Constraints and Motivations on the Participation of Saudi Arabian High School Students in Physical Activity and Sport

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List of Publications

The following papers were produced to disseminate the concept and results of the work undertaken by the author during the course of this PhD research.

Conference Papers

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Abstract

A low level of physical activity and sport participation among adolescents has been particularly evident over the past decade, and youth inactivity has become a significant public health issue that has attracted the attention of many researchers around the world (Centers for Disease Control and Prevention, 2015; World Health Organization, 2011).

The purpose of this research project is to critically examine the major constraints and motivations in relation to physical activity and sport participation among male high school students who live in the city of Riyadh, Saudi Arabia. Using the hierarchical model of leisure constraints designed by Crawford, Jackson and Godbey (1991) and the motivational model developed by Frederick and Ryan (1993), this study explores the determinants of their physical activity and sport participation levels. Data were collected via a self-reported questionnaire completed by 909 male students aged 16–19 from Riyadh high schools in 2010–2011.

The results of this study show that 74 per cent of respondents were not active enough to meet international guidelines for participation levels in physical activity and sport. By global standards, this figure suggests that male adolescents in Riyadh exhibit low levels of physical activity. The finding also showed that while many respondents were keen to participate, and understood the benefits associated with increased levels of physical activity, their ambitions were thwarted by a lack of knowledge, low levels of interpersonal support, and significant structural constraints. Lack of facilities and the lack of accessibility were identified as the highest constraints among respondents. Thus, it is not surprising to find that over 40 per cent of respondents said ‘the street’ was the most popular place for physical activity and sport participation. The results of this study also show statistically significant differences in constraints and motivational variables

when mediated by respondents' type of school, age, grade level and location in Riyadh, but the effect size of these differences was trivial. Finally, the findings suggest in order to increase participation, the Saudi government and its sport associations should not only promote the enjoyment and social connectedness associated with sports and active recreation – and thus reinforce the motivation to engage- but also create more facilities and structured spaces in which these activities can take place.

Declaration of Original Work

I, Majed Essa Alahmad, declare that the PhD thesis entitled *Constraints and Motivations on the Participation of Saudi Arabian High School Students in Physical Activity and Sport* is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature: 

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Chapter 1: Introduction to Thesis

1.1 Introduction

The purpose of this chapter is to explain the nature of research topic investigated in this thesis, identify the problematic nature of the topic, discuss its significance, and summarise its overall purpose and structure. The chapter also provides a contextual frame to the study by back-grounding Saudi Arabia's geography, economy, society, culture, education system and research setting. It discusses the importance to Saudi Arabians of participating in physical activity and sport, as well as government policies that aim to secure greater levels of participation. In addition, the chapter outlines the research problems, aims and objectives, questions and hypotheses, thesis structure and the definition of the key terms used in the study. The chapter ends with a statement on the study's research delimitations.

1.2 Physical Activity and Sport in Contemporary Society

1.2.1 Physical Activity and Public Value.

Physical activity is an important social practice that delivers significant public value. This is because physical activity has significant health benefits and contributes to the prevention of non-communicable diseases (World Health Organization, 2015). High levels of physical activity among the general population is associated with a fitter and healthier body, a confident disposition, and an alert mind (Adrianne, Hardman & Stensel, 2009; American Heart Association, 2015; Australia Bureau of Statistics, 2013; Janssen & LeBlanc, 2010).Greater participation in physical activities can also reduce the risk of heart disease later in life, ensure positive social interaction, improve mental health, prevent obesity, and stabilise mood states (Department of Health in UK, 2011). Nations around the world have thus initiated policies aimed at increasing physical activity levels in order to improve health and well-being (American Heart Association,

2015; Australia Bureau of Statistics, 2013; Cooper & Kontulainen, 2014; Eime, Young, Harvey, Charity & Payne, 2013; Gordon-Larsen, McMurray & Popkin, 2000).

Nonetheless, many people are inactive, and do not participate at rates and intensities that are beneficial, and are not reaching the recommended physical activity guidelines for their age. Physical inactivity is now recognised as a major contributor to global health problems. There is a close association between inactivity and costly medical conditions such as type 2 diabetes, stroke, and heart disease (Pratt, Norris, Lobelo, Roux & Wang, 2014). There is also evidence linking a decline in physical activity with obesity (Australian Bureau of Statistics, 2013; Department of Health, 2011 & 2014; Statistics Canada, 2015).

1.2.2 Adolescent Physical Activity and Sport Participation.

The opportunity to participate in physical activity and sport programs is influenced by a variety of factors. According to the WHO (2002), there are five major locations and times when people have the opportunity to be physically active: (1) work;(2) school; (3) transport, which includes walking or cycling to work or school; (4) domestic duties such as housework; and (5) leisure time.

Recently, there has been concern about young people's leisure –time practices, and especially their low levels of physical activity and sport participation. It has become a significant public health issue and has attracted the attention of many researchers around the world (Juan, Bengoechea, Montes & Bush, 2010; Rombaldi, Menezes, Azevedo & Hallal, 2010; WHO, 2004). The low rate of participation is particularly noticeable during the adolescent period (Trost et al., 2002). Additionally, there has been significant concern in the USA, Canada, and UK, about not only children's low levels of participation in physical activity, but also their increasing level of obesity (Active, 2011; Department of Health in UK, 2011; Eaton et al., 2010; Fulton et al., 2011;

Slingerland, Borghouts & Hesselink, 2012; Troiano et al., 2008). The research data also shows a significant gender divide, with boys being more active than girls (Loucaides, 2009; Loucaides, Plotnikoff & Bercovitz, 2007; Wanget al., 2013).

A number of studies have also found falling levels of physical activity among adolescents during their high school years (Al-Hazzaa et al., 2014; Vigo-Valentín, Bush & Hodge, 2014; Wartecka-Wazynska, 2013). Low levels of physical activity were particularly evident during the later adolescent years (Australian Bureau of Statistics, 2013; Department of Health,2011; Statistics Canada, 2015). A USA study, for example, found that inactivity declined for 13-17 years old, but increased for young adults aged 18-24 years old (Casper & Harrolle, 2013; Council, 2012). Telama and Yang's (2000) study, on the other hand, showed that physical activity levels in Finland declined regularly after the age of 12.

In these studies adequate levels of physical activity participation were expressed as 20–60 minutes of moderate- to high-intensity endurance exercise performed three or more times per week (Department of Health and Ageing, 2005a; Pate et al., 1995; SPARC, 2007). It is now recommended that, ideally, activity levels among adolescents should be 60 minutes per day of moderate to vigorous-intensity physical activity daily (WHO, 2015).

1.2.3 Participation in Physical Activity and Sport in Saudi Arabia.

Saudi Arabia is particularly vulnerable to declining levels of participation in physical activity and sport. The Saudi Arabian government's policy has been cognisant of the need to increase adolescent engagement and the number of young people participating in physical activities and sport (Alsweden, 1995). Despite increasing government involvement in sport in Saudi Arabia, and despite the popularity of soccer, swimming, and cycling (Al-Hazzaa, 2000),low levels of physical activity and sport

participation among the population persist, and the issue is becoming problematic. According to Al-Hazzaa (2007a, 2007b), during the past 30 years the lifestyles of Saudis have increased the scale of the problem. It was found, for example, that less physically active individuals were more likely to adopt unhealthy dietary habits, and less likely to seek out fresh-food alternatives to pre-cooked take-away meals (Al-Hazzaa et al., 2014). A study by Al Muammar and El Shafie (2014) delivered similar results. Adolescents from Riyadh City had low daily milk consumption, little fruit and vegetable consumption, and additionally, did not take part in regular exercise. Other studies also found that low levels of physical activity participation were associated with low consumption of fruit, vegetables, milk (Al-Hazzaa et al., 2014).

Overall, the level of adolescent inactivity in Saudi Arabia is high, with 48 per cent of Saudi boys not reaching a moderate daily regime of physical activity (Al-Rukban, 2003). In addition, Al-Refaee and Al-Hazzaa (2001) found that physical inactivity among different groups of Saudi children and adults had actually increased. In young adults the inactivity rate was 43 per cent, while in middle aged male adults it reached 53 per cent. In one study it was found that 60% of male high school students did not meet recommended daily physical activity (PA) levels (Al-Hazzaa et al., 2014).

The above studies of physical activity in Saudi Arabia are illuminating, but they were limited by their concern for broad issues such as health and lifestyle. They did not address the specific ways in which young people engaged with physical activity and sport, and neither did they examine the constraints on participation on one hand, and the motivations to participate on the other. Hence, this study of Saudi adolescents aims to expand the level of analysis by securing a detailed understanding of not only the level of physical activity and sport participation among Saudi Arabian high school students, but also the factors that impact upon their motivations and ability to participate.

1.2.4 Why Focus on Physical Activity and Sport?

Overall, most academic Saudi Arabia studies confirm that low level of physical activity and sport participation occur among young and high school students. They also concur that it constitutes a major social and health problem that needs to be addressed urgently. Thus, this thesis will examine the reasons for this low level of participation by analysing data on the constraints and motivations of a sample of male high school students in the city of Riyadh, Saudi Arabia. As a starting point, this study asks the following three-part question: What are the physical activity and sport participation levels among young Saudi Arabians; what prevents young Saudi Arabians from being more active and playing more sport and games; and what motivates young Saudi Arabians to be more active and play more sport?

With this question as a backdrop, this thesis has the overarching purpose of exploring and explaining the patterns of physical activity and sport participation among adolescents in Riyadh, Saudi Arabia. In preparing for this research project, it was evident that participation levels have been low for some time and that the sedentary nature of Saudi Arabian society has increased the health risks associated with preventable lifestyle diseases such as heart failure, diabetes and some forms of cancer (Al-Hazzaa et al., 2014). However, there is only a small amount of data available that explain the scope and scale of this problem, and there are even less data that can be used to build an evidence base to formulate policy initiatives to increase participation in the future. With these limitations in mind, it is clear that a broad –based and rigorous research project is an essential step in first, understanding what motivates Saudi Arabian adolescents to undertake physical activity and sport, and enables engagement to occur, and, second, what factors constrain participation, and act as barriers to further engagement. While high levels of motivation, and the presence of enabling factors, will

normally lead to increased participation, the existence of constraints and barriers will deter participation. These issues constitute the focus of this thesis, and it is anticipated that the results of the study will fill a significant research gap, and make a unique contribution to the analysis of Saudia Arabian adolescent participation in physical activity and sport.

1.2.5 Influences on Physical Activity and Sport Participation.

There a many factors that influence levels of participation in sport and physical activity. To make sense of these factors, and critically examine their inter-relationship, it is essential to have a model for identifying and categorising the factors, and explaining the ways in which they link with other factors to shape participation. With this issue in mind, it was important to adopt a model that not only looks at individual traits, dispositions and attitudes, but also takes into account social and contextual factors. This approach is a core feature of the social-ecological model, which includes a broad range of micro and macro factors distilled into three dimensions (Nelson, Abbott & Macdonald, 2010). Dimension 1 includes individual traits and genetic characteristics like temperament and personality. Dimension 2 includes social connections that shape behaviour, which range from proximal social connections like friends and family, to distal social connections like neighbourhoods, community links and organisational influences. Dimension 3 includes structural conditions, which range from physical and environmental factors like access to resources, infrastructure and facilities, and long-term weather patterns, to broad political and socio-cultural conditions like governing systems, levels of economic development, rights and freedoms, cultural traditions, religious practices, customs and taboos, and rules and laws. The social-ecological model is conceptually strong because it provides space for an array of interdependent factors to be considered (Bauman et al., 2012; Li & Rukavina, 2012; McGannon, Busanich,

Witcher & Schinke, 2014; Sallis, Owen & Fotheringham, 2000). A conceptual map of the social-ecological model, and its application to physical activity and sport, is contained in Figure B.1 in Appendix B.

While many of the macro issues – and the social and cultural factors in particular - were relevant to a research project of this type, it was decided to remove them from the study on the grounds that they would make the project methodologically complex, and generate an unwieldy combination of variables to address. Therefore, to ensure the timely completion of this study, while also ensuring its theoretical legitimacy and empirical relevance, it was decided to narrow it to an analysis of individual traits and characteristics, social and proximal connections, and structural conditions. In order to meet this methodological requirement, and achieve an effective operational outcome, two complementary models were used to frame the study. The first is a hierarchical model of constraints, designed and developed by Crawford and Godbey (1987) and Crawford et al.(1991). The second is a model of motivation as proposed by Frederick and Ryan (1993). Leisure researchers have subsequently used these models to gain a better understanding of physical activity participation and non-participation levels (Casper et al.,2011; Cooper et al., 2012; Palen et al., 2010 ; Sibley et al., 2013; Vasickova et al., 2014).

Within this framework, physical activity and sport participation levels are seen to be influenced by a range of factors, either as constraints (Casper et al., 2011; Palen et al., 2010; Shifman, Moss, D'Andrade, Eichel & Forrester, 2012), or as motivators (Cooper, Schuett & Phillips, 2012; Luka, 2013; Sibley, Hancock & Bergman, 2013).In a seminal paper, Crawford and Godbey (1987) categorised the constraints on physical activity participation levels as intrapersonal, interpersonal and structural. Intrapersonal constraints include poor psychological disposition, low levels of physical ability,

limited knowledge and lack of interest. Interpersonal constraints are social interaction considerations such as lack of partners or lack of encouragement. Structural constraints include environmental features such as lack of facilities, lack of low cost options and the absence of sidewalks (Crawford & Godbey, 1987). Identification of these constraints and motivating factors is an important component in the process of understanding participation levels in physical activity and sport. It enables researchers to systematically explain the strength of the variables, and their inter-relationships. It also allows policy-makers and administrators to be more rational and deliberate in first, channelling action and resources towards reducing constraints that limit youth sport participation (Casper et al., 2011),and second, providing information and advice to guide the design of activities that enhance social and community engagement among young people (Kowalski, Crocker & Kowalski, 2010).

Many studies have been undertaken that focus on the constraints on participation in sport and physical activities (Casper et al., 2011; Palen et al., 2010; Shifman et al., 2012). However, the literature shows disparate inter-variable results, ranging from strongly negative to weakly positive relationships between constraints and physical activity participation. Jung-Woong et al. (2009), for intance, found a negative relationship - that is, the more severe the constraints, the lower the level of physical activity. Another study found a lack of peer and family support (a constraint) had negatively influenced male adolescent physical activity participation levels (Allison et al., 2005).These results have intuitive appeal, but other researchers have found a positive relationship between lack of constraints and physical activity participation, where inferior facilities, and poor access, often failed to discourage participation (Van Cauwenberg et al., 2011). According to White (2008), this result provided evidence that constraints are sometimes viewed not as reasons to not engage, but instead as barriers to

be overcome, which is what he found when investigating outdoor recreation participation. White's (2008) analysis thus suggests that the relationship between barriers and participation is more dynamic that previously thought. That is, participants often use negotiation strategies that can limit the negative impact of constraints on activity participation, with high levels of motivations being used to exert greater negotiation efforts to ensure future participation.

The above study highlights the role that motivation plays in initiating and continuing physical activity and sport participation. Smith&Biddle (2008) found it had a strongly positive effect on the frequency of participation, especially when linked to social interaction and the need for achievement. Iannotti et al. (2012) reported similar results. This finding is also consistent with Frederick and Ryan (1993) who found that interest/enjoyment and competence were positively linked to time spent exercising per week. A number of theories have been used to frame the analysis of motivation in physical activity and sport, for example Leisure motivation scale (Beggs et al., 2014; Chen & Pang, 2012), Behavioural regulations (Seghers et al., 2014), and Self-determination theory (Lapointe & Perreault, 2013). Therefore, it is important for this research project to clearly understand what motivates young people to participate in physical activity programs. This is especially relevant to the topic here, as there is evidence of low levels of participation among school students not only around the world (WHO, 2015), but also in Saudi Arabia (Al-Hazzaa et al., 2014).

A large number of studies have addressed the motivations for participating in physical activity and sport, with the most commonly identified factors being enjoyment and pleasure, a sense of mastery and achievement, health, social interaction, competition, and fitness (Cooper et al., 2012; Iannotti, 2013; Seghers, Vissers, Rutten, Decroos & Boen, 2014; Wang, Liu, Bian & Tan, 2010). Moreover, people who are

highly motivated are not only systematic and rational in how they approach their sport and physical recreation experiences, but also often become addicted to the pleasures and risks (Fehmi et al, 2014; Owen, Smith, Lubans, Ng & Lonsdale, 2014). For example, highly motivated exercise enthusiasts such as parachutists greatly enjoy the unique sensations associated with falling through the air (Lapointe & Perreault, 2013).

This introductory discussion of the influences on participation in physical activity and sport highlights a range of issues regarding this research project. They also suggest there are some conflicting ideas regarding the interplay of constraints and motivation, and how they finally shape engagement and participation in physical activity and sport. These issues will be examined in more detail in Chapters 2 to 4, where they will be subject to critical analysis, and integrated into a working model of the determinants of participation in physical activity and sport.

1.3 Background to the Study

1.3.1 Geography of Saudi Arabia.

The Kingdom of Saudi Arabia is situated in the Middle-East region of Asia; it is one of the so-called 'Gulf Countries'. In 2008, Saudi Arabia's population was estimated at around 28 million, with 22.6 million Saudis and 5.6 million foreign nationals (Riyadh Principality, 2010; Royal Embassy of Saudi Arabia, 2010). Saudi Arabia's total land mass is 2.2 million square kilometres, and it has a hot and dry climate. Its spatial relationship with other Middle-East nations is illustrated in Figure 1.1 (Royal Embassy of Saudi Arabia, 2010).

Figure 1.1. Map of Saudi Arabia (Quick Maps, 2006).

1.3.2 Economy, Society and Culture of Saudi Arabia.

In 1938, Saudi Arabia was transformed economically when major oil reserves were discovered throughout the nation. The country is now not only the world's largest exporter of crude oil, but it has also become a major producer of petrochemicals (Sippel, 2003). This outcome gave the Kingdom immediate political legitimacy, with Saudi Arabia now owning the largest reserves of oil in the world. Additionally, the Saudi Arabian culture has been shaped by local traditions for thousands of years. Over the past 60 years it has become more diversified, with people from all over the world living and working within the country. In addition, Saudi Arabian culture is heavily influenced by Islamic values and Islamic religious practices. The official language of the country is Arabic (Royal Embassy of Saudi Arabia, 2010). According to Alriyadh.net (2011), the mean Saudi employee salary is $US 39.000 a year. The minimum annual wage is $US 25,000 , while is guaranteed by the Saudi governments. This suggests that most Saudi

Arabia in employment have incomes which provide significant amounts of discretionary spending.

1.3.3 Education System in Saudi Arabia.

The Saudi system of education has been improving, as is the case in many other developing countries. The education system is structured into four levels: a) primary school; b) middle school; c) high school; and d) higher education. The aim of the Saudi educational policy is to ensure that education becomes more professionalised to meet the religious, economic and social needs of the country. The policy also seeks to improve the general level of education and thus reduce illiteracy levels. In 1953, when Prince Fahd Bin Abdul Aziz became Minister of Education, an enormous education redevelopment program was instituted, with special attention to Islamic education values, which includes the belief in human self-respect and the creation of opportunities for students to contribute to the development and evolution of their society. As part of this educational package, all levels of public education in Saudi Arabia are free for all Saudis (Ministry of Foreign Affairs, 2007; Prokop, 2003). Moreover, physical education, which includes physical activity and sport, has become an important component of education in Saudi schools (Ministry of Education, 2013). Physical education became more important in school curriculum as it has in schools around the world, such as Canada, Australia and the USA (Tannehill, Romar, O'Sullivan, England & Rosenberg, 1994). As a result, today's young people are encouraged to participate in physical education programs, with the aim of improving overall health standards.

At the same time, the Saudi Arabian education system has a number of special features that gives it an idiosyncratic cultural flavour. As Al-Liheibi (2008) noted, there are often significant differences in education systems around the world, particularly in the physical education curriculum. For example, in Western nations, the physical

education curriculum emphasises the use of local school facilities, technology and the integration of all students, especially with respect to gender. However, in Saudi Arabia, the policy initiated by the Ministry of Education separates male and female students into different school buildings. Additionally, the gender of the teacher is the same as the gender of the students. Further, the physical education program is only offered to male students, and physical education class time falls away as students' progress through their various years of schooling. In primary school, children have two 90-minute sessions per week for physical activity; however, when they reach the middle and high school years, they only have one 45-minute class per week on physical education. This means that the priority given to physical education falls as students move through the secondary education system.

1.3.4 Sport Development in Saudi Arabia.

The government of Saudi Arabia has paid great attention to sport and youth affairs since the 1930s. In 1945, Saudi Arabia established the first Department of Sport Movement, which was then under the administrative umbrella of the Ministry of the Interior. Fifteen years later, in 1960, the departmental functions of youth welfare were assigned to the Ministry of Education, and it became the body responsible for youth activities. In 1974, the Council of Ministers Resolution No. 560 decreed that all activities involved in the 'care for young people' be bundled together to become an independent body known as the 'General Presidency for Youth Welfare'(King Khaled Military Academy, 2001).

As a result of the importance placed on sport and youth affairs, additional sport facilities were built during this period to attract more participation. By 1975, there were 54 licensed sport clubs, 10 sport federations and three stadiums (one each in Jeddah, Riyadh and Dammam). The number of sport clubs had increased to 153 by 1984, and

significantly, the club system supported more than 50,000 athletes at this time. Therefore, the 153 Saudi clubs were scheduled in five competitions: 1) Zain League; 2) Series A; 3) Series B; 4) Series C (champions areas); and 5) League areas. Saudi Arabian sport has witnessed a notable development during the period of King Fahd bin Abdulaziz's reign. Further, the Saudis have also achieved great sporting success, especially in football, reaching the Asian Cup final in 1984, 1988 and 1996. In 1989, Saudi Arabia won the World Youth Cup and competed in the final of the World Cup in 1994, 1998, 2002 and 2006 (FIFA, 1994–2010; Ministry of Foreign Affairs, 2007). Therefore,the focus of sport development has been on 'elite' sport, especially football. On the other hand, relatively few government resources have been allocated to mass participation sport. According to General President of Youth Welfare Budget Report funds have been allocated to build and develop sport stadium and professional sport clubs around Saudi Arabian cities (competitive sport clubs). There is no financial support for the construction of projects for the sport facilities within the neighbourhoods to implement sports programs for local community members (Ajel, 2011). As result the club-based model of sport, which features heavily in many European sport development models, has been given a low priority in Saudi Arabia. Additionally, there has been little commitment to the provision of community sports and leisure centres, which dominate the active recreation landscape of nations like Australia, Denmark, England, Germany, and New Zealand.

1.4 Research Setting: Riyadh City

Riyadh is the capital of the Kingdom of Saudi Arabia and is located in the centre of Saudi Arabia. Riyadh's climate is hot and dry in summer and cool to cold in winter. Today, Riyadh is a cosmopolitan city with many world-standard facilities and services. The city is also Saudi Arabia's political, economic and cultural heartland. In 50 years,

the city has undergone an urban renaissance, turning from a small town surrounded by ancient walls to a modern city with an area of 1,800 square kilometres. The city's population is increasing at a very high rate; since 1968, it has exceeded the country's annual growth rate of 9 per cent. In 1968, the city had a population of 300,000; in 2009, the population increased to 5.2 million people, comprising 65 per cent Saudi residents and 35 per cent non-Saudi residents(Riyadh Principality, 2011).

Riyadh is now one of the fastest-growing cities in the world, with 162 suburbs. The infrastructure improvements to Riyadh, such as the installation of good road networks and extensive communications systems, have resulted in safer transportation by both road and air, creating a fast transport system between Riyadh and other cities (Riyadh Principality, 2011).

According to the Riyadh Principality (2011), in 2000, Riyadh had 545 primary schools, 300 middle schools, 143 high schools and 48 schools for adult education. High schools can be either public or private. Public schools have no fees, but they are also characterised by the fact that they have only a few sport facilities. On the other hand, private schools have enrolment fees and also have more extensive sport facilities. Data from the Riyadh Education Department indicates that in 2006, Riyadh had 207 public male high schools and 89 private male high schools, with a total school population of 113,763 students. In 2007–2008, the numbers increased to 217 public male high schools and 93 private male high schools, with a total school population of 122,827 students. The most recent data about schools and students indicates that in 2013-2014 there was a decreasing number of schools and student in both public and private schools. This shrinkage of the public school sector has compensated for by the expansion of the private school system. More details about school and student numbers are provided in Table 1.1.

This study was conducted in each of the five regions of Riyadh, which are conveniently designated as South, North, East, West and Middle. Riyadh was chosen for the study for a number of reasons. First, it is the capital of the Kingdom of Saudi Arabia (Royal Embassy of Saudi Arabia, 2010). Second, it is the largest Saudi Arabian city, with 144 public male high schools and 126 private male high schools (Ministry of Education, 2013–2014). Third, it has the highest number of sporting organisations, such as the General Presidency for Youth Welfare, sport federations, stadiums and the four main sport clubs (Riyadh Principality, 2011). Finally, it has the College of Physical Education and Sport, which is the only college in Saudi Arabia that focuses on physical education and sport (College of Physical Education and Sports, 2010).

Table 1.1

Number of Male High School Students in Riyadh

Years	Public schools	Number of students	Private schools	Number of students	Total number of schools	Total number of students
1950	١١	—	٤	—	١٥	—
2006–2007	207	83,993	89	29,770	296	113,763
2007–2008	217	89,008	93	33,819	310	122,827
2013-2014	144	48,404	126	44,817	270	93,221

Source: General Directorate of Education in Riyadh, Benin (2010:2014)

1.5 Policy Issues in Physical Activity and Sport in Saudi Arabia

The issue of physical activity levels and sport participation has become a major global talking point over the last 10 years. As the citizens of industrialised countries become more adapted to new technologies, and consume a vast array of labour saving devices, they have become increasingly sedentary. This trend to declining levels of routine physical activity is now a cause for serious concern amongst government

officials, health promotion agencies, and health care workers. Physical activity has also become an important policy issue for international health-based organisations such as the World Health Organisation (WHO). WHO is now encouraging the development of national physical activity policies and programs to increase participation levels, and thus decrease chronic health problems. National strategic plans for increasing physical activity have typically included policy recommendations that are aimed specifically at children and adolescents (Chodzko-Zajko, 2006; Pate, Trilk, Wonwoo & Jing, 2011). In response to falling levels of physical activity, many highly industrialised countries have implemented policies to increase participation in physical activity for particular population subgroups, especially children and youth. The physical activity and sport participation policy strategies in Saudi Arabia focus on two areas-schools and community- to promote physical activity in children and youth.

1.5.1 School-based Policies on Physical Activity and Sport.

Physical education, which includes physical activity and sport, has become an important component of education in schools around the world (Barkeret al., 2013). According to Standage et al. (2012), physical education can contribute to the stock of individual knowledge and help to improve academic performance. It plays an important role in supporting students' motivation experiences, and well-being. Further, physical education plays an important part in developing and changing people's values and attitudes. Participating in physical education can give young people intrinsic pleasure and enjoyment. For example, Bernstein, Phillips, & Silverman (2011)found that a high percentage of students enjoyed physical education classes, and believed they were places to learn and have fun with friends. Further, Zeng, Hipscher and Leung (2011) found a positive relationship between physical education classes and physical activity participation levels. They also found that students believed that physical education

classes “provide an important relief from the stress of one’s daily life”(p.532). Another study confirmed that school-based physical activity interventions were effective in increasing the number of children engaged in moderate to vigorous physical activity (Dobbins, Husson, DeCorby & LaRocca, 2013).

In Saudi Arabia, physical activities and sport in public and private schools are delivered weekly through physical education classes and programs. All goals and general objectives of physical education in schools are derived from the educational policies set by the Saudi Arabian Ministry of Education. These policies provide guidelines that shape the process of education performance. Additionally, the educational policies reflect the religion of Islam (Ministry of Education, 2006). In 1954, physical education was approved as a program within the education policy as an essential part of public education; it was also viewed as an important way of preparing young people for effective citizenship. According to Salem Al-Ghamdi, the Assistant Director of the General Administration of Educational Supervision in the Ministry of Education, a new curriculum for physical education has recently been implemented. As part of the program, textbooks have been updated so that teachers identify and understand: (1) the skills to be developed during the classes; and (2) the methodology for teaching these skills (Department of Education in Karjj, 2010).

As noted above, the objectives of school physical education programs derive from the general Saudi Arabian policy statements for education. According to these policy statements, the physical education program seeks to achieve the following objectives: (1) the promotion of a healthy body; (2) the improvement of motor skills in students; (3) the development of an understanding regarding the importance of physical activities in schools and beyond; (4) the building of values; (5) the productive use of students’ free time by participating in physical activities and sport; (6) the strengthening

of students' concern with body safety and the care of physical deformities; and (7) the development of expertise and intellectual knowledge (Department of Education in Karjj, 2010).

As a result of the centralised nature of Saudi Arabian education policy, both public and private high schools have the same physical education curriculum. The most recent program directives require physical education within high schools across Saudi Arabia to achieve the following goals: (1) teach Islamic behaviours that are associated with physical activity; (2) improve students' behaviour, which leads to respect for individual differences among students; (3) increase all fitness elements associated with physical health; and (4) develop students' knowledge of health and physiology associated with physical activities (Department of Education in Karjj, 2010; Ministry of Education, 2006).

1.5.2 Community-based Policies.

Physical education within schools is one arm of the physical activity and sport policy development model of national governments. The other arm comprises community participation programs. It has been well documented that there are many good reasons for securing strong community participation in physical activity and sport. One of the most important reasons relates to improved public health (Kohl et al., 2012; Richardson et al., 2014). Thus, Saudi government policy has been careful to explicitly address the youth sector in order to increase their interest and thereby raise the numbers of young people playing sport and undertaking various forms of physical activity.

As previously noted, a significant initiative was undertaken in 1974 when a decision was made to establish a youth welfare system under the name 'General Presidency of Youth Welfare'(Alsweden, 1995). This organisation recently put forward a number of goals that drive its strategies and policies in order to increase the

participation level among community members. While the policy for community physical activity and sport development is conceptually sound, there is concern that its implementation has been incomplete. As a result, the following policy aims need to be tempered by this observation. Current government policy aims to:

- Contribute to youth education from an Islamic perspective develop youth sport and physical activities in all Saudi cities by establishing sport facilities and expanding recreational programs, and by establishing special programs for the disabled.
- Encourage and support private sector participation to achieve the organisation's goals and programs by building sport centres and recreational spaces, and by supporting the operations of sport clubs.
- Deliver specific recreational and sport activities to community groups develop sport coaching and administrator programs.
- Support the construction of sport facilities.
- Introduce sport programs on behalf of the Olympic Committee of Saudi Arabia (Alshamri, 2001; Ghamlas, 1995).

1.6 Research Problems

This research project is underpinned by an accumulation of data which indicates that the level of participation in physical activity and sport in Saudi Arabia is not only low, but also slowly declining. According to Abalkhail (2002), an increase in the body mass index from 1994 to 2000 was marked among Saudi Arabian young people. This was viewed as a problem for both sexes, with a noticeable increase in male high school students aged 10–16 years. According to Al-Hazzaa (2007a, 2007b), during the past 30 years, the lifestyles of Saudi communities have been changing, including physical activity patterns and eating habits. Of major concern are the high numbers of inactive

adolescents; one study found that 48 per cent of Saudi boys do not participate in daily physical activity programs (Al-Rukban, 2003). In another study by Al-Hazzaa (2004), all of the studies between 1993 and 2004 showed that physical inactivity levels among different groups of Saudi children and adults rarely fell below 43 per cent. For some segments of the adult male population, the figure was even higher, with 54 per cent being inactive, and classified as sedentary. In addition, the prevalence of physical inactivity by males has increased from early adulthood (16–30 years) (Al-Hazzaa, Al-Sobayel, Abahussain, Qahwaji, Alahmadi & Musaiger, 2011, 2013; Khalid, 1995).

Amin et al. (2011) examined individual barriers towards physical activity among adult Saudis in the city of Al-Hassa. The study showed that only 52 per cent of respondents were suitably active and met the minimum recommended level of physical activity. The most often cited constraints were lack of facilities, bad weather, cultural traditions, and time. In another study, Al-Nozha, Ali and Osman (1997) found that more than 58 per cent of young Saudi males were at risk of suffering coronary heart disease due to their physical inactivity. It has also been found that 20 per cent of males in Riyadh walk for less than 10 minutes at a time on any single day of the week (Al-Hazzaa, 2006).

Many Western nations, such as Canada and the USA, have had to deal with similar problems and, in recent years, significant concerns have arisen regarding children's low participation levels in physical activity, as well as the increasing level of obesity in children and youth (Casper & Harrolle, 2013; Centers for Disease Control and Prevention. 2013; Fulton et al., 2011;Statistics Canada, 2015). In 2012-2013 CHMS survey indicate that most school-aged children and youth are not getting enough physical activity to meet the current Canadian Physical Activity Guidelines. Only 13% of boys were getting an average of at least 60 minutes of daily moderate to vigorous

physical activity as recommended in the Canadian Physical Activity Guidelines (Statistics Canada, 2015). One years earlier, according to Casper and Harrolle (2013) about 50% of the sample (n=457) was inactive and 81% would like be more active. Further, several studies have found increased levels of physical inactivity among adolescents during their high school years (Al-Hazzaa et al., 2014; Casper et al., 2013; Elena, 2014; Heggebo & Anderssen, 2003; Vigo-Valentin et al., 2014). There is increasing evidence that links the decline of physical activity with the increasing number of health problems being experienced, such as obesity and heart disease (World Health Organization, 2015; Department of Health in UK, 2011).

Regrettably, young people are also more at risk of suffering health problems. It appears that most young people do not follow the USA physical activity guideline recommendations, which suggest 60 minutes of moderate to vigorous physical activity per day (American Heart Association , 2015; World Health Organization, 2015;). The results of these studies raise the following question: what prevents young people from being active and from playing sport or any physical activity? This question underpins the aim of this study, which is an area of research that has received only limited attention in Saudi Arabia.

Alkmies (2010) identified a number of factors that have been used to explain the increasing levels of inactivity among young Saudis, and their apparent preference for sedentary behaviour. One reason was the lack of emphasis on sport in public schools, as opposed to private schools. Another reason was a poorly organised sport system that failed to deliver well-structured programs and competitions for young people, especially in more disadvantaged communities. These factors are sensibly postulated, but there is little or no research that supports Alkmies' claims. As a result, there is a need to investigate the constraints and motivations that affect physical activity and sport

participation among Saudi Arabian adolescents. Hence, this study will address this question in relation to male adolescents in the city of Riyadh, Saudi Arabia.

As noted in the early part of this chapter, the study has adopted a constraints and motivations-based model to frame the discussion and analysis. This model has a number of operational strengths. First, other researchers have successfully employed the constraints -based model (Casper et al., 2011; Godbey, Crawford & Xiangyou Sharon, 2010; Palen et al., 2010; Shifman et al., 2012) and other studies have successfully employed the motivations-based model (Cooper et al., 2012; Luka, 2013; Frederick & Ryan,1993; Sibley et al., 2013). Second, it is the best model for addressing the research questions, as the sequential order of the model is taken into account in the process of the analysis. Third, the constraining and motivating factors examined within this model are essential for explaining the low levels of participation in physical activity and sport (Cooper & Quatrano, 1999). The relationship between the variables underpinning the research questions and the hypotheses that follow, highlights the fact that participation in physical activity and sport is not only influenced by the expectation of having a positive leisure experience (motivational factors), but it is also affected by problematic factors that make participation difficult (constraining factors).

1.7 Research Aims and Objectives

As noted above, the primary aim of this research is to investigate the patterns of physical activity and sport among Saudi Arabian adolescents and, in doing so, identify and better understand the factors that both constrain their levels of participation, and motivate them to participate. This study will focus specifically on male high school students in Riyadh, as previous studies have recognised them as a group that has become increasingly sedentary in recent years. This study has five objectives(see Table 1.2), which are derived from the primary aim:

Table 1.2

List of Research Objectives

Objective 1	To identify the physical activity and sport participation levels among male high school students using the three factors of frequency, duration, and type of sport (Type of sport used to determine the intensity).
Objective 2	To investigate the constraints that influence male high school students' physical activity and sport participation levels.
Objective 3	To identify the motivations that influence male high school students' physical activity and sport participation levels.
Objective 4	To examine the relationship between the constraints, motivations and physical activity and sport participation.
Objective 5	To identify the different constraints, motivations, and physical activity and sport participation levels among male high school students, according to type of school, age, grade level and region lived in Riyadh.

1.8 Research Significance

Despite recent Saudi Arabian government policy initiatives aimed at encouraging greater levels of participation in physical activity and sport, the levels of participation are still low. Health professionals and research academics are continually challenged to find ways to encourage people to become physically active, while obesity and inactivity are now a major concern for government officials and policymakers (Al-Hazzaa et al., 2013; Mahfouz et al., 2008; Mostafa & Khashaba, 2011). The evidence

from this research indicates that the provision of suitable physical activity and sport facilities and access to the existing facilities require attention to improve the physical activity participation levels among the country's young people.

1.9 Research Contribution to Knowledge

The current study will contribute to the body of knowledge relating to young people's participation in physical activities, specifically in Saudi Arabia. In addition, the results are expected to make valuable contributions to public policy for nations and communities that (1) have similar cultural traditions, (2) do not give a high priority to community health and increased physical activity participation among young people, and (3) do not prioritise the need to reduce health-related problems in later life.

Very few studies have addressed the physical activity and sport practices of Saudi Arabian adolescents, and the factors that constrain their participation levels and motivate them to participate. This research project will thus contribute insights about the impact of constraints and motivations on levels of physical activity. These issues are addressed in more detail in Chapters 3 and 4. They will be debated, and the analysis of constraints and motivations will be used to build an integrative model of the determinants of physical activity and sport. This model will become the driver of the remainder of the study, and will be used to interrogate the results. Chapter 7 will discuss the overall levels of participation, and the ways in which constraints and motivators have shaped participation. Chapter 8 will use the results to shape a number of policy options for building participation amongst adolescents in Saudi Arabia, while Chapter 9 will identify specific strategies, programs, and resources needed to re-engage young Saudi Arabians with the multi-faced benefits of physical activity and sport participation.

In short, this study will deliver a model for building a fitter and healthier Saudi Arabian citizenry, and as such, will provide a significant addition to the body of knowledge around policies for improving the overall welfare of Middle eastern nations.

1.10 Research Questions and Hypotheses

The study aims to investigate the physical activity and sport practices for this cohort of young people. Elements of the research method will provide data about the research questions and a number of statistical procedures will be used to test a range of hypotheses to better address the research objectives. These hypotheses provide a clear direction for the analysis of the research questions and there are a range of statistical procedures that will provide insights about these hypotheses. The following questions and hypotheses are posed:

Q1. What are the levels of physical activity and sport participation among Saudi Arabian male high school students?

Descriptive statistics were used to answer this research question, and the following hypotheses were tested.

H1. There are differences between participation levels among Saudi Arabian male high school students in physical activities and sport.

H1a. There are differences between physical activity participation levels among Saudi Arabian male high school students in physical activities and sport according to type of school.

H1b. There are differences between physical activity participation levels among Saudi Arabian male high school students in physical activities and sport according to age.

H1c. There are differences between physical activity participation levels among Saudi Arabian male high school students in physical activities and sport according to grade level.

H1d. There are differences between physical activity participation levels among Saudi Arabian male high school students in physical activities and sport according to location in Riyadh.

Q2. What are the constraints that influence Saudi Arabian male high school students' participation in physical activities and sport?

Descriptive statistics were used to answer this research question, and the following three hypotheses were tested.

Relationships

H2. There is a relationship between constraints and participation levels in physical activities and sport among Saudi Arabian male high school students.

H2a. There is a relationship between total constraints and participation levels in physical activities and sport among Saudi Arabian male high school students.

H2b. There is a relationship between intrapersonal constraints and participation levels in physical activities and sport among Saudi Arabian male high school students.

H2c. There is a relationship between interpersonal constraints and participation levels in physical activities and sport among Saudi Arabian male high school students.

H2d. There is a relationship between structural constraints and participation levels in physical activities and sport among Saudi Arabian male high school students.

H3. There is a relationship between total constraints and total motivations among Saudi Arabian male high school students.

Differences

H4. There are differences between constraints among Saudi Arabian male high school students' participation in physical activities and sport.

H4a. There are differences between total constraints among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.

H4b. There are differences between total constraints among Saudi Arabian male high school students' participation in physical activities and sport according to age.

H4c. There are differences between total constraints among Saudi Arabian male high school students' participation in physical activities and sport according to grade level.

H4d. There are differences between total constraints among Saudi Arabian male high school students' participation in physical activities and sport according to location in Riyadh.

H4e. There are differences between intrapersonal, interpersonal and structural constraints among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.

H4f. There are differences between intrapersonal, interpersonal and structural constraints among Saudi Arabian male high school students' participation in physical activities and sport according to age.

H4g. There are differences between intrapersonal, interpersonal and structural constraints among Saudi Arabian male high school students' participation in physical activities and sport according to grade level.

H4h. There are differences between intrapersonal, interpersonal and structural constraints among Saudi Arabian male high school students' participation in physical activities and sport according to location in Riyadh.

Q3. What are the motivational factors that influence Saudi Arabian male high school students' participation in physical activities and sport?

Descriptive statistics were used to answer the third research question, and the following hypotheses were tested.

Relationships

H5. There is a relationship between total motivations and participation levels in physical activities and sport among Saudi Arabian male high school students.

H5a. There is a relationship between total motivations and participation levels in physical activities and sport among Saudi Arabian male high school students.

H5b. There is a relationship between body-related factor and participation levels in physical activities and sport among Saudi Arabian male high school students.

H5c. There is a relationship between competences and satisfaction factor and participation levels in physical activities and sport among Saudi Arabian male high school students.

H5d. There is a relationship between intrinsic factor and participation levels in physical activities and sport among Saudi Arabian male high school students.

Differences

H6. There are differences between motivations among Saudi Arabian male high school students' participation in physical activities and sport.

H6a. There are differences between total motivations among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.

H6b. There are differences between total motivations among Saudi Arabian male high school students' participation in physical activities and sport according to age.

H6c. There are differences between total motivations among Saudi Arabian male high school students' participation in physical activities and sport according to grade level.

H6d. There are differences between total motivations among Saudi Arabian male high school students' participation in physical activities and sport according to location in Riyadh.

H6e. There are differences between competences and satisfaction, and body-related and intrinsic factors among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.

H6f. There are differences between competences and satisfaction, and body-related and intrinsic factors among Saudi Arabian male high school students' participation in physical activities and sport according to age.

H6g. There are differences between competences and satisfaction, and body-related and intrinsic factors among Saudi Arabian male high school students' participation in physical activities and sport according to grade level.

H6h. There are differences between competences and satisfaction, and body-related and intrinsic factors among Saudi Arabian male high school students' participation in physical activities and sport according to location in Riyadh.

1.11 Thesis Structure

This research study into the physical activity levels, constraints and motivational factors influencing male high school students in Riyadh comprises nine chapters:

- **Chapter 1** provides an introduction and summary of the significance of this research into the constraints and motivations relating to participation in physical activity. It also outlines the major conceptual ideas and outline of the thesis.
- **Chapters 2–4** review the relevant research literature. The three main concepts underpinning the analysis are physical activity participation levels, constraints, and motivations. Importantly, each chapter identifies the research gaps from previous studies. Finally, these chapters reiterate the research aims and objectives, along with the research questions and hypotheses.
- **Chapter 5** discusses the conceptual model that underpins this study and explains how it has been developed.
- **Chapter 6** explains the methodology used in the current research—namely, the quantitative design. It gives special attention to the measurement of physical activity and sport participation levels, the key constraints, and major motivational factors. The chapter also discusses the sample selection and size, instrument measures, translation process, validity and reliability of the

questionnaire, data collection procedure (including pilot and main study) and data analysis. The chapter concludes by explaining the researcher's arrangements for ethical approval.

- **Chapter 7** presents the research results.
- **Chapter 8** examines the research findings and discusses them in relation to the research aims and objectives. The chapter provides an overview of how the current research has added to previous research into constraints, motivations and physical activity participation levels. The strengths and limitations of the research are also addressed.
- **Chapter 9** draws conclusions from the research and explains how and to what extent the study has met the research objectives, answered the research questions and confirmed the hypotheses. Finally, the chapter sets out policy recommendations to increase participation levels, and discusses and implications for future research into physical activity and sport participation in Saudi Arabia.

1.12 Definitions of Key Terms

Before commencing this study, it was important to secure an agreement on several key terms. This understanding allowed the topic to be fully explored, and for the arguments and findings that arose from the literature review to have meaning. Thus, the following definitions are provided in order to minimise any misunderstandings when comparing and contrasting the results of the current study with the results of other studies:

Constraints: Constraints are defined as the "factors that are assumed by researchers and/or perceived or experienced by individuals to limit the formation of leisure preferences and/or inhibit or prohibit participation and enjoyment in leisure"(Jackson, 2000, p. 62).

Leisure: leisure is defined as "time away from work, and personal care"(Aguiar, Mark, and Erik Hurst, 2006, p. 1).

Leisure Activity: Leisure activities may be defined as "activities that individuals engage in for enjoyment or well-being which are independent of work or activities of daily living" (Verghese, LeValley, Derby, Kuslansky, Katz, Hall & Lipton,2006, p. 2).

