

If you decide to volunteer and participate in the first study, you will be required to initially complete a consent form for the first study and subsequently complete a survey-questionnaire focused on reporting the frequency of nightmares/bad dreams and related sleep concerns for the past 12 months (which should only take approximately 20 mins). The survey-questionnaire may be completed on campus or you can take it home and return it once completed. The survey-questionnaire will also have a form requesting your contact details (completely voluntary), so you can be contacted after the first study if you meet the criteria to participate in the second study. Again, your participation for the second study is completely voluntary, if you volunteer to participate in the first study it does not mean you are volunteering to participate in the second study.

If you meet the selection criteria (one or more nightmares per week) for the second study, you will be contacted and invited to participate in the second study. Once again if you decide to participate you will be required to complete a consent form for the second study and subsequently complete a battery of questionnaires (which should only take approximately 90 mins) prior, post and 6 months after the

treatment. You will also be required to maintain a dream/nightmare journal for the duration of the research-study.

The treatment technique will be on a C.D, which you can take home and listen to at your leisure.

What will I gain from participating?

For the first study you will gain information and knowledge about nightmares, and for the second study you will gain additional information and knowledge about dreams, starting and maintaining a dream/nightmare journal, current treatments and receive a nightmare treatment on a C.D. which you can keep.

How will the information I give be used?

The data collected will be strictly for research purposes and the completion of a PhD degree.

What are the potential risks of participating in this project?

Study 1: Some participants may become distressed when completing the nightmare survey, due to the content and theme of the research study or the potential awareness/knowledge of personal underlying issues. If this occurs, a psychologist from the V.U Student Counselling Services will be available for consultation. Information for accessing further resources such as the Australian Centre for Posttraumatic Mental Health or SANE Australia will also be available.

Study 2: Some participants may become distressed when completing the batteries of questionnaires and/or during the treatment phase, due to their participatory commitment to the research-study or the sequence of the research process implemented. If this occurs a psychologist from the Victoria University Student Counselling Services will be available for consultation during and also after the research-study has ended.

The Victoria University Student Counselling Services telephone number is: 9919 2399

How will this project be conducted?

First Study: Participants will be recruited from the various campuses of Victoria University via advertisements placed strategically around the campuses. Participants will be required to complete a short survey-questionnaire, which can be taken home and returned personally or via a reply-paid envelope. Participants meeting the selection criteria for the second study will be invited to participate in the second study. Participants will be informed that they will be contacted prior to the second study commencing.

Second Study: The procedure for the second study has 6 phases.

Phase 1: From the survey/questionnaire 20 – 50 participants meeting the selection criteria will be contacted and invited to be part of the sample for the second study.

Phase 2: This sample will be randomly divided into 2 groups (treatment group and control group) and will be administered pre-treatment measures.

Phase 3: Treatment group receives treatment SLAT and control group receives the best current practice/treatment systematic desensitization.

Phase 4: Both groups are administered post-treatment measures.

Phase 5: Six month follow-up: treatment group receives measures again and control group crosses over

and receives treatment SLAT.

Phase 6: Control group receives post-treatment measures after they have received the treatment SLAT.

Who is conducting the study?

Any questions or queries about your inclusion in this research-study may be directed to principal researcher Dr. Gerard Kennedy. His contact details are (03) 9919 2481 or gerard.kennedy@vu.edu.au. Alternatively, you can contact student researcher Fabian Elzo on fabian.elzo@researcher.vu.edu.au

Any queries about your participation in this project may be directed to the Principal Researcher listed above.

If you have any queries or complaints about the way you have been treated, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781.

Appendix 2

CONSENT FORM FOR PARTICIPANTS IN THE FIRST STUDY

INFORMATION TO PARTICIPANTS:

We would like to invite you to take part in a research-study aimed at investigating nightmare experiences. The research- study will be divided into two related studies. The first study is designed to investigate the frequency of nightmares and related sleep concerns for the past 12 months.