Motivations: Motivations are defined as the reasons for continued participation in a leisure activity (Laverie, 1998).

Physical activity: Physical activity is described as "any bodily movement produced by skeletal muscles that result in energy expenditure" (Caspersen, Powell & Christenson, 1985, p. 128).

Physical inactivity: Physical inactivity is defined as "fewer than 150 minutes per week spent in moderate or vigorous physical activities" (Hallal, Victora, Wells & Lima, 2003, p. 1894).

Physical education: Physical education is part of the total educational program that contributes primarily through movement experiences (Pangrazi, 2007). Other definition is "Physical education classes were designed to promote high levels of physical activity, teach movement skills, and be enjoyable" (Sallis et al., 1997, p. 1329).

Sedentary behaviour: Sedentary behaviour is defined as "energy expenditure between 1 and 1.5 METs while sitting or lying" (Kozey-Keadle, Libertine, Lyden, Staudenmayer & Freedson, 2011, p. 1561).

Sport: Sport can be defined as a structured and competitive activity that uses rules, associations, schedules, scoring, record keeping and timing (Coakley, 2004).

It is also important to specify the terms that are used to identify specific age groups. Previous studies used different words to describe similar samples. In this study the sample age is between 16-19 years old, and thus, the following definitions are

provided in order to minimise any misunderstandings when comparing and contrasting the results of the current study with the results of other studies:

Exercise: which is referred to as "planned, structured, and repetitive bodily movements done to improve or maintain one or more components of physical fitness" (US Department of Health and Human Services, 1996, p. 20).

Adolescents: Adolescents – young people between the ages of 10 and 19 years (WHO, 2014).

Child: a child means every human being below the age of 18 years unless under the law applicable to the child, majority is attained earlier (United Nations Human Rights, 1989).

Youth: 'youth', as those persons between the ages of 15 and 24 years (UNESCO, n.d).

1.13 Research Delimitations

As specified previously, the aims of the research were to investigate the patterns of physical activity and sport among Saudi Arabian adolescents and better understand the factors that both constrain their levels of participation and motivate them to participate. In order to make the study manageable, a number of delimitations were set. This was done so that the research goal would be achievable, and that it would provide focused results that could inform future policy initiatives.

First, this study was confined to students enrolled in high schools (both public and private) in Riyadh City- Saudi Arabia. It was conducted in 2010. The study was also confined to a sample of students from the grades 10, 11 and 12. This student cohort was chosen because earlier Saudi Arabian studies suggested this age group had a high prevalence of physical inactivity (Al-Hazzaa, 2004; Al-Hazzaa et al., 2013). It was also found that physical activity patterns were likely to change in young adulthood in line

with changes in lifestyle that occur in the transition from adolescence to adulthood (Al-Hazzaa et al., 2013; Ross et al., 2014).

Additionally, the study only examines male students' participation levels. This decision narrowed the focus of the study severely, but it was forced upon the researcher. In Saudi Arabia, male researchers cannot enter and meet female students because it contravenes Education Ministry policy. Moreover, this policy is non-negotiable. The study was also limited to questions about individual, social and structural influences at the micro and community level. Macro-social issues like cultural traditions, religious practices, economic development, political institutions, rights and freedoms, and customs and taboos were all significant issues, and would have provided many illuminating findings. However, they were excluded from the study because they introduce a range of issues that would have added unmanageable levels of density and complexity to the study. While they were consistent with the research aims, it was decided that they would be side-lined in this instance, and revisited for a subsequent study. Finally, the data of this study was only collected in the Winter season. This means the data on the patterns of participation may be different – and probably higher - to that gathered in the very hot Summer season in Saudi Arabia. The Winter season was also selected because the previous studies that investigated physical activity level of Saudis collected their data during this period. This de-limitation meant that useful comparisons could be made with the finding of Al-Hazzaa et al. (2014); and Al-Hazzaa et al., 2011).

1.14 Chapter Summary

In recent years there has been ongoing concern about young people's low levels of physical activity and sport participation, and it has become a significant public health

issue that has attracted the attention of many researchers around the world (Juan et al., 2010; Rombaldi et al., 2010; WHO, 2015). The low rate of participation is particularly noticeable during the adolescent period (Trost et al., 2002). In Saudi Arabia, the percentage of inactive adolescents is high, with approximately 48 per cent of Saudi boys not undertaking daily physical activity (Al-Rukban, 2003; Amin et al., 2011).

At the same time, it has been found that physical activity and sport participation levels are influenced by a range of constraints. These constraints on physical activity participation levels are general categorised into an intrapersonal dimension, an interpersonal dimension, and a structural dimension (Adam, Hiamey & Afenyo, 2014; Casper, Bocarro, Kanters & Floyd, 2011; Jung-Woong, Min-Haeng & Kang-Bon, 2009). It has also been found that individual motivation is a significant influence on participation. Traditionally, the motivations to engage in physical activity participation are divided into a body-related dimension ,a competence dimension and an interest/enjoyment dimension (Frederick & Ryan, 1993; Mayorga-Vega & Viciana, 2014; Pano & Markola, 2012; Iannotti et al., 2013).

This chapter has presented an outline of the purpose of this thesis, how the research will be undertaken and how the thesis is organised. It has also identified the aim of this research, which is to investigate the patterns of physical activity and sport among Saudi Arabian adolescents and, in doing so, identify and better understand the factors that constrain and motivate their levels of participation. Finally, and in light of the cultural constraints operating in Saudi Arabia, the current study will focus specifically on male high school students in Riyadh.

Chapter 2: Literature Review Part 1: Participation Levels —An International Perspective

2.1 Introduction

An understanding of the physical activity and sport participation benefits is important to reduce the risk of diseases such as the avoidance of obesity, weight control, reduced anxiety and stress (WHO, 2015). Also, regular physical activity facilitates better social benefits through increased social interaction and integration (Bauman et al., 2002). While there is universal agreement that physically active communities are, all other things being equal, healthier and happier than those communities which are not, there is far less agreement on what types and levels of physical activity will deliver optimal benefits, and what conditions need to be in place to produce high levels of activity across all ages, social classes, occupations, ethnicities, income levels, and genders.

The purpose of this chapter is to provide an overview of physical activity and sport participation including a broad analysis of the benefits of physical activity, and the problems that emerge when activity levels are low. This overview will specifically examine physical activity and sport participation in adolescent populations in different countries, physical activity measurements, and guideline on levels of physical activity and sport that are needed to generate fitness and health benefits. There will also be a discussion on how regular physical activity and sport engagement in childhood and adolescence can contribute to healthier lifestyles as an adult.

This chapter begins by focusing on the benefits and problems that are associated with the physical activity and inactivity of young people's lifestyles. This is an important issue to address because there is growing concern about children, youth, and adolescent's low levels of participation in physical activity, as well as the increasing

level of obesity in children and youth (Hallal et al., 2012; Rangul et al., 2012; Tremblay et al., 2011; WHO, 2015). This chapter provides background information related to objective 1 of this study.

The latest studies related to physical activity in Saudi Arabia document a steady decline in the participation of adolescents in physical activity (high school student) (Al-Hazzaa et al., 2013; Al-Hazzaa et al., 2014). Three international studies from Canada (Statistics Canada, 2015), Australia (Australian Bureau of Statistics, 2013), United Kingdom (Department of Health,2011) have also reported declining levels of physical activity participation among adolescents aged 13-17 years. The chapter concludes by identifying the need for research regarding the increased physical activity and sport participation among of this group of age and how the results of this study will assist Saudi Arabia policy makers and sport associations to manage their strategies more effective.

2.2 Benefits of Participating in Physical Activity and Sport

Many campaigns have been mounted to improve people's awareness of the benefits of physical activity; in some cases this has led to increasing levels of participation (American Heart Association, 2015; Australia Bureau of Statistics, 2013; Centers for Disease Control and Prevention, 2008; Cooper & Kontulainen, 2014; World Health Organization, 2015).

The benefits of physical activity have been clearly demonstrated for the general population (Adrianne et al., 2009; Chimen et al., 2012), and the benefits that accrue for youth and adolescents are also well documented (Hallal et al., 2012; Rangul et al., 2012; Tremblay et al., 2011; WHO, 2015). The literature increasingly shows that the young, as well as older people, benefit substantially from regular doses of physical activity. For example, ongoing participation in physical activity and sport in childhood and

adolescence has been shown to produce a number of benefits, including enhanced skeletal development, avoidance of obesity, weight control, reduced anxiety and stress, increased self-esteem and improved academic performance (WHO, 2015). In addition, there is the benefit of social integration, which helps people feel connected with their community (Armstrong, Bauman & Davis, 2000; Blair & Connelly, 1996; Caspersen et al., 1985; Centers for Disease Control and Prevention, 2011a; Department of Health and Ageing, 2010; Eimeet al., 2013; Paffenbarger Jr et al., 1994; US Department of Health and Human Services, 1996; WHO, 2002, 2011b).

Participation in physical activity also plays a strong role in reducing the incidence of certain cancers (WHO, 2011). Involvement in physical activity during childhood may delay the onset of chronic diseases during adulthood (Sawyer et al., 2012). A positive environment will introduce positive values and help to avoid negative health behaviours such as smoking, high alcohol use and crime (Trost, 2003). For these reasons, and as previously indicated, many clinical and public health organisations have developed recommendations for physical activity and fitness among youth (Department of Health and Ageing, 2014). The US Centers for Disease Control and Prevention (2015) and US Department of Health and Human Services (2008) recommends that 60 minutes or more of moderate sport activities daily, or alternatively, high-intensity (vigorous) activity, for at least three days per week. Consequently, people need to become more active by participating in daily physical activities and sport, which will help to reduce disease risk factors such as those mentioned above (American Heart Association, 2015; Australia Bureau of Statistics, 2013; Cooper & Kontulainen, 2014). In addition, the importance of physical activity can be confirmed by examining the adverse effects of inactivity on fitness, health and well-being.

2.3 Problems Associated with Physical Inactivity

Physical inactivity refers to ‘doing no or very little physical activity at work, at home, for transport or in discretionary time’(Bull et al., 2004, p. 743). At present, there is a considerable amount of literature quantifying the role of physical inactivity as a risk factor. Physical inactivity has increased in many countries and is now listed as one of 10 risk factors associated with lack of economic social improvement of developing countries (WHO, 2002, 2011). Further, physical inactivity is documented as an important risk factor for multiple causes of deaths globally, as well as chronic morbidity and disability (Centers for Disease Control and Prevention, 2015). According to Al-Nozha et al. (1997), over 58 per cent of young Saudi males are at risk from coronary heart disease due to their physical inactivity. In Australia, physical inactivity is the second most serious health problem after tobacco smoking (Department of Health and Ageing, 2014).

A number of studies have found increased levels of physical inactivity among adolescents during their high school years (Austrlia Bureau of Statistcs, 2013; Hohepa, Scragg, Schofield, Kolt & Schaaf, 2009; Fulton et al., 2011; Utter, Denny, Robinson, Ameratunga & Milfont, 2011). The WHO (2011) confirmed that high levels of physical inactivity among people in different age groups is partly due to more passive hobbies being undertaken during leisure time, as well as an increase in sedentary behaviour during working and home activities. In addition, the declining use of public transportation and an increased use of motor vehicles to commute to work have been connected with declining physical activity levels. Many environmental factors may also discourage people’s involvement in physical activity, such as the threat of violence, high-density traffic, low air quality and pollution, and a lack of parks, sidewalks, and sport and recreation facilities (Moran et al., 2014; Van Dyck et al., 2013).

Recently, an obesity epidemic has spread throughout developed and developing countries (Malik, Willett & Hu, 2013). Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health (WHO, 2011). In global terms, obesity has achieved epidemic proportions, with at least 2.6 million people dying each year due to overweight or obesity-related diseases. It was once associated only with people who lived sedentary lifestyles in high income countries; however, obesity is now also common among people who live in low- and middle-income countries (WHO, 2010b). According to the WHO (2002), obesity-related diseases will contribute more to premature deaths in North America and Western Europe. The growing prevalence of obesity among young people indicates that physical activity levels are declining and that more people are leading sedentary lifestyles. These two behavioural changes are key determinants of the increase in overweight/obesity in Western populations (WHO, 2011) and the rising burden of disease globally (Centers for Disease Control and Prevention, 2015).

Despite some claims that the issue has been exaggerated, obesity among young children and adolescents has increased. Previous studies conducted in the USA confirmed that physical activity participation level declined steadily among the young people from ages 12 through 21 years of age (e.g., Andrew, Pedersen & McEvoy, 2011; Thompson & Harmon, 2012). In the USA, the prevalence of overweight children is continuing to increase, especially among adolescents (Ogden, Flegal, Carroll & Johnson, 2002). The 2007–2008 National Health Survey found that 17 per cent of Australian children aged 5–17 were overweight, and almost 8 per cent were obese (Department of Health and Ageing, 2009). An increase in the body mass index was marked among Saudi Arabian young people. This was viewed as a problem for both sexes, with a noticeable increase in male high school students aged 10–16 years. The

prevalence of overweight was 9.7% and obesity was 14.2% among Saudi male adolescents in Alahsa city (Amin et al., 2008). In addition, it was found that obesity and overweight were associated with watching TV for more than two hours per day (Khader et al., 2009).

All of the studies mentioned above confirm that obesity has increased among children and adolescents, and that low levels of activity lead to many health problems. The absence of physical activity and the consequent transition to more sedentary lifestyles has accentuated body-related health problems. According to Pate, O'Neill and Lobelo (2008, p. 174), sedentary behaviour refers to "activities that do not increase energy expenditure substantially above the resting level, and includes activities such as sleeping, sitting, lying down, and watching television, and other forms of screen-based entertainment". MET levels have also been used to identify sedentary behaviour, with . Kozey-Keadle et al. (2011) definingsedentary behaviour as "energy expenditure between 1 and 1.5 METs while sitting or lying"(p. 1561).

Sedentary behaviour is associated with problematic health outcomes, such as cardiovascular disease, obesity, metabolic diseases, psychosocial problems and cancer, which may be contributing to the decline of physical activity participation (Department of Health in UK, 2004; Hamburg et al., 2007; Owen, Healy, Matthews & Dunstan, 2010; Pate et al., 2008; Tremblay, Colley, Saunders, Healy & Owen, 2010). The fusion of sedentary behaviour with physical inactivity plays a major role in shaping the current and future health of young people, and most health evidence has focused on increased physical activity and sport participation as a target to reduce sedentary behaviour (Biddle, Petrolini & Pearson, 2014: Pearson et al., 2014).

Physical inactivity and sedentary behaviour and their consequences are a product of modern life. In addition to encouraging physical activity it is important to discourage

excess sedentary time. For example, a child who obtains at least 60 minutes per day of moderate physical activity can still be considered sedentary if they spend a great deal of their time sitting or lying down (e. g, playing video games) (Australian National Preventive Health Agency, 2013; World Health Organisation, 2013). There is now an accumulation evidence to suggest that sedentary behaviour creates a barrier to physical activity participation, while a decline in physical activity and sport participation is a precursor to sedentary behaviour (Biddle, Petrolini & Pearson, 2014: Pearson et al., 2014).

The gradual decline of physical activity participation has many causes, and although there is a consensus about the problems it has created, there is not a clear strategy for how to deal with it. This study will contribute a better understanding of how to deal with the decline in physical activity by investigating the impact of constraints and motivation factors on physical activity and sport participation.

2.4 Setting the Scene for Examining Physical Activity and Sport Participation in Adolescent Populations

Physical activity and sport in adolescence is often viewed as a taken-for-granted experience because most young people have exuberance and energy that drives their daily routines. However, when physical activity in all of its forms is placed under the researcher's critical gaze, many problematic issues emerge: First, while physical activity in the form of sport, exercise and physical recreation can improve community health and well-being; there are significant groups of people who do not emotionally or rationally connect with physical recreation, exercise and sport in the way it is currently delivered. Second, the provision of spaces and places to provide opportunities to be physically active often attracts mainly those people who are already active. Third, young people, who have traditionally been the most active demographic cohort, are, on

balance, less eager to engage in physical activity programs. Finally, while some promotional campaigns endorsing greater levels of physical activity have been successful in attracting participants, many others have not (Fung et al., 2012; Kriemler et al., 2011; Heath et al, 2012).

As a result, studying this field can be a complex task, hampered by a variety of practical difficulties (US Department of Health and Human Services,2013; WHO, 2015; American Heart Association, 2015).

There is a general belief that physical activity in the form of sport, exercise and physical recreation can improve community health and well-being. Specifically, it can increase a person's life expectancy, control weight, reduce obesity, reduce risks for cardiovascular disease and promote healthy lifestyles (US Department of Health and Human Services, 2010). Nevertheless, there is uncertainty surrounding the definition of physical activity and how it connects to physical recreation, exercise and sport. Physical activity covers a range of planned activities, such as sport and exercise, along with active leisure activities (O'Sullivan & Macphail, 2010). Many attempts have been made to define physical activity, but the commonly accepted definition of physical activity (which has been adopted in this study) is "any bodily movement produced by skeletal muscles that result in energy expenditure" (Caspersen et al., 1985, p. 128). Although physical activity can be sport, it is only one category of physical activity. Sport has a precise meaning and is defined as a structured and competitive activity that uses rules, associations, schedules, scoring, record keeping and timing (Coakley, 2004, p. 511). Nevertheless, physical activity can also include exercise, which is referred to as "planned, structured, and repetitive bodily movements done to improve or maintain one or more components of physical fitness"(US Department of Health and Human Services, 1996, p. 20).

Another thing to note about physical activity is that it can occur in many places and spaces. According to the WHO (2002), there are five major places that provide opportunities to be physically active: (1) work; (2) school; (3) transport (e.g. walking or cycling to work or school); (4) domestic duties (e.g. housework or gathering fuel); and (5) leisure time (e.g. participating in sport or recreational activities).

Despite these opportunities being available at every turn, so to speak, an increasing number of people, both adolescents and adults, are becoming more sedentary and less active. Thus, concern about young people's low levels of physical activity has been the focus of many researchers (Australian Bureau of Statistics, 2013; Department of Health, 2011; Centers for Disease Control and Prevention, 2013; Statistics Canada, 2015). Moreover, emerging evidence shows that levels of physical activity decline during the transition from high school to college (Kilpatrick, Hebert & Bartholomew, 2005). As a result, growing global attention is being directed towards promoting health and preventing injury, disability and illness. Further, a growing number of public health studies promote physical activity participation among different demographic groups and age levels in order to give them a greater understanding of the beneficial role that physical activity can play in improving their health and well-being. The aim here is to establish basic evidence to support the delivery of health promotion strategies (American Heat Association, 2015; WHO, 2015). It has also been found that active children will become active adults; thus, health promotion efforts have focused on childhood physical activity levels in part (Abbott, 2006). School environments have consequently been recognised as significant institutions for the promotion of physical activity among youth (Biddle & Mutrie, 2008; Centers for Disease Control and Prevention, 2008).

The promotion of lifelong physical activity participation is now a fundamental goal of school and community physical activity programs, where the aim is to encourage both males and females to participate (Centers for Disease Control and Prevention, 2008, 2013; Daley, 2002; Wechsler, Devereaux, Davis & Collins, 2000). There is strong agreement that schools can provide a solid foundation of physical activity for students, which can subsequently carry over to adulthood (Centers for Disease Control and Prevention, 2013).

2.5 Physical Activity Measurements

There are a number of techniques and procedures used to measure the level of physical activity in populations, and it is important to evaluate the various techniques before selecting a method to measure physical activity within a study or intervention program. The World Health Organisation identifies the act of measuring physical activity and specifying the factors impacting on it, as a crucial first-step in mitigating physical inactivity (WHO, 2005). There are some challenges faced when measuring physical activity levels among people, especially children and adolescents. The challenges that are faced by many researchers can be categorised as behavioural, personal and tools of measurements (Trost et al., 2000; Sirard & Pate, 2000). The following section provides a general summary of both objective and subjective measurement methods and discussion of strength and weakness.

Objective methods rely on the professionally set standards for physical activity measurement that are considered free from bias and interpretation. Examples of these methods include pedometers to measure steps taken (Tudor-Locke & Myers, 2001) and accelerometers, which measure movement intensity (Bassett&Strath, 2002; Troiano, 2006). Accelerometers and pedometers can measure the physical activity of children, adolescents and adults. Many studies confirm that these techniques are accurate, and

have generally been reliable in assessing physical activity behaviours in children, adolescents, and adults, especially when assessing physical activity and energy expenditure (Clemes & Biddle, 2013; Corder et al., 2008; Lubans et al., 2014; Trost, 2005; Schofield et al., 2005).

There are, however, some limitations and issues in accelerometers measurement in assessing physical activity levels. For example, these instruments can overestimate energy expenditure during activity (Hageman et al., 2004) and although they can capture both upper- and lower-body movements in a variety of physical activities in (e.g., swimming, cycling and climbing stairs; (Trost, 2005); throwing, catching, carrying or lifting (Welk, Corbin & Dale, 2000), these instruments cannot provide details on the type of activities participated in (Treuth et al., 2004). Therefore researchers have to rely on self-reports of participants to accurately recall their movements or make aggregate estimates on various movements and energy expenditure during such activities. There has been a concern among users of accelerometry in children and adolescents that 'accelerometry output may vary systematically with age, as a result of age-related changes in height or weight, or biomechanics of movement'(Reilly et al., 2008, p.618).As Dollman et al. (2009) point out, 'accelerometers are more expensive than pedometers' and their data can be 'complex to manage and interpret' with large samples (p.519). Also, Dollman et al. write: 'Accelerometers and pedometers do not provide any information about physical activity type and context, and pedometers only provide information on the number of steps taken'(p.519). Overall, though, accelerometry has been shown to provide 'a practical, reliable and valid means of quantifying the amount and intensity of physical activity'(Reilly et al., 2008, p.618). Biddle et al. (2011) argue that 'objective methods for the assessment of physical activity are now more common and more feasible'(p.2).

This is ‘largely because both the cost and complexity’ that were once attached to these methods ‘have been addressed’ (Biddle et al., 2011, p.2).

Other techniques and procedures to measure the level of physical activity in populations can be viewed as subjective. The subjective methods rely on the person engaged in physical activity to provide an assessment of their behaviour. Subjective self-report methods include proxy reports, logs and diaries, interview-administered recall, and self-administered recall (Biddle et al., 2011). A number of subjective instruments have been developed to measure physical activity participation level. The range of these measures include: Godin and Shephard’s (1985) Leisure Time Exercise Questionnaire (LTEQ); The Adolescent Physical Activity Recall Questionnaire (APARQ), designed by Booth et al.(2002); The Weekly Activity Checklist (WAC) questionnaire, designed by Sallis and colleagues (1993); The Activity Questionnaire for Adolescents (PAQ-A)seven-day recall questionnaire, proposed by Kowalski et al. in 1997; The Previous Day Physical Activity Recall (PDPAR), The International Physical Activity Questionnaire (IPAQ); and The Global Physical Activity Questionnaire (GPAQ), developed by the WHO. Each of these tools has its strengths, but they all rely on respondent not only being trustworthy, but also being able to accurately recollect the time they spent being physically active, and what form the activities took. They also adopt similar approaches to the measurement of physical activity, were frequency, duration, intensity, and prioritise.

Observation is another approach to measure an individual’s level of physical activity. Direct observation cannot always estimate energy expenditure precisely (Lyden et al., 2014). However, inaccuracy can at least be reduced by having qualified physical activity assessor's record physical activity behaviours. Through personal recall of physical activity information, useful data can be collected about physical activity type

and intensity, as well as the frequency and duration of physical activity. These methods can be time-efficient, but may also be labour-intensive for participants. For example, participants may be required to log several details about their activity levels post-exercise, whereas if they used a pedometer, they would perhaps only have to detail the number of steps taken (Dollman et al., 2009).

At a population level, self-report measures such as questionnaires can be used to measure physical activity among large numbers of people within a short timeframe. If well-structured, these questionnaires can collect useful information about frequency, intensity, duration, and type of physical activity (Biddle et al., 2011; Biddle et al., 2012; Trost & Rice, 2012). These measures, however, have their limitations. Respondents are susceptible to lying or giving inaccurate information in questionnaire responses. Some study found that self-reports had low to moderate validity (Kohl, Fulton & Caspersen, 2000). This means that self-reports may be less likely to accurately reflect people's real-world behaviours. Corder et al. (2009) also found inaccuracy of self-administered reports among British teenagers. While some questionnaires would measure physical activity accurately, others gave erroneous and unrealistic results. The accuracy of the reports would be impacted, for example, by difficulties in recalling past information. Thus, the reports would not be used to accurately measure physical activity among the British teenagers. However, there was notably higher accuracy among children below the age of 6 and physically fit adults.

Certain population groups may be more susceptible than others to falsely reporting information on physical activity levels. Obese children may exaggerate in their reports on the exercise and physical activity they undertake, and they may choose to conceal some crucial information on their diet (WHO, 2010). Thus, self-reports

require participants to be truthful to produce an accurate report of their actual behaviours (Stamatakis et al., 2012).

Therefore, in measuring physical activity, one must consider both the subjective and objective methods. Factors that must be taken into consideration before one selects a method are: accuracy, type of activity, age of the participants and the ability of that method to obtain accurate data. The self-report was employed in this study for reasons that include cost- effectiveness, the fact that it can measure a large sample size (Biddle et al., 2011), and the similarity to the international and Saudi Arabia studies systems that used self-report. This will provide more consistent methodologies and style findings. As Biddle et al. (2011) point out, self-reports are easy to analyse and "contrasts with possible outputs such as mean estimates of time spent in specific types of physical activity behaviours, or total physical activity behaviour, or 'dose''(p.2).

Also there is some evidence from other studies that used objective approaches to measure physical activity level (e.g. accelerometer andpedometer) and confirmed that there were similarities with the findings of studies that used self-reporting (HyunJu & Rana, 2014; Troiano et al., 2008). The current study's combination of self-report data about the type of activity (to measure intensity) (Coe et al., 2006; Tucker et al., 2011; Trost et al., 2003), frequency and duration will provide useful insights about Saudi Arabia youth participation in sport and physical activity. There are limitations in this approach and these limitations are explained in Chapter 8.

2.6 Physical Activity Guidelines for Young People

The above discussion raises the question of what can be done to better educate people—especially adolescents—regarding the benefits of being more active, as well as the amount of activity required to deliver the best health and fitness benefits. With these issues in mind, governments around the world have created benchmarks and guidelines

to assist people to design appropriate schedules and programs. Heath-related factors have led to the development of physical activity guidelines in many countries such as Australia and USA (Centers for Disease Control and Prevention, 2015;Department of Health and Ageing, 2014).

Physical activity guidelines are consensus statements that are developed by relevant specialists in the field of health and sport (Tremblay et al., 2011), and they are based on evidence that links physical activity with different health results (e.g. obesity, chronic diseases, academic performance and blood lipids). As already noted, physical activity participation plays an important part in promoting good health and preventing or reducing chronic diseases (American Heart Association, 2015; Australia Bureau of Statistics, 2013; Cooper & Kontulainen, 2014; World Health Organization, 2015). For these reasons, guidelines for physical activity have been established that not only provide health benefits, but can also fit into the busy lives of people living in modern society (Cavill et al., 2001; Janssen, 2007; US Department of Health and Human Services, 2008).

The guidelines for physical activity are based on the argument that relatively moderate amounts of physical activity will have positive effects on health (American College of Sports Medicine, 2008). The guidelines set out to achieve specific health benefits, which include increasing fitness, illness avoidance, wellness promotion and weight control (Charles, Guy & Don, 2000). During the past five decades, several health organisations around the world have designed specific physical activity guidelines for people in different age groups. These organisations include the American College of Sports Medicine, US Department of Health and Human Services, Australia's physical activity guidelines, Canada's physical activity guidelines, and Department of Health in the UK.

USA physical activity guidelines are the most comprehensive for young people. The physical activity guidelines for children and adolescents recommend 60 minutes or more of moderate sport activities daily, or alternatively, high-intensity (vigorous) activity, for at least three days per week. Moderate sport activities include bicycle riding, skateboarding, climbing and brisk walking, while vigorous sport activities include soccer and basketball, or physical activities such as jumping rope, and running (Centers for Disease Control and Prevention, 2015; US Department of Health and Human Services, 2008). It is also recommended that children and adolescents participate in muscle-strengthening and bone-strengthening as part of their 60 minutes or more of daily activities at least three days per week. The Department of Health and Human Services' pronouncements on Physical Activity Guidelines for Americans state that it is essential to encourage and support young people to engage in physical activities that are appropriate and enjoyable, and that offer variety for their age.

Australia's physical activity guidelines for young people aged 12–18 refer to the minimum amount of physical activity necessary for excellent health (Department of Health and Ageing, 2014). These guidelines were adapted from the 1994 International Consensus Conference and the 1997 Health Education Authority Consensus Conference (Trost, 2005). The latest Australia guidelines recommend that children and youth do at least 60 minutes of moderate to vigorous physical activity every day (or nearly every day) to keep healthy as part of play, sport activities, school and community activities, and recreation. Children and youth should also avoid extended periods of inactivity through participation in sedentary activities, and they should not spend more than two hours per day playing computer games, watching TV or surfing the Internet (Department of Health and Ageing, 2014).

Canada's physical activity guidelines for children and youth provide advice to help Canadians move towards healthier lifestyles. Canada's Physical Activity Guides were designed by the Government of Canada and the Canadian Society for Exercise Physiology. In 2010, the Public Health Agency of Canada reviewed its physical activity guidelines and released new guidelines in 2011. The guidelines explain the types of physical activities that offer important health benefits to children, youth and adults. They are framed in line with international standards and reflect advances in exercise science and input from experts in the field (Public Health Agency of Canada, 2012). Canada's physical activity guidelines, like Australia's, recommend that children and youth aged 5–17 participate in at least 60 minutes of moderate- to vigorous-intensity physical activity daily, while also noting that 'more is even better'. Vigorous-intensity activities at least three days per week is also appropriate, and spending at least three days per week doing activities that strengthen muscle and bone is encouraged. Overall, children and youth should be engaged in both aerobic activities that result in faster breathing, and an increased heart rate, and strengthening activities that build muscles and bones to achieve optimal health benefits.

A similar approach has been adopted by the New Zealand national government. According to SPARC (2011), New Zealand's national sports planning agency, physical activities and sport should include all recreation opportunities necessary to support lifelong participation in sport for young people. Enjoyment and fun are key drivers to engage young people in physical activity and sport. New Zealand's Physical Activity Guidelines for young people confirmed that young people should do 60 minutes or more of moderate to vigorous physical activity every day of the week, including exercise such as walking, running, cycling, playing sport or taking part in recreational activities. It is also suggested that young people should not spend more than two hours per day

watching TV, playing computer games or surfing the Internet (Ministry of Health, 2014; Sport New Zealand, 2014). Table 2.1 provides a summary of selected physical activity participation guidelines for young people.

Table 2.1

Physical Activity Participation Guidelines for Young People

Country	Organisation	Age Group	Recommendation	References
USA	US Department of Health and Human Services Centers for Disease Control and Prevention	Children and adolescents	• 60 minutes or more of moderate physical activity every day, including bicycle riding, skateboarding, and climbing • High-intensity physical activities at least three days per week, including sport activities such as soccer and basketball • Participate in muscle-strengthening and bone-strengthening as part of 60 minutes or more of daily activities at least three days per week	US Department of Health and Human Services, 2008 Centers for Disease Control and Prevention, 2015
Australia	Department of Health and Ageing	Aged 12–18	• 60 minutes of moderate to vigorous physical activity every day • Should not spend more than two hours per day using computer games, watching TV or surfing the Internet	Department of Health and Ageing, 2014
Canada	Public Health Agency of Canada	Aged 5–17	• 60 minutes of moderate- to vigorous-intensity physical activity every day • Vigorous-intensity activities at least three days per week • At least three days per week doing activities that strengthen muscles and bones • Children and youth should be engaged in aerobic activities	Public Health Agency of Canada, 2012
New Zealand	Sport New Zealand	Aged 5–18	• 60 minutes or more of moderate to vigorous physical activity every day of the week • Should not spend more than two hours per day watching TV, playing computers games or surfing the Internet	Sport New Zealand, 2014

Overall, guidelines in Australia, the USA, Canada and New Zealand agree on the need to have a physically active population. To this end, they prescribe daily programs of physical activity that will ideally be located in sport venues or structured recreational settings. It is also agreed that, as the best possible scenario, young people should participate in at least 60 minutes of moderate to vigorous physical activity every day, including bicycle riding, skateboarding, climbing, brisk walking, football and basketball. There was also a consensus that children and youth should not spend more than two hours per day in sedentary activities (e.g. watching TV, playing computer games and surfing the Internet).

2.7 Participation Levels of Physical Activity Among High School Students: An International Perspective

This section aims to present and compare recent estimates of the physical activity participation level among high school students from different countries. Participation in physical activity by high school students is now a subject of considerable academic and public health research on an international basis. Increasing number of studies have found that physical activity patterns established during youth, especially in high school, are significant in laying the foundation for positive physical activity habits in the future (Al-Hazzaa et al., 2014; Sabău, 2014; Slingerland et al., 2012; Isgor & Powell, 2011; Utter et al., 2011). There has also been a consensus that regular participation in physical activity programs provides a number of individual and social benefits, as mentioned in a previous sections.

Despite the growing awareness of the capacity of physical activity and sport to deliver an array of health and fitness benefits, over the past two decades there has been a steady decline in physical activity participation levels among high school students. For instance, globally, approximately 31% of adolescents were insufficiently active in 2008

(WHO, 2011). In 2010, a study found that 81% of adolescents aged 11-17 years were insufficiently physically active with approximately 3.2 million deaths each year are attributable to insufficient physical activity (WHO, 2015). However, in 2008, the prevalence of insufficient physical activity was highest in the Americas and the Eastern Mediterranean Region and lowest among the South East Asian Region (WHO, 2011).

USA data has demonstrated decreasing participation in physical activity by adolescents. For instance, Centers Disease Control and Prevention (2013) study reported that only 29% percent of high school students had participated in at least 60 minutes per day of physical activity on each of the 7 days before the survey. Another study by Troiano et al. (2008) examined the physical activity levels of 6–19 year olds – from the 2003-2004 National Health and Nutritional Examination Survey (NHANES).They found that physical activity declined significantly across age groups with only 8% of adolescents achieving 60 minutes per day as recommended in the physical activity guidelines. Moreover, 42% did not meet the recommended levels of physical activity.

This trend of declining activity was confirmed by Casper and Harrolle (2013) who examined and compared constraints to physical activity among Latinos based on age, gender, income, and self-reported leisure time activity. Using the Stanford Brief Activity Survey (SBAS), this study found that 50% of the sample (n=457) was inactive and 81% would like to be more active. While this study found a small increase in participation in the period leading up to 2013, the overall results found that a majority of respondents did not meet recommended levels of physical activity. This study also confirmed that Latinos generally face more physical activity barriers than White Americans (Whitt-Glover et al., 2009).

Also when comparing USA high school student participation level with another country, such as Canada, there is clear evidence of low levels of physical activity participation level among high school students. In 2005, it was found that 48% of Canadian children aged 12 or older were categorised as inactive during their leisure time (Statistics Canada, 2005).

Levels of physical activity vary according to age among young people. The Canadian Fitness and Lifestyle Research Institute (2006) found that young people aged 12–14 were more active than those aged 15–19. It was also found that approximately 44% of boys aged 15–19 were not active enough to meet physical activity guideline recommendations. Fuller et al. (2011) carried out a study to examine association between the availability of intramural and extramural sports in secondary schools and how the availability is associated with physical activity levels among high school student in Montreal, Canada. The study found a decline in physical activity levels in young people aged between 13 and 20.

The decline in physical activity in the US and Canada can be explained by the fact that US high school students faced more constraints (e.g. lack of accessibility, partners, and knowledge of physical activity resources as the most constraining factors (Centers for Disease Control and Prevention, 2013; Fuller et al. 2011).This raises a concern about the connection between inactivity and health risk. The decline in physical activity among US high school students also highlights the importance of physical activity as a public health priority for health promotion and disease prevention. Providing more opportunities for intramural sports in secondary schools may be an effective strategy to help adolescents attain recommended physical activity levels.

Other nation's studies confirmed a decline or low level of physical activity among high school students such as Australia (Department of Health and Ageing's.,

2009; Morley et al., 2012), New Zealand (Hohepa et al., 2009; Utter et al., 2011), Turkey (Kin-Isler et al., 2009), Brazil (Silva et al., 2014), and Poland (Bergier et al., 2012). This review of literature found that all the studies across different nations are consistent in the results indicating low levels of physical activity participation among the young people, see section 2.8.

Physical inactivity is now considered a global health concern, but no standardised approaches to measurement exist, and international comparisons and global surveillance are difficult. Prior research has identified the significant decline of physical activity and sport participation level over time among the high school students around the world. Previous studies confirm that there is an association between physical activity participation level and some factors that include age and school and neighbourhood environment. The following sections provide additional background and analysis of how those factors impact on physical activity and sport participation level. Therefore, intervening to increase participation in physical activity is an important strategy for maintaining functional status and independence in this age group who will typically suffer increased levels of chronic disease compared to younger adults. There are other factors influencing levels of physical activity, including constraints and motivations factors. These will be explored in greater detail in chapters 3 and 4.

2.7.1 Age.

Age-related decline in physical activity has been found in many studies and utilising a variety of methodological approaches. Research studies on high school students in Canada and the United States focus on the adoption and implementation of different physical activities while taking into account the age of the students (Heisz et al., 2015; Maguire & Edwards, 2011). From this perspective, age is one of the essential factors in relation to planning and undertaking physical activities, hence the opportunity

for the high school students to achieve their goals and targets in relation to physical and psychological development.

Additionally, researchers have examined the influence of age in determining the level of participation of high school students in physical activities. Younger students tend to engage in sporting or physical activities more so than their older counterparts (Weiss & Wiese-Bjornstal, 2009; Standage et al., 2012). Age has been associated with physical activity levels, inactivity prevalence increases with increasing age category (Al-Nozha et al., 2007; Colley, Eglinton & Elliott, 2011), young people aged 12–14 were more active than those aged 15–19 (The Canadian Fitness and Lifestyle Research Institute, 2006).

Similar results by Dumith et al. (2011), who systematically reviewed the international literature regarding physical activity change during adolescence, found there was a decline in physical activity participation. Most of those studies that informed this review were from USA and were conducted between 1990-2003. The result confirmed there was a decline of physical activity participation; the decline was greatest in older ages (13–16 years) among boys. Effective planning and execution is essential in the achievement of the goals and targets of the physical activities among high school students in diverse nations across the globe. There is a need for other research activities with the intention of determining the relationship between ages in relation to participation in the physical activities.

In conclusion, the amount of physical activity decreases with age due to reasons such as lack of time and health. The current study aims to investigate the physical activity participation level among high school student from Riyadh City according to the age. However, it is important to understand what other factors can enhance or hinder the physical activity of young people; this is explained further in Chapters 3 and 4.

2.7.2 School and neighbourhood environment.

Understanding what influences young people's physical activity may help to identify interventions to promote active lifestyles. Over the past decade there has been a growing acknowledgement of the role of 'the environment' in influencing health behaviour. Academic studies that examine environmental factors relating to physical activity participation level give inconsistent findings. Some find an association relationship (Baumanet al., 2012; Ferreira et al., 2007; Kneeshaw-Price et al., 2013; Veugelers et al., 2008) and others do not (Adkins et al., 2004; Fein et al., 2004; Mota,Almeida, Santos, & Ribeiro, 2005; Sallis et al., 2002). These differences may be due to limitations in study design: with one exception (Cleland et al., 2011), most studies have a small sample size (Kligerman et al., 2007) and focus on population subgroups (Adkins et al., 2004; Kligerman et al., 2007). Furthermore, young people experience their environments at different levels, such as the school environment as well as their neighbourhood. Most studies to date have focused on the built environment of the school and neighbourhood because physical activity appears to be influenced by multiple environments (Haerens et al., 2009; Millstein et al., 2011).

School environment are vital in understanding the engagement or participation of the students in physical activity. According to various studies, students in the physical education classes that reinforced traditional team games were less active in comparison to the students in physical education classes that incorporated culturally relevant, lifestyle, and small-sided games (Aelterman et al., 2012; Haerens et al., 2010). Schools should offer many opportunities for adolescents to engage in physical activities (i.e., physical education classes, extracurricular physical activities, and recess periods). High quality physical education is a key factor for enabling and promoting youth physical activity (Cardon et al., 2012; Lawson, 2008).

According to CDC (2013), 39.9% of the male students had attended daily physical education classes. Another study by Nichol et al. (2009) examined relationships between school recreational environments and adolescent physical activity among Canadian students. Data from 7638 grade 6 to 10 students from 154 schools who participated in the 2005/06 Canadian Health Behaviour in School-Aged Children Survey were analysed. This study found that overall, students at schools with more recreational features and opportunities reported higher rates of class time and free time physical activity; this was strongest among boy high school students. The variance in the percentage can be explained by the lack of facilities and sport programs or can be lacking of interest and fun during the class time, because motivation factors such as fun play a stronger role to many students to participate in the physical education class (Aelterman et al., 2012). In addition, availability of school play equipment, facilities, after-school programs, and after-school availability of fields was documented as important components. There was a similar result by Haerens et al. (2009) who found that adolescents' engagement in extracurricular physical activity at school was positively related to the availability of organised activities at school. The organisation of physical activities at school outside physical education classes, such as during the lunch breaks, during recesses, and during after-school hours, might be important to reach the recommended daily physical activity time of one hour.

Additionally, engagement in the sporting activities among high school students is vital in enhancing levels of development and discipline, both of which are ideal in relating or interacting with other individuals within the neighbourhood (Demetriou & Honer, 2012; Ridgers et al., 2012). Neighbourhood environments can also influence youth physical activity within the recreation environments. Access and proximity to parks, playgrounds, and recreation spaces are associated with youth physical activity.

Some studies confirmed that children and adolescents are more likely to be physically active if their neighbourhood has facilities and more safety (Millstein et al., 2011; Van Loon,Frank, Nettlefold & Naylor, 2014).

A limitation of the literature is that most studies have used a cross-sectional design. Because cross-sectional studies are used to 'determine prevalence, they are relatively quick and easy but do not permit distinction between cause and effect' (Mann, 2003. p.34). Nonetheless, these studies have some advantages. They provide evidence about potential mediators for planning of interventions and help to prioritise population target groups and used big sample sizes. A greater understanding of how the school and neighbourhood environment (e.g. availability of school play equipment, facilities, sport programs) can impact on young people's participation in physical activity will be explored as a constraint in Chapter 3.

2.8 Participation Levels of Physical Activity Among High School Students: Saudi Arabia

Current physical activity and sport participation levels in the Saudi Arabia, particularly in high school students, is shown to be rapidly decreasing (Al-Refaee & Al-Hazzaa, 2001; Al-Hazzaa et al., 2013; 2014; Mahfouz et al., 2008; Mostafa & Khashaba, 2011). In general, 45% of Saudi Arabian boys have low levels of physical activity (Al-Hazzaa et al., 2013). Also, public school students tend to be more active compared to private school students, overall 56% of males' students were inactive and did not meet the recommendation level of physical activity. There is also a higher prevalence for sedentary behaviours among females than males (Al-Hazzaa et al., 2014). This low levels of physical activity was explained by lack of time and sport facilities as the primary reason for inactivity among schoolboys.

These studies also indicate that low levels of participation in physical activity is associated with some social demographics factors such as age and education level. For example, inactivity prevalence increases with increasing age, especially in males and decreases with increasing education level (Al-Nozha et al., 2007). It is clear that the recent statistics about the participation rates in the Saudi Arabia are not achieving the advised 60 minute per day recommendation from the different health departments (Department of Health and Ageing, 2014; US Department of Health and Human Services, 2008). Academic researchers and public health officials feel this is a worrying situation as there are many health implications resulting from a national neglect towards physical activity and sport or exercise involvement.

There are some limitations of the studies about Saudi Arabian youth participation in physical activity and sport. Most of the studies have used a cross-sectional design and self-report approach. These are issues because respondents are susceptible to lying or giving inaccurate information in questionnaire responses and some study confirmed that (Corder et al., 2009). Thus, self-reports require participants to be truthful to produce an accurate report of their actual behaviours (Stamatakis et al., 2012). On the other hand, a cross-sectional design can only just predict the prevalence (Frone et al., 1997), cannot be determined (Nilsson et al., 2009), do not allow for the testing of causal directions of relationships (Biddle et al., 2005).

Also, these studies have focused on broader health issues such as sedentary behaviour and obesity rather than levels of physical activity and sport participation among schoolboys. Nonetheless, these studies have some merit because they examined both genders (they had female assistance to easily access the female schools and contact with female students). These studies suggested there is a need for the school physical activity programs to increase the physical activity among the respondents and to

encourage young people to participate in regular activity and exercise as early as possible so as to develop their lifetime health.

In addition, Al-Hazzaa et al. (2014) suggested there was a need to further address the psycho-social, cultural and environmental factors associated with physical activity participation levels in order to learn more about Saudi Arabian youth's participation in physical activities. In line with the social-ecological model of human behaviour, it is suggested that cultural and commercial factors – and not just psycho-social factors - may be important influences on participation in physical activity and sport. This study understands the importance of these macro factors, but as noted in Chapter 1, it focuses its attention on the constraint and motivations that influence physical activity participation levels. Chapters 3 and 4 will address the ways in which Saudi Arabian adolescent participation in physical activity and sport is shaped by these two micro variables.

2.9 The Big Picture

The research in participation in physical activity and sport show that children and young people have similar patterns of physical activity participation, and exhibit a slow decline. There are some exceptions (Casper et al., 2013; CDC, 2013; WHO, 2015), and not all countries are the same. For instance, USA and Canada have slightly higher participation rates than Saudi Arabia. There were also differences in the physical activity participation levels according to age. Younger students are more active than the older students, who subsequently become less active as they transition to middle age. In addition, most Saudi studies have confirmed the low levels of physical activity participation among the 15-19 years old age group. The literature also points to the fact that there is a global physical activity participation problem that includes high school students who have traditionally been the most active age cohort. Saudi studies reveal the

inactive nature of Saudi young people, and the majority of males did not achieve the recommended physical activity levels necessary for upholding health and preventing disease. The high prevalence of inactivity among Saudi people represents a major public health concern (Al-Nozha et al., 2007). Table 2.2 provides a summary of selected studies that illustrates the levels of physical activity and sport participation among high school students from different countries. Saudi Arabia tends to have one of the lowest levels of physical activity participation among high school students.

Table 2.2

Level of Physical Activity in Different Countries

Country of study	Methodology	Measurement tool	Age cohort	Physical activity level	References
Globally	National survey	frequency, duration, intensity, type	11-17 years	In 2010, that 81% of adolescents were insufficiently physically active	WHO (2015)
USA	a nationally representative survey	Non available	high school students	29% of high school students had participated in at least 60 minutes per day of physical activity	(Centers for Disease Control and Prevention, 2013).
	2003-2004 NHANES	accelerometer	6–19 year olds	Physical activity declined significantly across age groups with only 8% of adolescents achieved 60 minutes per day as recommended in the physical activity guidelines, and 42% did not meet the recommendation levels	Troiano et al. (2008)
	SBAS.	frequency, intensity, duration, and type of activity.	18 year old and over	50% of the sample was inactive and 81% would like be more active	Casper and Harrolle (2013)
Canada	Questionnaire	nature, frequency and duration	aged 12 or older	48% of Canadian children were categorised as inactive during their leisure time	Statistics Canada (2005)
	Questionnaire	type of sport they currently participate in most frequently	12-19 years	Found that young people aged 12–14 were more active than those aged 15–19. It was also found that approximately 44 % of boys aged 15–19 were not active enough to meet physical activity guideline recommendations	Canadian Fitness and Lifestyle Research Institute (2006)
	Questionnaire	Weekly activity checklist (duration)	13-20 years	Decline in physical activity levels in young people	Fuller et al. (2011)
Saudi Arabia	self-reported questionnaire	duration, frequency and intensity	15–19 years	44% of males' students were active	Al-Hazzaa et al. (2014)
	self-reported questionnaire	duration, frequency and intensity	15 and 19 years	45% of Saudi Arabian boys having low levels of physical activity	Al-Hazzaa et al. (2013)

The above studies show that while young people around the world exhibit high levels of physical activity when compared with other age cohorts, in absolute terms their levels of physical activity are low. This problem is especially evident among adolescents. In Saudi Arabia, there was a low level of physical activity participation across all ages and sexes. In the USA, participation levels among high school students have also declined between 2003 and 2013.

At the same time, these studies should be treated with caution. First they often contain methodological differences, especially with respect to sampling and the ways in which sport and physical activity are defined. This leads to difficulties in comparing and contrasting results. In addition these result are usually presented for a specific time period and do not provide for uninterrupted longitudinal analysis. Nonetheless, there is a consistent trend of declining levels of physical activity among youth on a global scale. In conclusion, most of the studies above showed that there are evidence of declined or low level of physical activity participation among young people over the years in both gender. Also there are some constraints that influence the participation level, for example, socioeconomic status and environment (school and neighbourhood) can act as a constraint on young people's participation in physical activity.

2.10 Chapter Summary

This chapter has highlighted the increasing concern about low levels of participation in physical activity among high school students around the world with particular reference to the concomitant increasing sedentary behaviours. This chapter also showed that physical activity and sport participation can increase high school student general health bearing in mind that physical inactivity in high school students is

decreasing and showed low level of participation in many countries as indicated by the physical activity guidelines from Australia, UK, Canada and USA.

Chapter 3: Literature Review Part II: Constraints on Participation

3.1 Introduction

The preceding discussion of participation in physical activity and sport paints a somewhat gloomy picture of the overall levels of engagement. It also identifies a number of trends and developments in wider society that will make it difficult to strengthen people's engagement, especially among adolescents and young adults. This raises the question of why participation levels are not higher, and what it is that prevents people from engaging more regularly and more vigorously in physical activity and sport programs. While there are good reasons for playing games and sport, and for doing exercise and physical recreation, in many case, they are not sufficiently well recognised or weighted to motivate people to get out of their armchairs or office work stations and become more active. Further, over time, many factors have had the opposite effect; that is, they have actually neutralised the motivators and replaced them with a raft of constraining and disabling factors. What are these barriers to participation, and what can be said about them?.

This chapter examines three fundamental constraint factors: intrapersonal, interpersonal and structural. It also examines in more detail the relationships between constraints and physical activity participation levels. The different constraint variables among social demographics are also addressed in this chapter. The chapter concludes with a summary of the key findings from the literature. This chapter provide background information related to the objective 2.

3.2 Constraints

Many factors constrain young people's involvement in physical activity and sport: (1) intrapersonal constraints; (2) interpersonal constraints; and (3) structural constraints (Crawford et al., 1991). Each of these three crucially important dimensions is reviewed below.

3.2.1 Categories of constraints.

As already noted, the lack of participation in physical activity and sport constitutes a serious public health problem among youth because it is a risk factor for obesity, high triglyceride levels, depression and anxiety (Strong et al., 2005). A majority of adolescents and children do not obtain the level of daily participation in physical activity that is recommended by many health associations (Canadian Fitness and Lifestyle Research Institute, 2006; Casper, Bocarro, Kanters & Floyd, 2011; Fuller, Sabiston, Karp, Barnett & O'Loughlin, 2011; Troiano, Berrigan, Dodd, Masse, Tilert & McDowell, 2008). As a result, the constraints on leisure time and physical activity have received increasing attention from researchers during the past three decades (Adam et al., 2014; Alexandris & Carroll, 1999; Casper, Bocarro, Kanters & Floyd, 2011; Palen et al., 2010; Jackson, 1988; Jung-Woong et al., 2009). Numerous researchers (Crawford & Godbey, 1987; Iso-Ahola & Mannell, 1984) began using the term 'constraints' to leisure rather than 'barriers' in order to paint a sharper picture of the concept, as the idea of a 'constraint' suggests that a range of factors can be at work. It also highlights the fact that the factors can be interpersonal and intrapersonal on one hand, and structural—for example, equipment and facilities—on the other. In addition, many of the constraints investigated have moved from a narrow focus on barriers to participation in leisure time physical activity towards a broader conceptualisation of constraints (Arab-Moghaddam, Henderson & Sheikholeslami, 2007).

The concept of constraints has been examined for nearly three decades. Constraints are defined as "factors that are assumed by researchers and perceived by individuals to inhibit or prohibit participation and enjoyment in leisure"(Alexandris & Carroll, 1999, p. 317). According to the hierarchical model of constraints designed and developed by Crawford and Godbey (1987) and extended in Crawford, Jackson and Godbey (1991), there are three types of constraints: (1) intrapersonal, which refer to individual/psychological factors such as lack of knowledge and lack of interest; (2) interpersonal, which refer, for example, to lack of partners for the activity or support to participate in the activity (e.g. siblings, peers, parents- family, teachers, coaches) and (3) structural, which refer to facilities and services, accessibility, finance, and time. While finance and time could be interpreted as intrapersonal these factors are not psychological, but external to the individual.

The constraint model was proposed first by Lewin (1951). From the perspective of social psychology, Lewin challenged that an individual's behaviour was subjugated by internal and external factors. Research in the early 1960s that studied barriers in leisure, physical activity and sport participation focused on the relationship between participants and non-participants. Research examined factors that delayed participation in sport or physical activity during leisure time. Jackson (1988) stated that, even though researchers have examined non-participation in leisure activities from the 1960s to the 1970s, they have been unsuccessful in examining leisure constraints because they used poor variable measurements. Such investigations analysed the general characteristics of non-participants. Numerous researchers studied the characteristics of leisure constraints in the mid-1980s, with most of them looking at participation barriers as obstacles that could not be overcome (Jackson et al., 1993; Jackson & Rucks, 1995). Consequently, in the 1980s, researchers clarified the concept of leisure constraints to examine a

relationship between non-participation and leisure constraints (Boothby, Tungatt & Townsend, 1981; Francken & van Raaij, 1981; Jackson, 1991; Jackson, 1983; Witt & Goodale, 1981).

Casper et al. (2011) evaluated the psychometric properties of the constraint measures using panel data from 2,029 students aged 11-15 years old. The results of this self-report study indicated that a 7-factor model was stable and applicable to various demographic groups. The value of this project was that it re-developed the traditional constraint model suitable for equivalency between groups, with model specifications, factorial validity, and multi-group invariance of perceived constraints. The design of the study was robust with various preliminary analysis (examining skewness and kurtosis), the use of confirmatory factor analysis and eventually ending up with a 7-factor model similar to the hierarchical constraints model. The limitations of the study include the time difference of 9 months. This could impose a 'learning' advantage where some students may answer the questions based on prior knowledge. On the other hand, the researchers applied an on-line self-administered questionnaire with each school providing computers (where the survey was preloaded). This may impose undue 'pressure' and or 'group thinking 'among the students.

Previous research has investigated each constraint and found them all to be significant influences on adolescents' physical activity participation levels. For example, a major study by Caldwell and Baldwin (2005) confirmed that constraints influence leisure interests, physical activity choices and participation in physical activity across a range of leisure experiences. The study recommended that in order to better understand why some individuals do not participate in physical activity and sport, it is essential to examine not only their personal traits and dispositions, but also a range of interpersonal, family, school, workplace and community-centred factors. These

influences have subsequently been classified into three dimensions, as shown in Figure 3.1 (Alexandris & Carroll, 1997; Casper et al., 2011; Crawford & Godbey, 1987; Crawford et al., 1991).

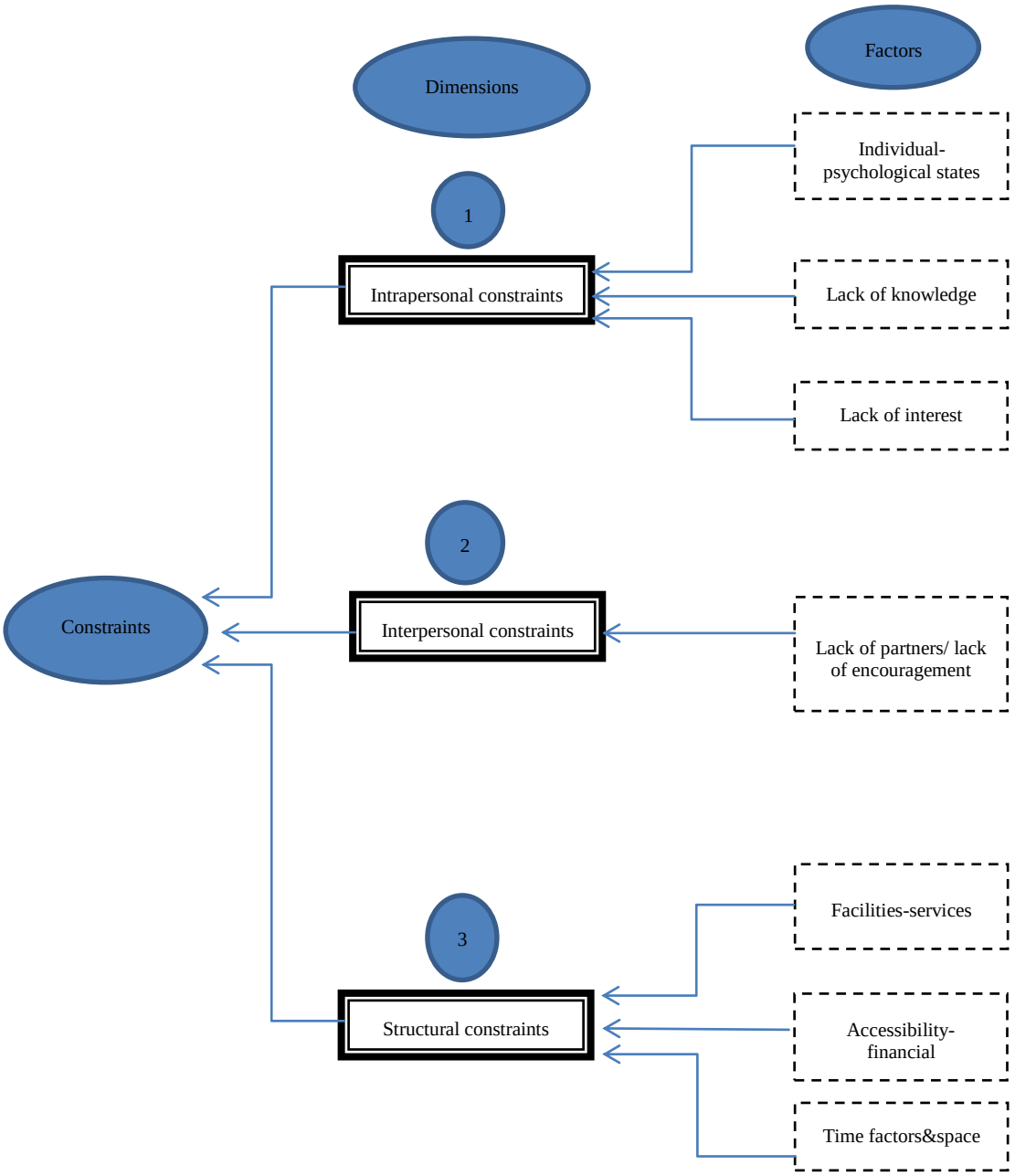


*Figure 3.1.*Constraints model.

According to Crawford & Godbey (1987) and Crawford et al., (1991).each of the three dimensions operates with in a hierarchical structure. At the base of the hierarchy are the intrapersonal constraints. They are the most potent factors, since interpersonal and structural factors have little influence on participation if intrapersonal factors like a lack of commitment, little knowledge and no interest weigh heavily on the decision-making calculus. If intrapersonal constraints are minimal, and the interest is

there, but the interpersonal constraints are strong, then structural factors will not have a significant impact on participation. Finally, structural constraints will be influential only when intrapersonal and interpersonal constraints have been negotiated.

While this model illustrates the general way in which the three dominant constraining dimensions work, it does not provide a detailed analysis of exactly how each dimension operates in shaping individuals' attitudes and behaviours. To clarify this issue, a detailed explanation of each constraining dimensions and its seven constituent components - or factors- is provided in the following sections.

3.2.1.1 Intrapersonal constraints.

As previously defined, intrapersonal constraints are "primarily concerned with subjective perceptions or assessments of appropriateness and relevance of participation in a given leisure activity by the individual in question" (Godbey et al., 2010, p. 121). Intrapersonal constraints are underpinned by various intrapersonal theories and have been examined by numerous researchers. Alexandris, Tsorbatzoudis and Grouios (2002) used the hierarchical model of constraints to examine levels of sport participation among young people. Their hierarchical model conceptualised a number of key intrapersonal constraint factors: (1) individual psychological conditions; (2) lack of knowledge; and (3) lack of interest (Alexandris & Carroll, 1997; Crawford & Godbey, 1987; Crawford et al., 1991).

Intrapersonal constraints involve individual psychological states and attributes that interact with leisure preferences, any of which can shape someone's commitment to one type of leisure practice—for example, reading—or building a passionate interest in a less sedentary leisure practice—for example, a game of tennis. Alternatively, they may act to constrain someone's capacity to engage in these activities. Examples of intrapersonal constraints include stress, family issues and lack of knowledge (Casper et

al., 2011; Crawford & Godbey, 1987; Palen et al., 2010). According to Crawford et al. (1991), intrapersonal-level leisure preferences are formed "when intrapersonal constraints are absent, or their effects have been confronted through some combination of privilege and exercise of the human will" (p. 313). Consequently, intrapersonal constraints will interact with leisure preferences rather than intervene between preferences and participation. This means that intrapersonal constraints are important to this study because they are the fundamental determinants of: (1) the types of sport and leisure practices that young people may or may not be interested in; (2) the types of sport and leisure practices they would ideally participate in if they had the opportunity; and (3) the types of sport and leisure practices they would not be interested in participating in, even if they had the opportunity. Figure 3.2 illustrates the relationship between constraints, preferences and participation.

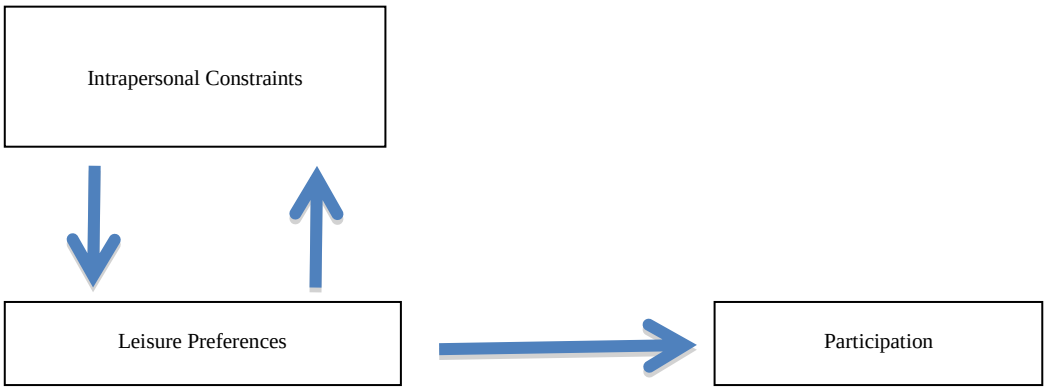


*Figure 3.2.*Intrapersonal constraints effecting to participation level (Crawford et al., 1991).

A number of studies have used this approach in studying people's sport and physical recreation preferences and practices. For example, Palen et al.(2010) explored the constraints used by the hierarchical model of constraints (Crawford & Godbey, 1987; Crawford et al., 1991) and their negotiation strategies among 114 high school

students aged 14-18 years old. As Crawford and Godbey predicted, they found that intrapersonal constraints were major influences on leisure activity preferences. As Figure 3.1 indicates, intrapersonal constraints are multi-faceted; as a result, they can be more clearly understood if they are categorised into distinctive functional factors.

A number or specific intrapersonal constraint factors have been documented in other studies, including: (1) lack of interest; (2) concerns about one's appearance; (3) health/fitness limitations; and (4) not enough skills to confidently participate (Allison, Dwyer & Makin, 1999; Allison et al., 2005; Kowalski & Lankford, 2010; Liechty, Freeman & Zabriskie, 2006; Palen et al., 2010). It has also been found that intrapersonal constraints increase significantly with advancing age (Alexandris, Barkoukis, Tsorbatzoudis & Grouios, 2003; Alexandris & Carroll, 1997; Jackson, 1993).On balance, the older the age group, the greater the constraints, the weaker the preferences and the lower the level of participation.

The 'lack of interest' factor is frequently identified as an intrapersonal constraint in studies on physical activity and sport participation research (Crawford & Godbey, 1987; Crawford et al., 1991; Henderson, Stalnaker & Taylor, 1988; Kubayi, Totiola & Monyeki, 2013). For example, Ng (2011) identifies the drivers and barriers perceived by 1,333 adolescent (aged 11-17 years old) in rowing activities. The findings of this study confirm that the main constraint for respondents was a lack of interest in starting rowing activities. A limitation of this study was that it focused on only one type of physical activity (rowing). This makes it difficult to generalise Ng's findings to other studies that examine physical activity and more general sport participation.

For example, Palen et al. (2010) explored the constraints and negotiation strategies among 114 high school students aged 14-18 years old in South Africa. The study used focus groups, whereas Ng (2011) used self-reporting. Intrapersonal

constraints were mentioned in all 15 focus groups, and the lack of interest factor was most frequently mentioned among respondents. However, unlike the studies mentioned above, Palen et al.'s study recommended ways for students to overcome perceived barriers. The potential weaknesses of Palen et al.'s study are that potential for shyness, dominance or lack of involvement among participants were no reported.

In contrast to the above, other studies have found that lack of interest was actually the least important factor preventing young people from participating in leisure activities. For example, Bülent, Fatih, Beyza and Suat (2010) used questionnaires to examine the constraints to leisure activity participation among 501 Turkish individuals aged 18 and over. This study suggests that those responsible for organising leisure activities (for example, PE teachers) should pay attention to the all groups' preferences and the factors that constrained individuals to participate in the given activities. This suggests that teachers, friends and parents can play an important role in encouraging and motivating children to participate in, and become interested in, physical activity. The role of encouragement relates to interpersonal constraints and is discussed further in the next section.

Shifman et al. (2012) illustrated the above point. This study compared the constraints faced by 292 international students and domestic students. The results indicated that international students who have participated in intramural sports had significantly higher intrapersonal constraints compared to domestic students. For example, international students might be lack of knowledge , this can be explained by dissimilar way of life and environment. Another reason is that domestic students might have been given more opportunities to participate in physical activity than some of the international students. The study recommended that university recreation and student

service departments may need to collaborate more closely to foster awareness and help overcome the constraints.

Conversely, low family income levels can affect children's interest in getting involved in physical activity participation. For example, Adam et al. (2014) aimed to identify the constraint factors influencing 1160 students aged 20 to 25 years old from the University Of Cape Coast in Ghana. In this study found 62.1% of students had a lack of interest in preferred leisure activities. Students from low-income backgrounds were more constrained by intrapersonal constraints than those from high income backgrounds. This finding could be explained by the fact that in most Ghanaian societies, leisure is considered as a prerogative of the wealthy as a luxury activity. This finding is consistent with other studies that found lower SES groups tend to face higher levels of constraints in general except time and interest (Casper et al., 2011). Yankholmes and Lin (2012) also suggested that students from low-income families are usually focused on their studies since they feel that achieving academic excellence is the surest way of obtaining a good job after university and, thus, obtaining a better future life.

Lack of knowledge is another intrapersonal constraint for young people participating in physical activity. For example, Casper, Bacarro, Kanters and Floyd (2011) evaluated the perceived constraints of 2,465 middle-school boys and girls to sports participation across 4 schools in 6th–8th grades using a web survey. The hierarchical Leisure Constraints Theory was used to measure the constraints dimensions. The results revealed that knowledge was perceived as the lowest-ranked constraint.

However, other studies have suggested that a lack of knowledge of the benefits of physical activity can act as a significant constraint on participation among youth

(Brusseau et al., 2011; Kahn et al., 2002; Kulinna & Silverman, 2000). At the same time Knowledge of the benefits of physical activity participation can overcome constraints to participation (Chaix et al., 2013).

Additional studies have found that intrapersonal constraints are powerful predictors of physical activity and sport participation levels (Alexandris, Grouios, Tsorbatzoudis & Bliatsou, 2001; Alexandris et al., 2003; Crawford & Godbey, 1987; Crawford et al., 1991; Ridinger, Funk, Jordan & Kaplanidou, 2012). Based on the earlier literature reviews, most studies provide evidence to support the power of intrapersonal constraints in shaping participation levels. For this reason, it is consequently imperative that this study includes the identification of individual dispositions, beliefs and emotions that are likely to affect the decisions of young people to participate or not in physical activity and sport programs.

3.2.1.2 Interpersonal constraints.

Interpersonal constraints are the second of the three dimensions of leisure constraints to be discussed. As previously defined, interpersonal constraints "are the result of interpersonal interaction and the relationship between individuals' characteristics"(Crawford & Godbey, 1987, p. 123). However, unlike intrapersonal constraints, they not only interact with leisure preferences to deliver subsequent participation, but they also directly shape participation. For example, as research shows, an individual may experience an interpersonal leisure barrier if he or she is unable to locate a suitable partner to engage with in a particular activity (Crawford & Godbey, 1987). The lack of a partner may change participation preferences by shifting someone away from a team sport (e.g. cricket) and re-orienting them to an individual sport (e.g. running) or even a more passive activity (e.g. playing computer games). It might also change participation in a more direct sense by disabling participation altogether.

Consequently, interpersonal constraints will interact with both the preference for, and subsequent participation in, physical activity. This interaction, and the direction it takes, is illustrated in Figure 3.3.

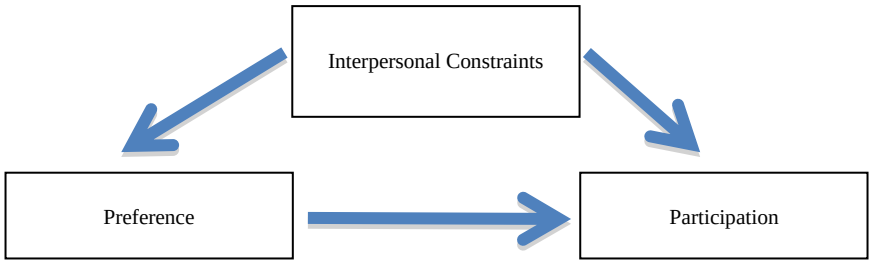


*Figure 3.3.*Interpersonal constraints and their interaction with preferences and participation level (Crawford et al., 1991).

Figure 3.3 highlights the claim that, at the interpersonal level, "the individual may encounter many constraints outside their immediate control" (Crawford et al., 1991, p. 313). From a technical perspective, interpersonal constraints are related to preferences and participation; therefore, they intervene in the preference–participation relationship in two distinct ways (Godbey et al., 2010). Interpersonal constraints are essentially social interaction considerations, and they include factors such as a lack of partners, parental discouragement and the lack of encouragement from significant others (Crawford & Godbey, 1987).

A number of studies have used this approach in studying people's sport and physical recreation preferences and practices. As Figure 3.2 indicates, interpersonal constraints are multi-faceted; as a result, they can be more clearly understood if they can be categorised into distinct functional factors.

Specific interpersonal constraint dimension have been documented in other studies. These include the lack of a partner (e.g. siblings, peers, parents, and coach)

(Shifman et al., 2012; Kowalski & Lankford, 2010; Liechty, Freeman & Zabriskie, 2006; Palen et al., 2010). According to Palen et al. found that lack of parental support was the most common interpersonal constraint to leisure participation among respondents. Therefore, this finding could be explained by parents trying to protect children from the dangers in their peer groups and neighbourhoods. Palen et al.'s recommended that it was possible to reduce parental constraints indirectly by measures targeted at improving neighbourhood safety. Improving neighbourhood safetywill mean that parents are more likely to allow their children to participate in physical activity with their friends in public spaces. The lack of parental support has ramifications for the physical activity that young people undertake.

A lack of partners and friends can also affect the amount that a young person participates in physical activity. Crawford and Godbey (1987) suggest that a lack of partners and friends may occur for a variety of reasons, such as different levels of skills, dissimilarity of preferences, different capabilities and different timetables. For example, Wang et al. (2010) examined perceived motivators and constraints among regular players of basketball games. One hundred and twelve basketball players from three different cities in central California (in the public facilities) aged over 18 years participated in this study. Eighteen per cent of these players said it was difficult to find friends to play with, and that this was a barrier to continued participation in the game.

This study highlights the complexity of a group activity such as basketball where players need to start at a specific time; and for the game to be competitive, they also should have equal skill levels and the availability of standardised facility such as a basketball court. Some limitations of Wang et al.'s study include that it investigated just one type of sport (basketball) and the study sample involved few females

In other studies, a lack of friends to participate with, as well as support problems with peers and parents were cited as barriers to participation (Fulton et al., 2011). In a cross-national study conducted on youth in Germany, South Africa and the USA, peer influence was associated with constraints on physical activity participation levels. This suggests that the importance of peers in general, and friends in particular, in physical activity participation may be universal (Caldwell & Smith, 2006). As a result, the ability to participate in physical activity with friends was a particularly significant factor for increasing adolescent physical activity participation (Cohen-Mansfield, Marx & Guralnik, 2003; Lubans, Morgan & McCormack, 2011). In support of this finding, Palisano et al. (2009) investigated social and community participation of children and youth with cerebral palsy and found that a high percentage of activities were undertaken with friends and others outside the home. The above studies suggest that the physical activity participation of young people benefits greatly from the support and encouragement of parents and friends, and which, in the school setting , may include teachers and coaches (Fitzgerald et al., 2012; Jõesaar, Hein, & Hagger, 2012). However, not all young people have this support, particularly from their parents.

3.2.1.3 Structural constraints.

Structural constraints are one of the most dimensions that constrains people's ability to participation in physical activity and sport. It was first proposed by Crawford and Godbey (1987). Structural constraints are defined as 'intervening factors between leisure preference and participation'(Crawford & Godbey, 1987, p. 123). This relationship is illustrated in Figure

3.4.

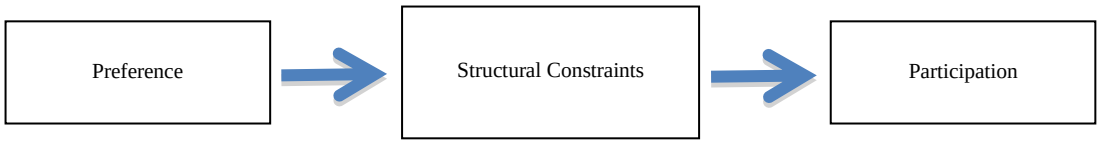


*Figure 3.4.*Structural constraints effecting to participation level (Crawford et al., 1991).

Structural constraints refer to the physical environment and people's economic, cultural and social situations. According to Crawford et al. (1991) and Crawford and Godbey (1987), these constraints typically include the availability (or lack thereof) of facilities and services, as well as accessibility to facilities and services. People's financial situations and the time they have at their disposal can also be classified as structural constraints. During the past decade, the influence of structural constraints, such as facilities, financial issues and accessibility, has received increasing attention from researchers and has been examined across different population groups (Kubayi et al., 2013; Humpel et al., 2004; Salmon, 2010b; Wilson & Dollman, 2007; Oyeyemiet al., 2014; Jung-Woong et al., 2009).

Not all studies have found that a lack of facilities and difficulties accessing them lead directly to a fall in participation. For example, Alexandris and Carroll (1997) concluded that structural constraints have no significant relationships with sport participation or non-participation. In these circumstances, people will often change their leisure preferences, or they will take action to overcome the constraint in order to better manage their patterns of participation (Crawford et al., 1991).

Overall, though, the construction and maintenance of facilities are important factors in reducing constraints (Hume, Salmon & Ball, 2005;Palen et al., 2010). Further, many studies have identified a positive association between facility accessibility and young people's physical activity involvement (Ammouri., 2007; De Vet, De Ridder & De Wit, 2011; Drakou et al., 2008; Evenson et al., 2006; Kubayi et al., 2013). 'Accessibility' can include access to sport facilities, transport, finances, and access to sporting programs.

Drakou, Tzetzis and Mamantzi (2008) investigated university students' leisure constraints in Greece. Self-report questionnaires were distributed to 380 students and 320 questionnaires were returned. The results revealed that the lack of facilities was the second highest constraint cited by students. Lack of facilities may reflect the shorter and low quality of some sport and leisure facilities, including overcrowding. Therefore, the study suggests including the lacking of sport facilities and limited opportunities in leisure programs are often responsible for low participation. Kocak, Harris, Isler and Cicek (2002), who examined physical activity levels and sport participation among Turkish junior high school students, found lack of sport facilities was the major reason reported for not participating in sport. Similarly a study conducted by Shifman et al. (2012) who compared the constraints faced by 292 international students against non-international students who participate in intramural sports, found that the lack of facilities (too crowded) as the main structural factors most constraining their intramural sport participation.

In contrast, other studies have found that safety problems around neighbourhoods, including traffic speed and density, along with 'stranger danger' rhetoric, can reduce participation levels. Concerns have also been expressed about the ways in which safety issues can potentially limit children's independent mobility, particularly affecting the school journey (Hillman, 1999). Dwyer et al. (2008) found that many parents were concerned about unsafe outdoor environments, and in some instances, parents acted as a constraint for children who were thinking of engaging in physical activity programs. In addition, some parents indicated that when there were no facilities close to home, and when they did not have a car to travel to parks or recreation centres, participation levels declined.

On the other hand, lack of money was a key issue for the decline in physical activity participation for many people (Humbert et al., 2006; Kowalski & Lankkford, 2011). A Canadian study found that the children of families on low incomes have considerably lower participation rates in sport (Statistics Canada, 2009). Butcher, Sallis, Mayer and Woodruff (2008) investigated the correlates and physical activity guideline compliance among adolescents and found that those from low income families were less likely to meet recommended physical activity participation guidelines than those from higher-income backgrounds.

Various studies have shown that most leisure activities require financial resources, and these demands often directly contribute to participation opportunities on one hand and constraints on the other (Butcher et al., 2008; Lee, Scott & Floyd, 2001). People on high incomes can easily explore opportunities to engage in physical activities, while people who have low incomes are more inclined to not participate in physical activity participation due to a lack of financial resources. Steenhuis et al. (2009) investigated financial factors and prices as a barrier to participation in physical activity by low income men. The study found that the dominant barrier to participating in physical activity and sport was financial constraints. Participants indicated that the cost of membership to fitness centres and the cost of clothing and equipment were increasing every week.

Many people who want to participate in a variety of recreational and sport activities have noted lack of time as one of the most constraining factors. Time spent in physical activity is an important issue to address, as time is considered a major barrier to participation (Casper et al., 2011; Flood & Parker, 2014; Palen et al., 2010; Jung-Woong et al., 2009). Some studies have indicated that a lack of time may represent a lack of motivation (Bowles, Morrow Jr, Leonard, Hawkins & Couzelis, 2002).

Therefore, it is not surprising that time was viewed as the most salient barrier to sport participation in many constraint studies (Al-Hazzaa et al., 2014; Casper et al., 2011).

Jung-Woong et al. (2009) examined the relationships between constraints, motivation and physical activity level with a random sample of 1,109 Korean youth who completed self-report questionnaires based on the hierarchical leisure constraints theory. The results revealed that the most dominant constraint on physical activity participation was lack of time. The basis for the time constraints may be attributed to Korean youths who generally spend more time studying Mathematics and English rather than participating in physical activities or sport. Similarly, the results of this study are in line with those of (Casper et al., 2011; Palen et al., 2010) which reported that lack time due to studies was the main constraint. In another study that used the hierarchical leisure constraints theory, Flood & Parker (2014) aimed to identify constraints and motivations to adventure participation in a study of 193 college students. Overall the key constraint reported was lack of time. The authors concluded that to enhance adventure participation, managers need to emphasise the physical and psychological benefits.

The above studies suggest that there are a number of structural constraints that lead to a decline in physical participation among young people aged between 14 and 24 years. These constraints include lack of facilities, lack of accessibility (e.g. through transport, lack of financial resources), perceptions of neighbourhood safety, and lack of time. This suggests that access to facilities, money and time can lead to an increase in physical activity participation among young people. The absence of facilities can make participation in physical activity considerably more difficult, particularly when coupled with other structural constraints such as a lack of time and money.

3.3 Saudi Arabia Constraints on Physical Activity Participation

In an early Saudi Arabian study, a lack of facilities was cited as a major constraint. Al-Refaee and Al-Hazzaa (2001) assessed the patterns of physical activity among Saudi adult males living in Riyadh, using self-administered questionnaires. Saudi males aged 19 years and older (N = 1333) were randomly selected. The result confirmed that just over half (53%) of Saudi males were totally physically inactive. Time constraints seem to be the major contributing factor to this physical inactivity, The study suggested that public policies were needed to encourage active living and discourage sedentary habits, and also health care providers have an important role to play in promoting physical activity among the population. The issue of like of time to participle in physical activity among high school students has been confirmed by other research (Al-Hazzaa et al., 2014). A study by Al Agili & Park (2012) found that Saudian adolescent males practised sport activity after school in the streets and empty lots. This behaviour is explained by the lack of structured sport facilities available for young people in Saudi Arabia.

Mostafa and Khashaba (2011) investigated physical activity level and barriers against physical activity among adult Saudis. A total of 400 adults were selected from attendants of Primary Health Care centres in Abha City. This study found that 65% of participants had low physical activity, with 28.3% of those participants having only one barrier, while 71.8% having two or more barriers. This finding can be explained by structural constraints that influenced participants participation in physical activity. Those factors were an unavailability of physical activity centres, lack of time due to family commitments, and having no money to participate in physical activity. The study recommended that equipment be made available at institutions, for affiliated staff to use during their breaks and to provide the necessary motivation and social encouragement to

increase people's involvement in physical activity. Similarly, the results of this study are in line with those of Al-quaiz and Tayel (2009), who identified that 80.5% of respondents reported that lack of resources was the most common barrier to physical activity. Al-Hazzaa et al. (2014) suggested future research to address the environmental factors associated with physical activity participation levels in order to learn more about their participation in physical activities.

While the above studies are narrowly focussed , there is clear evidence that Saudi Arabian high school students –both male and female - had low levels of physical activity and sport participation. The main reasons for not participating in physical activity and sport include lake of time, unavailable sport facilities and programs during school times and after.

Table 3.1 presents the most frequently cited constraints on physical activity participation among young people. All these studies have been selected by searching the Sportdiscuss data base. The search terms were physical activity, participation, constraints, student, and high school, and the search only included articles that had been published between 2010 and 2015. Evidence show that different constraints influence young people's participation in physical activity and sport. Also, the research from different countries illustrates that there is no consistency of constraints' impact on young people. However, in a Saudi Arabian study, a lack of time was cited as one of the main constraint (Al-Hazzaa et al., 2014; Al-Refaee & Al-Hazzaa, 2001).

Table 3.1

Most Frequently Cited Constraint Factors on Physical Activity

Dimensions	Constraining Factors	Country	References
Intrapersonal Constraints	Lack of knowledge	USA	Casper et al., 2011
	Lack of interest	South Africa	Palen et al., 2010
		Turkey	Bülent et al., 2010
		Ghana	Adam et al., 2014
		Hong Kong	Ng (2011)
Interpersonal Constraints	Lack of partners (e. g. lack of encouragemen and support)	USA	Wang et al., 2010
		USA	Fulton et al., 2011
Structural Constraints	Lack of facilities	USA	Casper et al., 2011; Fulton et al., 2011
		Saudi Arabia	Al-Refaee & Al-Hazzaa, 2001 Al-Hazzaa et al. 2013&2014
		Greece	Drakou et al., 2008
		Canada	Shifman et al., 2012
	Lack of finances/Services	Canada	Dwyer et al., 2008
		Turkish	Bülent et al., 2010
		Greece	Drakou et al., 2008
		USA	Butcher et al.,2008
		Netherlands	Steenhuis et al., 2009
	Lack of time	USA	Casper et al., 2011 Flood&Parker, 2014
		South Korea	Jung-Woong et al., 2009
		Saudi Arabia	Al-Hazzaa et al.,2014)
		South Africa	Palen et al., 2010

3.4 Relationship Between Constraints and Physical Activity Participation Levels

When examining the relationship between constraints and participation levels, a number of complex issues arise. This is a result not only of the often-interdependent relationship between constraints and physical activity levels, but also many mediating variables, including gender, age, occupation, sport participation history and current health status. These factors affect people's decisions to become more or less physically active. A number of studies have investigated the constraints to participation on physical activity and found that perceived constraints have a marked effect on participation levels. These constraints include the ultimate adaptations that need to take place for the adolescents to take their physical activities to new levels.

However, the literature also shows disparate perspectives ranging from negative and positive to weak relationships between constraints and physical activity participation (Alexandris et al., 2008; Hubbard & Mannell, 2001; Elkins & Beggs 2007; Trapp et al., 2012; Oyeyemi et al., 2014; White, 2008). White (2008), for example, noted constraint factors negatively influenced outdoor recreation participation. These findings are in line with other studies. For example, Alexandris and Carroll (1997), noted a negative relationship between constraints and physical activity participation. Jung-Woong et al. (2009) investigated constraints, motivations and physical activity participation levels among Korean youth and also found a negative correlation between constraints and physical activity. Conversely, Kay and Jackson (1991) found a high level of constraints for both participants and non-participants. This may suggest that a lack of motivation exists for young people to participate in physical activity.

However, in most instances studies have found a positive relationship between a lack of constraints and physical activity participation (Hubbard & Mannell, 2001;

Oyeyemi et al.,2014). For example, Hume et al. (2005) and Sallis et al. (2001) noted that physical activity, especially for children and adolescents, has been positively associated with accessible and convenient facilities. Hume et al. (2005) found that open areas and green spaces provided opportunities to undertake physical activity, and therefore increased the likelihood of young people undertaking this physical activity. Sallis et al. (2001) found a correlation between levels of physical activity among young people and high levels of physical improvements and adult supervision in the school and neighbourhood environments. These findings suggest that policy makers must consider the importance of psychosocial and built environment resources in enabling young people's physical activity participation.

Various studies have suggested that interpersonal and structural constraints such as age, gender, lifestyle, occupational status and income, have a more significant relationship with participation levels than intrapersonal constraints (Alexandris and Carroll, 1997; Carroll & lexandris, 1997; Shaw, Bonen & McCabe, 1991). While Alexandris et al. (2002) found that the main participation constraints were intrapersonal, it can also be seen that interpersonal and structural constraints regularly prevent participation in physical activity. For example, low incomes can impede the payment of fees, while also making it difficult to pay for transport to and from sporting facilities. This constraint becomes even more significant when there are no facilities in the surrounding neighbourhood, and travel costs are high.

3.5 Differences in Constraint Variables Among Social Demographics

Research in the physical activity and public health field indicates that there are differences in constraint variables on physical activity participation depending on social demographic variables such as age, gender, race, region, ethnicity and education. The most commonly used demographic factors to identify the differences in constraints

between samples is age (Budruk, Cowen, Yoshioka & Kulinna, 2009; Casper et al., 2011; Davey, Fitzpatrick, Garland & Kilgour, 2009; Humbert et al., 2008; Kubayiet al., 2013; Son, Kerstetter & Mowen, 2008).

In general, research findings have indicated that constraints are not similarly experienced by all ages. Casper et al. (2011) examined the perceived constraints to sport participation among middle-school students from four schools. Nearly 2,500 participants completed a web-based survey, which found significant differences in constraints to physical activity and sport participation among different age subgroups. Biddle et al. (2011) found that different categories of constraints were related to individual psychological factors among different age groups. Some studies confirmed that differences of constraints level on physical activity participation can be related to age differences (Casper et al., 2011; Jackson, 1993). Son et al. (2008) investigated the relationship between age, gender, leisure constraints and physical activity participation. They speculated that, while there are no differences between older and younger groups, the exact nature of the constraints which each group faces will differ. For example, members of an older age group might face a greater lack of time (for example, due to employment or family commitments) than members of the younger group.

The influence of grade level differences on perceived constraints was examined by studies of high school students. Humbert et al. (2008) examined the intrapersonal, social, and environmental factors influencing youth physical activity using a qualitative ecological framework. He used a sample of160 students from four high schools (grades 9 to 12) and five middle schools (grade 7 to 8) located in a mid-sized Canadian city. This study found several differences in constraints among students in grades 11 and 12. The study suggests that part-time employment among secondary school youth is a major reason for decreased involvement in physical activity. The study also suggests that

middle-school educators should work to ensure that their students understand that leading a physically active lifestyle can benefit all aspects of their health and well-being.

Allison et al. (1999) found that the nature of the constraints faced by high school students in different grade levels was different. For example, students in grade 9 faced constraints such as a lack of support from family and friends and a fear of injury. Students in grade 11 were constrained more by cost and a lack of time (for example, due to study and work commitments). These findings are in line with the study by Bulent et al. (2010) who found that students in different grade levels faced different constraints to physical activity, such as individual psychology, access to facilities and services, and time constraints. According to Tae (2007), there is a shifting relationship between leisure constraints and social demographics among city dwellers in Washington DC. A lack of time is the main constraint for individuals with higher education and incomes, while individuals with lower educational qualifications faced parking and transportation problems. For example, these individuals may have been on lower incomes, which prevented them from purchasing cars and using transport.

In conclusion, constraints will differ according to factors such as age, grade level, level of education, and income. For example, as discussed above, members of older groups face greater time commitments (for example, related to employment and family) than members of younger groups. People on lower incomes are less likely to be able to afford memberships to sporting facilities, or the transport to travel to these facilities, than their higher-income counterparts.

3.6 Chapter Summary

The objective of this Chapter was to demonstrate the importance of understanding how participation in physical activity and sport is shaped by leisure

constraints. This review provided insights into the range of variables that must be addressed in order to undertake a scholarly analysis of the topic. This is particularly important when tackling the vexing issue of adolescent involvement, and doubly important when focusing on Saudi Arabian high school students' participation in physical activity.

As Chapter 2 highlighted, there is significant concern about low levels of participation in physical activity, as well as concern about the increasing level of inactivity among children and young people. Physical activity participation among adolescents is influenced by a complex mixture of variables, including intrapersonal, interpersonal and structural constraints. The decline of physical activity participation during high school years has been considered to be related to a range of factors, including lack of time and a lack of neighbourhood facilities in which to undertake physical activity. The problem of low levels of physical activity participation has not only become an important leisure studies research issue, but also an important public health research issue.