Your participation in the first study will require you to complete a survey-questionnaire focused on reporting the frequency of nightmares/bad dreams and related sleep concerns. The first study will also be used to recruit participants for the second study. The survey-questionnaire in the first study should only take approximately 20 mins to complete.

It is not anticipated any significant risks will occur due to this research-study. Nevertheless, a psychologist from the V.U Student Counselling Services will be available for consultation if any unexpected risks do arise. The data collected will be strictly for research purposes and the completion of a PhD degree.

CERTIFICATION BY SUBJECT

I, _____
of _____

certify that I am at least 18 years old* and that I am voluntarily giving my consent to participate in the study:

“A survey of nightmare frequency and intensity in an Australian University sample and treatment with a storyline alteration technique SLAT” being conducted at Victoria University by: Dr. Gerard Kennedy.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by:

Fabian Elzo

and that I freely consent to participation involving the use on me of these procedures:

Participants will be recruited from classes held at the various campuses of V. U. The researcher will strategically place advertisements around the campuses. Participants will be required to complete a short survey-questionnaire which can be taken home and returned upon completion. The survey-questionnaire will include another form that will request participants to provide their contact details on a completely voluntary basis. The completed forms will be used for recruitment purposes only, in order to contact participants from the first study that meet the selection criteria (one or more nightmares per week) for the second study.

Participants meeting the selection criteria for the second study will be contacted and invited to participate in the second study which again is completely voluntary. Participants willing to be involved in the second study will be required to complete a consent form for the second study. They will subsequently be advised of the commencement date for the second study.

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed: _____

Date: _____

Any queries about your participation in this project may be directed to the researcher Dr. Gerard Kennedy on (03) 9919 2481. If you have any queries or complaints about the way you have been treated, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781

Appendix 3

A survey of nightmare frequency and intensity in an Australian University sample and treatment with a Story-Line Alteration Technique (SLAT)

If you meet the selection criteria for the second study and are you willing to participate in the second study please complete your contact details below.

Your Name:.....

Telephone Mobile:.....

Telephone Home:

Email:

Please return this form with your completed survey-questionnaire.
You will be contacted prior to the second study commencing.

Thank-you for your participation.

Appendix 4

Nightmare Frequency Questionnaire

Please tick one:

Gender: Male _____ Female _____

Age: _____

Part I: Frequency by NUMBER OF NIGHTS with Nightmares.

Nightmares are defined as bad/dysphoric dreams that wake you up.

Based on the previous three months, please estimate on average how often you experience nightmares by selecting one of the following categories based on **number of nights.**

Select only one column from the four listed, then circle **one** category:

Zero	Yearly	Monthly	Weekly
0 nights	1 night per year 2 per year (1 per 6 mths) 3 per year (1 per 4mths) 4 per year (1per 3 mths) 5 per year 6 per year (1per 2 mths) 7 per year 8 per year 9 per year 10 per year 11 per year	1 night per mth 2 nights per mth 3 nights per mth	1 night per week 2 nights per week 3 nights per week 4 nights per week 5 nights per week 6 nights per week 7 nights per week

Part II: Frequency by ACTUAL NUMBER of Nightmares

Select only one column from the four listed, then circle **one** category:

Zero	Yearly	Monthly	Weekly
0 nights	1 night per year 2 per year (1 per 6 mths) 3 per year (1 per 4mths) 4 per year (1per 3 mths) 5 per year 6 per year (1per 2 mths) 7 per year 8 per year 9 per year 10 per year 11 per year	1 night per mth 2 nights per mth 3 nights per mth	1 night per week 2 nights per week 3 nights per week 4 nights per week 5 nights per week 6 nights per week 7 nights per week -----per week**

****If your total number of nightmare is more than 7 per week, please *estimate On Average* the actual number for a typical week and fill in the blank. (For Example, some people have *more* than one nightmare or disturbing dream in a single night.**

They may report 2 disturbing dreams per night for 7 nights in the week. Their total number per week would be 2 nightmares x 7 nights = 14)

Part III: Type of Nightmare Reported

Select the appropriate column

Nightmare content relates to a traumatic personal experience	Nightmare content does not relate to a traumatic personal experience	Both types of nightmares (contents) are experienced

Trauma is defined as sudden or unexpected events that are considered abnormal and elicit strong reactions.

Appendix 5

Pittsburgh Sleep Quality Index & PTSD Addendum

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month.

1. During the past month, what time have you usually gone to bed at night?

BED TIME: _____

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?

NUMBER OF MINUTES: _____

3. During the past month, what time have you usually gotten up in the morning?

GETTING UP TIME: _____

4. During the past month, how many hours of actual sleep did you get at night?
(this may be different than the number of hours you spent in bed)

HOURS OF SLEEP PER NIGHT: _____

For each of the following questions, tick **3** the box [] of the one response that best describes your sleeping patterns. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you:

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
a. Cannot get to sleep within 30 minutes	[]	[]	[]	[]
b. Wake up in the middle of the night or early morning	[]	[]	[]	[]
c. Have to get up to use the bathroom	[]	[]	[]	[]
d. Cannot breath comfortably	[]	[]	[]	[]
e. Cough or snore loudly	[]	[]	[]	[]
f. Feel too cold	[]	[]	[]	[]

- g. Feel too hot [] [] [] []
- h. Had bad dreams [] [] [] []
- i. Have pain [] [] [] []
- j. Other reason(s), please describe:
-

- | | Not
during
the past
month | Less than
once a
week | Once or
twice a
week | Three or
more times
a week |
|---|------------------------------------|-----------------------------|----------------------------|----------------------------------|
| k. How often during the past have you had trouble sleeping because of the above reason(s) | [] | [] | [] | [] |

6. During the past month, how would you rate your sleep quality overall?

- Very good []
- Fairly good []
- Fairly bad []
- Very bad []

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

- Not during the past month []
- Less than once a week []
- Once or twice a week []
- Three or more times a week []

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

- Not during the past month []
- Less than once a week []
- Once or twice a week []
- Three or more times a week []

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all []
- Only a very slight problem []
- Somewhat of a problem []
- A very big problem []

10. Do you have a bed partner or room mate?

- No bed partner or room mate []
- Partner/room mate in other room []
- Partner in same room, but not same bed []
- Partner in same bed []

If you have a room mate or bed partner, ask him/her how often in the past month you have had:

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
a. Loud snoring	[]	[]	[]	[]
b. Long pauses between breaths while asleep	[]	[]	[]	[]
c. Legs twitching or jerking while you sleep	[]	[]	[]	[]
d. Episode of disorientation or confusion during sleep	[]	[]	[]	[]

e. Other restlessness while you sleep; please describe:

f. How often during the past have you had trouble sleeping because of the above reason?

	[]	[]	[]	[]
--	-----	-----	-----	-----

PSQI Addendum for PTSD

Instructions

Please answer the following additional questions regarding your sleep in the past month. Include any observations from your bedpartner/roommate.

1. During the past month, how often have you had trouble sleeping because you...

a. Feel hot flashes:

- **Not during the past month** []
- **Less than once a week** []
- **Once or twice a week** []
- **Three or more times a week** []

b. Feel general nervousness:

- **Not during the past month** []
- **Less than once a week** []
- **Once or twice a week** []
- **Three or more times a week** []

c. Had memories or nightmares of a traumatic experience:

- **Not during the past month** []
- **Less than once a week** []
- **Once or twice a week** []
- **Three or more times a week** []

d. Had severe anxiety or panic, not related to traumatic memories:

- **Not during the past month** []
- **Less than once a week** []
- **Once or twice a week** []
- **Three or more times a week** []

e. Had bad dreams, not related to traumatic memories:

- **Not during the past month** []
- **Less than once a week** []
- **Once or twice a week** []
- **Three or more times a week** []

f. Had episodes of terror or screaming during sleep without fully awakening:

- **Not during the past month** []
- **Less than once a week** []
- **Once or twice a week** []
- **Three or more times a week** []

g. Had episodes of “acting out” your dreams, such as kicking, punching or screaming:

- **Not during the past month** []
- **Less than once a week** []
- **Once or twice a week** []
- **Three or more times a week** []

2. If you had memories or nightmares of a traumatic experience during sleep (question 1c above)

a. How much anxiety did you feel during the memories/nightmares?