The chapter has clarified the research related to constraints, and it has explained the background to the thesis objectives in order to compare and contrast the findings of the current study. To better understand why individuals do not participate in physical activity and sport, the major influences were classified into three main categories. In terms of the constraints on physical activity participation, the current literature has mainly focused on three constraint dimensions: intrapersonal, interpersonal and structural.

The relationship between constraints and physical activity participation is also influenced by an array of socio-demographic factors. Interpersonal and structural constraints, such as age, gender, lifestyle, occupational status and income, had a more

significant relationship with participation levels than intrapersonal constraints. There were significant differences in constraints to physical activity and sport participation among different age subgroups. Further, there were several differences in constraints among young people according to education level. However, the constraint problem is just one side of the participation coin. There are also many factors that 'attract' young people to physical activity experiences and sport programs, rather than pushing them away. Factors like improved bodily appearance, feelings of competence, satisfaction, and social connectedness, can all motive people to become more physically active. These factors will be discussed in more detail in Chapter 4.

Chapter 4: Literature Review Part III: Motivations to Participation

4.1 Introduction

While chapters 2 and 3 identified factors that can inhibit participation in physical activity and sport, there are other factors that 'drive' participation. This chapter examines the relationship between motivation and physical activity and sport participation levels in more detail. Section 4.2 addresses the drivers, that is, the motivational factors that can increase levels of physical activity and sport participation. Section 4.3 addresses the different measurements of motivations. Section 4.4 explains the relationships between motivation and physical activity; and section 4.5 explains the relationships between motivation and constraints. The chapter ends with a summary of the key findings from the literature.

4.2 Motivations

As the previous discussion found, many factors have been used to explain why so many people decide not to, or why they find it difficult to, undertake a sport, exercise or physical recreation activity. Constraints to participation include lack of confidence, limited peer support, parental indifference, limited facilities and provision of services, and lack of time. However, there are many good reasons for being physically active; the evidence shows that physical activity and sport participation in adolescence contributes to physical, physiological ,psychological health and connected with their community (Eime et al., 2013; Sawyer et al., 2012; US Deparment of Health and Human Services, 2010; WHO, 2015).

Numerous studies have found that regular participation delivers many positive effects, including improvements in overall health and well-being (Erdvik et al., 2014;

Chiu, 2009; Chiu & Kayat, 2010; Cooper et al., 2012; Iannotti,et al., 2013; Luka, 2013; Litt, Iannotti & Jing, 2011). However, an expected improvement in overall well-being is just one of many reasons why someone may want to engage in sport, exercise and physical recreation. There are many drivers—or what will henceforth be identified as motivators—that are brought to bear when a decision is made to become more active. Before proceeding, it is important to be clear about what motivation is about, and what it means. In the context of this study, motivation is defined as the factors that provide a catalyst for engaging in a behaviour that leads to increased levels of participation in physical activity and sport (Laverie, 1998; Sallis et al., 2000). Motivational factors include enjoyment, competence and social interaction (Cooper et al., 2012; Kang et al., 2012; Seghers et al., 2014; Sibley et al., 2013; Litt et al., 2011). Broadly speaking, motivation has been used not only to explain people's leisure behaviour (Boslaugh et al., 2005; Chiu, 2009), but also to illustrate what initiatives can be taken to encourage people to become more interested, involved and committed to an activity, program or social cause. Consequently, an individual's participation level in physical activity usually results from his or her own motivations (Chang, 2003; Havitz et al., 2013).

Another important thing to note about motivation in physical activity and sport is that it often differs markedly between different classes and groups of people. For example, social motivation was found to be a stronger motivation for girls, while and achievement motivation was a stronger motivation for boys (Iannotti et al., 2013; Soares, Antunnes & van den Tillaar, 2013). It is also important to note that studies have shown that motivation can be both intrinsic and extrinsic. Both are important and are differentially associated with levels of participation and satisfaction (Buckworth, Lee, Regan, Schneider & DiClemente, 2007; Cooper et al., 2012; Seghers et al., 2014; Luka, 2013).

A number of theories have been used to frame the analysis of motivation in physical activity and sport. Researchers have analysed motivation from many theoretical perspectives, Three such approaches are cognitive, self-determination and drive (Frederick & Ryan, 1993).Cognitive theory holds that the primary source of motivation is intrinsic motivation, which is stronger in reinforcing behaviour compared to extrinsic motivation (Edmunds, Ntoumanis & Duda, 2007; Williams & Gill, 1995). For instance a high school student with a passionate commitment to football may be more motivated to continue playing, relative to other students who may also be involved, but only for some ephemeral social connection that may occur.

Self-Determination Theory (SDT) assumes that individuals have both internal and external locus of control. Internal locus of control makes a person feel they are the initiator and sustainers of their own actions - thus feeling the emergence of self-determination based on their own choices, values, and interests. Whereas those with an external perceived locus of causality experience their behaviour as controlled by some external event, person, or force. For example, a basketball player who competes in a game because of the pressures from the coach or need for status or approval from family or friends is said to be extrinsically motivated. The focus of the theory is that the internal locus is connected with intrinsic motivation, while the external locus is connected with extrinsic motivation (Ryan & Deci, 2000; Slate & Slate, 2014). SDT identifies three needs requiring satisfaction: (1) Competence: succeeding in what you do (2) Relatedness: connecting with others (3) Autonomy: being in control of your life. The theory has been applied to a wide range of physical activity contexts including recreational exercise, weight loss programs and clinical populations, and across a range of ages (Fortier, Duda, Guerin & Teixeira, 2012; Hagger & Chatzisarantis, 2007; Kilpatrick et al., 2002; Ryan & Deci,2000; Teixeira et al., 2012).

Markland and Ingledew (2007) maintained that different participation motives carry different functional significance depending on their intrinsic extrinsic orientation. An adequate understanding of the goal orientations will, therefore, aid health practitioners provide individuals with accurate advice to engage in appropriate activities thereby maximising their satisfaction.

The drive theory was first addressed by Clark Hull in 1943, who considered that internal wants and needs are a necessary criterion for any sustained behaviour to occur, and for learning to take place (Chang, 2003). The theory attributes behaviour to the desire to reduce tension produced by primary (biological) and or secondary (accrued) drives. All human behaviour could be attributed to the pleasure gained when those drive-induced tensions are reduced. The weaknesses of this theory are that it failed to explain human actions that produced, rather than reduced tension. For example many teenagers enjoy riding roller blades or skydiving despite the fact that those activities may cause fear and anxiety related to potential injuries (Gardner, 2000; Levine & Leven, 2014; Madsen, 2013).

Motivation in the physical activity domain has been identified as a key factor in the initiation and continuation of physical activity levels, frequency and positive effects (Chiu, 2009; Elijah & Eric, 2012; Sibley et al., 2013; Frederick & Morrison, 1996). Therefore, it is important for this research project to clearly understand what motivates young people to participate in physical activity programs. This is particularly relevant to the topic of this thesis, as there is evidence of low levels of participation among school students not only around the world, but also in Saudi Arabia.

A broad range of studies has been undertaken on youth and adolescent involvement in sport and physical recreation, and an impressive list of motivational factors has been identified. However, the most frequently cited motives for youth

participation are: fun, skills development, challenge, fitness, opportunity to make friends, coping with moods and stress, and socialisation (Cooper et al., 2012; Chiu & Kayat, 2010; Chiu, 2009; Seghers et al., 2014; Weiss, 1993). Moreover, people who are highly motivated are also very systematic and rational in the ways they approach their sport and physical recreation experiences. They will make time to prepare for an activity, they will change their own timetable if required, they will create time, and they will, in many instances, organise with others to enjoy the sporting experience in a group setting (Lapointe & Perreault, 2013; Owen et al., 2014). According to drive theory there is also evidence that building motivation in childhood and early adolescence is crucial to continued participation in future life (adulthood). This is because habits learned in childhood continue through to adulthood. Moreover, sedentary living early in life may lead to inactive habits in adulthood (Côté & Mallett, 2012; Perkins, Jacobs, Barber & Eccles, 2004; Hardcastle & Hagger, 2011).

4.3 Measurement of Motivation

The following section highlights how different researchers have applied and used various questionnaires to develop standardised instruments for examining participation motives. Two commonly used questionnaires are the Exercise Motivation Inventory (EMI) and Behavioural Regulation in Exercise Questionnaire (BREQ) – both of which have been used for many decades across multiple populations, resulting in high validity and reliability scores (Egli et al., 2011; Standage et al., 2012; Silva et al., 2010).

EMI developed by Markland and Hardy in 1993 examined reasons for engaging in exercise consisting of 12 subscales - namely, stress management, weight management, recreation, social recognition, enjoyment, appearance, personal development, affiliation, ill-health avoidance, competition, fitness, and health pressures.

Previous EMI studies have reported good validity scores (Egli et al., 2011; Markland et al., 1992; Silva et al., 2010; Ingledew, Hardy & De Sousa, 1995). On the negative, EMI has failed to assess fitness-related reasons for exercising (strength, and endurance) while being blamed for catering to only to individuals who currently exercise. As a reaction the mentioned weaknesses, a 69- item Exercise Motivation Inventory-2 (EMI-2) was modified by Markland & Ingledew (1997). It added a positive fitness scale while splitting the fitness co-variable into strength, endurance and nimbleness. The scale contains 51 items relating to: affiliation, appearance, challenge, competition, enjoyment, health pressures, ill-health avoidance, nimbleness, positive health, revitalisation, social recognition, strength and endurance, stress management, and weight management. Considering the 51 items, the new version is lengthier (which may lead to boredom and fatigue) and also still does not acknowledge participation motives related to the competitive aspects of appearance found in other studies on exercise (e.g., Rogers, Tammen & Morris, 1999).

Behavioural Regulation in Exercise Questionnaire developed by Mullan, Markland and Ingledew (1997) was designed to measure self-determined motivation in physical exercise – with co-variables such as external, interjected, identified and intrinsic regulation. BREQ has previously been used by Ingledew, Markland and Shepard (2004), Landry and Solmon (2004), Marklandand Tobin (2004), Mullanand Markland (1997). It was later revised and updated by Markland and Tobin (2004) by adding one more factor (amotivation) to the previous four. The new version of BREQ-2 scale has 19 items, compared with 15 in the original scale, which measure the stages of the self-determination. Since then, BREQ-2 has been used by some researchers resulting in good psychometric measurements (Barbeauet al., 2009; Jackson et al., 2013; Wang, 2004; Wilson & Rodgers, 2004). Some studies have found favourable validly score such

as Standage et al. (2012) – ranging from .70 to .89. One big drawback of this instrument is that it is mainly applied to already existing physical activity participants in universities or schools thereby neglecting non-participants and the general population (Duncan et al., 2010; Teixeira et al., 2012; Murcia et al., 2007; Ingledew et al., 2009).

As with constraints, a clearer understanding of how motivators work in different sporting and recreational situations can be achieved by developing systems for classifying them, and for placing them into distinctive groups. According to Frederick and Ryan (1993) it is important to group major influences under three main categories to better understand why individuals engage in physical activity and sport. Frederick and Ryan's (1993) motivation for physical activity motivation (MPAM) model includes 23 items measuring three main dimensions. These categories, listed in Figure 4.1, are: (1) body-related dimension, which refer to the desire to develop one's physical appearance and level of fitness; (2) competence dimension, which refer to skills development, competition and challenge; and (3) intrinsic dimension, which refer to the fun and enjoyment that can be derived from participation in sport and physical recreation. These three dimensions can then be used to build a model of sport and physical recreation participation along the lines of the hierarchical model of leisure constraints referred to in Chapters Two and Three (Alexandris & Carroll, 1997; Crawford et al., 1991; Hubbard & Mannell, 2001; Stodolska, 2000).

In this study, motivating factors will be examined from three perspectives. They are first, body-related motivation dimension; second, competence motivation dimension; and third, intrinsic motivation dimension. Frederick and Ryan (1993) adopted this approach in their analysis of physical activity and sport participation to enable the researcher to categorise intrinsic and competence factors as intrinsic motivation, and to use body-related factor as examples of extrinsic motivation. This also

means that intrinsic and competence motives will be associated with greater satisfaction, and a feeling of confidence in one's activity. Previous research confirms that these three factors are significant influences on adolescents' physical activity and sport participation levels (Cooper et al., 2012; Sibley et al., 2013; Vasickova et al., 2014). The details of the model are illustrated below, in Figure 4.1.

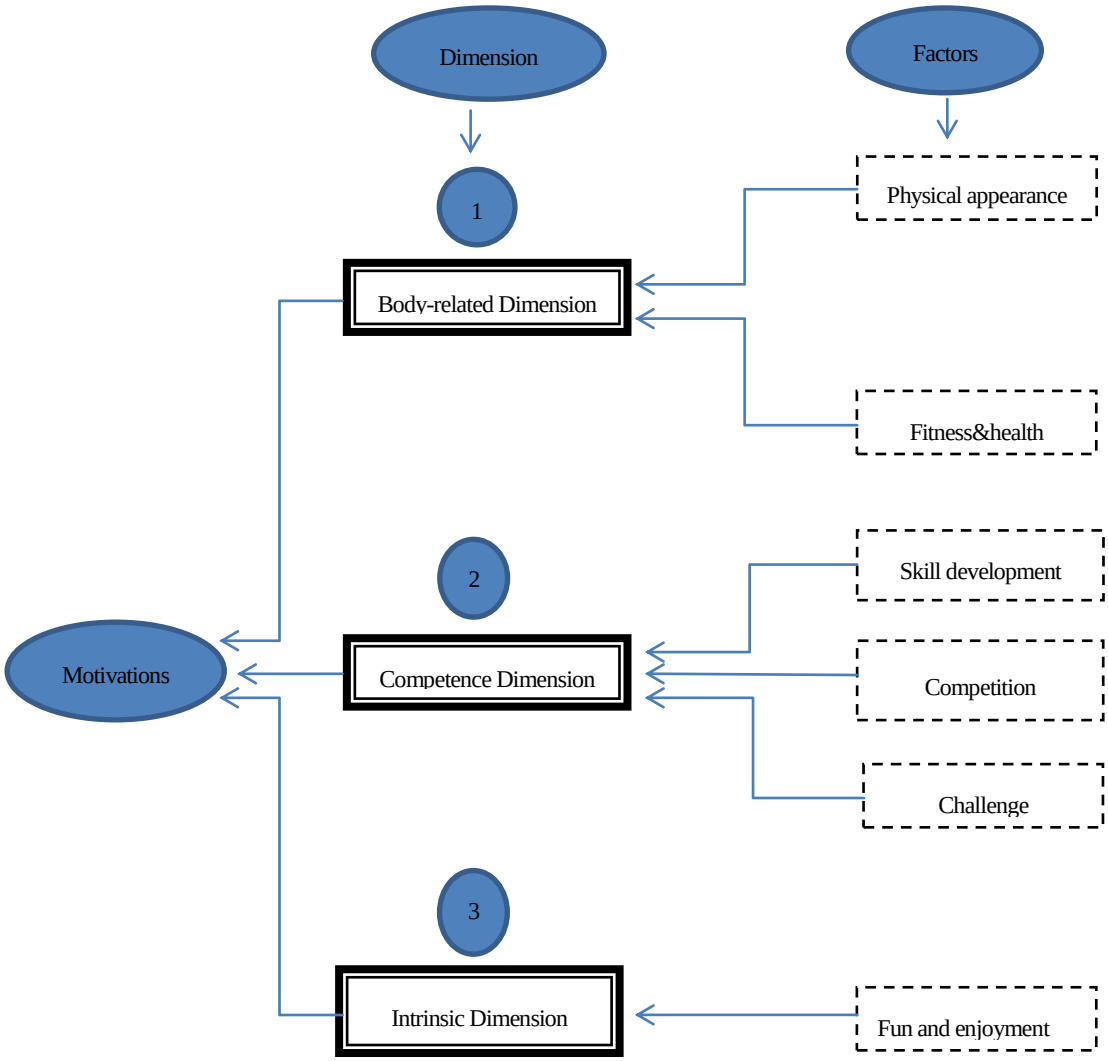


Figure 4.1. Three-pillar Motivation Dimensions (Frederick&Ryan, 1993).

The above model will be used to frame the following discussion of motivation. The concept of motivations has been examined for nearly two decades. Previous research has investigated each of these three motive dimensions and found them all to

be significant influences on adolescents' physical activity participation levels. It has been used successfully in many similar research projects. It is comprehensive, and covers all the motives for participation in sport and physical activities. The adaptation of the (MPAM) questionnaire is based on the fact that it captures the hypothesis of this study relating to body-related, competence, and intrinsic factors. The MPAM has also been used by a range of relevant other studies so it provides an established framework to compare to this study's results (Cooper et al., 2012; Chiu, 2009; Chiu & Kayat, 2010; Martens & Webber, 2002; Ryan et al., 1997; Jung-Woong et al., 2009). A detailed analysis of each motivation dimension is provided in the following sections.

4.3.1 Body-related motivation dimension.

Research indicate that there are several factors related to body image such as – appearance, health and social approval – which are further interconnected to fitness and appearance (Sibley et al., 2013; Iannotti et al., 2012; Litt et al., 2011; Orti & Donaghy, 2004). Furthermore people who participated in fitness activities had higher levels of body-related motivation (Frederick & Ryan, 1993) with poor body image linked to physical appearance being attributed to loss of interest in participation and fitness.

First, appearance – a factor that has been found to be more important to women than men possibly due to societal pressure (Frederick&Ryan, 1993; Kilpatrick et al., 2005). A study conducted in Poland by Vasickova et al. (2014) evaluated five different motives to participating in physical activities across 814 respondents aged 14-26 years old using Motives for Physical Activities Measure–Revised (MPAM-R) questionnaire developed by Ryan et al. (1997). For both genders, physical fitness was the most important motivating factor. Among the female respondents, appearance was also ranked highly, with males disclosing that interest and enjoyment were their main motives for participating in sport. This suggests that physical appearance and body

norms have a stronger impact on females than males. However, this study does have some potential weaknesses. These include the fact that respondents were not asked to specify the sport that they had in mind when they responded to each item.

Second is health and fitness factors (Ball et al., 2014; Cecchini et al., 2002; Hannus & Laev., 2011; Kilpatrick et al., 2005; Soares et al., 2013; Vasickova et al., 2014). Again, gender differences are apparent. For example, Cecchini et al. (2002) and Vedul & Kjelsås et al.(2012) found that boys placed more emphasis on health as a motivator. While, social relations were relegated to the position of least important motivator. Kilpatrick et al. (2005)found that when gender categories were sidelined, the strongest motives related to exercise behaviour among respondents were health and appearance using a modified version of EMI-2. One key advantage of this study was that the researchers distinguished between intrinsic motives (enjoyment and challenge) and extrinsic motives (appearance and weight loss) as following each other in levels of importance. The study concluded by suggesting that sport participation is linked to motivational strategies for physically active lifestyles than exercise. One limitation of this study is that it may not be general sable as the researchers used a small sample mainly from a class of students of Kinesiology. These students are (unlike the general population) already self-motivated towards physical activity. Similarly Ball et al. (2014) used EMI-2 to measure motivation of physical activity participation among adults – finding that the primary motive for participation was appearance, health benefits, stress and weight management.

Hannus and Laev (2011) investigated the motives of aerobics participants in relation to the perceived and preferred leadership behaviour of aerobics instructors. The study used a modified version of the Estonian Exercise Motivation Questionnaire-2. Data were collected from cross-sectional survey in 7 exercise clubs from 87 aerobics

participants (aged between 16–59 years old). The findings were that in aerobics participants, appearance and health-related factors are ranked higher than other motives such as enjoyment.

All the above studies differ in terms of methodological approaches and motivations measures used with body-related factors being the main motivation for young and older adults to participate in physical activity. In may be important for schools and communities to tailor their physical activity programs towards motivating peoples towards bettering their health and fitness which can also lead to better appearances (satisfactory body image).

4.3.2 Competence motivation dimension.

Perceived competence plays an important role in motivating people to engage in physical activities and sport (Barnettet al., 2013; Deci & Ryan, 2008; Frederick & Ryan, 1993; Ntoumanis, 2001; Stoddenet al., 2008; Sibley et al., 2013). In the sports behaviour field, competence is essentially about skill development, competition, and challenge (Frederick & Ryan, 1993). While perceived competence is an important motivator, it can be rated differently among different cohorts of participants. For example, a number of studies found that boys had a higher perceived competence than girls (Cooper et al., 2012; Erdvik et al., 2014; Sabiston & Crocker, 2008; Vedul-Kjelsås et al., 2012). Perceptions of competence also influence how people assess the quality of their leisure experiences. According to Frederick & Ryan (1993), perceived competence is a common thread in studies that found high levels of participation among young people. This, together with skill acquisition, is a predictor of who is most likely to continue participation in a sport or physical recreation program in the longer term. Consequently, perceived physical competence was a significant variable in explaining

differences in young people's preparedness to engage in physical activity and sport (Deci & Ryan, 2008; Frederick & Ryan, 1993).

Several studies have also confirmed that people who received higher levels of support from others – including parents, peers and coaches - translated this support into higher levels of perceived competence. In turn, higher levels of perceived competence directly influenced children's attraction to physical activity and sport (Seabra et al., 2013; Weiss, 2000; Welk, Wood & Morss, 2003; Deci & Ryan, 2008; Frederick & Ryan, 1993).Thus, ' support' seems to be a pivotal influence, since it becomes a catalyst for the acquisition of additional positive feelings toward physical activity and sport participation.

Seabra et al. (2013)evaluated an adapted version of the Youth Physical Activity Promotion model in order to understand the predisposing, enabling, and reinforcing factors influencing physical activity behaviour, using a random cross-sectional sample of 683 children (8–10 years of age) selected from 40 public elementary schools in Portugal. This study found that parental influence positively and directly influenced children's physical activity. Children who received higher levels of parental encouragement had greater levels of perceived physical competence. In turn, this led to increases in physical activity participation. Similarly, Woods, Bolton, Graber & Crull et al. (2007) examined the influences of perceived motor competence and motives on children's physical activity using a mixed methodology approach. Competence was measured by using MPAM-R and the Perceived Competence Scale (PCS) developed by (Williams, Freedman & Deci, 1998). In this study, 49 students aged from 7 to 12 years from 16 school districts located in the Midwest were selected. This study found that competence was the second highest–ranked motivational factor by both MPAM-R and PCS scales. Based on these results, researchers suggested that children need more

encouragement from adults in their lives (parents and PE teachers) to enjoy physical activity, while increasing their perceived competence. This finding is consistent with a study by Ryan et al. (1997) who found that participants (who were university students) confirmed that enjoyment and competence were the strongest motivating factors for physical activity.

Similarly, Cooper et al. (2012) found that participants aged 20 years or younger had high mean scores in motives of competence using SDT and a modified version of the MPAM. One limitation of this study was that it had an unequal sample with the size of the group sample not equally distributed, that is, only recreational programs were observed. The study was conducted in the winter season only, thereby making it difficult to compare the possible effects on participants of climate or temperature changes. A future study might wish to analyse variables such as the history of intramural participation in sport.

4.3.3 Intrinsic motivation dimension.

Intrinsic motivation has been defined as the desire to do something based on the inherent enjoyment or satisfaction derived from the behaviour itself. Conversely, extrinsic motivation has been defined as the desire to perform a certain behaviour based on the potential rewards that may be received as a result (Deci & Ryan, 1985). In many health and leisure studies, researchers have reported that intrinsic motivation is the main determinant of physical activity participation (Bagoien & Halvari, 2005; Buckworth et al., 2007; Cooper et al., 2012; Luka, 2013; Tsorbatzoudis, Alexandris, Zahariadis & Grouios, 2006).

Many studies of physical activity and sport view the concept of ‘enjoyment’ in much the same way. ‘Enjoyment’ is most commonly defined as ‘a positive affective response to sport experience that reflects generalised feelings such as pleasure, liking,

and fun'(Scanlan & Simons, 1992, pp. 202–203). In general populations the enjoyment factor is not only a necessary component of intrinsic motivation, but also a determinant of continued participation and adherence in physical activity and sport (Carroll & Loumidis,2001; Frederick & Ryan, 1995; Luka, 2013; McCarthy, Jones & Clark-Carter, 2008; Robbins, Pis, Pender & Kazanis, 2004; Salmon, Owen, Crawford, Bauman & Sallis, 2003; Seghers et al., 2014; Sibley et al., 2013; Tao, Solmon, Kosma, Carson & Xiangli, 2011).

Moreover, some studies have found positive association between enjoyment and high levels of physical activity in youth (Cooper et al., 2012; Gao et al., 2013; MacPhail et al., 2008). Other studies, however, did not find a positive association between enjoyment and high levels of physical activity (Deflandre et al., 2001; Neumark-Sztainer et al., 2003). For instance, Fitzgeraldet al. (2012, p. 953), reported that having fun is an especially important part of adolescent peer group activity in that, "junior tennis players who had similar beliefs and interests, companionship, pleasant play, and conflict resolution with their best tennis friends perceived their experiences as more fun and pleasurable and were psychologically committed to continued participation in the sport". The influence of an individual's peer group was also noted by Hashim et al. (2008), who found that positive peer interaction was very important for enjoyment during physical activity participation, both within and outside school.

Like competence, the importance of enjoyment varies between different cohorts of participants, with younger participants rating it higher than those in older age groupings (Cooper et al., 2012; Ferrer-Caja & Weiss, 2000; Seghers et al., 2014; Litt et al., 2011). Whisenant and Jordan (2008) found that coaches played a critical role in influencing the level of an athlete's enjoyment. This indicates that positive engagement with a physical activity and sport programs may be a prime driver of participation.

Other drivers might include how motivated an individual is to participate in the sport. Similar results emerged from a study undertaken by Smith and St Pierre (2009), who examined the 'perception of enjoyment' factor in physical education classes among American and English secondary students. This study found that students who had strong and positive interactions with their teachers also reported high levels of enjoyment. Students stated that a strong sense of enjoyment was built in part upon personal relationship and other extrinsic, non-achievement related factors. Kohl (2002) recommended that sport administrators, parents, peers and coaches must aim to create environments that facilitated young people's enjoyment in physical activity and sport.

Further, sport researchers have found that a key factor for enjoying sport participation involves experiencing higher degrees of perceived competence, challenge and motor performance (Amorose & Horn, 2001; Sollerhed et al., 2008; Hashim, Grove & Whipp, 2008; McCarthy et al., 2008; Kang et al., 2012; Wiersma, 2001).A study by McCarthy et al. (2008) evaluated the sources of enjoyment among 152 youth sports participants using self-reported questionnaires. MANOVA was used to examine the developmental differences in sources of enjoyment among two groups (under 11)and over 11 – all aged 8-15 years old. The results were that older students reported greater enjoyment and referenced competencies and recognition to a greater extent than younger children. The participants in the above study reported high levels of self-referenced competency, affiliation with peers, competitive excitement, positive parental involvement and enjoyment.

The studies above confirm that there are a number of key factors that make physical activity and sport enjoyable. Frederick and Ryan (1993) also found that the interest/enjoyment factor was significantly associated with the number of hours of participation in sport and fitness groups. Litt et al. (2011) conducted a study to validate

a measure of external reward, health values, and personal interest motivations and levels of physical activity among a national representative survey of 9,011 American adolescents from grades 6-10. With the help of Confirmatory Factor Analysis (CFA) and structural equation modelling, the study found that having fun is a major reason for engagement in physical activity. This study had a number of limitations. The study relied on self-reports, and thus could be biased, and the weakness of using the self-report has been explained in chapter 2. The study was cross-sectional and this makes it impossible to discern temporal associations. However, a key strength of the study is that it involved a large national sample, thus making it general sable across the USA.

Seghers et al. (2014) used Goal content theory and SDT to test a motivational sequence involving 1,277 Flemish children's goals for leisure-time sports and PA. The analysis used Structural equation modelling(SEM) and Chi-square analysis. Overall, boys reported stronger intrinsic motivation than girls. The authors highlighted the importance of emphasising intrinsic goals, especially for 10-12 year olds. The limitations of this study included the use of cross-sectional design. This design prevents a causality conclusion between goals, regulations and physical activity. The second limitation of the study was the use of pedometers which do not measure exercise intensity. Furthermore many of the activities were predetermined, thereby negating the 'pure' influence of intrinsic motivation.

Similarly, Sibley et al. (2013) examined relationships between the exercise motives, exercise behavioural regulations and physical fitness of 194 college students using the MPAM-R. This study found that stronger intrinsic motivation directly influenced the performance of college students. This finding is consistent with other studies (Campbell et al., 2001; Ferrer-Caja & Weiss, 2000). Consequently, intrinsic

motivations are considered the dominant influence on people's desire to increase or maintain physical activity and sport participation throughout their adolescence.

An illustrative study was undertaken by Kilpatrick et al. (2005), who investigated the different motivations to participate in physical activity and sport with respect to male and female college students. This study found that both males and females were more likely to report intrinsic motivations for participating in recreational sport activities. The intrinsic motivators in this instance where the challenges involved in the physical activity and the enjoyment that followed this activity. All of the above-mentioned studies indicate that intrinsic factors offer the greatest motivation to participate in physical activity. Extrinsic motivation are generally performed to obtain a reward or outcome that is separate to the behaviour itself (Ryan et al., 1997). An example of this outcome could be improved physical appearance. A sample of the most frequently cited motivations for physical activity participation among young people is provided in Table 4.1.

There are no known studies of Saudi Arabia male youth motives for physical activity and sport. As a result, there is not much known about what motivates these young men to participate in physical activity. Thus, this research will make an important contribution to existing knowledge about the physical activity and sport motivations for male high school students in Riyadh.

Table 4.1

Most Frequently Cited Motivation Variables from Different Physical Activity

Dimension Findings	References
Body-related	Cecchini et al. (2002); Sores et al. (2013); Vasickova et al. (2014); Kilpatrick et al. (2005); Ball et al. (2014)
Competence motivation	Cooper et al. (2012); Woods et al. (2007)
Intrinsic motivation	Seghers et al. (2014); Fitzgerald et al. (2012); McCarthy et al. (2008); Kilpatrick et al. (2005)

4.4 Relationship Between Motivation and Physical Activity Participation Levels

Physical activity plays a crucial role in maintaining good health. The relationship between motivation variables and physical activity is a major issue in understanding both non-participation and participation in a cohort of adolescents (Lawman et al., 2011). The relationship between motivation variables and participation, and motivation and non-participation levels of physical activity has received considerable critical attention. For example, a number of studies have observed the relationship between motivation factors influencing physical activity participation levels among gender and age groups (Bopp et al., 2006; Campbell et al., 2001; Johnson, 2009; Litt et al., 2011; Richards, Reeder & Darling, 2004; Ryan et al., 1997; Jo Salmon, 2010). For example, Campbell et al. (2001) investigated age differences as motivating factors for participation in sport and exercise among older and younger adults, and found significant differences between age groups. Carraro, Young and Robazza (2008) also discovered gender differences in physical activity participation and levels of enjoyment among Italian students, with girls reporting lower enjoyment levels than boys.

Previous studies revealed a strong relationship between physical activity and motivation factors (Alexandris et al., 2011; Soares et al., 2013; Lannotti et al., 2012; Lerner et al., 2011; Litt et al., 2011; Lawman et al., 2011; Zhang et al., 2011). Litt et al. (2011) examined the relationship between social motivations, external motivations and health motivations for adolescent physical activity. The findings of this study confirmed that social motivations were positively associated with physical activity, but only for female adolescents. They also found a strong and positive relationship between physical activities and health motivation factor for all adolescents.

Lerner et al. (2011) examined the participation rates in and correlates of physical activity with other variables (motivations and barriers) among 532 students in colleges within Ireland. Using interviews to evaluate the correlation and MPAM-R to evaluate the strength of five motives for participating in physical activity. This study found that intrinsic motivational factors (e.g., fun (37%) and enjoyment (29.9%)) were found to be primary positive correlates of physical activity/sport participation for both genders, but more so for the male respondents than the female respondents. The study had two main limitations. Firstly, the studied relied on self-reports, and these reports can contain an element of bias and self-censorship. Secondly, the sample was not distributed equally among males and females. The amount of time an individual spends undertaking physical activity is strongly influenced by factors such as enjoyment of the physical activity, health and other body motivation factors, social and achievement motives and the acquisition of new skills (Chen et al.,2007; Davey et al.,2009; Frederick & Ryan,1993; Iannotti et al., 2013; Kilpatrick et al.,2005).

Lawman et al. (2011) examined the effects of motivation, enjoyment and self-efficacy on physical activity among disadvantaged adolescents (e.g. those from low socioeconomic backgrounds), and found a differential association between those factors

and physical activity participation levels. This study demonstrated a positive trend for the effect of motivation on moderate to vigorous physical activity participation levels.

The above studies indicate that motivation tends to have substantial implications on the physical activity levels of an individual. Participants are more likely to report intrinsic motives with reference to enjoyment and challenge in the course of engaging in physical activity and sports. From this perspective, there is substantial need for the entities to focus on enhancing motivation to facilitate increased engagement in physical activities. It is essential to note that motives for sport participation are more desirable in comparison to those for exercise, and might facilitate improved adherence to the recommendations on engaging in the physical activities.

There is also evidence to show that external motivation does always lead to greater levels of participation. Iannotti et al. (2013) found a negative relationship between external motivation and physical activity participation, which suggests that internal motivation that involves and pleasure and enjoyment are mostly important to undertaking physical activity participation among adolescents. According to Iannotti et al. (2013), this was particularly noticeable amongst girls. This study confirmed that the health motive was related negatively to physical activity participation among early and middle adolescents from Western Europe. However, among Eastern European adolescents, the health motive impacted positively on physical activity participation. This suggests differences in health promotion between Western and Eastern Europe, that is, health promotion is possibly stronger in Eastern Europe. The current study examines how motivating factors for high school students in Riyadh City differ according to the region the students live in but the cultural differences are unlikely to be as distinctive as the European settings.

4.5 Relationship Between Motivations and Constraints

The relationship between constraints and motivation has also received attention from researchers in physical activity and leisure time participation. For example, Alexandris and Carroll (1997) noted that understanding the interaction between constraints, motivation and participation was necessary for both the removal of inappropriate constraints and the promotion of appropriate motivations. A number of studies have investigated the relationship between constraints and motivation, with some finding significant negative relationships. That is, the removal of constraints— for instance, the lack of a partner—will usually lead to an increase in motivation. This is because the availability of a partner will usually make an activity more enjoyable. In contrast, and unsurprisingly, more and stronger constraints were likely to lead to lower levels of motivation; this again constitutes a negative relationship (Alexandris et al., 2002; Jung-Woong et al., 2009; Alexandris et al., 2011; Alexandris et al.,2008).

Jung-Woong et al. (2009) investigated the constraints, motivation and physical activity participation levels among Korean youth. The results confirmed negative correlations between constraints and motivation. That is, as constraints accumulated, the motivation to participate in physical activity declined. Alexandris et al. (2011) also found that relationships between constraints, motivation and physical activity were also negative. That is, as constraints were dismantled, motivation to participate in physical activity mostly increased. He also found that a prior knowledge of an activity plays an important role in determining future participation in this activity. Alexandris et al. (2002) similarly found that persons who confirmed higher levels of intrinsic motivation, lower levels of extrinsic motivation and less perceived constraints, exhibited an increase in sport participation. These studies suggest that there is a significant negative relationship between constraints and intrinsic motivation.

At the same time, a few studies found no empirical evidence to support a negative relationship between constraints and motivation (Alexandris&Carroll, 1999; Alexandris, Funk & Pritchard, 2011; Hubbard & Mannell, 2001; Iso-Ahola & Mannell, 1984; Stodolska, 2000). For example, Hubbard and Mannell (2001) found that, despite the existence of constraints, a strongly motivated person is still likely to engage in physical activity programs. Their study found that participants who were motivated could negotiate the constraints they faced and increase their level of participation in physical activity over time.

This study hypothesises that there is a relationship between motivation dimensions and constraints, and physical activity and sports participation levels among Saudi Arabian male high school students. That is, high levels of motivation combined with a low level of constraints will lead to high rates of participation in physical activity. However, when high motivation is combined with a high level of constraints, the likelihood of increased participation becomes uncertain. Conversely, low levels of motivation, even when combined with a low number of constraints, are still likely to lead to decreased participation.

4.6 Chapter Summary

Within this thesis, the objective of the literature review has been to critically examine the ways in which participation in physical activity and sport is shaped by leisure time motivational factors. This review has enabled the researcher to secure a sharper insight into to the multiple variables that must be addressed to undertake an appropriately scholarly analysis of the topic. This is especially important when tackling the vexing issue of adolescent involvement, and doubly so when focusing on high school students' participation in physical activity and sport in Saudi Arabia.

As Chapter 2 highlighted, there is significant concern about low levels of participation in physical activity, as well as the increasing level of inactivity, among children and youth. And, as Chapter 3 showed, physical activity participation among adolescents is influenced by a complex mixture of intrapersonal, interpersonal and structural constraints. This chapter examined the motivation issue. This is a crucially important to address, since leisure behaviour is determined by a complex array of constraints and motivational factors. To better understand why individuals participate in physical activity and sport, the major motivational influences were classified into three main categories. The three sources of motivations are: body-related dimension; competence dimension ; and intrinsic dimension.

Participation in physical activity can therefore be driven by a desire to improve 'body condition', especially when this leads to positive changes in body image and health enhancement. Hence, body-related motivations can reflect personal values, such as health maintenance. Perceived competence also plays an important role in motivating people to engage in physical activities and sport. Enjoyment is also an essential factor, and is embedded in most major sport motivation theories and scales as mentioned in this chapter.

Finally, this chapter examined relationships between motivations and constraints and physical activity participation. Understanding the interaction between constraints, motivation and participation is necessary to both remove appropriate constraints and promote appropriate motivations. It is also complex, since some studies showed the relationship was not always negative, which is to say that increasing constraints leads directly to a fall in motivation, while the removal of constraints will immediately increase motivation. As a result, to secure a better understanding of how all these factors are linked, and the relationship they have with each other, it is essential to provide a

conceptually integrated overview of constraints, motivations and participation factors relevant to the analysis. This will be done in Chapter 5.

Chapter 5: Conceptual Models of Participation in Physical Activity and Sport

5.1 Introduction

Based on previous empirical findings and theoretical frameworks, it is essential to have a conceptual model that illustrates the inter-connectedness of the main variables viewed as essential to this study. These variables include the constraints on, and motivations for, physical activity and sport participation levels among male high school students in Saudi Arabia. The literature proposes that various constraint and motivation variables will influence people's physical activity and sport participation levels. The first part of the framework explains how the interaction between constraints and motivations shape overall levels of participation in physical activity and sport participation. The second part of the conceptual framework provides space for a discussion of the constraints on physical activity and sport participation. The third part discusses motivations for physical activity and sport participation.

5.2 Building a Conceptual Model of Participation

As Chapters Two, Three and Four illustrate, there are multiple variables that shape people's patterns of sport and physical recreation participation. While it is important to be aware of these variables, and to understand how they influence people's decisions to participate or not participate in physical activity and sport, it is also imperative to conflate these variables into coherent and manageable categories. One way of doing this is to construct a model that not only sorts the variables into meaningful clusters, but also demonstrates the ways in which one cluster affects the others, how a change in one cluster-element might affect some other element, and finally how their interdependent interactions shape overall levels of participation.

There are a number of frameworks that would be used to examine physical activity participation. One commonly used one is the Behavioural Epidemiology Framework (BEF). BEF describes how basic and applied research on physical activity and health may be used to inform the development of programs aimed at promoting physical activity interventions and public health policy (Sallis & Owen, 1999; Sallis et al., 2000). It illustrates a systematic method of categorising current health-related research (e.g., PA, nutrition, smoking cessation) through the following research phases:

1. Establish the links between physical activity and health.
2. Evaluate interventions to promote physical activity.
3. Identify factors that influence physical activity habits.
4. Develop methods for accurately measuring physical activity.
5. Translate research into practice.

Using third approach, researchers can shift their focus to phases that may be underrepresented and warrant further investigation. Moreover, the phases outlined in the framework are generally sequential, building on the previous stage. The particular focus of this study, is however, to investigate the factors (constraints and motivation) that affect physical activity and sports participation in high school students. Three of the BEF steps are applicable to the current research. Phase 2 (development and application of methods for measuring physical activity), phase 3 (factors influencing physical activity) and phase 5 (recommendations on policy solutions) are applied in the current research. Phase 1 (establishing links between physical activity and health) is not investigated in the current research because in this study just focus in what factor that influencing the physical activity participation level such as constraints as decreasing the participation levels and motivations factors increased the participation levels; and Phase

2 (evaluating interventions to promote physical activity) is beyond the scope of the current research.

The socio-ecological model (SEM) - which was briefly reviewed in Chapter 1 - is another common framework that is used to guide research about physical activity participation. The social-ecological model is conceptually strong because it provides space for an array of interdependent factors to be considered (refer to Section 1.2.5 for the explanation of this model) (Bauman et al., 2012; Li & Rukavina, 2012; McGannon et al., 2014; Sallis, et al., 2000), This model is applicable to this currently study because of its capacity to include issues about constraints and motivation, especially dimension 3 in the SEM includes structural conditions, which range from physical and environmental factors like access to resources, infrastructure and facilities. However, it is also clear that the inclusion of political, cultural and economic variables in this study would stretch the project to breaking point from a methodological and analytical perspective. Thus, these factors were not included in the study.

The literature reviewed in earlier chapters of this thesis was used to design a model that would allow for an integrated, but critical analysis of physical activity and sport participation in Saudi Arabia. The model draws on a combination of established measurement scales to examine the levels of physical activity, constraints, and motivations on physical activity and sport for a sample of high school students in Saudi Arabia.

In accordance with the structure of other related studies, this research project requested the respondents reveal their patterns of participation over the course of the previous 7 days and to rate the constraints and motivation variables that they believe shaped their participation. They were then asked to provide socio-demographic data that was used to match their patterns of participation to their socio-demographic profiles.

Their socio-demographic profiles were used to assist in explaining the constraints and motivations they encountered, and how they influenced the patterns of participation in physical activity and sport programs.

5.3 Measuring Participation

The first part of the conceptual framework of this study is the concept of physical activity participation levels. This concept has been used in many previous studies via the Physical Activity Questionnaire for children and adolescents within seven days recall (Booth et al., 2002; Countryman et al., 2013; Godin, 2011; Morrow et al., 2013; Ridgers et al., 2012). A number of other instruments have been developed to measure physical activity participation levels and are explained in chapter 2.The Physical Activity Questionnaire was chosen for this study because it allowed for the collection of data that covered all aspects of leisure-based physical activity, and provided for the inclusion of specific sport activates and exercise programs.

There are four measurable items of self-report physical activity: duration, frequency, intensity and type of physical activity or sport variable (Bauman, Phongsavan, Schoeppe&Owen, 2006). Three of those four measures—duration, frequency and type of physical activity were used to measure physical activity levels in this study (Type of physical activity was used to measure the intensity via the activity's MET value. This is explained in detail in Chapter 6) . They are the most common variables used to measure physical activity and sport participation levels (Bauman et al., 2006; Booth, Okely et al., 2002; Godin & Shephard, 1985; Trinh, Nguyen, van der Ploeg, Dibley & Bauman, 2009; WHO, 2010a). Figure 5.1illustrates the variables used to measure physical activity and sport participation and the demographic variables that (explained in chapter 6) were explored in this study. The impact of constraints (Bulent et al., 2010; Casper et al., 2010; Palen et al., 2010) and the influence motivation

(Frederick & Ryan, 1993) are explained in the following sections and will be incorporated in the conceptual model.

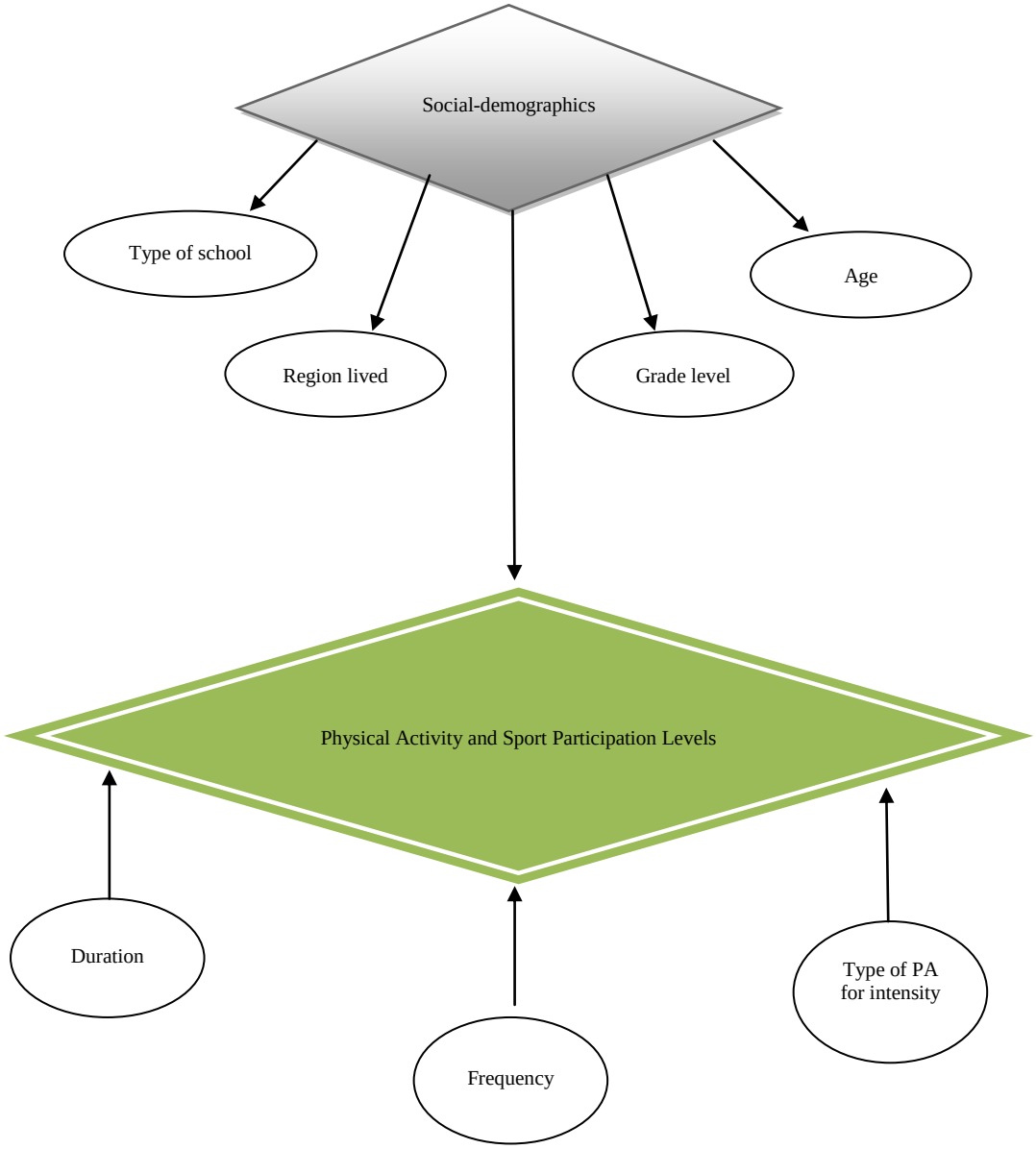


*Figure 5.1.*Framework of this study (relationship between physical activity participation levels and demographic variables).

5.4 Measuring Constraints

The second part of the conceptual framework provides space for a discussion of the constraints on physical activity participation, and includes the three independent dimensions of intrapersonal, interpersonal and structural constraints. These were

measured by applying the model developed by Alexandris and Carroll (1997), where 29 items measure seven factors through three dimensions. The dimensions are: (1)interpersonal constraints, which include individual psychological elements, lack of knowledge, lack of interest; (2) intrapersonal constraints, which include lack of partner and friend encouragements; and (3) structural constraints, which include facilities/services, accessibility/financial and time. The questionnaire used a five-point Likert-type scale that ranged from 'strongly agree'(value=1) to 'strongly disagree'(value=5).

As explained in detail in Chapter 3, constraints are 'factors that are assumed by researchers and perceived or experienced by individuals to limit the formation of leisure preferences and to inhibit or prohibit participation in leisure activities'(Jackson, 1991, p. 279). The popular models of constraints proposed by Crawford and Godbey (1987) and Crawford et al. (1991) posit that multiple facets influence levels of participation in physical activity and sport. Alexandris and colleagues developed an instrument for evaluating constraints on participation of physical activity via age in various samples, and found support for its theoretical usefulness (Alexandris et al., 2002; Alexandris et al., 2003; Alexandris & Carroll, 1997).

The model for this study uses three dimensions of constraints: these are first, interpersonal constraints; second, intrapersonal constraints; and third, structural constraints. Intrapersonal constraints relate to psychological state, attributes, characteristics and the person's state of mind. In addition, they interact with leisure preferences rather than intervene between preferences and participation. An intrapersonal constraint could be stress, depression, worry, religiosity and someone feeling uncomfortable with their weight, and not wanting people to see their body (Crawford et al., 1991). Interpersonal constraints include factors that result from an

individual's interactions with two or more people. For example, an inability to find a partner to share activities is one type of interpersonal constraint, while the absence of friends might be another. This kind of constraint may interact with both preferences for and consequent participation. Finally, structural constraints are defined as environmental features, such as lack of resources and time (e.g., facilities, programmes and economic factors). These variables exist externally to the individual, as prevailing factors between leisure preference and participation (Crawford & Godbey, 1987; Crawford et al., 1991).

The three categories of constraints are ordered into a hierarchy. In other words, the constraint levels are arranged from most proximal (intrapersonal) to most distal (structural). Thus intrapersonal constraints are viewed as the most powerful deterrent to participation. This ordering highlights how a person needs to overcome personal reasons for participation before they worry about with whom they are going to participate and what structural supports are needed for them to participate in the activity (Crawford et al., 1991).

This measurement was adopted as a part of this research framework because it has been used successfully in many similar research projects. It is comprehensive, and incorporates the key constraints for participation in physical activities and sport (Crawford et al., 1991). Leisure Constraints Questionnaire‖ (LCQ) is relevant for the current research because has been used for adolescents (Casper et al.,2011; Palen et al., 2010) and students of local universities (Bülent et al., 2010; Shifman et al., 2012). Although the LCQ was developed in the 1980s, there are relevant studies from recent times (as cited above) that demonstrate its contemporary application. Figure 5.2 illustrates the application of the LCQ model's influence on levels of physical activity and sport.

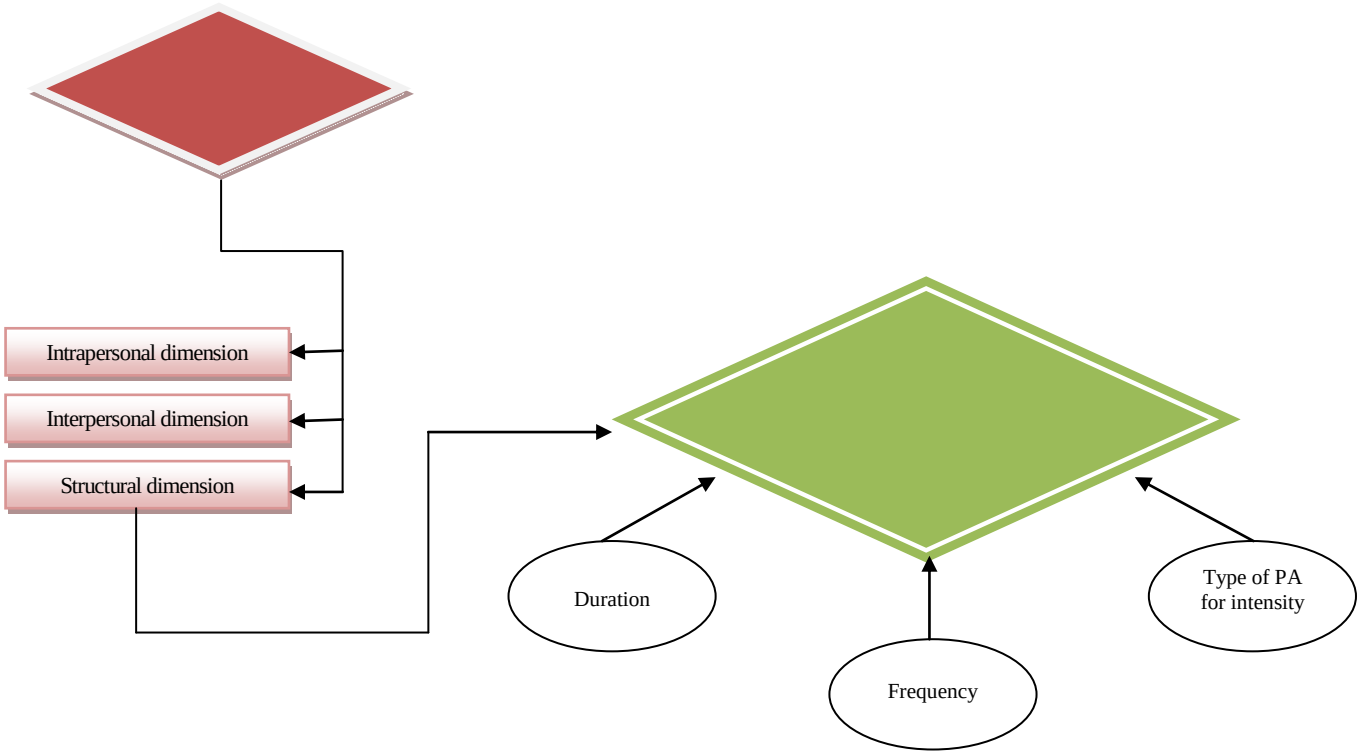


*Figure 5.2.*Framework of this study (relationship between constraints and physical activity participation levels).

5.5 Measuring Motivation

This study adopted the model developed by Frederick and Ryan (1993) which is a conceptual framework including motivation for physical activity and sport participation. Frederick and Ryan's (1993) motivation for physical activity motivation (MPAM) model includes 23 items measuring three main dimensions. The dimensions are: (1) body-related dimension, which includes physical appearance, fitness and health; (2) competence dimension, which includes skill development, competition, and challenge and (3) Intrinsic dimension, which include fun / enjoyment. The questionnaire used a five-point Likert-type scale that ranged from 'strongly agree'(value=1) to 'strongly disagree'(value=5).

This measurement was adopted as a part of this research framework because it has been used successfully in many similar research projects. It is comprehensive, and incorporates the key motives for participation in physical activities and sport (Frederick, Morrison & Manning, 1996; Jung-Woong et al., 2009; Ryan et al., 1997). MPAM is relevant for the current research because it has been used for adolescents (Frederick & Ryan, 1993); students of local universities (Cooper et al., 2012) and young people aged nine years and over (Koivula, 1999; Molanorouzi et al., 2014). Although the MPAM was developed in the 1990s, there are relevant studies from recent times (as cited above) that demonstrate its contemporary application. Figure 5.3 illustrates the application of the MPAM model's influence on levels of physical activity and sport.

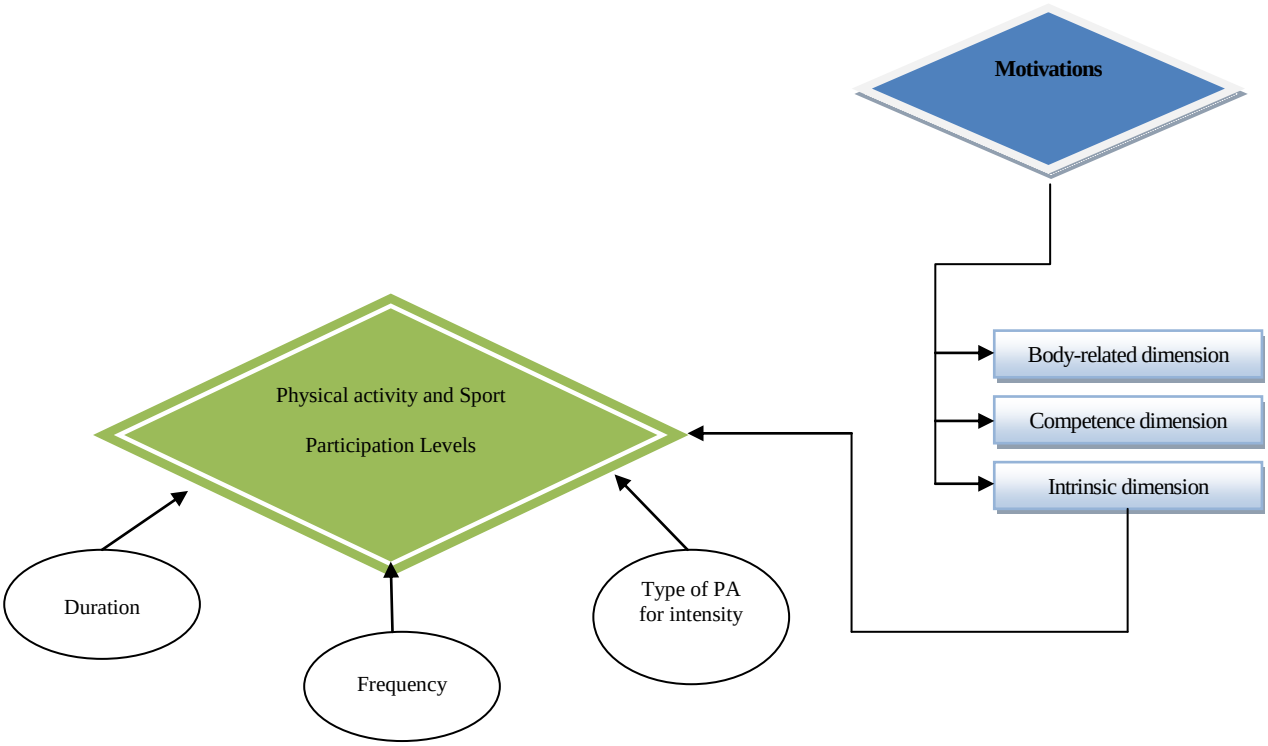


*Figure 5.3.*Framework of this study (relationship between motivations and physical activity participation levels).

5.6 Integrating the Variables into an Holistic Model

The levels of physical activity and the scales for constraints and motivation provided the ‘measuring sticks’ for this research. As Figure 5.4 shows, both constraints and motivation are multi-factorial, working to inhibit participation on the one hand, and providing a catalyst for participation on the other. It also provides for inter-activity to occur, where constraints can shape motivation, while motivation can shape the seriousness of the constraint. Finally, it gives space to socio-demographic factors that may moderate and mediate levels of participation.

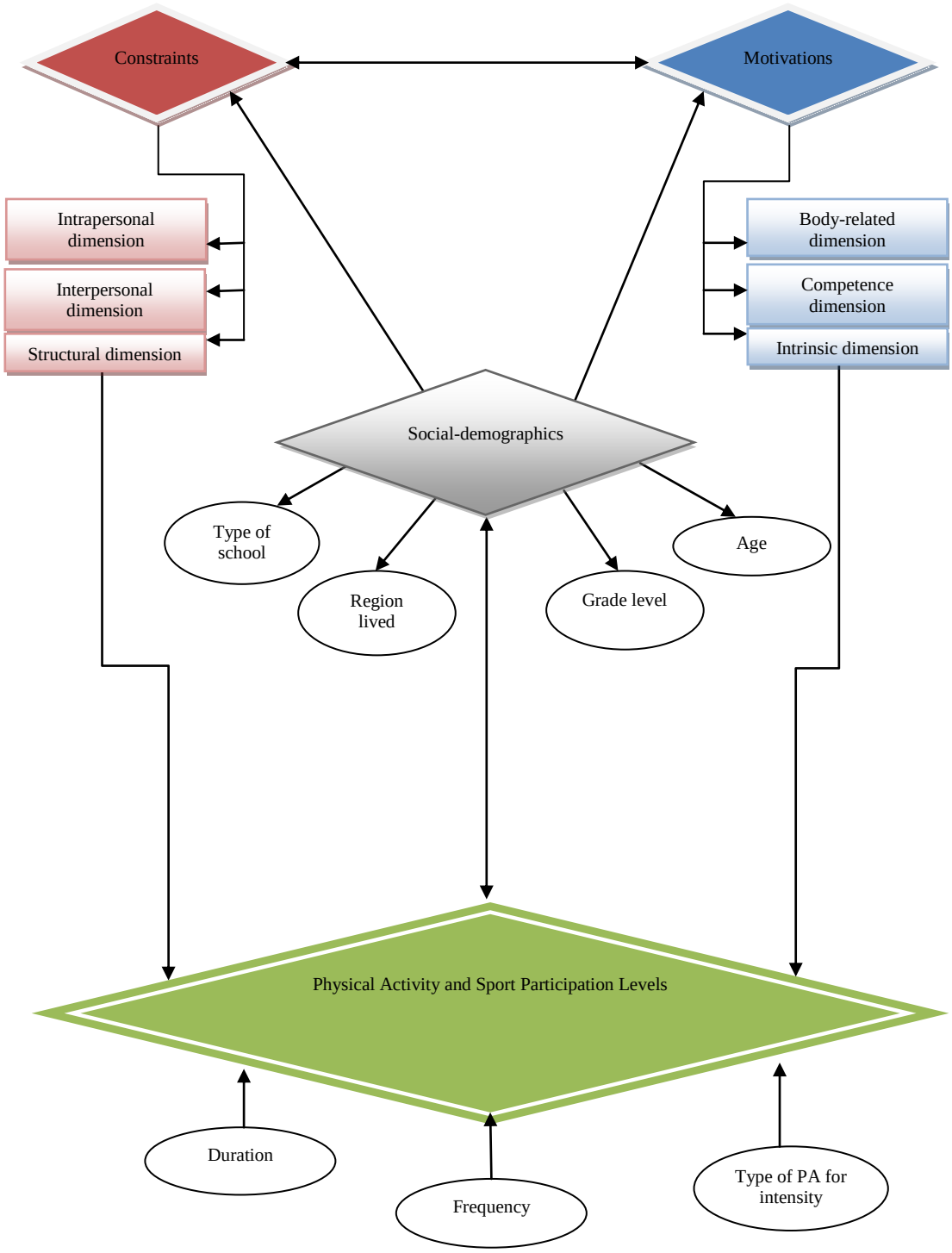


*Figure 5.4.*Framework of this study (relationship between constraints and motivations and physical activity participation levels).

The conceptual model, illustrated in Figure 5.4, identifies the variables used in this study to explain not only the levels of physical activity and sport participation

among Saudi high school students, but also the anticipated relationship between them. It therefore guides the discussion and analysis of the data.

5.7 Chapter Summary

Participation levels were examined via the Physical Activity Questionnaire for children and adolescents, within seven days recall. There are three measurable instruments of self-report physical activity: duration, frequency and intensity (Bauman et al., 2006). These three dimensions (duration, frequency and type of physical activity as an indicator of intensity (explained in Chapter 6)) was used to measure physical activity levels in this study.

The constraints that influence male high school student physical activity participation levels were examined using Alexandris and Carroll's (1997) model of leisure constraints. This model measures seven factors through three dimensions: (1) interpersonal constraints (2) intrapersonal constraints, and (3) structural constraints.

The motivations were examined within Frederick and Ryan's (1993) framework. As previously noted, this model measures 23 variables through three motivation dimensions, including: (1) body-related dimension (2) competence dimension, and(3) interest/enjoyment dimension.

While many scholars have proposed alternative frameworks, each one of these three scales has been identified as a suitable approach for the collecting of reliable and valid data. These three scale also have a long history, and have successfully guided constraints and motivation research in physical activity and sport or exercise settings for a 30 year period. The framework proposed in this study was also consistent with the items and factors from previous studies so there was scope to provide useful insights and discussion of the current findings with previous studies (refer to Chapter 8).

Chapter 6: Method

6.1 Introduction

The purpose of this chapter is to explain and justify the research methodology that was used to respond to the research questions and hypotheses. A quantitative examination of perceptions of constraints, motivations to physical activity and sport participation will inform our understanding of how and why constraints and motivations limit or increase high schools students' participation in physical activity and sport. The research hypotheses, setting, sampling and recruitment procedures, data collection methods, survey instruments, data analyses methods of the study are all explained in this chapter.

The first thing to note is that method and methodology are distinctly different. According to Dew (2007), methods are ways of collecting data, whereas methodology refers to 'the principles underlying particular research approaches' (p. 433). In addition, methods explain the approach used by researchers to produce data for analysis (Carter & Little, 2008). This chapter explains the methods used, and the rationale for their use, so other interested researchers can understand the research methods that were employed (Esterberg, 2002).

As previously noted, this research project has two theoretical frameworks. The first is a three-dimensional, seven-factorial, hierarchical model of constraints, as developed by Crawford and Godbey (1987) and Crawford et al.(1991). The second framework is a three-dimension, seven-factor model of motivation as designed by Frederick and Ryan (1993). For the purposes of this thesis, these frameworks will be used to address two of the main research questions. The first question is '*What are the constraints that influence Saudi Arabian male high school students' participation in physical activities and sport?'*. The second question is '*What are the motivational*

factors that influence Saudi Arabian male high school students' participation in physical activities and sport? The third research question, *'What are the levels of physical activity and sport participation among Saudi Arabian male high school students?* 'is examined via the Physical Activity Questionnaire for children and adolescents. In each case the data is collected by inviting respondents to provide responses related to (1) the frequency of their activity (2) the duration of their activity and (3) the type of activity (used to determine intensity based on the MET level). The level of activity data were used to construct the three primary items for a physical activity scale among male high school student of Riyadh city. A quantitative methodology has been employed to answer these three research questions.

For a project of this type, ethical approval is essential as a prelude to collecting data: it is not from people, it is about people (Creswell, 2009; Neuman, 2011; Royse, 2011). Because, without this foundation researchers run the risk of unintentionally harming their research participants. Consequently, ethical approval from the Victoria University Human Research Ethics Committee was obtained for this study.

This chapter provides the research design (section 6.2); the development of the instrument is explained in section 6.3, followed by the process for the questionnaire's application and data collection procedures in Section 6.4. The statistical procedures used to analyse the data are explained in Section 6.5, and the chapter concludes with Section 6.6 by providing a summary of the methods used for this research.

6.2 Research Design

According to Royse (2011), research design is essential to test hypotheses and to guide the research process. The research design also outlines the approach to data collection, and guides the decisions researchers take when analysing results (Tharenou, Donohue & Cooper, 2007). According to Creswell (2009), there are three types of

research design: quantitative, qualitative and mixed method. The use made of each of these depends on the aims of the study, how the variables will be measured, the type of information being sought, and how the information will be analysed (Andrew et al., 2011). This study has adopted a quantitative design.

Quantitative research methods are defined as "a means for testing objective theories by examining the relationship among variables"(Creswell, 2009, p. 4). Quantitative research began in the late nineteenth century; the principle ideas came from the physical sciences, such as physics and chemistry. Three historical trends are present in quantitative methods: (1) statistical procedures; (2) test and measurement practices; and (3) research designs (Creswell, 2009). Quantitative research is interested in questions of how much, or how well, or to whom does the phenomenon of concern apply (Frankel & Walen, 2000). Quantitative research emphasises conceptualising, measuring and analysing information from the real world by means of numerical data, representing explicitly defined variables (Mitchell & Bernauer, 1998).

This research project has employed quantitative methods to investigate levels of physical activity and sport participation, and the associated constraints on, and motivations for physical activity and sport participation among male high school students in Riyadh, Saudi Arabia. The reasons for choosing a quantitative method are threefold. First, the study places a heavy emphasis collecting and analysing information in the form of numbers. Second, it involves the collection of scores that measure distinct attributes of individuals, involving their attitudes, preferences and behaviours. Third, it allocates a significant amount of time to the procedures of comparing groups and correlational studies (Cresswell, 2008, p. 48). Most studies in this field have employed a quantitative method to collect data related to the effect of constraints and motivation on patterns of physical activity participation (Ball et al., 2014; Cooper et al.,2012; Deci &

Ryan, 2008; Jung-Woong et al., 2009; Kubayi et al., 2013; Luka, 2013; Palen et al., 2010; Oyeyemiet al., 2014; Shifman et al., 2012; Sibley et al., 2013).

Self-report surveys are the most common tool for undertaking studies of this type. There are many different forms of surveys that can be used to collect data to deliver quantitative outputs. The most popular tool researchers use to collect data in quantitative research is the questionnaire. Using a questionnaire allows researchers to describe trends, determine individual opinions and help identify important beliefs, preferences and attitudes of groups of individuals (Creswell, 2008; Thomas, 2003). For this study, a questionnaire was used to collect two principal types of information: fact and opinion (Thomas, 2003).

There are many advantages from using a questionnaire design, also referred to as self-reports. First, they are usually low cost, and they save time. Second, they generate high acceptability. Third, they provide convenience. Fourth, they are highly suitable for the systematic measurement of current attitudes and practices (Creswell, 2009; Jones, 2014; Miller et al., 2010; Mitchell & Jolley, 2012).

Another advantage of the questionnaire/self-report measure for this study is its ability to capture the physical activity performed by the people within the timeframe of seven days (Booth et al., 2002; Countryman et al., 2013; Godin, 2011; Morrow et al., 2013; Ridgers et al., 2012). Self-report measures for physical activity assessments have been used in three general areas of exploration: epidemiological, behaviour change and correlational studies (Baranowski, 1988). Generally, self-report measures of physical activity in children have produced estimated activity levels consistently higher than those reported with other instruments. Despite significant limitations, self-report tools still offer considerable potential for school applications (Oyeyemi et al., 2014; Weiss & Wiese-Bjornstal, 2009; Welk, 2008). Therefore, the study developed and used

questionnaires based on the self-report measures. The use of the self-report approach has been used by similar studies at an international level, so this will provide better opportunity to discuss how the results compare to these other studies.

The use of survey methods also allows findings to be generalised to a larger population, and enables information gathering from numerous constructs and perceptions in a short time frame, and an economical manner (Creswell, 2008). For this study, the survey was a self-administrated questionnaire. It collected data related to the constraints, motivations and levels of physical activity and sport participation in public and private schools in different regions and schools of Riyadh, Saudi Arabia.

6.3 Questionnaire Development

This section explains the development of the questionnaire used in this project. The self-administrated questionnaire consisted of questions relating to the constraints and motivation that may influence male high school students' participation levels in physical activity and sport. The questionnaire used established measurement scales for constraints, motivation. In addition, physical activity participation items were modified from several scales as mentioned in Table 6.4. An established physical activity measure (e.g. APARQ, PAQ-A) was not used because some of the established questionnaires have elements, for example, gardening, sleeping behaviour, sedentary behaviour etc. that are not relevant to the measures to be used in this study. The questionnaire measured frequency, duration, and type of activity to measure intensity (intensity was derived from MET values by using the type of physical activity and sport) because those elements have been found to be main elements to measure and calculate the participation level of physical activities and sports (Table 6.3). Therefore, this study used these three items to measure physical activity and sport participation level among high school students (see

section 6.3.1 for more information about the questionnaire design). Copies of the questionnaire (both English and Arabic versions) can be found in Appendix A1 and A2.

6.3.1 Scales used in the main study survey.

This section details the scales that were included in the questionnaire administered in the main study. The main questionnaire contained 72 items, included in one of three sections: A, B and C (see Appendix A).

6.3.1.1 Constraints.

Three independent dimensions of intrapersonal, interpersonal and structural were used to measure the constraints. Researchers (Alexandris & Carroll, 1997; Casper et al., 2011; Crawford et al., 1991; Godbey et al., 2010; Palen et al.2010; Shifman et al. 2012; Jung-Woong et al., 2009) agree that the three independent dimensions comprising the full set of constraints for physical activity participation measurement consist of seven factors. Factor 1 (Individual psychological), factor 2 (lack of knowledge) and factor 3 (lack of interest), were classified as intrapersonal constraints. Factor 4 (lack of partners/ encouragement) was classified as an interpersonal constraint. Finally, factor 5 (facilities-services), factor 6 (accessibility-financial) and factor 7 (time) were classified as structural constraints (Crawford & Godbey, 1987). For more details about constraints, see Section 3.2.

The 29 items for measuring constraints were used in both the pilot and main study. Intrapersonal constraints consist of 14 items. Items one to seven refer to individual psychological (i.e. I'm afraid of getting hurt), items eight to 11 refer to lack of knowledge (i.e. I'm not skilled enough) and items 21to 23 refer to lack of interest (i.e. I've not enjoyed it in the past). Items 24 to 26 refer to the lack of partner factor, classified as an interpersonal constraint (i.e. my friends don't have time). Finally, structural constraints consisted of 12 items. Items 12 to 16 refer to facilities/services

(i.e. I don't like the activities offered), items 17 to 20 refer to accessibility/financial (i.e. there's no opportunity near my home) and items 27 to 29 refer to time (i.e. I don't have time due to studies or work). Table 6.1 lists all 29 items used in the constraints scales (Alexandris & Carroll, 1997; Crawford et al., 1991). Details of how the scale was used are presented in the questionnaire in Appendix A.

Table 6.1

Constraints Scale

		Intrapersonal		**Interpersonal**		**Structural**		
No.	**Item**	**Individual/ Psychological**	**Lack ofknowledge**	**Lack of Interest**	**Lack of partners**	**Facilities/ Services**	**Accessibility/ Financial**	**Time**
1	It makes me feel tired	✓						
2	Afraid of getting hurt	✓						
3	Not happy in social situation	✓						
4	Feel too tired for recreation	✓						
5	Health-related problems	✓						
6	Not confident	✓						
7	Not fit enough	✓						
8	Not know where to participate		✓					
9	Not have anyone to teach me		✓					
10	Not know where I can learn it		✓					
11	Not skilled enough		✓					

No.	Item	Intrapersonal		Interpersonal		Structural		
		Individual/ Psychological	Lack ofknowledge	Lack of Interest	Lack of partners	Facilities/ Services	Accessibility/ Financial	Time
12	Facilities poorly kept					✓		
13	Facilities crowded					✓		
14	Facilities inadequate					✓		
15	Do not like activities offered					✓		
16	Timetable does not fit with mine					✓		
17	Transportation takes too much time						✓	
18	No opportunity near my home						✓	
19	No car						✓	
20	Cannot afford						✓	
21	Not enjoyed in the past			✓				
22	Not want to interrupt routine			✓				
23	Not interested			✓				
24	Friends do not have time				✓			
25	Nobody to participate with				✓			
26	Friends do not like participating				✓			
27	Time: family							✓
28	Time: work/studies							✓
29	Time: social							✓

No.	Item	Intrapersonal		Interpersonal		Structural		
		Individual/ Psychological	Lack ofknowledge	Lack of Interest	Lack of partners	Facilities/ Services	Accessibility/ Financial	Time
	commitment							

Principal components analysis of constraints on recreational sport participation (Alexandris&Carroll, 1997)

The 29 item scale has a high level of reliability based on the Cronbach's alpha analysis. Cronbach's alpha reliability was developed by Cronbach (1951) as an index for estimating the reliability of measurement instruments such as scales, multiple item tests, questionnaires or inventories (Cronbach, 1951). Jung-Woong et al.(2009) examined the constraints and relationships between constraints, motivation and physical activity level among secondary students in South Korea and they found the Cronbach's alpha reliability of the seven factors was 0.94; Alexandris and Carroll (1997) investigated constraints on recreational sport participation among 18 years and over of Greek population in Greece. They found the Cronbach's alpha reliability of the whole scale was 0.85. Devellis (1991) recommended that a Cronbach's alpha above of 0.59 is acceptable. This scale has been used in several studies to confirm all factors, ensuring relevance, comprehensibility and acceptable validity (Alexandris & Carroll, 1997; Jung-Woong et al., 2009). The constraints items in the questionnaire used in this research used a five-point Likert-type scale, ranging from 'strongly agree'(value=1) to 'strongly disagree'(value=5). In this study, the scale has been recoded to reverse the values; so the higher levels of agreement are the higher scores. More clarification about this recoding is provided in Chapter 7.

6.3.1.2 Motivations.

The physical activity motivation questionnaire, as developed by Frederick and Ryan (1993), for a sample size of 376 adults (134 of them were men) for the age range of 20-70 years, was used to collect data regarding motivations for physical activity and

sport participation. This motivation of physical activity measure assessed three types of motives for engaging in physical activity and sport. According to Frederick and Ryan (1993), the three motivations dimensions are: 1) body-related dimension; 2) competence dimension; and 3) intrinsic dimension.

Frederick and Ryan's (1993) motivation measures consist of 23 items used to measure motivation factors of participation in physical activity and sport. The body-related dimension, included ten items, related to the desire to develop physical appearance and fitness (i.e. I want to lose or maintain weight).The competence dimension included seven items related to skill development, competition and challenge *(*i.e. I like the competition). The intrinsic dimension included six items related to fun / enjoyment (i.e. I enjoy this activity). Table 6.2 lists the items used in the motivation scales. The details of how the scale was used are presented in the questionnaire in Appendix A.

Table 6.2

Motivations Scale

No.	Item	Body-related	Competence	Intrinsic
1	It makes me feel tired	✓		
2	I want to lose or maintain weight	✓		
3	I want to cope better with stress	✓		
4	I want to improve my appearance	✓		
5	I want to have more energy	✓		
6	I want to define my muscles	✓		
7	I want to be attractive to others	✓		
8	I want to improve my body shape	✓		
9	I will feel ugly if I don't	✓		
10	I want to improve cardio fitness	✓		
11	I want to get better at my activity		✓	
12	I like the competition		✓	
13	I want to obtain new skills		✓	
14	I want to improve existing skills		✓	
15	I like the challenge		✓	
16	I want to keep up my current skill level		✓	
17	I like the excitement of participation		✓	
18	It's fun			✓
19	I think it's interesting			✓
20	It makes me happy			✓
21	I like to do this activity			✓
22	I find this activity stimulating			✓
23	I enjoy this activity			✓

This instrument has been adopted for this research because it has been used successfully in many similar research projects, it is comprehensive, and covers all motives for participation in sport and physical activities (Cooper et al., 2012; Chiu, 2009; Chiu & Kayat, 2010; Frederick et al., 1996; Martens & Webber, 2002; Ryan et al., 1997; Jung-Woong et al., 2009). Frederick and Ryan (1993) explored the motivational differences between two groups for sport and exercise; they provide

evidence for the reliability and validity of these three motivation factors. Reliability with Cronbach's alpha value was above 0.87. This scale has been used in several studies involving adolescents to confirm all factors, ensuring relevance, understanding and face validity (Cooper et al., 2012; Frederick et al., 1996; Ryan et al., 1997). The motivation items in the questionnaire used in this research used a five-point Likert-type scale, ranging from 'strongly agree'(value=1) to 'strongly disagree'(value=5). In this study, the scale has been recoded from 5 to 1, so the higher levels of agreement are the higher scores. More clarification about the recording is provided in chapter 7.

6.3.1.3 Participation levels in physical activity and sport.

According to Bauman et al.(2006), physical activity involves a complex range of behaviours. Four measurable characterisations of self-report on physical activity are duration, frequency, intensity and the type of physical activity and sport. As noted in Chapter 2, securing consensus on what constitutes an appropriate level of physical activity is not always clear. The level of physical activity is not only frequency, but also includes duration and intensity level of physical activity and sport. This point was highlighted by Alexandris et al.(2003), who found serious limitations in many physical activity measures.

Previous studies have also examined physical activity participation levels by using physical activity questionnaires for children and adolescents that provide for seven-day and twelve-month recall. As a result, there are many and varied ways of measuring physical activity levels. The most commonly used models are the LTEQ, the Adolescent Physical Activity and. Recall Questionnaire (APARQ), the WAC, the Physical Activity Questionnaire for Adolescents (PAQ-A), the GPAQ, the Seven-Day Physical Activity Recall Questionnaire, and IPAQ. These models are summarised in Table 6.3.

Table 6.3

Physical Activity Questionnaires for Children and Adolescents

No	Name of Instrument	Measurements	References
1	LTEQ	Frequency of vigorous, moderate, and slight leisure time exercise participated during a usual week.	Godin & Shephard 1985 Teixeira et al., 2012 Stanley et al., 2012
2	APARQ	Duration, frequency and type of activity.	Booth et al., 2002 Thompson et al., 2013
3	WAC	Performance, duration, and intensity.	Sallis et al. 1993 Helmerhorst et al., 2012 Cancela et al., 2013
4	PAQ-A	Frequency and duration.	Kowalski et al., 1997 Duncan et al., 2012
5	GPAQ	Activity at work, travel to and from places, recreational activities, as well as sedentary behaviour.	WHO 2010 Cleland et al.,2014
6	7–Day Physical Activity Recall questionnaire	Intensity degree of leisure time/ occupational physical activity as well as gardening, walking and sleeping during morning/ afternoon/ evening.	Dishman & Steinhardt, 1988 Jacobs et al., 1993 Rauh, Hovell, Hofstetter, Sallis & Gleghorn, 1992 Sallis, Buono et al., 1993 Taylor et al., 1984
7	IPAQ	Short version . Long version.	Craig et al., 2003 Lee et al., 2011 Sebastiao et al., 2012

There are some common variables that are used to measure physical activity levels in research studies. (Cho, 2004; Godin & Shephard, 1985; Jung-Woong et al., 2009; Laaksonen et al., 2002). As noted in the previous section, the three main dimensions that are used to measure the total amount of physical activity undertaken by people are frequency, duration and intensity (Corder et al., 2008). In each case the data is revealed by inviting respondents to provide responses related to i) the frequency of their activity, ii) the duration of their activity and iii) the type of activity (used to determine intensity). This study employed a seven-day recall instrument model, to

measure physical activity participation levels among high school students from Riyadh City. The ‘seven-day recall’ refers to the last seven days including week days of the school week and the weekend.

Frequency.

The frequency question consisted of four options adopted by Godin and Shephard (1985) and instrument ‘LTEQ’. Frequency was measured by asking respondents to indicate how often they had participated in physical activity in the previous seven days, see Table 6.6. The options were once per week, twice per week, three times per week, four times per week, five times per week, six times per week, seven times per week, and more than 7 times per week, see Table 6.5.

Duration.

The duration question included four options adopted by Booth et al. (2002) and the instrument ‘APARQ’. Duration was measured by asking respondents to indicate how long they participated in physical activity in the previous seven days see Table 6.6. The options were less than 30 min per day, 31-60 min per day, 61-90 min per day, and More than 91 min per day, see Table 6.5.

Intensity.

The intensity of the physical activity (vigorous, moderate and low) was based on the type of activity and was determined by a three-step process. In step one, respondents were asked to nominate their most popular form of physical activity and sport most often participated in during the last seven days. They could nominate up to three activities. In step two, a MET value (a measure of the level of intensity) was allocated to each activity (Ainsworth et al., 2000). Where more than one activity was selected, an average MET value was calculated. In step three, a MET value was used to categorise the activity as one of three levels of intensity; for example, high (more than 6 METs),

moderate (between 3 to 5.99 METs) and low (less than 3.0 METs). For example, the total average of intensity for respondent 'A' was 8.45 METs per week. This identified the activity as high-intensity. In this study, intensity was estimated from adult-derived standard energy costs of specific physical and sport activities, using MET values, see Tables 6.4 and 6.5 (Ainsworth et al., 2000). For, examples there some studies that have used MET values to determine levels of physical activity. It is also worth noting that several of the studies, e.g., Coe, et. al., (2006) and Trost, et. al., (2003) also used the MET derived levels of physical activity for a range of parametric statistical tests. These studies demonstrates the precedent for using MET values to calculate the level of physical activity and also demonstrate the capacity to use the MET derived levels of physical activity for parametric statistics, (e.g. t-tests).

There is concern about the MET value because the questionnaire design (type of activities) may not allow the researcher to decide what the main activity was that the respondents participated in during the 7 days before they completed the questionnaire. In this case, the researcher decided to take the average of all activities selected by respondents. This limitation may impact the result of the physical activity and sport participation level. It has been acknowledged and explained in the limitations section which appears in chapter 8.

Table 6.4

List of Physical Activity Common to All Respondents and Their Corresponding MET Value

Type of activities	**Intensity**			**MET**	**Description**
	Low	**Moderate**	**Vigorous**		
Soccer			×	7.0	Soccer, casual, general (Taylor Code 540)
Volleyball			×	8.0	Volleyball, competitive play in a gymnasium

Type of activities	Intensity			MET	Description
	Low	Moderate	Vigorous		
Basketball			×	8.0	Basketball, game (Taylor Code 490)
Tennis			×	8.0	Tennis, singles (Taylor Code 420)
Table tennis		×		4.0	Table tennis, ping pong (Taylor Code 410)
Swimming			×	8.0	Swimming, sidestroke, general
Walking		×		3.8	Walking, 3.5 mph, level, brisk, firm surface, walking for exercise
Gymnastics		×		4.0	Gymnastics, general
Aerobics (water, step, dance)			×	6.5	Aerobic, general
Weight training			×	6.0	Weight lifting (free weight, nautilus or universal-type), power lifting or body building, vigorous effort (Taylor Code 210)
Water skiing		×		6.0	Skiing, water (Taylor Code 220)
Camping				2.5	Camping involving standing, walking, sitting, light-to-moderate effort
Golf		×		4.5	Golf, general
Handball			×	8.0	Handball, team
Athletics			×	6.0	Track and field (high jump, long jump, triple jump, javelin, pole vault)
Running			×	8.0	Running (Taylor Code 200)
Martial Arts (e.g. self-defence, karate and judo)			×	10.0	Judo, jujitsu, karate, kick boxing, tae kwan do
Bicycling		×		8.0	Bicycling, general
Ride horse		×		4.0	Horseback riding, general
Electronic games	×			1.5	Sitting—card playing,

Type of activities	Intensity			MET	Description
	Low	Moderate	Vigorous		
					playing board games

According to WHO (2002, 2011a), physical inactivity is increasing in many countries and is now listed as one of 10 risk factors associated with the economic and social improvement of developing countries. Electronic games are popular activities for children and young people, but this type of activity is classified as passive behaviour activity (WHO, 2011b). In this study, the researcher decided to list this activity in order to know how many hours the sample play electronic games, and how this might impact their physical activity and sport participation levels. Electronic games such as Play-stations are used in this study to indicate passive activity, not to measure sedentary behaviour. This provides some insight into the popularity of this type of activity. This creates some limitation to the physical activity participation levels of respondents given that this popular activity with a low MET value will impact on the average of the three most popular activities. It is mentioned as a limitation in this study (see chapter 8).

Table 6.5

Physical Activity Scale

No	Items	Example of choice options	Instrument	References
1	Frequency	(i.e. 3 time per week)	LTEQ	Godin & Shephard 1985
2	Duration	(i.e. less than 30 min)	APARQ	Booth et al. 2002
3	Type of intensity	(i.e. low)	Standard energy costs	Ainsworth et al. 2000

The frequency, duration and intensity variables were used to construct the three primary items for a physical activity scale.

High Level of Physical Activity.

Physical activity level designated as high would have met the following minimum requirements for frequency, duration and intensity levels for respondents:

- Participation of three days or more per week of vigorous activities, with duration of 60 minutes or more.
- Participation of seven days per week of moderate activities, with duration of between 30 to 60 minutes.

Moderate Level of Physical Activity.

Physical activity level designated as moderate met the following minimum requirements for frequency, duration, and intensity level, containing:

- Participation in three days or more of vigorous activities per week, with duration of less than 30 minutes.
- Participation in five days of moderate activities per week each day, with duration of at least 30 minutes.

Low Level of Physical Activity.

Physical activity level designated as low would not meet any of the criteria of high or moderate levels. The application of the three criteria is summarised in Table 6.6.

Table 6.6

Physical Activity Participation Level Measurements Criteria

Category of Intensity	Duration	Frequency	Level of Intensity	Description
High	At least 60 or more minutes	3 days per week	Of high level activities	High level of PA
	At least between 30 to 60 minimums per day	7days	Of moderate intensity activities	
Moderate	At least 20 minutes per day	3 days or more per week	Of high activities	Moderate level of PA
	At least 30 minutes per day	5 or more days	Of moderate level intensity activity	
Low	Not meeting any of the criteria for either of the previous categories		High, moderate or low intensity activity	Low or inactive level of PA

The physical activity and sport participation levels in this research used three variables to measures the participation levels. The frequency, duration and intensity variables were used to construct the three primary items for a physical activity scale among male high school student of Riyadh city.

6.3.1.4 Demographic profile.

Section C of the questionnaire included nine questions designed to provide respondents' general personal and demographic information. Respondents were asked to indicate their age, male birth sequence position, grade level, region of residence, academic grade point average (GPA) in the last year, car ownership status, type of school, father's education level and monthly income (respondents' mother information was not collected for cultural reasons). Type of school grade level, region of residence has been selected to comparison of physical activity participation level m constraints, and motivations because non-Saudi Arabia studies have examined them. Measurements

of respondents' personal and demographic information allowed comparisons to be made between all participants. The discussion in Chapter 2, 3, and 4 indicated that previous studies have shown significant differences according to participant's demographic characteristics such as age. It also permitted individuals to define themselves in terms of a social identity (Ashforth & Mael, 1989; Billig & Tajfel, 1973; Fogg et al., 2001; Tajfel, 2010). Table 6.7 provides a list of the variables included in the demographic profile. Details of how the scale was used are presented in the questionnaire in Appendix A.

Table 6.7

Demographic Variable

No	Items	Option 1	Option 2	Option 3	Option 4	Option5	Option 6
1	Age	16 years old	17 years old	18 years old	19 years old		
2	Position within your family	Only son	Oldest son	Second oldest son	Third oldest son	Fourth oldest son	Fifth or more oldest son or last
3	Grade level	10^{th}	11^{th}	12th			
4	Father's education level	Less than high school	High school	High school	Bachelor degree	Postgraduate degree	
5	Region lived	North Riyadh	South Riyadh	East Riyadh	West Riyadh	Middle Riyadh	
6	Father's monthly income	US$ 1000–2000	US$ 2100–3000	US$ 3100–4000	US$ 4000–more		
7	Cumulative academic GPA last year	Excellent	Well done	Well	Accepted	Fail	
8	Have a car	Yes	No				
9	Type of school	Public school	Private school	Other			

Nine additional items were included in Sections B of the questionnaire that relates to physical activity participation levels. They were used to confirm analyses and explore their impact on physical activity and sport participation levels. Those additional items are place of participation, mode of transport to and from school, nature of participation, current participation, encouragement, school sport facilities availability, accessibility of schools sport facility, mainly participating with, and family belief in the benefits of participation, see Table 6.8.