- **None** []
- **Very little** []
- **Moderate** []
- **Severe** []

b. How much anger did you feel during the memories/nightmares?

- **None** []
- **Very little** []
- **Moderate** []
- **Severe** []

c. What time of night did most memories/nightmares occur

- **Early in the night** []
- **Middle of the night** []
- **Late night near morning** []
- **No particular time** []

Appendix 6

CONSENT FORM FOR PARTICIPANTS IN STUDY 2

INFORMATION TO PARTICIPANTS:

We would like to invite you to take part in the second study of the research-study aimed at investigating nightmare experiences. Your participation is completely voluntary.

The second study is designed to trial a brief treatment technique Story-line Alteration Technique' SLAT(on a C.D which you can take home and listen to at your leisure lasting approx 5 mins) for persons experiencing problems with weekly nightmares. The content of the C.D includes:

- An explanation of nightmares and corresponding categories
- Instructions on how to edit your nightmare by means of suggestion/s

Your participation will require you to complete a battery of questionnaires (which you can take home and should only take approx 90 mins to complete) prior, post and 6 months after the treatment. You will also be required to maintain a dream/nightmare journal for the duration of the research-study.

The procedure for the second study has 6 phases/stages.

1. From the survey/questionnaire in the first study 20 – 50 participants will be contacted and invited to be part of the sample experiencing 1 or more nightmares per week for the second study
2. This sample will be randomly divided into 2 groups, treatment and control groups and be administered pre-measures/questionnaires
3. Treatment group receives the treatment SLAT and control group receives the best current practice/treatment Systematic Desensitization
4. Both groups are administered post-treatment questionnaires
5. Six month later the treatment group is administered post-questionnaires again and control group receives the treatment SLAT
6. Control group receives post-treatment questionnaires after completing treatment SLAT

It is not anticipated any significant risks will occur due to this research-study. Nevertheless, a psychologist from the V.U Student Counselling Services will be available for consultation if any unexpected risks do arise. The data collected will be strictly for research purposes and the completion of a PhD degree.

CERTIFICATION BY SUBJECT

I, _____
of _____

certify that I am at least 18 years old* and that I am voluntarily giving my consent to participate in the study:

“A survey of nightmare frequency and intensity in an Australian University sample and treatment with a storyline alteration technique” being conducted at Victoria University by: Dr. Gerard Kennedy.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by:

Fabian Elzo

and that I freely consent to participation involving the use on me of these procedures:

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed: _____

Date: _____

Any queries about your participation in this project may be directed to the researcher Dr. Gerard Kennedy on (03) 9919 2481. If you have any queries or complaints about the way you have been treated, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781

Appendix 7

Nightmare Effects Survey

1. Do you believe that your nightmares affect other aspects of your life

1. YES__ 2. NO__

1a. Please rate how much your **SLEEP** is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1b. Please rate how much your **WORK** is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1c. Please rate how much your **RELATIONSHIPS** are adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1d. Please rate how much your **DAYTIME ENERGY** is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1e. Please rate how much your **SCHOOL** is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1f. Please rate how much your **MOOD** is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1g. Please rate how much your **SEX LIFE** is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1h. Please rate how much your DIET is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1i. Please rate how much your MENTAL HEALTH is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1j. Please rate how much your PHYSICAL HEALTH is adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

1k. Please rate how much your LEISURE ACTIVITIES are adversely or negatively affected by nightmares. (Circle 1 answer)

0. Not at all	1. Slightly	2. Moderately	3. Very much	4. A great deal
---------------	-------------	---------------	--------------	-----------------

NOTE: We might want to make up some questions about nightmare or disturbing dream content. For example, Does the content of your nightmare or disturbing dream relate to something that really happened to you? Or scale some questions 0 = no reality 5 = it really happened etc..