Table 6.8

Additional Behavioural Variables

An additional Nine Items				
No	**Items**	**Example**	**Questionnaire**	**References**
1	Place	(i.e. health community centre)	GPAQ	
2	Travel to and from school	(i.e. by car, walking)	GPAQ	
3	Participate under organised or non-organised physical activity and sport	(i.e. I participate in non-organised physical activity and sport)	APARQ	Booth et al. 2002
4	Current participation	(i.e. yes, I participated)	APARQ	Booth et al. 2002
5	Mainly participating with	(i.e. with my friends, with my relative/s)	By researcher 2011	By researcher 2011
6	Encouragement	(i.e. my physical education teacher, my coach, my father)	Perceptions of Environmental Supports Questionnaire	Kirtland et al. 2003
7	School sport facilities availability	(i.e. yes, no);	Perceptions of Environmental Supports Questionnaire	Kirtland et al. 2003
8	Accessibility of schools sport facilities	(i.e. yes, no);	Perceptions of Environmental Supports Questionnaire	Kirtland et al. 2003
9	Family believes in the benefits of participation	'Strongly disagree' to 'Strongly agree'	By researcher 2011	

In summary, data were collected through a self-administrated questionnaire comprising questions relating to constraints, motivations and physical activity and sport participation level among male high school students of Riyadh City. It was divided into three sections.

Section A of the questionnaire has two parts. Part one of section A relates to constraint measurement, which consists of three dimensions that may influence participation levels. These dimensions include: (1) interpersonal constraints; (2) intrapersonal constraints; (3) structural constraints. Part two of section A relates to motivations measurement, which consists of three dimensions that encourage individuals to participate in physical activities and sport. These dimensions are: (1) body-related; (2) competence; and (3) intrinsic. Section B relates to the physical activity and sport participation level, which consists of three variables that influence participation levels. These variables include: (1) frequency (2) duration, and (3) intensity based on the type of physical activity and sport. Section C relates to the student social demographics, and additional features of their physical activity participation.

6.4 Questionnaire Process and Data Collection Procedure

This section provides details about the procedure of questionnaire translation and issues about validity and reliability of the questionnaire. In addition, the criteria and methods of data collection, as well as pilot and main study procedures are explained.

6.4.1 Procedure of questionnaire translation.

Translation of questionnaires is the most frequently chosen method to employ ‘equivalent’ instruments in cross-national and cross-lingual survey research, because most instruments were originally developed in the English language by researchers in the United Kingdom or the United States (Harkness & Schoua-Glusberg, 1998). The

major reason behind the translation of questionnaires is to make the instrument available in the required language required for the field of study. Translating an existing instrument means a shorter developmental period and lower costs than developing a new instrument cross-culturally (Peters & Passchier, 2006; Guillemin, Bombardier & Beaton, 1993). There are three types of translation methods: (1) one-way translation; (2) committee approach; and (3) forward and back translation.

One-way translation is the fastest (and cheapest) method to translate an instrument. However, concerns arise about the quality of the translation because the process of translation is done by one person or a group of experts for one time only (Peters & Passchier, 2006). However, the committee approach to translation involves two panels, with each panel having five to seven members. The first panel does the translation, and the second evaluates the translation quality, by people who speak the target language. In addition, the pilot test is important after completing the translation process within new target populations, to confirm the validity and reliability of the translated version (Peters & Passchier, 2006).

Forward and back translations are the most frequently recommended or used approach within translation guidelines. Forward and back translation methods are used to guarantee clarity, accuracy and consistency of information, and to ensure that participants' comprehension would not be affected by the translation (Brislin, 1970; Guillemin et al., 1993; Triandis, 1972). It is most commonly used and recommended as a way to assess translation work (Brislin 1970; Bullinger et al., 1998; Hilton & Skrutkowski, 2002; MAPI Research Institute, 2004–2011; Peters & Passchier, 2006). Figure 6.1 illustrates the steps of this translation process.

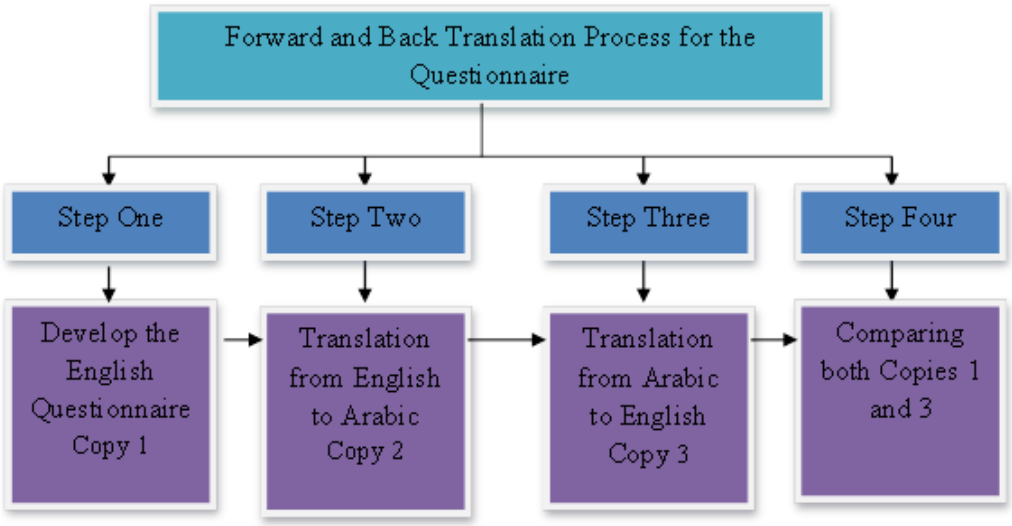


Figure 6.1. The questionnaire forward and back translation process.

6.4.1.1 Issues about the translation process.

The translation process normally includes some issues and challenges (Harkness et al., 2010) The Arabic language has much in common with other languages, like English (Shirko, Omar, Arshad & Albared, 2010). A translation of a questionnaire between two different languages faces some issues such as the quality, equivalence and translating conceptually rather than translating word for word, which may affect validity and reliability (Brislin 1970; Bullinger et al., 1998; Chang, Chau & Holroyd, 1999; Peters & Passchier, 2006).

According to Chang et al.(1999), 'Equivalence is a form of validity that refers to the agreement between two measures of the same construct'. Further, there are three types of equivalence, which are: (1) Semantic equivalence, defined as 'The meaning of each item is the same in each culture after translation into the language and idiom of each culture' (Cella, Lloyd & Wright, 1996); (2) Functional equivalence, defined as 'pertains to whether or not the items in a translated version of a scale have a meaning similar to the source version as opposed to being literally equivalent to the original' (Bullinger, Anderson, Cella & Aaronson, 1993); and (3) Technical equivalence, defined

as ‘The method of assessment (e.g. paper-and-pencil, interview) is comparable in each culture with respect to the data it yields’ (Cella et al., 1996). Commonly, translation of instruments strive to ensure item equivalence (Flaherty et al., 1988; Hui & Triandis, 1985). Ensuring equivalence is an important prerequisite for identifying culturally specific expressions of concepts under investigation, especially in studies comparing between two different cultures (Chang et al., 1999).

Quality of translation is an important factor that assesses equivalence between the original and the target version of the questionnaire, and maintenance of the original instrument’s meaning (Brislin 1970; Peters & Passchier, 2006). It also ensures that true cross-cultural comparisons are achieved. Researchers have to follow international guidelines to ensure the quality of the translation, to standardise the translation process within different countries, to evaluate the validity of translated questionnaires and avoid problems (Peters & Passchier, 2006). According to Brislin (1970), the translators’ familiarity with English contributed to a received high translation quality. Translators need to consider the definition of the original term, translating it in the most relevant way (Bullinger et al., 1998; WHO, 2011e). This ensures high validity when respondents in the target culture answer the questions (Guillemin et al., 1993; Herdman, Fox-Rushby & Badia, 1997). In this research, the translation of the questionnaire from English to Arabic followed the forward and back translation method, as recommended by different researchers (Brislin 1970; Guillemin et al., 1993; Peters & Passchier, 2006; Triandis, 1972).

First, the questionnaire was developed in English, based on the established measurement scales for constraints, motivation, and physical activity and sport participation. The second step required the English questionnaire be to be sent to an expert in both English and Arabic, for translation from English to Arabic. The third step

required the Arabic questionnaire copy to be translated by an expert in both Arabic and English, for an English translation, based on the Arabic version. In the fourth step, the researcher and the translator compared both English copies (the original and the translated copies) to check there was no discrepancy in the questions in copies one and three. Consequently, as a significant step after the translation process is complete, an instrument needs to be pilot tested in its translated version, within the new target population (Peters & Passchier, 2006).

6.4.2 Validity and reliability of the questionnaire.

Validity and reliability tests are important for research studies that rely upon various instruments, such as a survey for data collection. Validity indicates accuracy in measurement of a construct (Pallant, 2005; 2011). According to De Vaus (2003), Hancock and Mueller (2010) and Neuman (2009), validity can be measured in various ways, for example content validity, construct validity, and criterion-related validity. In this thesis, content and construct validity were employed. Content validity was used to check the measurement items (Adams, Khan, Raeside & White, 2007). In this thesis, 64 items representing three constructs were used to measure the relationship between constraints, motivations and physical activity participation level. All of the measurement items for each construct were adopted from the literature. To check the accuracy and correction of each question about hypothesised constructs, a pilot study was employed to ensure the suitability of each item. This helped to justify the content validity of the instrument.

According to Hair et al. (2006), construct validity relates to the measurement's capacity to meet theoretical expectations. It is used to check if a variable correlates with others and to confirm the conceptual model is internally consistent (Creswell, 2009; Tashakkori & Creswell, 2007). Chi (2005) proposed that 'researchers establish

construct validity by correlating a measure of a construct with a number of other measures that should, theoretically, be associated with it'(p. 102). Therefore, a correlation coefficient was used to test the relationship between the three constructs in this thesis, including constraints, motivations and physical activity participation levels.

A reliability test is also an important step in the research, which presents how free the scale is from random error, by using the most frequently used methods, for instance an internal consistency scores (Pallant, 2005; 2011). Internal consistency is the degree to which the items of a scale measure the same underlying attribute. The techniques employed in this study provide a reliable estimation of Cronbach's coefficient alpha, which has a value between zero and one (positive or minus). The higher the Cronbach's alpha is, the greater the reliability of the scale. In the social and behavioural sciences, reliability and validity of Cronbach's coefficient alpha in the 0.70 or above range are often considered acceptable (Hancock & Mueller, 2010). However, in physical education and leisure studies, for example Devellis (1991), a Cronbach's alpha above of 0.59 is acceptable. A scale has high internal consistency when the items are highly correlated and result in a Cronbach's alpha of greater than 0.70 (Nunnally, 1978).

Crawford et al.(1991) developed 29 items of constraints to measure seven factors through three constraint dimensions. They found Cronbach's alpha coefficient was calculated for the whole scale and for each subscale, ranging from 0.59 to 0.81. In a similar study, Jung-Woong et al. (2009) examined the constraints and relationships between constraints, motivation, and physical activity levels. They found the alpha reliability coefficient of the whole dimension was 0.94. In contrast, Frederick and Ryan (1993) investigated motivational differences between two groups. They found the Cronbach's alpha coefficients were 0.92, 0.87, and 0.88 for these three factors,

respectively. The coefficient alphas for each of the scales used in this thesis were calculated using PASW (SPSS) v.20. Further details for the pilot and main study reliability result checks are described in Chapter 7.

6.4.3 Data collection procedure.

This section explains the criteria and methods to select the participants from each school for data collection. Data were collected via a self-report questionnaire that consisted of questions relating to constraints and motivations that influenced male adolescent participation in physical activity and sport. Data collection involved two stages: a pilot study and the main study.

Approval to access the school was obtained from the Saudi Arabia Education Department of Boys. The data were collected from the 30 male high schools in Riyadh, 50 male students from each school were selected randomly from a list of student names at the school. On the first day, the researcher provided students with the consent and information forms for parents, detailing the requirements of participating in the study. Students who obtained parental approval to participate in the research were involved in a second meeting. Students who did not provide the signed consent forms were not able to participate in the study. The students were provided with oral and written instructions regarding how to complete the questionnaires. Once consent was confirmed in the second meeting, the researcher distributed the questionnaire for students to complete during their physical education class time (45 minutes) with the help of physical education teachers. The researcher collected the completed questionnaires at end of October 2010. The same procedures were followed in all schools.

6.4.3.1 Pilot study.

According to Sarantakos (2005), an important research step is a pilot test regarding the benefits that researchers can obtain. It is an opportunity to practice using

the research instruments before the main study. Pilot tests are important after completion of the translation process within a new target population, to confirm the validity and reliability of the translated version (Peters & Passchier, 2006).

Before conducting the main study, a pilot study was completed to practice using research instruments before the main study, to check the study's reliability and identify any problematic issues. The pilot was completed to ensure that the final questionnaire was suitable and simple to understand for the study sample's age group (Sarantakos, 2005). De Vaus (2002) recommends pilot tests should be conducted by the designer of the questionnaire and should involve a sample of between 75 to 100 respondents with similar characteristics as the main study sample, so that feedback and corrections are relevant. PE teachers confirmed the understanding of the Arabic questionnaires and verified that the students could thoroughly understand the questions. In this pilot study, 100 questionnaires were distributed among the sample of two male high schools in Riyadh, Saudi Arabia. This procedure was conducted for measuring the validity and reliability of the questionnaire. Results of the pilot study are provided in Chapter 7.

6.4.3.2 Main study.

For the main study, a self-administered questionnaire was used to collect the data from approximately 1500 respondents, from the 30 male high schools in Riyadh, Saudi Arabia. The researcher gained access to the respondents by visiting them in their schools. A standard procedure was followed to organise a specific time with the physical education teachers to meet students at the schools. The researcher explained the purpose and importance of conducting this study and then the questionnaire was distributed.

Population.

The population is the units from which the sample is selected and refers to the entire group of people that a researcher wants to investigate (Bryman & Bell, 2003; Cavana, Delahaye & Sekaran, 2001; Tabachnick & Fidell, 2001). Riyadh is one of the fastest-growing cities in the world, with a growth rate of 4.2% during the period 1997–2005. In 2009, the growth percentage was 4%, and Riyadh's population was 4.9 million. Sixty-eight per cent of the population was Saudian, 55% of them were males, and 45 per cent were females. Non-Saudis accounted for 32 per cent of the population in 2009. The total population aged between 15–19 years consisted of 175000 females and 200000 males.

Sample Selection.

Sample selection is an important issue for data collection. There are two kinds of sampling designs that include probability and non-probability. Each of them has different sampling strategies (Racha, 2002). In this research, the sample was designed by probability sampling, including 'simple random sampling'. In this type of sampling, each member of the population sample under study has an equal chance to be selected. The advantage of simple random sampling is the high generalisability of findings (Black, 1999; Cavana et al., 2001). Thus, simple random sampling design has been employed in this study to select both the respondents and the schools. This was done by drawing names from a basket until the required number was reached (Cavana et al., 2001; Cohen, Manion & Morrison, 2000).

The respondents in this survey were male students aged between 16 and 19 years, from Riyadh high school regions, who were enrolled in semester two, 2010–2011. Data from five regions of Riyadh including south, north, east, west and middle, were collected in this study. The sample only included males for two reasons. First,

most parents do not allow male contact with daughters, particularly those who are 12 years old and over. This behaviour and custom is embedded in Islamic religion and Saudi culture. Secondly, the school system in Saudi Arabia is separated into male-only and female-only schools. Hence, it would be difficult to access female schools due to Female Department of Education policy in Riyadh. The age group has been selected because it is a critical time in adolescent development, when obesity and poor nutrition become problematic (Al-Hazzaa, 2007b). It has been noted that physical inactivity is increasing (Al-Nozha et al., 1997; Cavill et al., 2001; Eisenmann et al., 2004).

Sample Size.

Sample size is associated with the research style such as theory testing by questionnaire. This usually requires a large sample, particularly if inferential statistics are to be used for analysis (Cohen et al., 2000). According to Borg and Gall (1979) the sample size should be large where there are many variables; with expected small relationships and the sample will be broken down. According to Hair, Black, Babin, Anderson and Tatham (2006) the sample size that suits univariate, bivariate and multivariate analysis approaches should have a minimum ratio of at least five respondents for each estimate variable. Alexandris, Barkoukis, Tsorbatzoudis and Grouios (2003) examined the constraints on participation in physical activity among older Greek adults, and there was limitation of confidence in any attempt to make generalisations due to the small sample size. As well as this, they recommended future studies related to constraints on participation in physical activity should be verified with larger samples.

This study provided for 64 variables (excluding variables of demographic characteristics) for measuring the constraints (29 variables), motivations (23 variables) and physical activity and sport participation levels (12 variables). Based on this number

of variables and Alexandris et al.'s (2003) suggestion, the sample size suitable for this thesis was 320 (64*5) respondents from setting. The sample was drawn from the five regions within Riyadh zone, including 30 public and private schools. Therefore, the total of this research sample was approximately 1500 respondents who were invited to participate in this study.

6.5 Data Analysis

Quantitative data analysis is a complex approach to gaining knowledge (Neuman, 2011), and for this reason Gratton and Jones (2010) recommend that data needs to be rigorously interpreted, organised and analysed to answer research questions. Quantitative analysis deals with data in the form of numbers and uses mathematical operations to investigate their properties (Nicholas, 2010). This research has used a quantitative method to collect numeric data that was organised, interpreted and analysed using SPSS v. 20.

This section explains the steps undertaken for quantitative data analysis, including the approach for checking missing data, and assessing data normality. Descriptive analysis was used to describe the sample and lay the foundation for subsequent analyses. An understanding of these procedures is required before the data can be used for inferential statistical analysis. The section concludes by explaining the inferential statistics used to address the research objectives.

6.5.1 Missing data.

Missing data are responses for particular variables that are missing in the database because the respondents did not provide a response to a question (Creswell, 2008). Excluding cases listwise will completely exclude the case from all analysis if it is missing even one item of information, or if it is missing figures required for a specific analysis. This method limits the sample size of the study. This study has managed

missing values by excluding cases listwise because the large sample allowed the researcher to eliminate cases without compromising the integrity of the sample size.

6.5.2 Normality test.

The data analysis for this research required the sample to be based on a normal population, so there was a need to determine the normality of the sample based on a normality test. A normality test is a statistical procedure to test the suitability of data for statistical analysis by checking the distribution of data values with the cumulative distribution of a normal distribution. The normality test explores levels of skewness and kurtosis and a histogram, to explain how well the sample represents a normal population (Hair et al., 2006; Pallant, 2011; Tabachnick & Fidell, 2007). For a distribution to be considered normal, both the skewness and kurtosis of the distribution should be between +2.58 and -2.58 (Abu-Bader, 2011; Blanksby & Barber, 2006; Hair et al., 2006). According to Pallant (2011), skewness and kurtosis values that are not significant (>0.05) indicate a normal distribution (a non-significant result). In this study, skewness and kurtosis statistics were calculated to inspect normality. The test for normality also inspected the histogram of the data distribution of constraints and motivations variables.

6.5.3 Descriptive analysis.

Descriptive analysis includes a number of data analysis options to summarise information about participants. Descriptive statistics are important because they provide foundation findings that help answer the research questions, and additionally establish patterns in the data (De Vaus, 2002; Pallant, 2011). Frequencies of responses are used for the categorical variables; the mean, mode and standard deviation are used for the numeric variables (Pallant, 2011). Descriptive statistics, including percentages and frequencies, were used to describe sample characteristics. Descriptive analysis procedures were employed to evaluate the nature of the data by focusing on the mean,

mode and standard deviation to describe the main research constructs of constraints, motivations and physical activity participation levels. This allowed the researcher to describe a set of data with a single numerical value. Categorical data, such as the social demographic information of age, type of school, grade level and region lived in Riyadh, used frequencies and percentages to explain the results.

6.5.4 Factor analysis.

A large number of studies have employed factor analysis validation instruments (Comrey, 1978; Ford, MacCallum & Tait, 2006; Thompson, 1997). Factor analysis is not designed to test hypotheses or find any significance between groups, but does reduce a large number of variables to a smaller set of underlying factors (Coakes, Steed & Price, 2008; Pallant, 2011). There are two main approaches to factor analysis, which are exploratory and confirmatory. Exploratory factor analysis attempts to discover the nature of the constructs influencing a set of responses (DeCoster, 1998). In contrast, confirmatory factor analysis is a more complex and sophisticated set of techniques used later in the research process to test specific hypotheses or theories concerning the structure underlying a set of variables.

This study needed to determine the underlying factor structure of both constraints and motivation scales for two main reasons: (1) there is no evidence of studies applying those scales with Saudi Arabian youth, or in neighbouring countries such as United Arab Emirates and Bahrain; and (2) to determine the structure of a set of constraints and motivation variables to compare with the original scale. The following sections discuss the details of the exploratory factor analysis.

6.5.4.1 Exploratory factor analysis.

Exploratory factor analysis is often used in the early stages of research to gather data about the interrelationships among a set of variables. Exploratory analysis

procedures are powerful tools that can address a wide range of theoretical questions (Hair et al., 2006). The two main objectives for using exploratory factor analysis are: (1) to determine the number of common factors influencing a set of measures; and (2) to determine the strength of the relationship between each factor and each observed measure (DeCoster, 1998). It is useful for identifying the presence of meaningful patterns among the original variables, and for extracting the main service factors (DeCoster, 1998; Lu, Lai & Cheng, 2007). There are three main steps to conducting factor analysis.

Step one is assessment of the data's suitability for factor analysis. To help evaluate data factorability, two tests are recommended. Bartlett's test of sphericity needs to be significant ($p < 0.05$), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy needs to be greater than 0.6 for a good factor analysis (Pallant, 2011).

Step two is factor extraction, which involves determining the smallest number of factors that can be used to best represent the interrelationships among the set of variables. The most common extraction technique is principal components. There are number of techniques that will manage to assist in decisions concerning the number of factors to retain, which are Kaiser's criterion; scree test; and parallel analysis. Kaiser's criterion is known as the most common technique to determine the number of factors to retain. It is also known as the eigenvalue rule. Factors with an eigenvalue of 1.0 or more are retained for further investigation. Catell's scree test plot involves plotting each of the eigenvalue of the factors to identify where the shape of the curve changes direction and becomes horizontal. The point at which the curve changes direction can be recognised as a point for factor retention for further analysis. Finally, parallel analysis involves comparing the size of the eigenvalues with those randomly generated from a

data set of the same size. The factors with eigenvalues greater than the corresponding values from the parallel analysis are retained for further investigation (Pallant, 2011).

The final step is factor rotation and interpretation. Factor rotation aims to improve the interpretation of a given factor solution. This step requires the evaluation of the data factorability, this includes two tests. Bartlett's test of sphericity needs to be significant ($p < 0.05$), and the KMO measure of sampling adequacy needs to be greater than 0.6 for a good factor analysis (Pallant, 2011), for more details see chapter 7.

Principal components analysis (PCA) was employed in this study by using the three main steps to conduct the factor analysis. The PCA was used to derive the underlying dimensions of physical activity participation constraints and motivations, to understand the application of the scales in the study of Saudi Arabian youth.

6.5.5 Correlation.

Correlation analysis is used to identify the strength and direction of linear relationships between two variables. There are a number of statistical methods available to identify relationships between many variables, for example Pearson's product-moment correlation coefficient (r) for parametric statistics, and Spearman's rank correlation for non-parametric statistics. Since the results were interval / ratio data the Pearson's correlation was used. The value of the Pearson's correlation coefficient (values ranging from -1.00 to +1.00) indicates the strength of relationships. A correlation of 0 indicates no relationship between the variables. Pearson's product-moment correlation coefficient was used to describe the strength and direction of the linear relationship to identify the correlation between constraints and motivations, participation is the ultimate output or dependent variable; whereas motivations and constraints are the explanatory variables.

6.5.6 T-tests.

T-tests are used to compare the values on some continuous variables for two groups. There are different types of T-tests available in SPSS. The independent-samples t-test is used to compare mean scores of two different groups of people or conditions. A paired-samples t-test is used to compare mean scores for the same group of people on two different groups of accessions (Pallant, 2011). In this study, independent-sample T-tests were employed to determine the difference between total constraints and total motivations variables and type of school.

6.5.7 One-way ANOVA.

A one-way ANOVA test was used to compare the values on some continuous variables of more than two groups (Pallant, 2011). There are two types of ANOVA test which is used when a study has different participants or cases in each group, and when researchers measure the same participants under different conditions (Pallant, 2011). In this study, the between-groups one-way ANOVA with POST-HOC tests was employed to determine the difference between the three constraints dimensions and three motivation factors by age, grade level, and region lived among high school students. The ANOVA is sensitive in detecting differences, but the post-hoc test has more stringent significance levels to reduce the risk of type 1 error. A type one error happens when a null hypothesis is rejected while it is true. The error accepts the alternative hypothesis, despite it being attributed to chance (Pallant, 2011).

6.5.8 MANOVA.

MANOVA is an extension of ANOVA, used if there is more than one dependent variable. There are many ways the MANOVA test can be used: one-way, two-way and higher-order factorial designs. This test can also examine and compare differences among different groups of subjects. The advantage of using MANOVA is that it

‘controls’ or adjusts for the increased risk of a type 1 error. It is possible to avoid and minimise this error by selecting an appropriate alpha level (for level two, 0 .05 and 0.01 are often used). The other alternative is to apply what is known as a Bonferroni adjustment to the alpha level. This involves setting a more stringent alpha level for each comparison, to keep the alpha across all the tests at a reasonable level. Thus, a Bonferroni adjustment will divide the alpha level of 0.05 by the number of the tests intend to be used, and use the revised alpha level as the criteria for determining significance (Pallant, 2011). For example, in this study there were three comparisons, so the new alpha level was 0.017.

MANOVA procedures are complex. Before proceeding with the main MANOVA analysis, a number of preliminary analyses were performed, to ensure there were no violations of sample size, normality, outliers, linearity, homogeneity of regression, multicollinearity and singularity, and homogeneity of variance-covariance matrices. Sample size assumption can affect other assumptions; for example a large sample can overcome violations of some other assumptions (e.g. normality). Conversely, large sample sizes are not strictly necessary to gain a good result from some assumptions (Pallant, 2011). In this study, one-way MANOVA was used to identify the difference between the three constraints and three motivation variables by age, grade level, and region lived among high school students.

6.5.9 Effect size.

The ‘effect size’ calculation is a way to assess the importance of a finding. There are numbers of statistics to identify effect size, the ones commonly used to compare between groups are ‘partial eta squared’ and ‘Chen’s d’. Partial eta squared values can range from 0 to 1. There are guidelines to interpret the strength of different effect size statistics. Partial eta squared was used in this study. This figure was used to determine

the importance of findings that reached statistical significance. Table 6.9 provides a summary of the guidelines for interpreting the effect size of the partial eta squared analysis. (Winter, Abt & Nevill, 2014). This statistic is particularly important because it provides insights about the strength of the association between variables. Although a statistical test may reach statistical significance, the effect size will indicate the indicate the level of magnitude of the differences (Pallant, 2011).

Table 6.9

Guidelines of Effect Size

Size	**Eta Squared** (% of Variance Explained)
Trivial	0 – 0.19
Small	0.20 – 0.49
Medium	0.50 – 0.79
Large	0.80 and greater

6.6 Chapter Summary

This chapter has provided an overview of the research methods used to investigate the research questions and test the hypotheses in this thesis. As discussed above, this research is confined to adolescent males attending high schools in Riyadh, Saudi Arabia. Hence, the three main questions contain six main hypotheses, mentioned in Chapter 1. This research has used a quantitative method to collect numeric data that was organised, interpreted and analysed using SPSS v. 20. Data analysis included the methods of screening and cleaning the data, the approach for checking missing data, and assessing data normality.

Six types of analysis were used in this research, including descriptive analysis procedures were employed to evaluate the nature of the data by focusing on the mean, mode and standard deviation to describe the main research constructs of constraints,

motivations and physical activity participation levels, factor analysis was used to derive the underlying dimensions of physical activity participation constraints and motivations, to understand the application of the scales in the study of Saudi Arabian youth , pearson's product-moment correlation coefficient was used to describe the strength and direction of the linear relationship to identify the correlation between constraints and motivations, between physical activity participation levels as independent variables, and constraints and motivations as dependent variables (H2a to H5d), independent-sample T-tests were employed to determine the difference between total constraints and total motivations variables and type of school (H1a, H4a and H6a), between-groups one-way ANOVA with POST-HOC tests was employed to determine the difference between the three constraints dimensions and three motivation factors by age, grade level, and region lived among high school students (H4a, H4b, H4c, H4d, H6a, H6b, H6c and H6d) and One-way MANOVA was used to identify the difference between the three constraints and three motivation variables by age, grade level, and region lived among high school students.(H4e, H4f, H4g, H4h, H6e, H6f, H6g and H6h). The analytical approaches used in this research, the forms of data analyses to be undertaken, and the ethics of conducting a questionnaire for this study were explained.

The process of this investigation, which is to test a model of constraints and motivations on physical activity participation among high school students from Riyadh City, Saudi Arabia, was confirmed through rigorous research methods. The chapter included a detailed discussion of hierarchical models of constraints, as designed and developed by Crawford and Godbey (1987) and Crawford et al.(1991), and a three-factor model of motivation designed by Frederick and Ryan (1993). It was noted that these models were used to address the three main research questions.

The chapter included a discussion of the questionnaire design, which was divided into three sections. Section A of the questionnaire contained two sets of questions, which were related to: 1) constraints; and 2) motivation for physical activity participation. Section B of the questionnaire contained questions that were related to participation levels in physical activity and sport. This section included a discussion of physical activity levels and how they can be best measured. Finally, Section C of the questionnaire contained questions that collected data about respondents' demographic profile and features of physical activity participation. These sections included the main independent and dependent variables, as described in the theoretical framework.

A pilot study (100 questionnaires) was conducted to check the study's reliability and identify any problematic issues. The pilot study demonstrated the reliability and validity of the questionnaire. Consequently, the questionnaire was used for the main study. The data analysis is provided in Chapter 7.

Chapter 7: Results

7.1 Introduction

Chapter 7 presents the results of this study into Riyadh male high school student participation in physical activity and sport. These results were prepared using the methods discussed in Chapter 6. Data from this study were collected by the questionnaire, which is divided into three sections, as described in the theoretical framework developed in Chapter 5. The first section contained two sets of questions, which were related to: (1) constraints included the three independent dimensions of intrapersonal, interpersonal and structural constraints; and (2) motivation included the three motivations of body-related dimension; competence dimension; and intrinsic dimension.

The questionnaire's second section measured the level of physical activity participation by focusing on frequency, duration and types of physical activity and sport used to identify the intensity of the activity. Finally, the questionnaire's third section collected data about the social demographic information, including age, grade level, type of school and region of Riyadh and other characteristics related to their participation. The key results relating to constraints are shown in Table 7.15, and motivations are shown in Table 7.16.

This chapter is divided into five main parts. The first part, Section 7.1 introduces the chapter. The second part, Section 7.2, explores the suitability of the data for analysis. This section includes an explanation of the codes for measurement items, screening and cleaning the data, missing data analysis, normality result and reliability. Section 7.3 provides the descriptive statistics. This includes personal data (age, type of school, region of residence, education grade level) for the main variables that informed the research questions and hypotheses. Data about the ratings of the constraints,

motivations and physical activity participation level variables are also included. The fourth part, Section 7.4, focuses on inferential statistics, by addressing the hypotheses that were initially presented in Chapter 1. This includes PCA to check the application of the factors associated with the constraints and motivation scales, the correlation between constraints, motivation, and physical activity participation level variables, and the differences in respondents' constraints and motivations variables, according to participants' social demographic variables. The fifth part, Section 7.5, provides a summary of the chapter. All analyses were conducted using SPSS software (version 20).

7.2 Suitability of Data Examination Analysis

This section provides the outcomes of the missing data analysis, screening and cleaning the data, and normality test results. This section concludes with a discussion regarding the reliability of the survey.

In this study, the scale of constraints and motivation were 1 = strongly agree, to 5 = strongly disagree. This method was used, as it was the first time it had been applied to Saudi Arabian children, to easily be understood by them. After data collection and during data analysis, the researcher decided to recode the scale from 5 = strongly agree to 1 = strongly disagree, based on other studies' scales (Alexandris & Carroll, 1997; Frederick & Ryan, 1993).

7.2.1 Screening and cleaning the data.

Cleaning data is essential to check for errors before analysis begins. Data were collected from 1299 respondents. There were a few errors in the data entry so adjustments were made to the final data file.

7.2.2 Missing data.

After checking the whole data set, 390 cases out of 1299 cases were removed, as large and important data was missing (In some intances, a fuil page of questionnaires

were not answered). Consequently, in this study a useable sample size of 909 respondents without missing data was obtained.

7.2.3 Constraints variables normality test.

The constraints variables demonstrated that the shapes of all univariate distributions were reasonably normal (see Figure 7.1). In addition, inspection of the skewness and kurtosis values of all the constraint variables in Table 7.1indicated that the levels of skewness and kurtosis were within the recommended range of -2.58 to +2.58 (Abu-Bader, 2011; Hair et al., 2006). The normality test by subscale constraints variables (interpersonal, intrapersonal and structural constraints) was also done. For all subscale constraints variables, skewness and kurtosis values range between -2.58 to +2.58 (see Table 7.1), that is, the data followed a normal distribution. Consequently, this study was able to use parametric statistical techniques (Pallant, 2011) for the analysis of the constraints variables.

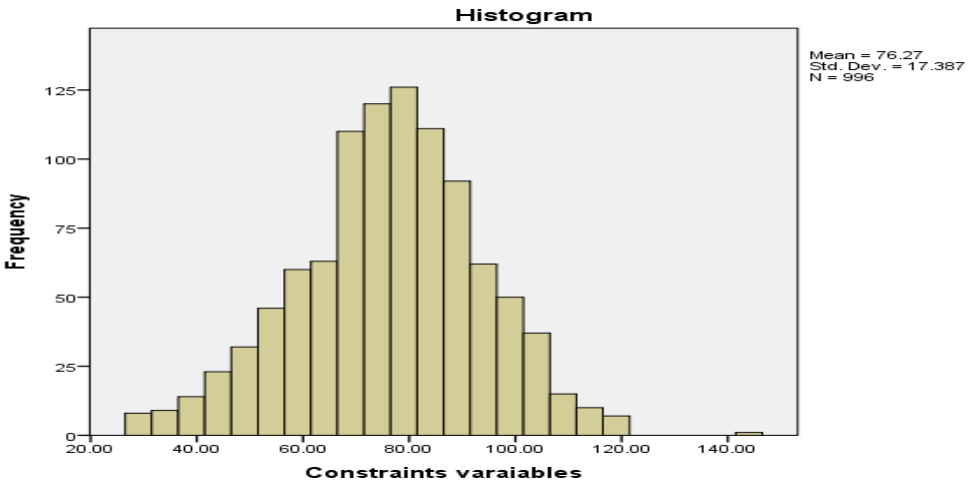


*Figure 7.1.*Histogram of constraints variables normality test.

Table 7.1

Normality Test Result by Subscale of Constraints Variables

Subscale Group	Sk*	Std. Error	Sk/SE	Ku**	Std. Error	Sk/SE
Whole constraints variables	-.160	.077	-2.07	.147	.155	.022
Interpersonal constraints	.248	.074	3.35	-.031	.148	-.20
Intrapersonal constraints	.463	.069	6.71	-.611	.139	- 4.39
Constraints variables	.160	.077	2.07	.147	.155	.94

*Skewness **Kurtosis

7.2.4 Motivation variables normality test.

The motivation variables demonstrated that the shapes of all univariate distributions were non-normal (see Figure 7.2). In addition, inspection of the skewness and kurtosis values of all motivation variables in Table 7.2indicated that the skewness and kurtosis figures for a normal distribution were more than the recommended range of -2.58 to +2.58 (Abu-Bader, 2011; Hair et al., 2006). In addition, a normality test by subscale motivation variables—body-related motivations, competence motivations and intrinsic motivations—was done. For all subscale motivation variables, the skewness and kurtosis figures for a normal distribution were more than recommended (see Table 7.2). As this result, motivation variables were non-normal in this study, so an option for the analysis of data might include non-parametric tests, such as Spearman's rho. However, the non-parametric techniques of analysis tend to be less powerful (Pallant, 2011).

A number of transformation options were explored. In this study the Box-Cox normality plot was used to transform data to a normal distribution (Lehmann, 1975; Pallant, 2011; Sakia, 1992; Yeo & Johnson, 2000). The histogram in Figure 7.3, of the motivations data after applying the Box-Cox normality plot, shows a data set for which the normality assumption is reasonable. After the transformation of data using the Box-Cox normality plot, the skewness and kurtosis values of all the motivation variables and

the subscale variables of motivations in Table 7.4, indicated the levels of skewness and kurtosis were within the recommended range of -2.58 to +2.58 (Abu-Bader, 2011; Hair et al., 2006). Consequently, this study was able to use parametric statistical techniques (Pallant, 2011) for analysing the motivation variables.

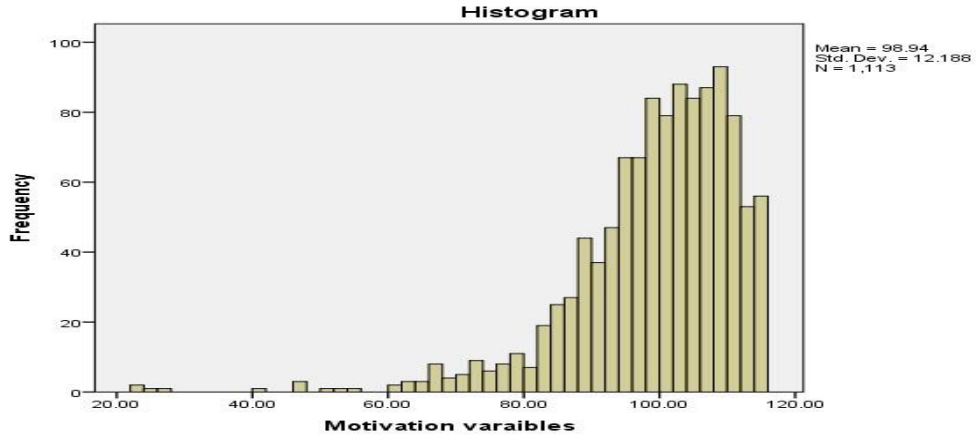


*Figure 7.2.*Histogram of motivations variables normality test.

Table 7.2

Normality Test Results by Subscale of Motivation Variables

Subscale Group		**Sk***	**Std. Error**	**Sk/SE**	**Ku****	**Std. Error**	**Sk/SE**
Before	Motivation variables	.146	.081	-2.07	3.90	.162	.022
After transform data	Motivation variables	-.077	.081	-.939	-.330	.162	-2.03
	Body-related motivations	-1.278	.071	-18	3.055	.142	21.514
Before	Competence motivations	-1.886	.070	-2.69	4.660	.139	33.525
	Intrinsic motivations	-1.672	.069	-2.42	4.205	.138	30.471
After transform data	Body-related motivations	.200	.081	2.46	-.509	.162	-3.141
	Competence motivations	-.517	.081	-6.38	-.551	.162	-3.401
	Intrinsic motivations	-.330	.081	-4.07	-.883	.162	-5.450

*Skewness **Kurtosis

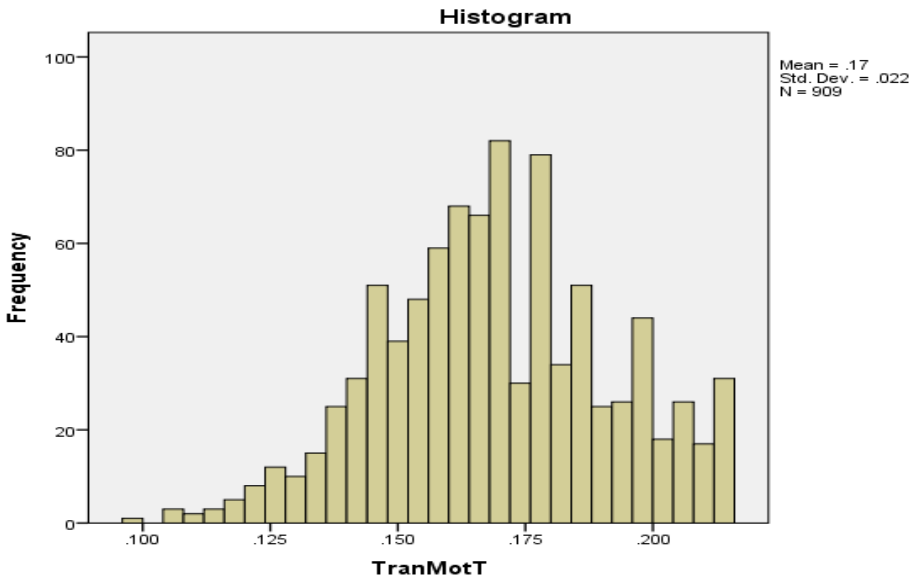


*Figure 7.3.*Histogram of motivations variables normality test by Box-Cox normality plot method.

A Box-Cox transformation was used to create new variables. These variables were used to compare the results with the raw scores, by conducting comparative ANOVA tests to determine whether the skewness and kurtosis affected the outcome of the hypothesis tests. The social demographic variables, for example age, grade level, region, and type of school, produced the same results from the ANOVA with both the transformed data and the original data. Table 7.3provides an example of ANOVA outcomes for tests that compared the analysis of the original data and the transformed data. Tabachnik and Fidell (2001) suggest the use of transformed variables is an effective way to address issues about the normal distribution of data, but the transformed variables may be difficult to interpret. The transformed variables in this study produced a more normal distribution, but the ANOVA tests produced similar results for the original data as with the transformed data. Since the scale for the motivation variables was well established, meaningful and widely used, it was decided to use the original data for the motivation scale. The original data of motivation

variables were used for data analysis using parametric techniques such as correlation, MANOVA, t-test and ANOVA, because the results are more easily interpreted.

Table 7.3

ANOVA Test Result for Competence Motivation Variables with Type of School

		Type of School				
		Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Competenceand satisfaction motivations	Between groups	213.883	1	213.883	11.795	.001
	Within groups	16447.380	907	18.134		
	Total	16661.263	908			
Transformation competenceand satisfaction motivations	Between groups	.040	1	.040	16.029	.000
	Within groups	2.284	907	.003		
	Within groups	2.325	908	213.883		

7.2.5 Results of the pilot study.

The pilot study was conducted with male high school students aged between 16 to 19 years old, who were living in Riyadh, Saudi Arabia, resulting in a sample size of 100 respondents. The pilot study was completed to practice using research instruments before the main study, to check the study's reliability and identify any problematic issues. The research instrument was composed of a quantitative method via a self-administrated questionnaire (survey). The pilot study questionnaire contained 72 items in the three sections. Respondents comprised 100 males; 28 per cent were aged 16 years old; 38 per cent were aged 17 years old; 27 per cent were aged 18 years old; 7 per cent were aged 19 years old; 43 per cent were of in the tenth grade; 53 per cent were in the eleventh grade; 31 per cent were in the twelfth grade; 100 per cent lived in East Riyadh; 78 per cent were in public school; 22 per cent were in private school; 37 per cent owned car; 63 per cent did not own the car.

In terms of reliability scores, the scales demonstrated acceptable reliability: Cronbach's alpha of the constraints scale was 0.81, and the motivation scale was 0.68. As recommended by Devellis (1991) Cronbach's alpha coefficient value was 0.59, for the measurement scale to be acceptable. There were no problems identified with the questionnaire in the pilot study. Consequently, the main study used the same questionnaire.

7.2.6 Reliability of the survey(main study).

Examination of the reliability of scales used in this research was necessary because of their capacity to influence the quality of data (Pallant, 2011). The techniques employed in this study provided a reliable estimation of Cronbach's coefficient alpha. The Cronbach'scoefficient alphas for each scale used in this thesis were calculated using SPSS. There were two independent scales used in the survey to measure the constructs planned in the conceptual model: constraints to participation (C) and motivations to participation (M). Table 7.4presents the Cronbach's alphas for measurement of the constraints and motivation scales used in this study. This table indicates that all constraints and motivations scales were at least acceptable, > 0.7 and many of the scales were above 0.8, which is preferable. The application of the scales is explored further through a PCA of the constraints and motivation variables in the next section.

Table 7.4

Reliability of Scales in this Study (N=1299)

Concept Scale	# of items	Cronbach's Alpha
Constraints in total	٢٩	٠,٨
1. Interpersonal constraints dimension	١٤	٠,8
2. Intrapersonal constraints dimension	٣	٠,8
3. Structural constraints dimension	١٢	٠,٧
Motivations in total	٢٣	٠,9
1. Body-related dimension	١٠	٠,8
2. Competence dimension	٧	٠,8
3. Intrinsic dimension	٦	٠,8

7.3 Descriptive Statistics

Descriptive analysis includes a number of data analysis options to summarise information about participants. Descriptive analysis procedures were employed to evaluate the nature of the data, by focusing on the mean, mode and standard deviation to describe the main research constructs of constraints, motivations and physical activity participation levels. Categorical data, such as social demographic information of age, type of school, grade level and region of residence in Riyadh, used frequencies and percentages to explain the results. These data were obtained from the final sample.

The data presented in this section are the descriptive statistics for the main variables that informed the research questions and hypotheses. Descriptive data for the other variables in the questionnaire, e.g., GPA, father's income, etc. are provided in Appendix B. The data presented in Appendix B will not be mentioned here but some of the data is used to inform the discussion in Chapter 8.