 Thank you for your time and participation 

Appendix 8

Post-traumatic Stress Diagnostic Scale (PDS)

Part 1

Many people have lived through or witnessed a very stressful and traumatic event at some point in their lives. Below is a list of traumatic events. Put a tick on the line provided next to ALL of the events that have happened to you or that you have witnessed.

1. _____ Serious accident, fire, or explosion (for example, an industrial, farm, car, plane, or boating accident)
2. _____ Natural disaster (for example, tornado, hurricane, flood, or major earthquake)
3. _____ Non-sexual assault by a family member or someone you know (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)
4. _____ Non-sexual assault by a stranger (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)
5. _____ Sexual assault by a family member or someone you know (for example, rape or attempted rape)
6. _____ Sexual assault by a stranger (for example, rape or attempted rape)
7. _____ Military combat or war zone
8. _____ Sexual contact when you were younger than 18 with someone who was 5 or more years older than you (for example, contact with genitals and breasts)
9. _____ Imprisonment (for example, prison inmate, prisoner of war, hostage)
10. _____ Torture
11. _____ Life threatening illness
12. _____ Other traumatic event
13. If you have ticked Item 12, specify the traumatic event below

IF YOU HAVE TICKED ANY OF THE ITEMS ABOVE, CONTINUE. IF NOT STOP HERE.

Part 2

14. If you marked more than one traumatic event in Part 1, put a tick on the line next to the event that bothers you the most. If you marked only one traumatic event in Part 1, mark the same one below.

- Accident
- Disaster
- Non-sexual assault/someone you know
- Non-sexual assault/stranger
- Sexual assault/someone you know
- Sexual assault/stranger
- Combat
- Sexual contact under 18 with someone 5 or more years older
- Imprisonment
- Torture
- Life-threatening
- other

Briefly describe the traumatic event you marked above.

Below are several questions about the traumatic event you marked above.

15. How long ago did traumatic event happen? (tick one)

- (1) Less than 1 month
- (2) 1 to 3 months
- (3) 3 to 6 months
- (4) 6 months to 3 years
- (5) 3 to 5 years
- (6) More than 5 years

For the following questions, circle Y for Yes or N for No.

During this traumatic event:

- 16. **Y N** Were you physically injured?
- 17. **Y N** Was some else physically injured?
- 18. **Y N** Did you think that your life was in danger?
- 19. **Y N** Did you think some else's life was in danger?
- 20. **Y N** Did you feel helpless?
- 21. **Y N** Did you feel terrified?

Part 3

Below is a list of problems that people sometimes have after experiencing a traumatic event. Read each one carefully and circle the number (0-3) that best describes how often that problem had bothered you IN THE PAST MONTH. Rate each problem with respect to the traumatic event you described in Item 14.

- 0 Not at all or only one time
 - 1 Once a week or less/once in a while
 - 2 2 to 4 times a week/half the time
 - 3 5 or more times a week/ almost always
22. 0 1 2 3 Having upsetting thoughts or images about the traumatic event that came into your head when you didn't want them
23. 0 1 2 3 Having bad dreams or nightmares about the traumatic event
24. 0 1 2 3 Reliving the traumatic event, acting or feeling as if it was happening again
25. 0 1 2 3 Feeling emotionally upset when you were reminded of the traumatic event (for example, feeling scared, angry, sad, guilty, etc.)
26. 0 1 2 3 Experiencing physical reaction when you were reminded of the traumatic event (for example, breaking out in sweat, heart beating fast)
27. 0 1 2 3 Trying not to think about, talk about, or having feelings about the traumatic event
28. 0 1 2 3 Trying to avoid adjectives, people, or places that remind you of the traumatic event
29. 0 1 2 3 Not being able to remember an important part of the traumatic event
30. 0 1 2 3 Having less interest or participating much less often in important activities
31. 0 1 2 3 feeling distant or cut out from people around you
32. 0 1 2 3 Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings)
33. 0 1 2 3 Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)
34. 0 1 2 3 Having trouble falling or staying asleep
35. 0 1 2 3 Feeling irritable or having fits of anger
36. 0 1 2 3 Having trouble concentrating (for example, during in and out of conversations, losing track of a story on television, forgetting what you read)
37. 0 1 2 3 Being overly alert (for example, checking to see who is around you, being uncomfortable with your back to a door, etc.)