7.3.1 Sample.

Chapter 6 provided a detailed explanation of the questionnaire, which included items, distribution methods and collection methods. The questionnaire collected

individual information of the 909 male high school students who lived in Riyadh, Saudi Arabia. The data shows that 23.5% of respondents were aged 16, 38.5% of respondents were aged 17, 27.6% of respondents were aged 18, and 10.3%of respondents were aged 19 (see Table 7.5). This means that most of the respondents were 17 years old, with the least amount of respondents 19 years old; the mean age was 17.27 years old, and ages ranged from 16 to19 years old (SD= .942).

Table 7.5

Respondent Age

Age	**Frequency**	**Percentage**
16 years old	214	23.5
17 years old	350	38.5
18 years old	251	27.6
19 years old	94	10.3
Missing system	0	0.0
Total	909	100.0

Table 7.6provides the details for the respondents' type of school; there was an even distribution between public (51%) and private (49%) school respondents. The sample design targeted an even spread of public and private schools. The data indicate that this even spread was achieved.

Table 7.6

Respondent Type of School

Type of school	**Frequency**	**Percentage**
Public school	464	51
Private school	445	49
Missing system	0	0
Total	909	100.0

The questionnaire asked respondents to indicate their residential location in Riyadh. It was found that 21.3% lived in the north region of Riyadh City, and 19.1% lived in the south region. Only 18.5% lived in the east region of Riyadh City, and 19.7% lived in the west region of Riyadh City; finally, 21.3% lived in the middle region of Riyadh City (see Table 7.7). The sample design targeted an even number of participants across the five regions.

Table 7.7

Respondent Region Lived

Region lived	**Frequency**	**Percentage**
North Riyadh	194	21.3
South Riyadh	174	19.1
East Riyadh	168	18.5
West Riyadh	179	19.7
Middle Riyadh	194	21.3
Missing system	0	0
Total	909	100.0

The questionnaire requested respondents to indicate their education grade level. Table 7.8 provides a summary of the respondent's education grade level. The data shows there were 26.2% studying in grade 10, with the majority of respondents, 37.7%, studying in grade 11, and 36.1% studying in grade 12.

Table 7.8

Respondent Grade Level

Grade level	Frequency	Percentage
Grade 10	238	26.2
Grade 11	343	37.7
Grade 12	328	36.1
Missing system	0	0
Total	909	100.0

7.3.2 Constraints variables.

Data for the constraints analysis was collected through the use of a constraints theory survey, which included 29 items covering the three independent dimensions of intrapersonal, interpersonal and structural constraints (Alexandris & Carroll, 1997; Crawford et al., 1991). Section7.4 provides more information about the interpretation of the constraints scale. The respondents were requested to rate the constraints variables of each item for their participation level in physical activity and sport. Table 7.9 provides the mean, mode, standard deviation, skewness and kurtosis statistics of the constraints items. The constraints variables scores range is 5 = strongly agree (high constraint), to 1 = strongly disagree (no constraints), with most respondents falling in between.

Mean scores of each item were tabulated to determine which items were most and least constraining. The statistics results show that the mean scores for all constraints items ranged from 3.60 to 1.78. Further, the results showed that two items rated as most constraining were ‘facilities inadequate (not enough or some facilities not available)’(mean=3.60) and ‘facilities crowded’(mean=3.47). The data also showed that two items rated as least constraining were ‘I am not interested’(mean=1.78) and ‘I do not like activities offered (not like it)’(mean=1.96). The rating of the constraints items was also reflected in the modes for the items. The mean scores for most of the

constraints variables are relatively low (e . g. most are less than 3.60). This suggests that the respondents did not have very strong constraints. The impact of these constraints is discussed in chapter 8.

The standard deviation measured the level of differences in the result for each variable (Pallant, 2011). In this study, the standard deviation of constraints variables ranged from 1.127 (I am not interested) to 1.673 (I have no car). This data reflects the sample's consistency for 'I am not confident' and less consistency for 'I have no car'. The level of skewness and kurtosis are also provided, and were discussed in Section 7.2, which explored the suitability of data for analysis.

Table 7.9

Constraints Variables

Item	Mean	Mode	Std. Deviation	Skewness	Kurtosis	Code
It make me feel tired	2.17	1	1.211	.851	-.347	C1
I am afraid of getting hurt	2.25	1	1.239	.741	-.555	C2
I am not happy in social situations	2.70	3	1.300	.230	-1.003	C3
I feel too tired for recreation	2.28	1	1.297	.726	-.651	C4
I have health -related problems	1.79	1	1.140	1.512	1.392	C5
I am not confident	1.94	1	1.126	1.096	.313	C6
It isnot intense enough for me	2.20	1	1.221	.743	-.484	C7
I do not know where to participate	2.77	1	1.519	.238	-1.435	C8
I have not anyone to teach me	3.04	5	1.558	-.052	-1.540	C9
I do not know where I can learn it	2.73	1	1.472	.272	-1.358	C10
My skills are deficient	2.52	1	1.321	.398	-1.040	C11
Facilities poorly kept	3.26	5	1.547	-.268	-1.460	C12
Facilities crowded	3.47	4	1.315	-.468	-.938	C13
Facilities inadequate (not enough, or some facilities not available)	3.60	5	1.289	-.600	-.779	C14
I do not like the activities offered	1.96	1	1.159	1.151	.430	C15

Item	Mean	Mode	Std. Deviation	Skewness	Kurtosis	Code
Programme's timetable does not fit with me	2.74	2	1.316	.232	-1.078	C16
The transportation takes too much time	3.10	4	1.407	-.116	-1.272	C17
There is no opportunity near my home	3.28	5	1.474	-.275	-1.329	C18
I have no car	3.07	5	1.673	-.067	-1.695	C19
I cannot afford it, the fees an expensive	3.39	5	1.417	-.387	-1.135	C20
I had not enjoyed this activity in the past	2.04	1	1.207	.994	-.010	C21
I do not want to interrupt my routines	2.09	1	1.240	.971	-.098	C22
I am not interested	1.78	1	1.127	1.429	1.090	C23
My friends do not have time	2.46	1	1.263	.455	-.843	C24
There is nobody to participate with me	2.49	1	1.403	.510	-1.090	C25
My friends do not like physical activity	2.27	1	1.251	.674	-.611	C26
I donot have time because of family needs	2.66	2	1.258	.309	-.926	C27
I do not have time because of studies	3.10	4	1.371	-.096	-1.239	C28
I do not have time due to social commitments	2.51	2	1.197	.452	-.683	C29

*(Note: Table presents statistical values for 909 respondents and missing items of 0)

7.3.3 Motivation variables.

Data for the motivations analysis were collected through using the questionnaire of physical activity motivation, developed by Frederick and Ryan (1993). This motivation of physical activity measure assessed three types of motives for engaging in physical activity and sport: 1) body-related dimension; 2) competence dimension; and 3) intrinsic dimension. The questionnaire of 23 items (covering seven variables) measured the rating for each of the items and identified which motivations had the highest and lowest effect on male high school student participation in physical activity and sport (Section 7.4 will explore the scales for the types of motivation). The

respondents were requested to rate the motivation variables of each item for their participation in physical activity and sport. Table 7.10 provides the mean, mode, standard deviation, skewness and kurtosis statistics for each of the motivation items. The motivation variables score range was 5 = strongly agree (high motivation), to 1 = strongly disagree (no motivation).

Mean scores of each item were tabulated to determine which items were most and least motivating. The statistics results show that the mean scores for all motivations items ranged from 3.19 to 4.71. The results showed that the two items rated as most motivating were, 'I want to improve my cardio fitness'(mean=4.71), and 'I want to be physically fit'(mean=4.69). The data also showed that two items rated as least motivating were, 'I want to lose or maintain weight'(mean=3.32) and 'I will feel ugly if I don't'(mean=3.19). The mode being 5 for all the variables, and the mode score of five for all motivation items reflected the high rating of these items.

The standard deviation of motivations variables ranged from 1.600 ('I want to lose or maintain weight') to 0.711 ('I want to improve existing skills'). This data reflects that the sample had more variance for 'I want to lose or maintain weight 'and less variance for 'I want to improve existing skills'. The level of skewness and kurtosis are also provided, and this was discussed in Section 7.2. The low standard deviation levels indicate a high level of consistency in the rating of the motivation levels. The relatively high ratings for the motivation variables indicates that the respondents have a high level of motivation when reflecting on the attractiveness of undertaking some form of physical activity or sport. This is revealed in the analysis of differences of the motivation ratings that is discussed in Section 7.4.

Table 7.10

Motivations Variables

Item	Mean	Mode	Std. Deviation	Skewness	Kurtosis	Code
I want to be physically fit	4.69	5	.727	-2.975	9.683	M1
I want to lose or maintain weight	3.32	5	1.600	-.295	-1.521	M2
I want to better cope with stress	4.04	5	1.052	-1.077	.722	M3
I want to improve my appearance	4.39	5	.923	-1.722	2.791	M4
I want to have more energy	4.58	5	.786	-2.372	6.262	M5
I want to define my muscles	4.48	5	.868	-1.917	3.572	M6
I want to be attractive to others	3.78	5	1.322	-.770	-.624	M7
I want to improve my body shape	4.39	5	.976	-1.878	3.163	M8
I will feel ugly if I don't	3.19	5	1.435	-.164	-1.285	M9
I want to improve my cardio fitness	4.71	5	.666	-2.951	10.314	M10
I want to get better at my activity	4.44	5	.848	-1.723	3.116	M11
I like the competition	4.51	5	.856	-2.055	4.279	M12
I want to obtain new skills	4.63	5	.752	-2.526	7.028	M13
I want to improve existing skills	4.65	5	.711	-2.636	8.168	M14
I like the challenge	4.54	5	.828	-2.181	5.101	M15
I want to keep up my current skill level	4.23	5	1.095	-1.470	1.409	M16
I like the excitement of participation	4.34	5	.922	-1.422	1.575	M17
It's fun	4.21	5	1.039	-1.425	1.503	M18
I think it's interesting	4.47	5	.791	-1.739	3.367	M19
It makes me happy	4.41	5	.868	-1.726	3.176	M20
I like to do this activity	4.55	5	.754	-2.049	4.920	M21
I find this activity stimulating	4.26	5	.949	-1.341	1.560	M22
I enjoy this activity	4.52	5	.805	-1.953	4.033	M23

*(Note: Table presents statistical values for 909 respondents and missing items of 0)

7.3.4 Physical activity participation variables.

Data for this variable were collected through the application of several questionnaires of physical activity participation (see Chapter 6). Previous studies have

examined physical activity participation levels using the Physical Activity Questionnaire for children and adolescent within seven days recall (Booth et al., 2002; Countryman et al., 2013; Godin, 2011; Morrow et al., 2013; Ridgers et al., 2012). These physical activity measures assessed the three main variables, which are type of activity and duration, adopted from APARQ, and frequency, adopted from LTEQ.

The 909 high school students rated their level of participation in physical activity and sport. Tables 7.11 to 7.14 provide data for the physical activity participation during the last seven days. Tables B.4, to B.11 provide data relating to features of how the respondents participated in the different activities, see appendix B. It is worth noting that only seven activities (e.g. Soccer, Volleyball, Table tennis, Swimming, Walking, Aerobics, Play station game) had more than 10% of participates involved.

Table 7.11 provides a summary of the respondents' type of physical activity and sport participation. The most popular activities were soccer (81.1%), electronic games (42%), swimming (32.8%), walking (21.1%), aerobics (16.1%) and volleyball (14.3%). The least popular activities were golf (0.2%), water skiing (0.8%), handball and martial arts (1.1%), gymnastics (1.3%) and tennis (2.6%), see Table 7.11.

Table 7.11

Type of Physical Activity and Sport Participation

Type of physical activity and sport	Frequency		Percentage	
	Yes	No	Yes	No
Soccer	737	172	81.1	18.9
Volleyball	130	779	14.3	85.7
Basketball	51	858	5.6	94.4
Tennis	24	885	2.6	97.4
Table tennis	93	816	10.2	89.8
Swimming	298	611	32.8	67.2
Walking	192	717	21.1	78.9
Gymnastics	12	897	1.3	98.7
Aerobics (water, step, dance)	146	763	16.1	83.9
Weight training	42	867	4.6	95.4
Water skiing	7	902	.8	99.2
Camping	56	853	6.2	93.2
Golf	2	907	.2	99.8
Handball	10	899	1.1	98.9
Athletics	48	861	5.3	94.7
Running	65	844	7.2	92.8
Martial Arts (e.g. self-defence, karate, judo)	10	899	1.1	98.9
Bicycling	35	874	3.9	96.1
Ride horse	40	869	4.4	95.6
Play station game	382	527	42.0	58.0

Table 7.12 provides the frequency of physical activity and sport participation. Most respondents participated three or more times per week, while there low of respondents participated two times or less per week, see Table 7.12 for more information.

Table 7.12

Time in School Week Allocated (Frequency) to Participation in Physical Activity

Frequency	Frequency	Percentage	Cumulate percentage
0	22	2.4	2.4
1 time	165	18.2	20.6
2 times	155	17.1	37.7
3 times	153	16.8	54.5
4 times	102	11.2	65.7
5 times	64	7.0	72.7
6 times	63	6.9	79.6
7times	52	5.7	85.3
More than 7 times	133	14.6	99.9
Missing system	0	.0	
Total	909	100.0	

When the duration of participation issue was examined, it was found that less than 11 per cent of respondents participated less than 30 minutes per session. The most common time spent participating was between 31 and 60 minutes (41.1%), while 48.3% of respondents participated for more than 60 minutes per session (see Table 7.13).

Table 7.13

Time Spent When Participating in Physical Activity (Duration)

Time	Frequency	Percentage
Less than 30 minutes	96	10.6
31–60 minutes	374	41.1
61–90 minutes	229	25.2
More than 91 minutes	210	23.1
Missing system	0	.0
Total	909	100.0

The data for the usual place where respondents participated in physical activity and sport is provided in Table 7.14. The most common places for respondents to

participate in physical activity and sports were: the street 39.8%, a club 13.2%, school 11.8% and home 10.3%. This result shows that school, home and clubs were about even in their usage. It is interesting to note that the most popular location for physical activity and sport was the street. This will be discussed further in Chapter 8.

Table 7.14

Place Usually Occupied When Participating in Physical Activity

Place	**Frequency**	**Percentage**
School	107	11.8
Home	94	10.3
Club	120	13.2
Gym	38	4.2
Health community centre	11	1.2
Street	362	39.8
Recreation place	88	9.7
Home and school	89	9.8
Missing system	0	.0
Total	909	100.0

7.3.4.1 Physical activity participation levels.

The basis for the rating of high, moderate and low levels of physical activity were explained in Chapter 6 and provided in Table 6.7. It was found that 73.7% of respondents had not met the minimum requirements for high level participation, which meant they had not achieved the minimum level of physical activity participation. In contrast, only 26.3% of respondents achieved the recommended levels of physical activity participation. As the explanation in chapter 2, the popularity of play station games brings the average level of PA down because it has such a low MET value. This limitation is acknowledged in Chapter 8.

Table 7.15

Respondent Physical Activity Participation Levels

Participation Levels	Frequency	Percentage
Low level	593	65.2
Moderate level	77	8.5
High level	239	26.3
Total	909	100.0

7.4 Inferential Statistics

Inferential statistics are a type of analysis that draw inferences about the population from which a data set was sampled (Kerr, Hall, Kozub & Kozub, 2002). Inferential statistics allows exploration of the relationships between dependent and independent variables, by examining a null hypothesis (Barnes & Lewin, 2005; Morgan et al., 2004; Siokos, 2011). Inferential statistics were used in this study to test the hypotheses presented in Chapter 1. This section provides the results that relied on inferential statistical techniques to find significant relationships between variables. This section focuses on the 25 hypotheses that related to the objectives of this research (see chapter 1 and Figure 7.4).

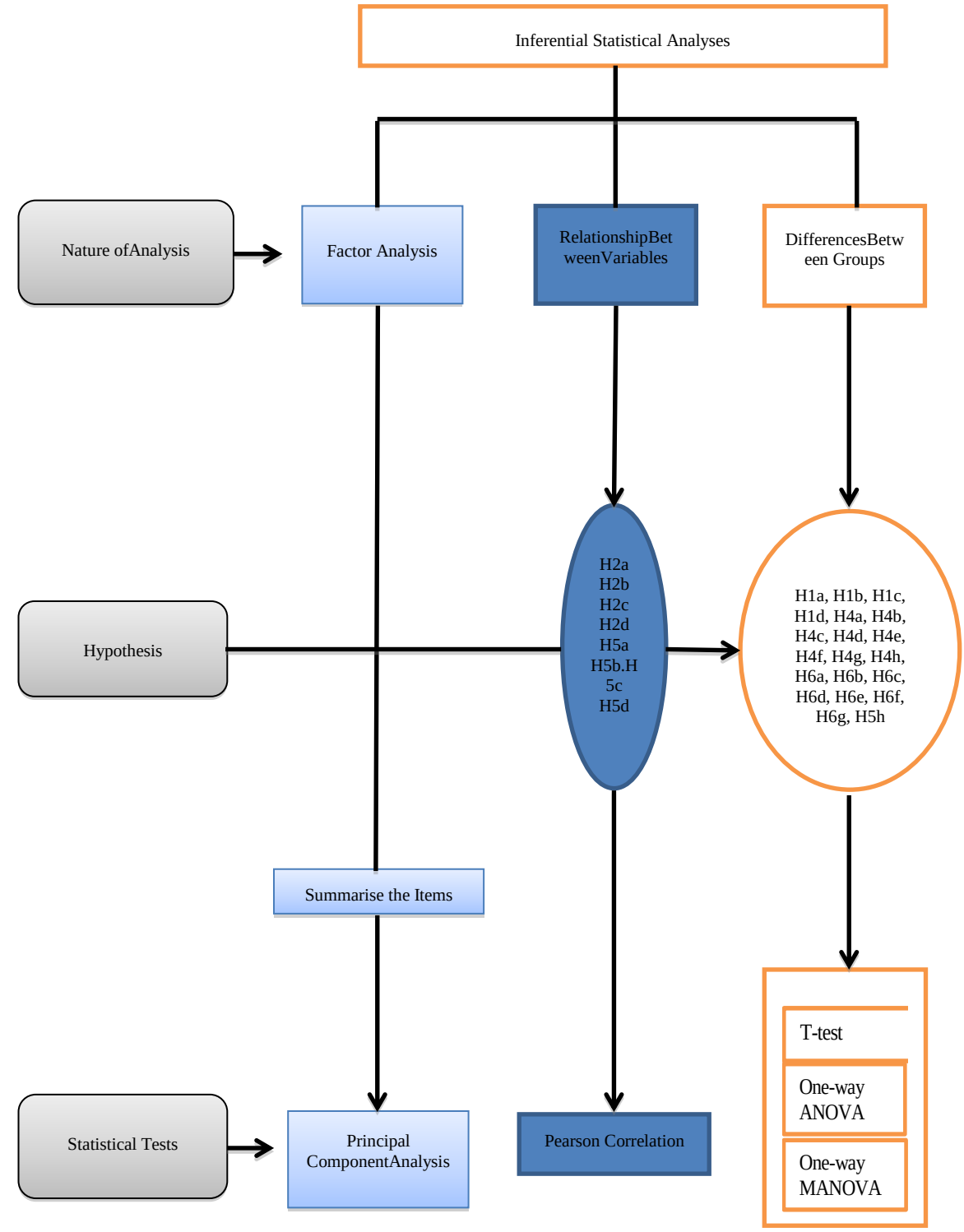


*Figure 7.4.*Inferential statistical analyses.

7.4.1 Principal component analysis result.

PCA was employed to reduce the number of a set of items in part one of the questionnaire. This helped to categorise items that related to the second and third

research question regarding students' physical activity participation constraints and motivation. The PCA was completed for the constraints and motivation variables, using SPSS. The computation of the correlation matrix, factor extraction and rotation was used, as the steps of a factor analysis procedure to achieve items measuring the two theoretical constructs of constraints (29 items), and motivation (23 items). The data consisted of 909 cases meeting the requirement of acceptable sample size for exploratory factor analysis (PCA) (Coakes et al., 2008; Tabachnik & Fidell, 2007). This study determined the underlying factor structure of both constraints and motivation scales, because: 1) there is no evidence of studies that have applied these scales on the youth of Saudi Arabia and neighbouring countries, such as United Arab Emirates and Bahrain; and 2) it was necessary to check and summarise the structure of the constraints and motivation variables, compared with the original scales.

7.4.1.1 Constraints constructs.

PCA was selected to operationally define the 29 items of constraint constructs reduce the number and difficulty of constraints items set. The outcomes from this PCA were used to test null hypothesis for H2a to H4h.

The 29 constraints items were subjected to PCA. Inspection of the correlation matrix revealed the presence of many coefficients of 0.3 and above, except four variables that were eliminated due to low anti-image correlation under 0.3. These variables were 'I am afraid of getting hurt'(C2), 'I am not happy in social situations'(C3), 'I feel too tired for recreation'(C4), and 'I have no car'(C19). The result of the constraints correlation matrix indicated that a considerable number of correlations were above 0.3, so the matrix was deemed suitable for factoring.

The solution of the PCA used 25 constraints items, with a sample of 909 cases. In this study, the standard of 150 cases was exceeded and there were more than five

cases per variable, as recommended by many authors (Hair et al., 2006; Pallant, 2011). The suitability of the constraints and motivations data for PCA was confirmed by correlations, KMO matrix, and Bartlett's test.

The KMO matrix value of 0.879 for constraints exceeded the recommended value of 0.6 (see Table 7.16). The Bartlett's test of sphericity reached statistical significance for constraints variables (Pallant, 2011; Tabachnick & Fidell, 2001); see Table 7.30.

Table 7.16

KMO and Bartlett's Test (Constraints Variable)

KMO Measure of Sampling Adequacy	.879
Approx. Chi-Square	6636.619
Bartlett's Test of Sphericitydf	300
Sig.	.000

Factor Extraction Result.

The cumulative percentage of the total variance extracted by successive factors of the three dimensions of constraints and factor analyses ranged from 21.2% to 54.2%. These results were considered satisfactory solutions in the social sciences field. An inspection of the screeplot revealed a clear break after the three components for constraints (see Figure 7.5).

Based on the eigenvalue, inspection of the screeplot and parallel analysis scores, five factors were accepted. Two components were rejected because they were below the curve change and did not meet the criteria from the parallel analysis. Table 7.17 provides the outcomes of the eigenvalues, screeplot and the parallel analysis. This outcome identified five factors for further consideration and analysis. Factors six and

seven were deleted because they did not meet the criteria from the parallel analysis and the screeplot analysis.

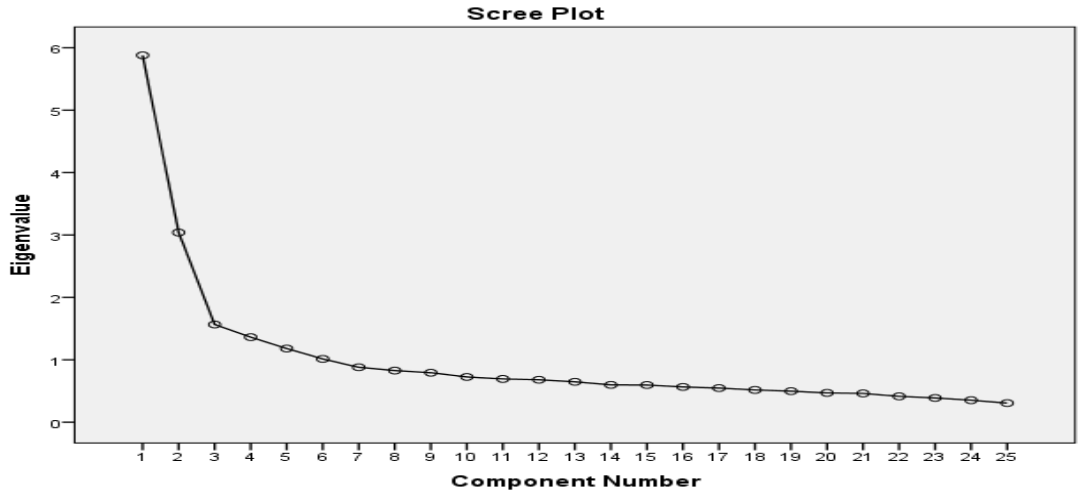


*Figure 7.5.*Screeplot for constraint variables.

Table 7.17

Comparison Eigenvalues from PCA and Criterion from Parallel Analysis for Constraints Variables

Constraints Component Number	Eigenvaluefrom PCA	Screeplot Position	Criterion Valuefrom ParallelAnalysis	Decision
1	5.879	Above curve change	1.3133	Accept
2	3.039	Above curve change	1.2645	Accept
3	1.565	Point of curve change	1.2277	Accept
4	1.363	Below curve change	1.1944	Accept
5	1.181	Below curve change	1.1655	Accept
6	1.014	Below curve change	1.1434	Reject
7	.881	Below curve change	1.1198	Reject

Factor Rotation Result.

Five factors of constraints were extracted with Varimax rotation to aid in the interpretation of these components. A Varimax rotation technique was employed to minimise the number of variables that had a high loading on each factor.

Table 7.18 provides the coefficient structure for five constraints components. The five constraints components solution explained a total of 52.1% of the variance, with Component 1 accounting for 23.5% of the variance, and Component 2 accounting for 12.1 % of the variance, Component 3 accounting for 6.2% of the variance, Component 4 accounting for 5.4 % of the variance, and Component 5 accounting for 4.7% of the variance (see Table 7.18). The rotated solution revealed the presence of a simple structure, with all five constraints components showing a number of strong loadings, and all variables loading substantially on only one component.

Table 7.18

Total Variance Explained of Constraints

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings[a]**
	Total	***% of variance***	***Rotation sums of squared loadings[a]***	***Total***	***% of variance***	***Cumulative %***	***Total***
1	5.879	23.517	23.517	5.879	23.517	23.517	2.107
2	3.039	12.157	35.674	3.039	12.157	35.674	3.206
3	1.565	6.262	41.936	1.565	6.262	41.936	3.041
4	1.363	5.452	47.388	1.363	5.452	47.388	3.635
5	1.181	4.722	52.110	1.181	4.722	52.110	3.487

Factor Interpretation Result.

The 18 variables were reduced to five components. Component 1 included two items that related to key ‘accessibility-financial’. Component 2 included six items that related to key ‘facilities/services’. Component 3 included four items that related to key ‘time’. Component 4 included three items that related to key ‘lack of partner’. Component 5 included three items that related to key ‘lack of knowledge.

A reliability test for five components of constraints produced Cronbach's alpha scores for each component. Component 1 was .51, Component 2 was .76, Component 3 was .72, Component 4 was .79, and Component 5 was .81. The reliability for the components is discussed further in the following pages. There was a weak negative correlation between those five constraints components (r = -.024). Table 7.18 identifies five factors derived from the 18 variables. The factors were:

- accessibility-financial (two variables, Component 1).
- facilities-service (six variables, Component 2).
- time factors (four variables, Component 3).
- lack of partners (three variables, Component 4).
- lack of knowledge (three variables, Component 5).

Table 7.19

Pattern and Structure for PCA with Varimax Rotation of Five Factor Solutions for Constraints

No	Items	Pattern Coefficients					Structure Coefficients					Commun-alities
		1	2	3	4	5	1	2	3	4	5	
C15	I do not like activities offered	.630	-.002	-.082	-.021	-.010	.709	.054	-.248	-.259	-.169	.602
C7	It is not fit enough for me	.446	-.042	.024	-.043	-.284	.546	.095	-.152	-.279	-.383	.454
C17	Transportation takes too much time	-.081	.798	.008	.039	.017	-.004	.773	-.114	-.146	-.271	.619
C12	Facilities poorly kept	-.128	.666	.056	.008	-.210	-.029	.720	-.080	-.195	-.442	.586
C18	There's no opportunity near my home	-.034	.612	.079	-.062	-.188	.048	.683	-.060	-.226	-.420	.522
C13	Facilities crowded	.450	.589	-.053	-.032	.104	.369	.637	-.158	-.247	-.401	.557
C14	Facilities inadequate (not enough or some facilities not available)	.346	.516	-.069	-.097	-.157	.457	.598	-.143	-.177	-.182	.607
C20	Cannot afford (fees expensive)	-.040	.506	-.155	-.085	-.044	.042	.555	-.255	-.251	-.279	.356
C28	I do not have time (caused by studies)	.094	.002	-.807	-.075	-.029	.166	.142	-.786	-.295	-.166	673
C29	I do not have time (caused by social commitment)	-.115	.090	-.722	.038	.019	.008	.164	-.754	-.231	-.120	.632
C27	I do not have time (caused by family needs)	-.202	.010	-.655	-.079	-.066	-.056	.118	-.714	-.327	-.192	.576
C16	The timetable does not fit with mine	.226	-.069	-.598	-.003	-.027	.331	.033	-.660	-.274	-.152	521
C26	My friends do not like physical activity participation	-.079	-.008	.006	-.870	.033	.085	.149	-.261	-.847	-.240	.725

No	Items	Pattern Coefficients					Structure Coefficients					Commun-alities
		1	2	3	4	5	1	2	3	4	5	
C24	My friends do not have time	.057	.000	.018	-.831	.023	.108	.177	-.289	-.841	-.294	.678
C25	There is nobody to participate with me	-.063	.003	-.021	-.829	-.022	.204	.161	-.243	-.821	-.253	.712
C10	I do not know where I can learn	-.032	.069	-.036	.029	-.865	.102	.384	-.161	-.267	-.878	.779
C8	I do not know where to participate	-.025	.040	-.016	.009	-.823	.107	.341	-.145	-.270	-.834	697
C9	I don’t have anyone to teach me	.040	.017	-.011	-.055	-.780	.162	.319	-.141	-.308	-.804	.655

Final Constraints Scale.

As indicated in table 7.18 and the subsequent explanation, the five factors (accessibility/financial, facilities/service, time factors, lack of partners and lack of knowledge) explained 23.5%, 12.1%, 6.2%, 5.4% and 4.7% of the variance, respectively. Components 1 and 2 were combined into one component for two reasons. First, some items were loaded with different components, did not fit with the name of the factor and were not suitable for, or were not understood by Saudi students. The second reason was the low Cronbach's alpha scores, which were was less than .70, as recommended by Pallant (2011). These two components were combined into one factor called facilities/accessibility. Table 7.20 presents comprehensive information on the PCA solution for the four factors derived from all 18 variables; these included:

- Facilities/accessibility (8 variables, Component 1).
- Time factors (4 variables, Component 2).
- Lack of partners (3 variables, Component 3).
- Lack of knowledge (3 variables, Component 4).

The Structure of Constraints scale mean scores of this study derived from the factor analysis test are provided in tables 7.20 and 7.20a.

Table 7.20

PCA of Constraints on Physical Activity Participation

No.	Item	Structural Constraints		Interpersonal Constraints	Intrapersonal Constraints
		Facilities/Accessibility	Time Factors	Lack of Partners	Lack of Knowledge
C15	I do not like the activities offered	√			
C7	It is not fit enough for me	√			
C17	The transportation takes too much time	√			
C12	Facilities are poorly kept	√			
C18	There is no opportunity near my home	√			
C13	Facilities are crowded	√			
C14	Facilities are inadequate (not enough or some facilities are not available)	√			
C20	Cannot afford (the fees are expensive)	√			
C28	I do not have time because of studies		√		
C29	I do not have time because of social commitments		√		
C27	I do not have time because of family needs		√		
C16	My timetable does not fit with mine		√		
C26	My friends do not like participating in physical activity			√	
C24	My friends do not have time			√	
C25	There is nobody to participate with me			√	
C10	I do not know where I can learn it				√
C8	I do not know where to participate				√

No.	Item	Structural Constraints		Interpersonal Constraints	Intrapersonal Constraints
		Facilities/Accessibility	Time Factors	Lack of Partners	Lack of Knowledge
C9	I do have not anyone to teach me				√

Table 7.20a

Constraints Dimensions and Factors Mean Scores

Dimension	Items	Mean	Adjusted Mean	Factor	Items	Mean	*Adjusted Mean
Structural constraints	12	35.27	2.94	Facilities/ accessibility	8	24.26	3.04
				Time factors	4	11.01	2.75
Interpersonal constraints	3	7.22	2.40	Lack of partners	3	7.22	2.40
Intrapersonal constraints	3	8.54	2.85	Lack of knowledge	3	8.54	2.85

*Adjusted Mean: Based on the dimension mean calculated to the five-point Likert scale.

Constraint Reliability Result.

Table 7.21 provides the Cronbach's alpha scores for the three constraint dimensions, which contain four components (facilities/accessibility, time factors, lack of partners and lack of knowledge) and the overall constraints measure. As a result of the reliability, the Cronbach's alpha coefficient was calculated for each component, and ranged from .73 to .81. In this study, the constraints were analysed using 18 constraint items that were categorised in three constraint subscales. Thus, the Cronbach's alpha coefficient of intrapersonal constraints included in Component 4 was .72, interpersonal constraints included in Component 3 was .79 and structural constraints included in components 1 and 2 were .74. Therefore, all subscales showed acceptable internal consistency and reliability (Pallant, 2011). Moreover, the internal consistency reliability

of the entire scale was found to be .86 (see Table 7.21). This result of reliability was consistent with previous results (Alexandris & Carroll, 1997).

Crawford et al. (1991) suggested that:

> The sequential ordering of constraints represents a hierarchy of importance, so that the constraints levels are arranged from most proximal (intrapersonal) to most distal (structural). This sequential ordering of constraints implies that intrapersonal constraints, as the most proximal, are the most powerful of the three constraint types, and structural, as the most distal, are the least powerful. (p. 3)

There are many studies that have used the three dimensions of constraints (intrapersonal, interpersonal and structural) to measure the constraint variable levels (Alexandris & Carroll, 1999; Alexandris et al., 2002; Caldwell & Baldwin, 2005; Casper et al., 2011; Crawford et al., 1991). Constraint dimensions and constraint factors according to the constraint hierarchy. To be consistent with previous studies, the three dimensions of constraints were used for the analysis of the constraint variables among the high school students.

Table 7.21

Constraints Scale Reliability

Component Name	**Cronbach's Alpha Coefficient**
Component 1 (Facilities/Accessibility)	.73
Component 2 (Time factors)	.72
Component 3 (Lack of partners)	.79
Component 4 (Lack of knowledge)	.81
Subscale name	**Cronbach's alpha coefficient**
Intrapersonal constraints	.72
Interpersonal constraints	.79
Structural constraints	.74
Whole scale	**Cronbach's alpha coefficient**
Constraints scale	.86

7.4.1.2 Motivations construct.

PCA was selected to define the 23 items of motivation constructs operationally to reduce the number and difficulty of a set of motivation items. The results from the PCA were used to test the null hypotheses for H5a to H6d (see Section 7.4).

7.4.1.2.1 Computation of the correlation matrix.

The 23 items of motivations on physical activity participation were subjected to PCA using SPSS Version 20. Inspections of the correlation matrix revealed the presence of many coefficients of .3, and above. Two variables were eliminated because of low anti-image correlation under .3. These variables were 'I want to lose or maintain weight'(M2) and 'I will feel ugly if I don't'(M9). The subsequent result of the motivations correlation matrix indicated a considerable number of correlations above .3, so the matrix was deemed suitable for factoring.

The solution of the PCA used 21 motivation variables with a sample of 909 cases. In this study, the standard of 150 cases was exceeded and there were more than five cases per variable, as recommended by many authors (Coakes et al., 2008; Pallant,

2011; Tabachnick & Fidell, 2007). The suitability of the motivation items for PCA was confirmed by correlations, the KMO matrix and Bartlett's test (Table 7.22). The Bartlett's test of sphericity reached statistical significance for the motivation variables (Pallant, 2011; Tabachnick & Fidell, 2001).

Table 7.22

KMO and Bartlett's Test (Motivations Variable)

KMO measure of sampling adequacy		.927
Bartlett's test of sphericity	Approx. chi-square	7756.307
	Df	210
Sig.	Sig.	.000

Factor Extraction Result.

The cumulative percentage of the total variance extracted by successive factors of the three motivations factor analyses ranged from 33.31% to 48.74%, so these results were considered satisfactory solutions in the social sciences field. An inspection of the screeplot revealed a clear break after the four components for motivation (see Figure 7.6). Table 7.23 provides the outcomes of the eigenvalues, screeplot and parallel analysis. Based on the eigenvalues, inspection of the screeplot and parallel analysis scores, three components were accepted. Table 7.24 provides the outcomes of the analysis to determine the number of factors to retain for further analysis.

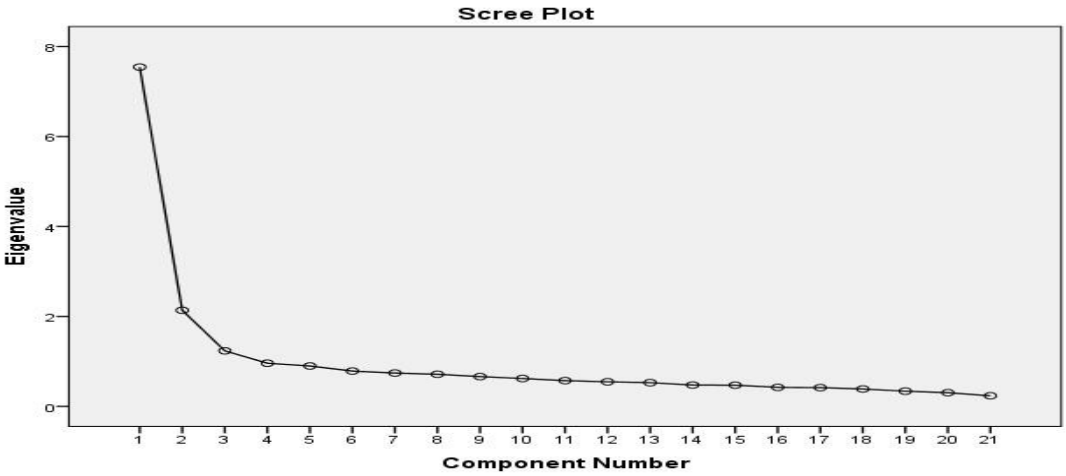


*Figure 7.6.*Screeplot for motivation variables.

Table 7.23

Comparison Eigenvalues from PCA and Criterion from Parallel Analysis for Motivation Variables

Number	Eigen Value from PCA	Screeplot Position	Criterion Value from Parallel Analysis	Decision
1	7.544	Above curve change	1.2804	Accept
2	2.136	Above curve change	1.2308	Accept
3	1.235	Change	1.1964	Accept
4	.960	Below curve change	1.1612	Reject

Factor rotation result

Three factors of motivations were extracted with Varimax rotation to aid in the interpretation of these components. Varimax rotation technique was employed to minimise the number of variables that have high loading on each factor. Table 7.24 provides the coefficient structure for the three motivation components. The three components of motivations solution explained a total of 52% of the variance with Component 1 accounting for 35.9% of the variance, Component 2 accounting for 10.1% of the variance and Component 3 accounting for 5.9% of the variance. The rotated solution revealed the presence of a simple structure, with all three motivation

components showing a number of strong loadings and all variables loading substantially on only one component.

Table 7.24

Total Explained Variance for Motivations

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings[a]**
	Total	*% of variance*	*Rotation sums of squared loadings[a]*	*Total*	*% of variance*	*Cumulative %*	*Total*
1	7.544	35.923	35.923	7.544	35.923	35.923	6.494
2	2.136	10.174	46.097	2.136	10.174	46.097	4.851
3	1.235	5.883	51.979	1.235	5.883	51.979	1.835

Factor Interpretation Result.

The 21 variables were reduced to three components. Component 1 included 11 items that related to key body-related factor loading rating from .42 to .77. Component 2 included eight items that related to key competence factor loading rating from .48 to .75. Component 3 included two items that related to key intrinsic factor loading rating from .54 to .59.

A reliability test for the three components of motivations produced Cronbach's alpha scores for each variable. Component 1 was .88, Component 2 was .79 and Component 3 was .54. According to Pallant (2011), it is recommended that the Cronbach's alpha coefficient of a scale should be above .70 and, if the reliability is less than .70, the mean and inter-item correlation matrix (ranging from .2 to .4) of the items should be reported. The recommended values of the mean inter-item correlation range from 0.2 to 0.4 (Briggs & Cheek, 1986). Thus, the two items show that the inter-item correlation is .375 and the mean is 4.310. Because the mean inter-item correlation for

the intrinsic factor items was generally above 0.2 and sufficiently high for the purposes of this study, it was used for further analysis. The whole scale of motivation reliability results were based on the acceptable range of >.70. This result meets the recommendation for the inter-item correlation matrix. There was a small positive correlation between these three motivation components (r = .105). As a result of the analysis, three factors were derived from all 21 variables (Table 7.25 provides the details for the PCA of the factors), these included:

- Body-related factor (11 variables, Component 1).
- Competence factor (8 variables, Component 2).
- Intrinsic factor (2 variables, Component 3).

Table 7.25

Pattern and Structure for PCA with Varimax Rotation of Three-Factor Solutions for Motivations

No.	Items	Pattern Coefficients			Structure Coefficients			Commun-alities
		1	2	3	1	2	3	
M12	I like the competition	.776	.001	-.191	.771	.334	.028	.594
M15	I like the challenge	.761	.067	-.095	.766	.461	.023	.607
M21	I like to do this activity	.716	-.087	.364	.747	.263	-.073	.679
M13	I want to obtain new skills	.703	.216	-.106	.740	.507	.006	.635
M23	I enjoy this activity	.682	-.025	.299	.739	.211	.463	.603
M14	I want to improve existing skills	.656	.281	-.123	.718	.254	.399	628
M17	I like the excitement of participation	.632	.096	.116	.685	.339	.222	.492
M22	I find this activity stimulating	.569	.042	.295	.629	.279	.385	.482
M16	I want to keep up my current skill level	.534	-.097	.020	.592	.355	.477	.260
M19	I think it's interesting	.482	.139	.389	.548	.515	.069	.521
M11	I want to get better at my activity	.420	.365	-.033	.501	.099	.091	.416
M8	I want to improve my body shape	-.177	.753	.239	.133	.714	.291	.584
M7	I want to be attractive to others	-.278	.673	.320	.427	.707	-.051	.515
M6	I want to define my muscles	.052	.671	-.012	.294	.688	.065	.476
M5	I want to have more energy	.216	.644	-.151	.465	.659	-.005	555
M1	I want to be physically fit	.072	.613	-.159	.271	.623	-.084	.415
M4	I want to improve my appearance	.273	.570	-.106	.537	.610	-.060	.504
M3	I want to better cope with stress	.074	.563	.018	.016	.605	.348	.356
M10	I want to improve my cardio fitness	.385	.487	-.169	.282	.592	.088	.514
M18	It's fun	.166	.078	.598	.285	.201	.632	.441
M20	It makes me happy	.507	.012	.543	.594	.254	.621	641

Final Motivations Scale.

As indicated in Table 7.24and the subsequent explanation, three factors (competence factor, body-related factor and intrinsic factor) explained 36%, 10.1% and 5.9% of the variance, respectively. One component had its name changed from 'competence factor' to 'competence and satisfaction factor' because some items were loaded with Component 1 from 3, making one factor, for example, 'I like to do this activity'(M21) and 'I think it interesting'(M19). Consequently, three factors were derived from all 21 variables. These factors were:

- Competence and satisfaction factor (10 variables, Component 1).
- Body-related factor (9 variables, Component 2).
- Intrinsic factor (2 variables, Component 3).

Tables 7.26 and 7.26a provide the final structure of the motivation scale and mean scores of this study as a result of the solution for the three factors derived from all 21 variables.

Table 7.26

PCA of Motivations for Physical Activity Participation

No	Item	Competence and Satisfaction Factor	Body-related Factor	Intrinsic Factor
M12	I like the competition	√		
M15	I like the challenge	√		
M21	I like to do this activity	√		
M13	I want to obtain new skills	√		
M23	I enjoy this activity	√		
M14	I want to improve existing skills	√		
M17	I like the excitement of participation	√		
M22	I find this activity stimulating	√		
M16	I want to keep up my current skill level	√		
M19	I think it's interesting	√		
M11	I want to get better at my activity		√	
M8	I want to improve my body shape		√	
M7	I want to be attractive to others		√	
M6	I want to define my muscles		√	
M5	I want to have more energy		√	
M1	I want to be physically fit		√	
M4	I want to improve my appearance		√	
M3	I want to cope better with stress		√	
M10	I want to improve my cardio fitness		√	
M18	It's fun			√
M20	It makes me happy			√

Table 7.26a

Motivation Factors Mean Scores

Dimension	Mean	Number of Items	*Adjusted Mean
Competence and satisfaction factor	44.07	10	4.40
Body-related factor	39.05	9	4.33
Intrinsic factor	8.62	2	4.31

*Adjusted Mean: Based on the dimension mean calculated to the five-point Likert scale.

Motivations Reliability Result.