38. **0 1 2 3** Being jumpy or easily startled (for example, when someone walks up behind you)

39. How long have you experienced the problems that you reported above? (circle one)

- 1 Less than one month
- 2 1 to 3 months
- 3 6 or more months

40. How long after the traumatic event did these problems begin? (circle one)

- 1 Less than 6 months
- 2 6 or more months

Part 4

Indicate below if the problem you rated in part 3 have interfered with any of the following areas of your life DURING THE PAST MONTH. Circle Y for Yes or N for No.

- 41. **Y N** Work
- 42. **Y N** Household chores and duties
- 43. **Y N** Relationship with friends
- 44. **Y N** Fun and leisure activities
- 45. **Y N** Schoolwork
- 46. **Y N** Relationships with your family
- 47. **Y N** Sex life
- 48. **Y N** General satisfaction with life
- 49. **Y N** Overall level of functioning in all areas of your life

Thank-you

Appendix 9

Profile of mood states (POMS 37-item)

Below is a list of words that describe feelings people have. Please read each one carefully. Then fill in ONE circle that best describes HOW YOU HAVE BEEN FEELING DURING THE PAST WEEK INCLUDING TODAY

	Not at all	A little	Moderately	Quite a bit	Extremely		Not at all	A little	Moderately	Quite a bit	Extremely
1. Tense	<input type="radio"/>	20. Discouraged	<input type="radio"/>								
2. Angry	<input type="radio"/>	21. Resentful	<input type="radio"/>								
3. Worn out	<input type="radio"/>	22. Nervous	<input type="radio"/>								
4. Unhappy	<input type="radio"/>	23. Miserable	<input type="radio"/>								
5. Lively	<input type="radio"/>	24. Cheerful	<input type="radio"/>								
6. Confused	<input type="radio"/>	25. Bitter	<input type="radio"/>								
7. Peeved	<input type="radio"/>	26. Exhausted	<input type="radio"/>								
8. Sad	<input type="radio"/>	27. Anxious	<input type="radio"/>								
9. Active	<input type="radio"/>	28. Helpless	<input type="radio"/>								
10. On edge	<input type="radio"/>	29. Weary	<input type="radio"/>								
11. Grouchy	<input type="radio"/>	30. Bewildered	<input type="radio"/>								
12. Blue	<input type="radio"/>	31. Furious	<input type="radio"/>								
13. Energetic	<input type="radio"/>	32. Full of pep	<input type="radio"/>								
14. Hopeless	<input type="radio"/>	33. Worthless	<input type="radio"/>								
15. Uneasy	<input type="radio"/>	34. Forgetful	<input type="radio"/>								
16. Restless	<input type="radio"/>	35. Vigorous	<input type="radio"/>								
17. Unable to concentrate	<input type="radio"/>	36. Uncertain about things	<input type="radio"/>								
18. Fatigued	<input type="radio"/>	37. Bushed	<input type="radio"/>								
19. Annoyed	<input type="radio"/>										

Appendix 10

SLAT Treatment

Welcome to the Treatment C.D

- Firstly, you will receive a definition and description of Parasomnias and the association they have with NMs
- Secondly, you will receive simple instructions on how to Edit or change you NMs

Parasomnias are sleep disorders characterized by partial arousals (mini wake-ups) during sleep or during transitions between sleep stages.

Parasomnias are often associated with stress, depression, and/or biological factors.

There are two major categories of Parasomnias, Primary and Secondary Parasomnias.

Nightmares (which are dreams) commonly occur in REM sleep (rapid eye movement sleep), and RNMs commonly fall under the Primary Parasomnia Category.

Most dreaming commonly occurs during the REM sleep stage which comprises approximately 20-25% of nightly sleep (2 hrs per night). NMs are a specific type of dream characterized by acute anxiety or fear and arouses you from sleep or wakes you up.

Because nightmares are dreams and dreams are narratives or stories we tell ourselves while we are asleep, we are both the authors as well as editors of our nightmares. That is, we can easily change them.

We can use this understanding to easily change or eliminate our NMs altogether.

Now, instructions on how to change your NMs:

1. Select a physical item (which we will call the power-item). This will symbolize all the power you need to overcome your nightmare threat. Examples of power-items are: socks, pyjamas, toy (toy gun), card etc.
2. Pick up your power-item and hold it with both of your hands and listen to the following instructions: “This item you are holding represents all the power you will ever need to overcome any threat during your nightmare experience. As soon as you feel threatened in your dream, you will be able to access your ‘power item’. By doing so you will be empowered to overcome (e.g. escape by flying away, or disappearing or destroying) your threat instantly. Anytime you want to access your ‘power-item’, all you need to do is ‘think of it’ and it will be at your disposal. ‘You can

overcome any threat during your dreams by simply thinking of your power-item.

3. Before going to sleep, have in your possession the power-item. Place the item near your bed (sleeping quarters) e.g. wear it or under your pillow or under your bed before going to sleep.
4. Listen to the C.D. as often as you need to, in order to understand what is required.
5. Listen to the C.D. again just prior (e.g. 1 hour before) going to bed.

Good luck and sweet dreams.

Appendix 11

SD Treatment

Welcome to the treatment CD.

You will learn how to use systematic desensitization to treat your nightmare experiences.

There are 3 steps in SD, beginning with:

1. Relaxation
2. Constructing an anxiety hierarchy
3. Pairing relaxation with the situations described in your anxiety hierarchy

Firstly, 'Relaxation'

Begin by concentrating on your breathing, focus as you inhale (as you breath in) and exhale (as you breath out). Do this for 10 breadths.

Now:

1. Hold you breath and count to 5 (don't take a deep breath)
2. When you get to 5, breathe out and say the word *relax* to yourself in a calm and soothing manner
3. Breathe in and out through your nose in a six second cycle. Breathe in for 3 seconds and breath out for 3 seconds (saying relax in your mind)
4. After 10 breaths hold your breath again for 5 seconds and then continue breathing using the 6 second cycle
5. Continue breathing this way until you feel comfortable and relaxed

Secondly, 'Constructing an Anxiety Hierarchy'

This involves creating a hierarchy of events related to your nightmare experience in an ascending order of anxiety.

Aim for 7 hierarchical steps, for instance:

- Step 1 – Going to bed
- Step 2 – Going to sleep
- Step 3 – Beginning to dream
- Step 4 – entering the dream scenario related to your nightmare
- Step 5 – being exposed to the nightmare experience
- Step 6 – experiencing the nightmare threat
- Step 7 – feeling anxiety or fear directly related to you nightmare experience

Thirdly, 'Pairing Procedure'

The overall goal of systematic desensitization is to reduce the ability of certain situations that cause anxiety or fear, in this case you nightmare

You will accomplish this by confronting each step of your hierarchy while you are in a deep state of relaxation.

Do this by, firstly achieving a state of relaxation using the relaxation instructions. Secondly, once you are relaxed imagine yourself in the first step of the hierarchy for approximately 30 secs e.g. going to bed. If you feel relaxed after this time go to step 2 and so on...

Anytime you begin to feel anxious or afraid stop and go back to the relaxation instructions and relax yourself once again.

Once you are relaxed resume the hierarchy and continue until you have reached step 7 and are able to feel completely relaxed.

Do not rush yourself. It is very important that you go at your own pace. Thirdly, repeat this procedure until you reach step 7. This may take a few days to a few weeks, depending on how often you practice and how quickly you are able to pair the relaxation state with the anxiety experienced.

Aim to practice seven consecutive days, if you are able to but remember – go at your own pace...

And fourthly, listen to the CD as often as required for you to understand what you need to do. Good luck and sweet dreams.