The internal consistency reliability of the full scale was found to be .89 (see Table 7.27). In addition, the results show that Cronbach's alpha coefficient of Component 3 was .53 and this result does not meet the recommended Cronbach's alpha coefficient score. Thus, this result of the reliability score would not normally be accepted because of the limited number of items in Component 3 and the Cronbach's alpha value (Pallant, 2011). However, this was not consistent with the results of the original scale developed by Frederick and Ryan (1993), in which the result of the main scale shows that the Cronbach's alpha coefficient of Component 3 (intrinsic factor) was .89. As a result of this statistical rule of thumb, the 'intrinsic factor'(which was .53) would be eliminated or not accepted. In this situation, the best way to explore the suitability of the factor further is to explore the mean inter-item correlation for the intrinsic factor items. The recommended values of the mean inter-item correlation range from 0.2 to 0.4 (Briggs & Cheek, 1986). The two items show that the inter-item correlation is .375 and the mean is 4.310. Because the mean inter-item correlation for the intrinsic factor items was generally above 0.2 and sufficiently high for the purposes of this study. Furthermore, George & Mallery (2003), provide the following rule of thumb: that an alpha ">.9 – excellent, .> .8 is good, > .7 is acceptable, > .6 is questionable, > .5 is poor, but any < .5 is unacceptable (p. 231). Gliem & Gliem (2003, p. 86) add that a rule of thumb for correlated item-total correlation should be at least

.40. Bearing in mind this justification, an alpha of .53 (which although poor, is still acceptable) even with the fact that this questionnaire was used for the first time in Saudi Arabian context.

Table 7.27

Motivations Scale Reliability

Subscale Name	**Cronbach's Alpha Coefficient**
Competence and satisfaction factor	.88
Body-related factor	.81
Intrinsic factor	.53
Whole scale	**Cronbach's alpha coefficient**
Motivations scale	.89

7.4.1.3 Summary of components.

The procedure of PCA identified four components of constraints and three components of motivations. The constraint constructs identified 18 items contributing to four components. Facilities and accessibility (Component 1), time factors (Component 2), lack of partners (Component 3) and lack of knowledge (Component 4). The three independent constraint dimensions of intrapersonal, interpersonal and structural included these four components. These three independent constraint dimensions were used in the analysis because previous studies recommended that the factors be combined into the conceptual grouping of the three dimensions of intrapersonal, interpersonal and structural constraints (Alexandris & Carroll, 1997). The internal consistency reliability of the full scale was found to be .86, which compared favourably with the previous studies, in which the Cronbach's alpha was .85 (Alexandris & Carroll, 1997).

The PCA of the motivation constructs identified 21 items contributing to three components: competence and satisfaction factor (Component 1), body-related factor (Component 2) and intrinsic factor (Component 3). The internal consistency reliability of the full scale was found to be .89, which demonstrates a good level of reliability.

7.4.2 Correlation result.

Three investigations of the relationships between two different groups of variables were conducted. The first investigation explored the relationship between constraints variables and the physical activity participation level among high school students in Riyadh City. The second investigation explored the relationship between motivation variables and the physical activity participation level among high school students in Riyadh. The third investigation explored the relationship between constraints and motivation variables among high school students in Riyadh City.

Pearson product-moment correlation coefficient (r) was conducted to test this set of hypotheses. The correlations explored the relationship between all the constraint variables, the three constraint dimensions (intrapersonal, intrapersonal and structural), all the motivation variables, the three motivation factors (competence and satisfaction, body-related and intrinsic) and the respondents' physical activity and sport participation level (low, moderate, high). The necessary assumptions for correlation analysis were achieved and the data were deemed suitable for correlation tests. The hypotheses tested included H1a to H6h (see Section 1.10).

7.4.2.1 Relationship between total constraints and physical activity participation level.

Correlation (r) analysis was used to measure the strength and direction of the association that exists between the total constraints and the physical activity participation level variables. The results indicated that there is a small significant and

negative relationship between the two variables (r = -.224, n = 909, p = .000; see Table 7.28). This result means that the constraint variables have a negative relationship on respondents' physical activity participation level, with high levels of constraint variables associated with lower levels of physical activity and sport participation. This result confirmed the validity of hypothesis H2a (see Table 7.32).

Table 7.28

Relationships between Total Constraints and Physical Activity Participation Level

		Total Constraint Variables	**Physical Activity Participation Level**
Total constraint variables	Pearson correlation	1	-.242**
	Sig. (2-tailed)	909	.000
	N		909
Physical activity participation level	Pearson correlation	-.242**	1
	Sig. (2-tailed)	.000	909
	N	909	

**Correlation is significant at the 0.01 level (2-tailed).

7.4.2.2 Relationships between constraint dimensions and physical activity participation level.

Correlation (r) analysis was conducted to explore the relationship between the intrapersonal, interpersonal and structural constraint dimensions and the physical activity and sport participation level. The results indicated that there was a significant small negatively correlated score for each constraint dimension variable with the total physical activity and sport participation levels, intrapersonal constraints (r = -.147, n = 909, p = .000), interpersonal constraints (r = -.197, n = 909, p = .000) and structural constraints (r = -.224, n = 909, p = .000); see Table 7.29). This result confirmed hypotheses H2b, H2c and H2d (see Table 7.32).

Table 7.29

Relationships between Constraint Dimensions and Physical Activity Participation Level

Type of Constraint		Physical Activity Participation Level
Intrapersonal constraints	Pearson correlation	-.147**
	Sig. (2-tailed)	.000
	N	909
Interpersonal constraints	Pearson correlation	-.197**
	Sig. (2-tailed)	.000
	N	909
Structural constraints	Pearson correlation	-.224**
	Sig. (2-tailed)	.000
	N	909

** Correlation is significant at the 0.01 level (2-tailed).

7.4.2.3 Relationship between total constraint and total motivation variables.

Pearson's product-moment correlation (r) analysis was conducted to determine the relationship between the total constraint and total motivation variables. The results indicated that there is no relationship between the two variables (r = .002, n = 909, p = .957). This result did not confirm hypothesis H3 (see Table 7.32).

7.4.2.4 Relationship between total motivations and physical activity participation level.

Correlation (r) analysis was conducted to determine the relationship between the total motivations and the physical activity participation level. The results indicated that there is a significant small negative relationship between the two variables (r = -.126, n = 909, p = .000; see Table 7.30). This result means that the motivation variables had a negative relationship with respondents' physical activity participation level, with high levels of motivation variables associated with a low level of physical activity participation. This result confirmed the validity of hypothesis H5a (see Table 7.32). The negative relationship between motivation and levels of physical activity and sport was unexpected and will be discussed further in Chapter 8.

Table 7.30

Relationships between Total Motivations and Physical Activity Participation Level

		Total Motivation Variables	Physical Activity Participation Level
Total motivation variables	Pearson correlation	1	-.126**
	Sig. (2-tailed)	909	.000
	N		909
Physical activity participation level	Pearson correlation	-.126**	1
	Sig. (2-tailed)	.000	909
	N	909	

** Correlation is significant at the 0.01 level (2-tailed).

7.4.2.5 Relationship between motivation dimensions and physical activity participation level.

Correlation (r) analysis was used to measure the relationship between the body-related, intrinsic, and competence and satisfaction motivations and the physical activity and sport participation level. The results indicated that there is a significant, weak, negative relationship between body-related and physical activity and sport participation level (r = -.078, n = 909, p = .019); and competence and satisfaction factor also show a significant small positive relationship (r = .153, n = 909, p = .019). The intrinsic factor showed no significant relationship with physical activity and sport participation level (r = .020, n = 909, p = .545), (see Table 7.31). The data indicate that the respondents who had high levels of competence and satisfaction motives (e.g. 'I like the challenge', 'I find this activity stimulating') during physical activity participation may continue to participate in physical activity, even if they are confronted by significant obstacles that have to be overcome. Conversely, body-related motives (e.g. 'I want to better cope with stress', 'I want to improve my body shape')show a negative weak correlation with physical activity participation level. This will be discussed in more detail in Chapter 8.

This result confirmed hypotheses H5b and H5c, and hypothesis H5d was not confirmed (see Table 7.32).

Table 7.31

Relationships between Motivation Factors and Physical Activity Participation Level

Type of Motivation		**Physical Activity Participation Level**
Body-related	Pearson correlation	-.078*
	Sig. (2-tailed)	.019
	N	909
Intrinsic	Pearson correlation	.020
	Sig. (2-tailed)	.545
	N	909
Competence and satisfaction	Pearson correlation	.153**
	Sig. (2-tailed)	.019
	N	909

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table 7.32 shows that hypotheses H2a, H2b, H2c, H2d, H5a, H5b, H5c and H5d were confirmed. There is a relationship between constraints and motivation and physical activity participation level among the respondents. In contrast, hypotheses H3 and H5d did not confirm that there is a relationship between the total constraint and total motivation variables, and interest/enjoyment motivations and physical activity and sport participation level among the respondents.

Table 7.32

Hypotheses Set 1: Relationship between Constraints, Motivation and Physical Activity Participation

No.	Hypothesis	Confirmed	Not Confirmed
H2a	There is a relationship between total constraints and participation levels of physical activities and sport among Saudi Arabian male high school students.	√	
H2b	There is a relationship between intrapersonal constraints and participation levels of physical activities and sport among Saudi Arabian male high school students.	√	
H2c	There is a relationship between interpersonal constraints and participation levels of physical activities and sport among Saudi Arabian male high school students.	√	
H2d	There is a relationship between structural constraints and participation levels of physical activities and sport among Saudi Arabian male high school students.	√	
H3	There is a relationship between total constraints and total motivations among Saudi Arabian male high school students.		√
H5a	There is a relationship between total motivations and participation levels of physical activities and sport among Saudi Arabian male high school students.	√	
H5b	There is a relationship between body-related factor and participation levels of physical activities and sport among Saudi Arabian male high school students.	√	
H5c	There is a relationship between competence and satisfaction factor and participation levels of physical activities and sport among Saudi Arabian male high school students.	√	
H5d	There is a relationship between intrinsic factor and participation levels of physical activities and sport among Saudi Arabian male high school students.		√

7.4.2.6 Relationships summary.

This section of the analysis has focused on the relationship between the constraints and motivation and physical activity and sport participation level among high school students from Riyadh City. These relationships were investigated using Pearson's product-moment correlation (r) to measure the strength and direction of association that exists between two variables. Findings of the correlation data analysis

indicated that respondents with high levels of constraints had lower levels of physical activity participation. In addition, there was no significant relationship between total constraint and total motivation variables and no significant relationship between the intrinsic motivation factor and physical activity and sport participation levels. This will be discussed further in Chapter 8.

7.4.3 Differences Among Groups

Sixteen investigations of the differences between two different groups of dependent variables and four groups of independent variables were undertaken. One group of dependent variables comprised the total constraints variable, interpersonal constraint dimension, intrapersonal constraint dimension and structural constraint dimension. The second group of dependent variables comprised the total motivations variable, competence and satisfaction dimension, body-related dimension and intrinsic dimension. The four groups of independent variables were the type of school, age, grade level and region of Riyadh lived in.

The difference between total constraints and total motivations and physical activity and sport participation among the respondents' type of school was explored by the independent-samples t-test. The difference between total constraints and total motivations and physical activity participation by respondents' age, grade level and region of Riyadh lived in were explored through an ANOVA test. The difference between three constraint dimension and three motivation dimensions(interpersonal constraints, intrapersonal constraints, structural constraints, competence and satisfaction, body-related and intrinsic) on physical activity participation among the respondents' type of school, age, grade level and region of Riyadh City lived in were explored by a MANOVA test. All assumptions for these tests were achieved and the

data were deemed suitable for those analyses. See Chapter 6 for the explanation of the statistical procedures.

7.4.3.1 Independent-samples t-test result.

An independent-samples t-test was conducted to test the second set of hypotheses. The t-test explored the differences of an independent variable (type of school) among the groups. The hypotheses that were tested were H1a, H4a and H6a (see section 1.10).

No statistical differences were found for physical activity participation, total constraints and total motivation based on type of school. Details regarding the statistics for these analyses are provided in Appendix B. Hypotheses H1a, H4a and H6a were not confirmed.

7.4.3.2 One-way ANOVA result.

One-way ANOVA was used to investigate the differences between the total constraint and total motivation variables (dependent variables) by respondents' age, grade level and region of Riyadh lived in (independent variables). The hypotheses that were tested included H4a, H4b, H4c, H4d, H6a, H6b, H6c and H6d (see Chapter 1).

Differences in Total Constraints Based on Age.

A one-way between-groups ANOVA was conducted to explore the effect of age on the level of constraints. Participants were divided into four groups according to their age (Group 1: 16 years; Group 2: 17 years; Group 3: 18 years; and Group 4: 19 years). There was a statistically significant difference at the $p < .05$ level for the four age groups; $F (3.905) = 5.7$, $p = .001$ (see Table 7.33). Despite reaching statistical significance, the actual difference in mean scores between the groups was trivial. The effect size, calculated using partial eta squared, was .018. Tukey post-hoc comparisons indicated that the mean score for 16 years ($M = 100.07$, $SD = 16.63$), 17 years ($M =$

98.96, SD = 16.35), 18 years (M = 98.52, SD = 17.70) were significantly different from 19 years (M = 91.59, SD = 20.11). Seventeen-year-old respondents (M = 98.96, SD = 16.35) did not differ significantly from either Group 3 or Group 4. This indicates that age 16 year old have high level of constraints. This confirmed hypothesis H4b (see Table 7.46).

Table 7.33

One-way ANOVA for Total Constraints Compared With Age Group

Source	**Df**	**Mean Square**	**F**	**Sig.**
Between groups	3	1689.58	5.700	.001
Within groups	905	296.41		

Differences in Total Constraints Based on Grade Level.

A one-way between-groups ANOVA was conducted to explore the effect of grade level on level of constraints. Participants were divided into three groups according to their grade level (Group 1: Grade 10; Group 2: Grade 11; and Group 3: Grade 12). There was a statistically significant difference at the $p < .05$ level for the three grade level groups; F (3.906) = 4.8, p = .008 (see Table 7.34). Despite reaching statistical significance, the actual difference in mean scores between the groups was trivial. The effect size, calculated using eta squared, was .010. Tukey post-hoc comparisons indicated that the mean score for grade 10 (M =100.89, SD = 15.98) was significantly different from grade 11 (M = 96.35, SD = 17.11). Grade 12 (M = 98.57, SD = 18.31) did not differ significantly from either Grade 10 or Grade 11. This indicates that Grade 10 have a higher level of constraint on physical activity and sport participation. This confirmed hypothesis H4c (see Table 7.46).

Table 7.34

One-way ANOVA for Total Constraints Compares With Grade Level

Source	Df	Mean Square	F	Sig.
Between groups	2	1460.905	4.895	.008
Within groups	906	298.456		

Differences in Total Constraints Based on Region of Riyadh Lived in.

A one-way between-groups ANOVA was conducted to explore the effect of region of Riyadh lived in on the level of constraints. Participants were divided into five groups according to their region of Riyadh City lived in (Group 1: North Riyadh; Group 2: South Riyadh; Group 3: East Riyadh; Group 4: West Riyadh and Group 5: Middle Riyadh). There was a statistically significant difference at the $p < .05$ level for the five regions of Riyadh City lived in groups; $F (3.904) = 4.18$, $p = .002$ (see Table 7.35). Despite reaching statistical significance, the actual difference in mean scores between the groups was trivial. The effect size, calculated using eta squared, was .010. Tukey post-hoc comparisons indicated that the mean scores for the north region ($M = 99.20$, $SD = 14.65$), south region ($M = 99.45$, $SD = 18.58$), east region ($M = 99.98$, $SD = 20.20$) and middle region ($M = 99.39$, $SD = 17.70$) were significantly different from the west region ($M = 93.65$, $SD = 14.71$). The south region ($M = 99.45$, $SD = 18.58$) did not differ significantly from the north, east or west regions. Consequently, this indicates the West region of Riyadh has lower constraints and this confirmed hypothesis H4d (see Table 7.46).

Table 7.35

One-way ANOVA for Total Constraints Compared With Region Group

Source	Df	Mean Square	F	Sig.
Between groups	4	1240.903	4.18	.002
Within groups	904	296.858		

Differences in Total Motivations Based on Age, Grade level and Region.

A one-way between-groups ANOVA was conducted to explore the effects of age, grade level and region on level of motivation. No statistical differences were found for these independent variables on the level of motivation. Details about the outcomes of this analysis are provided in Appendix B. These results do not confirm hypotheses H6b, H6c and H6d.

Differences in Physical Activity Participation Level Based on Age, Grade Level and Region.

A one-way between-groups ANOVA was conducted to explore the effect of age on level of physical activity participation. No significant differences were found for the effect of age and grade level on the level of physical activity. Details about these tests are provided in Appendix B. The results do not confirm hypotheses H1b and H1c.

A one-way between-groups ANOVA was conducted to explore the effect of region of Riyadh lived in on level of physical activity participation. Participants were divided into five groups according to their region of Riyadh City lived in (Group 1: North Riyadh; Group 2: South Riyadh; Group 3: East Riyadh; Group 4: West Riyadh; and Group 5: Middle Riyadh). There was a statistically significant difference at the $p < .05$ level for the five region of Riyadh City lived in groups; $F (3.904) = 2.50$, $p = .041$ (see Table 7.36). Despite reaching statistical significance, the actual difference in mean scores between the groups was trivial. The effect size, calculated using eta squared, was

.010. Tukey post-hoc comparisons indicated that the mean scores for the south region group (M = 1.655, SD = 890), east region group (M = 1.732, SD = .905), and west region group (M = 1.547, SD = .835) were significantly different from the north region group (M = 1.474, SD = .828). The middle region group (M = 1.659, SD = .897) did not differ significantly from the north, south or east regions. This indicates that North region of Riyadh has lower level of physical activity and sport participation, and confirmed hypothesis H1d (see Table 7.46).

Table 7.36

One-way ANOVA for Physical Activity Participation Levels Compared With Region of Riyadh City Lived in Group

Source	**Df**	**Mean Square**	**F**	**Sig.**
Between groups	4	1.904	2.508	.041
Within groups	904	.759		

7.4.3.3 MANOVA results.

There were two investigations of the differences between two different groups of dependent variables and the four independent variables of type of school, age, grade level and region of Riyadh lived in. The dependent variables were interpersonal, intrapersonal and structural constraint dimensions, and the motivation variables were competence and satisfaction, body-related, and intrinsic dimension (see section 7.3.2 and 7.3.3 for discussion of the constraint dimensions and motivation dimensions). First, the differences between intrapersonal, interpersonal and structural constraint dimensions (as dependent variable) on physical activity and sport participation (as independent variable) were explored. Second, the differences between competence and satisfaction, body-related and intrinsic motivation dimensions on physical activity participation were explored. MANOVA was used to identify the differences of independent variables

among groups. The hypotheses that were tested included H4e, H4f, H4g, H4h, H6e, H6f, H6g and H6h (see Section 1.10).

Differences Among Constraint Dimensions According to Type of School.

A MANOVA was performed to investigate the type of school differences in constraints among Saudi Arabian male high school students' participation in sport and physical activities. Three dependent variables were intrapersonal, interpersonal and structural constraint dimensions. The independent variable was type of school (public or private school). The results showed that there was a statistically significant difference between public and private schools among Saudi Arabian male high school students on the three dependent constraint variables, F (3,905) = 1.48, p > .218; Wilks' Lambda = .99; partial eta squared = .005. The effect size in this case is consideredand trivial. When the results for the dependent variables were considered separately, there was no difference that reached statistical significance, using a Bonferroni adjusted alpha level of .017, for more details see (section 6.6.4 and Table 7.37). This result has not confirmed hypothesis H4e (see Table 7.46).

Table 7.37

Type of School MANOVA on Three Dependent Constraint Variables

Variables of Constraints	**F**	**Df**	**Sig.**
Intrapersonal constraints	1.36	1,907	.243
Interpersonal constraints	4.03	1,907	.045
Structural constraints	.18	1,907	.668

Differences Among Constraint Dimensions According to Age.

A MANOVA was performed to investigate age differences in constraints among Saudi Arabian male high school students' participation in sport and physical activities. The three dependent constraint variables were intrapersonal, interpersonal and structural

constraint dimensions. The independent variable was age (age 16, age 17, age 18 and age 19). The results showed that there was a statistically significant difference among the age groups of the constraint dimensions, F (3,903) = 2.33, p > .013; Wilks' Lambda = .97; partial eta squared = .008. The value of effect size in this case is considered andtrivial. When the results for the dependent variables were considered separately, the only difference to reach statistical significance, using a Bonferroni adjusted alpha level of .017, were structural constraints, F (1,905) = 3.80 p = .010, partial eta squared = .008 and intrapersonal constraints, F (1,905) = 4.50, p = .002, partial eta squared = .243 (see Table 7.38).

An examination of the means score, as shown in Table 7.39, indicated that age 16 students reported slightly higher levels of intrapersonal constraints in physical activity participation than 17, 18, and 19 year olds. This result confirmed hypotheses H4f that there was a difference between age and the three dependent constraint variables among Saudi Arabia male high school students (see Table 7.46).

Table 7.38

Age MANOVA on Three Dependent Constraint Variables

Variables of Constraints	**F**	**Df**	**Sig.**
Intrapersonal constraints	4.50	1,905	.002
Interpersonal constraints	2.96	1,905	.031
Structural constraints	3.80	1,905	.010

Table 7.39

Means and Standard Deviations For Main Effect of Age on Three Dependent Constraint Variables

Constraint Variables	16 years old		17 years old		18 years old		19 years old	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Intrapersonal constraints	52.34	8.85	52.14	8.65	51.78	9.37	48.30	10.47
Structural constraints	36.89	8.24	35.81	8.20	35.96	8.29	33.41	8.28

Differences Among Constraint Dimensions According to Grade Level.

A MANOVA was performed to investigate grade level differences in constraints among Saudi Arabian male high school students' participation in physical activities and sport. The three dependent constraint variables were intrapersonal, interpersonal and structural constraints. The independent variable was grade level (grade 10, grade 11 and grade 12). The results showed that there was a statistically significant difference between grades 10, 11, and 12 among Saudi Arabian male high school students on the combined dependent constraint variables, $F(3,904) = 3.08$, $p > .005$; Wilks' Lambda = .98; partial eta squared = .010. The value of effect size in this case is considered and trivial. When the results for the dependent variables were considered separately, the only difference to reach statistical significance, using a Bonferroni adjusted alpha level of .017, was structural constraints, $F(1,906) = 5.15$, $p = .006$, partial eta squared = .010 (see Table 7.40).

An examination of the means score, as shown in Table 7.41, indicated that grade 10 students reported slightly higher levels of structural constraints in physical activity participation than grades 11 and 12. Obviously, from the results, there is a great similarity in the degree of constraints in terms of respondents' age and grade levels. This result confirmed hypotheses H4g that there was a difference between grade level

and the three dependent constraint dimensions among Saudi Arabian male high school students (see Table 7.61). This result is discussed further in Chapter 8.

Table 7.40

Grade Level MANOVA on Three Dependent Constraint Variables

Variables of Constraints	**F**	**df**	**Sig.**
Intrapersonal constraints	3.86	1,906	.021
Interpersonal constraints	2.17	1,906	.115
Structural constraints	5.15	1,906	.006

Table 7.41

Means and Standard Deviations for Main Effect for Grade Level on Three Dependent Constraint Variables

Constraint Variable	**Grade 10**		**Grade 11**		**Grade 12**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Structural constraints	37.29	8.28	35.06	8.22	35.65	8.54

Differences Among Constraint Dimensions According to Region of Riyadh Lived in.

A MANOVA was performed to investigate region of Riyadh City lived in differences in constraints among Saudi Arabian male high school students' participation in sport and physical activities. The three dependent constraint variables were intrapersonal, interpersonal and structural constraint dimensions. The independent variable was region of Riyadh City lived in(north, south, east, west and middle Riyadh). The results showed that there was a statistically significant difference between the north, south, east, west and middle regions in Riyadh among Saudi Arabian male high school students on the combined dependent constraint variables, F (3,902) = 4.33, p

>.000; Wilks' Lambda = .94; partial eta squared = .019. The value of effect size in this case is considered trivial. When the results for the dependent variables were considered separately, the only difference to reach statistical significance, using a Bonferroni adjusted alpha level of .017, was structural constraints, F (1,904) = 9.34, p = .000, partial eta squared = .04 (see Table 7.42).

An examination of the means score, as shown in Table 7.43, indicated that students who lived in East Riyadh reported slightly higher levels of structural constraints than students who lived in north, west, middle and south Riyadh. Consequently, this result confirmed hypothesis H4h that there were differences between regions of Riyadh City lived in and the three dependent constraint variables among Saudi Arabian male high school students (see Table 7.46). There are some issues regarding to constraint, motivation and physical activity level differences among respondents' regions lived that will be discussed further in Chapter 8.

Table 7.42

Region of Riyadh CityLived in MANOVA on Three Dependent Constraint Variables

Variables of Constraints	**F**	**Df**	**Sig.**
Intrapersonal constraints	1.09	1,904	.358
Interpersonal constraints	1.96	1,904	.097
Structural constraints	9.34	1,904	.000

Table 7.43

Means and Standard Deviations for Main Effect for Region of Riyadh City Lived in on Three Dependent Constraint Variables

Constraint variable	North Riyadh City		South Riyadh City		East Riyadh City		West Riyadh City		Middle Riyadh City	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Structural constraints	35.70	7.44	36.93	8.70	37.17	9.33	32.65	7.04	36.88	8.35

Summary of Constraint Variables MANOVA Results.

MANOVA was conducted to explore the differences between three dependent variables of constraint dimensions and four independent variables that include respondents' type of school, age, grade level and region of Riyadh lived in. The results showed that there was a statistically significant difference between public and private schools, age, grade level and region of Riyadh City lived in among the respondents. The partial eta squared scores indicate that the differences were trivial and small. These results confirmed hypotheses H4f, H4g and H4h (see Table 7.46 for summary of results of Hypotheses Set 1). Given the low level of eta squared scores the overall results indicate there were few important differences among respondents.

Differences Among Motivation Dimensions According to Type of School.

A MANOVA was performed to investigate type of school differences in motivation among Saudi Arabian male high school students' participation in sport and physical activities. The three dependent motivation dimensions were competence and satisfaction, body-related and intrinsic motivation dimensions. The independent variable was type of school (public or private school). The result showed that there was a statistically significant difference between public and private schools among Saudi Arabian male high school students on the combined dependent variables of motivations,

F (3,905) = 5.32, p > .001; Wilks' Lambda = .99; partial eta squared = .017. The value of effect size in this case is considered trivial. When the results for the dependent variables were considered separately, the only difference to reach statistical significance, using a Bonferroni adjusted alpha level of .017, was competence and satisfaction factor (see Table 7.44).

An examination of the means score, as shown in Table 7.45 indicated that private school students reported slightly higher levels of competence and satisfaction dimension in physical activity participation than public school students. This result confirmed hypothesis H6e that there was a difference between type of school and the three dependent variables of motivation dimensions among Saudi Arabian male high school students (see Table 7.46).

Table 7.44

Type of School MANOVA on Three Dependent Motivation Factors

Motivation Factors	**F**	**Df**	**Sig.**
Competence and satisfaction factor	11.79	1,905	.001
Body-related factor	.002	1,905	.966
Intrinsic factor	3.10	1,905	.078

Table 7.45

Means and Standard Deviations for Main Effect for Type of School on Three Dependent Motivation Factors

Motivation Factors	**Public School**		**Private School**	
	Mean	**SD**	**Mean**	**SD**
Competence and satisfaction factor	10.200	4.11	11.170	4.39

Differences Among Motivation Dimensions to Age, Grade Level and Region.

A MANOVA was performed to investigate age differences in motivations among Saudi Arabian male high school students' participation in sport and physical activities. Three dependent motivation factors were used and the independent variable was age (age 16, age 17, age 18 and age 19). The results showed that there was not a statistically significant difference between age 16, age 17, age 18 and age 19 among Saudi Arabian male high school students on the combined dependent variables of motivation factors. Details about the figures for this analysis are provided in Appendix B. This result has not confirmed hypotheses H6f (see Table 7.46).

A MANOVA was performed to investigate grade level differences in motivations among Saudi Arabian male high school students' participation in sport and physical activities. Three dependent motivation factors were used and the independent variable was grade level (grade 10, grade 11 and grade 12). The result showed that there was not a statistically significant difference between grade 10, grade 11 and grade 12 respondents on the combined dependent variables of motivation factors. Details about the figures for this analysis are provided in Appendix B. This result has not confirmed hypothesis H6g (see Table 7.46).

A MANOVA was performed to investigate region lived of Riyadh City indifferences in motivation among Saudi Arabian male high school students' participation in sport and physical activities. The three dependent motivation factors were used and the independent variable was region of Riyadh City lived in (north, south, east, west or middle Riyadh City). The results showed that there was not a statistically significant difference between the north, south, east, west and middle regions in Riyadh City among Saudi Arabian male high school students on the combined dependent variables of motivation factors. Details about the figures for this

analysis are provided in Appendix B. This result has not confirmed hypothesis H6h (see Table 7.46).

Summary of Motivation Dimensions MANOVA Results.

A MANOVA was conducted to explore the differences between three dependent motivation factor variables and the four independent variables of respondents' type of school, age, grade level and region of Riyadh City lived in. An examination of the differences between the three dependent variables of motivation factors and type of school showed that there was a statistically significant difference between public and private schools among Saudi Arabian male high school students. The significant means score indicated that private school students reported slightly higher ratings of the competence and satisfaction factor in physical activity participation than public school students, but the partial eta squared scores indicate that the difference is trivial. Further, the results showed that there was not a statistically significant difference between the three dependent variables of motivation factors and age, grade level and region of Riyadh City lived in among the respondents. Consequently, these results confirmed hypothesis H6e, but did not confirm hypothesis H6f, H6g and H6h. In conclusion, there was only a difference between the three motivation factors among respondents according to type of school. The motivation ratings seem to be consistent for all respondents; however, the constraints variables show some differences but these differences are usually quite a small effect size (see Table 7.46 for a summary of the results of Hypotheses Set 2).

Table 7.46

Hypotheses Set 2: Differences between Constraints and Motivation among Saudi Arabian Male High School Students' Participation in Physical Activities and Sport According to Social Demographics

No	Hypothesis	Confirmed	Not Confirmed
H1	There are differences between physical activity participation levels among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.		√
H1a	There are differences between physical activity participation levels among Saudi Arabian male high school students' participation in physical activities and sport according to age.		√
H1b	There are differences between physical activity participation levels among Saudi Arabian male high school students' participation in physical activities and sport according to grade level.		√
H1c	There are differences between physical activity participation levels among Saudi Arabian male high school students' participation in physical activities and sport according to region of Riyadh City lived in.		√
H4a	There are differences between total constraints among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.		√
H4b	There are differences between total constraints among Saudi Arabian male high school students' participation in physical activities and sport according to age.	√	
H4c	There are differences between total constraints among Saudi Arabian male high school students' participation in physical activities and sport according to grade level.	√	
H4d	There are differences between total constraints among Saudi Arabian male high school students' participation in physical activities and sport according to location in Riyadh.	√	
H4e	There are differences between intrapersonal, interpersonal and structural constraints among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.		√
H4f	There are differences between intrapersonal, interpersonal and structural constraints among Saudi Arabian male high school students' participation in physical activities and sport according to age.	√	
H4g	There are differences between intrapersonal, interpersonal and structural constraints among Saudi Arabian male high school students' participation in physical activities and sport according to grade level.	√	
H4h	There are differences between intrapersonal, interpersonal and	√	

No	Hypothesis	Confirmed	Not Confirmed
	structural constraints among Saudi Arabian male high school students' participation in physical activities and sport according to region of Riyadh City lived in.		
H6a	There are differences between total motivations among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.		√
H6b	There are differences between total motivations among Saudi Arabian male high school students' participation in physical activities and sport according to age.		√
H6c	There are differences between total motivations among Saudi Arabian male high school students' participation in physical activities and sport according to age.		√
H6d	There are differences between total motivations among Saudi Arabian male high school students' participation in physical activities and sport according to location in Riyadh.		√
H6e	There are differences between competence and satisfaction, body-related, and intrinsic factor among Saudi Arabian male high school students' participation in physical activities and sport according to type of school.	√	
H6f	There are differences between competence and satisfaction, body-related, and intrinsic factor among Saudi Arabian male high school students' participation in physical activities and sport according to age.		√
H6g	There are differences between competence and satisfaction, body-related, and intrinsic factor among Saudi Arabian male high school students' participation in physical activities and sport according to grade level.		√
H6h	There are differences between competence and satisfaction, body-related, and intrinsic factor among Saudi Arabian male high school students' participation in physical activities and sport according to region of Riyadh City lived in.		√

7.5 Chapter Summary

This chapter presented the major findings and tested the hypotheses developed in Chapter 1. This summary of the chapter is structured by the following three categories: suitability of data examination analysis, descriptive analysis and inferential statistics that included a PCA, correlation test, and differences among groups of respondents.

The results of the suitability of data examination analysis indicated that a useable sample size of 909 respondents without missing data was obtained by excluding cases listwise. Normality test results confirmed normality distribution for the full constraints scale but the results on the motivations scale was not normal based on a visual assessment of the histogram of the data distribution and skewness and kurtosis values. The Box-Cox normality plot was used to transform motivations data to a more normal distribution. The histogram in Figure 7.3 of the motivations data after applying the Box-Cox normality plot shows a dataset for which the normality assumption is reasonable. Further, analysis of the transformed motivation data and the original data produced similar results. Therefore, the original motivation data were used for analysis. Consequently, this study was able to use parametric statistical techniques (Pallant, 2011).

The reliability of the survey scales has been explored by the Cronbach's coefficient alpha. The coefficient alphas for each of the scales used in this thesis were calculated using SPSS. Table 7.4 presented the Cronbach's alphas for measurement of the constraints and motivation scales used in this study. The table indicates that all the constraints and motivations scales were at least acceptable, > 0.7, and many of the scales were above 0.8, which is preferable.

Descriptive analysis presented an overall background of the respondents, including age, type of school, and region of residence and education grade level. At the individual level, the respondents' ages ranged from a high of 19, a low of 16 and a median of 17.27. There was an even distribution according to the respondents' type of school and region of Riyadh City lived in. The results showed that most of the respondents had low levels of physical activity participation. Less than 9% of

respondents had medium levels of participation in physical activity and 26.3% of respondents had a high level of physical activity participation.

Inferential statistics were used in this study to test six main hypotheses that related to the objectives of this research (see Section 7.2 and Figure 7.4). The inferential analysis included PCA, correlations and differences among groups of respondents.

The PCA was used to identify a more parsimonious set of variables. Computation of the correlation matrix, factor extraction and rotation were used as the steps of a factor analysis procedure to achieve items measuring the two theoretical constructs of constraints (29 items) and motivation (23 items). Results of factor analysis revealed that three dimensions of constraints (intrapersonal, interpersonal and structural constraints) included five factors of constraints containing 18 items. The results of factor analysis revealed that the three motivation factors (competence and satisfaction factor, body-related factor, and intrinsic factor) contain 21items. The three constraint dimensions and three motivation factors were used for the analysis of the constraints and motivation of participation in physical activity and sport.

The results of the correlation data analysis were investigated using Pearson's product-moment correlation coefficient (r). Findings of the correlation data analysis indicated that respondents with high levels of constraints had lower levels of physical activity participation. Further, the results indicated that the motivation variables had a negative relationship with the respondents' physical activity participation level, with high levels of motivation variables associated with a low level of physical activity participation. This negative correlation is surprising; therefore, its implications are discussed further in chapter 8. In addition, there was no significant relationship between total constraints and total motivations variables and no significant relationship between intrinsic factor and physical activity participation levels. These findings suggest that the

level of constraints reduces the effects of motivation; thus, overall, the physical activity participation level is low.

The results of the differences between constraint, motivation (the dependent variables) and physical activity and sport participation level and type of school, age, year of school and region lived in variables (the independent variables) were investigated using a t-test, One-way ANOVA and MANOVA. The results of an examination of the differences between the dependent variables and independent variables showed that there are statistically significant differences in constraint, motivation and physical activity participation levels with some of the independent variables. The significant means score indicated that age 16 and grade 10 students reported slightly higher levels of structural constraints in physical activity participation than other groups. The results showed that there were not statistically significant differences between the three motivation factors and age, grade level and region of Riyadh City lived in groups (see section 7.4.3 for more detail). In addition, there were statistically significant differences between participation levels and region of Riyadh City lived in groups.

Most respondents in this study had low levels of physical activity participation as Table 7.14. Street was the most place for physical activity and sport participation (39%) and lees place was health community centre (1.2%). Consequently, lack of sport facilities was the main reason for this outcome. These findings suggest that structural constraints may contribute significantly to the low levels of participation. In sum, students who lived in North Riyadh reported the lowest levels of participation.

There are some interesting results that will be given further consideration in Chapter 8. Issues such as respondents' positive inclination to participate in physical activity and sport, lack of community sport facilities for training within sport

organisations, lack of encouragement to participate in physical activity and difficulties in accessing school sport facilities for physical activity participation have implications regarding how to address the physical activity needs of Saudi youth.

Chapter 8: Discussion

8.1 Introduction

This chapter discusses the findings from the data and, in doing so provides linkages back to the purpose and aims of the study as identified in Chapter 1, and the literature review as discussed in chapters 2, 3 and 4. The discussion in this chapter is also framed by chapter 5, which is used to explain the relationships between constraints, motivations and physical activity participation levels.

As noted in Chapter 1, the purpose of this study is to first, investigate the patterns of physical activity and sport among Saudi Arabian adolescents and second, identify and better understand the factors that both constrain their levels of participation, and motivate them to participate. The current study focuses specifically on male high school students in the city of Riyadh. Several studies have recognised that this adolescent high school cohort has become increasingly physically inactive (Al-Hazzaa et al., 2014; Alkmies, 2010). Other studies confirmed that current physical activity and sport participation levels in the Saudi Arabia, particularly in high school students, is slowly falling (Al-Refaee et al., 2001; Al-Hazzaa et al., 2013; 2014; Mahfouz et al., 2008; Mostafa & Khashaba, 2011). In 2013 it was found that 45% of Saudi Arabian boys had low levels of physical activity (Al-Hazzaa et al., 2013). These studies provide the context for this research project, which focuses on five research objectives.

The results showed that physical activity and sport participation levels among male Saudi Arabian high school students were, by international standards, extremely low, refer to Table 2.2 and sections 2.7 and 2.8. While the results also indicated changes in levels of participation when different combinations of socio-demographics, constraints, and motivators were taken into account, these differences were mostly trivial, and overall the respondents were homogeneous.

8.2 Physical Activity and Sport Participation Levels

This section will discuss the physical activity and sport participation levels among respondents from Riyadh City, Saudi Arabia. The section will look at the types of physical and sport undertaken; overall physical activity levels; sedentary leisure activities – and especially playstation games - active transportation; and differences between respondent groups.

8.2.1 Types of physical activity and sport.

Table 7.11 provides a summary of the different types of physical activity and sport engaged in by the participants in this study. The most popular activity was soccer, where 81% said they had played at least once during the seven days prior to completing the survey. This figure demonstrated the importance of soccer in Saudi Arabia's sporting culture. It was also high by international standards. For example, Kocak et al. (2002) found that 65% of Turkish junior high school students played soccer. This study also found that soccer was a popular activity for students of both public and private schools.

8.2.2 Leisure activities.

This study also found that Play Station games were the second most popular activity, where 42% of respondents said they had engaged in it. While this activity is relatively sedentary, and is not intense or vigorous, it shows that Saudi Arabian youth have a strong interest in competitive games. The third most popular activity was swimming, at 33%, while the fourth most prevalent physical activity was walking, with 21% of respondents saying they had engaged in it at least once over the previous seven days. Thus, this study found that Saudi Arabian youth had a preference for only a small range of leisure activities, some of which involved minimal physical exertion, with Play

Station being the dominant practice. The other major activities - swimming and walking - .involved loose structures and low levels of competition.

The results show that while eight out of every ten Saudi Arabian schoolboys regularly played soccer, most respondents had low levels of high intensity engagement, and high levels of low intensity engagement, with electronic games such as PlayStation being the exemplar. There was consequently significant amounts of passive activity, with many of the boys involved in soccer still operating at the low end of the physical activity scale.

Thus, when the duration, frequency, and type of physical activity and sport (which was used to determine intensity) of the respondents' physical activity and sport are taken into account, a different picture emerges. While soccer attracted both high levels of interest, and high levels of participation, it did not generate a high level of physical activity. When frequency and duration were taken into account, the level of physical activity amongst Saudi Arabian male high school students was quite low. The limitation has been explained on section 8.7, regarding the influence of the students' participation in sedentary behavior, e.g., play station games influenced the overall level of physical activity for male high school students. Including the play station games as one of the three activities reduced the overall level of physical activity. Nonetheless, even though soccer had high levels of interest the respondents did not participate frequently or long enough to achieve a high overall level of physical activity.

8.2.3 Overall participation levels.

Saudi Arabian male high school students actually had low levels of physical activity and sport participation.. This is because most respondents did not engage frequently or for very long in the three most popular activities of soccer, swimming and walking. Neither did they spend much time on the activity during the infrequent times

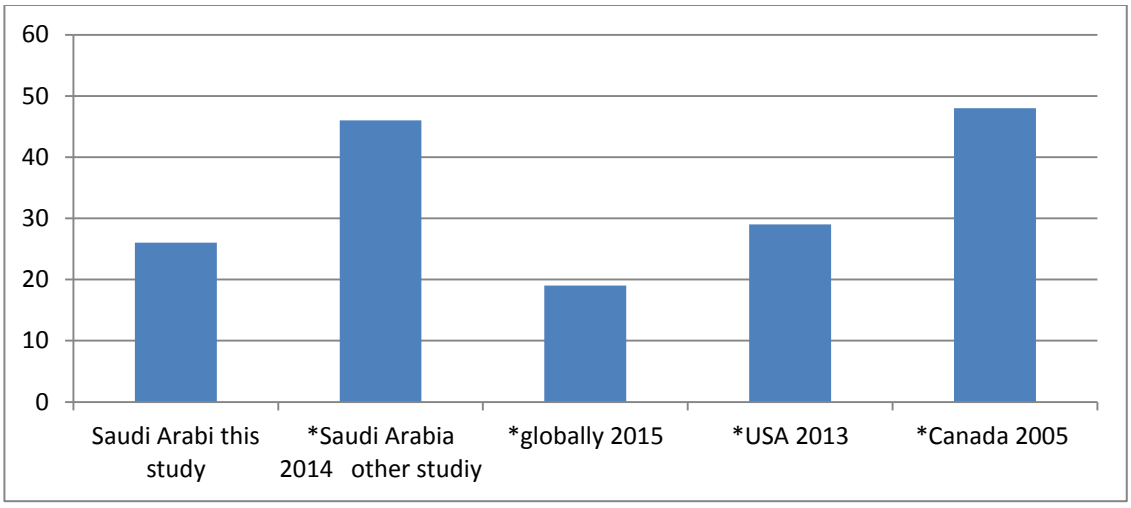
they did participate in it. And, in keeping with other studies that looked at Saudi youth participation in physical activity (Al-Hazzaa, 2004; Al-Hazzaa et al., 2011; Al-Hazzaa et al., 2013), they engaged in activities infrequently, and for short periods of time. As Table 7.15 illustrates, only 26% of respondents had high levels of physical activity and sport participation, despite the fact that 81% said they had played soccer in the seven days before the survey. On the other hand, 65% of respondents had low levels of participation in physical activity and sport, thus indicating the potential to propensity health issues. But, as previously noted, including the play station games as one of the more popular activities influenced the overall level of physical activity to be lower than it may have been (refer to Limitations on p. 277).

The results not only confirm a low participation count, but also show short periods of engagement, which indicates lower levels of participation overall. While the findings are not inconsistent with the results of earlier studies from Saudi Arabia, they paint an even more sedentary picture of male high school students. Between 1993 and 2004 physical inactivity levels among different groups of Saudi children and adults were mostly around 43% (Al-Hazzaa, 2004). Studies by Al-Rukban (2003), and Amin et al. (2011) also found that boys were regularly inactive، with 48% not participating in daily physical activity programs. The results from this study indicate even higher levels of physical inactivity.

These findings also suggest that young Saudi Arabian are less physically activity than young people in most western nations (Australia Institute of Health and Welfare, 2011; Canadian Fitness and Lifestyle Research Institute, 2006; Centers for Disease Control and Prevention, 2013; Eisenmann et al., 2004; US Department of Health Human Services, 1996; Statistics Canada, 2001 & 2005; Troiano et al., 2008; WHO, 2011d). While international studies indicate declining levels of physical activity

participation among young people (Al-Hazzaa, 2004; Al-Hazzaa et al., 2011; Al-Hazzaa et al., 2013;Cleland et al., 2011; Currie, 2004), the participation rates for Australians and New Zealanders, and to a lesser extent, Canada and the USA, are higher than those for Saudi Arabians, see table 2.2.

Figure 8.1illustrates the physical activity and sport participation levels from this study compared to other countries participation levels of physical activity among young people. For example, 29% of high school students from USA had participated in at least 60 minutes per day of physical activity (Centers for Disease Control and Prevention, 2013). Another study showed that 52% of Canadian children were categorised as inactive during their leisure time (Statistics Canada, 2005). Implications for this trend and recommendations regarding how to address the issues are discussed in Chapter 9.



* Sources(see Table 2.2)

Figure 8.1. Percentage of Young People meeting Physical Activity guideline Recommendation (60 minutes per day of physical activity).

The results of this study – which show that nearly two-thirds of Saudi adolescents in Riyadh city are non-active, also replicates the findings of Al-Hazzaa et al. (2011), who found a low levels of physical activity among Saudi Arabian boys.

Alkmies (2010) also found increasing low level of physical activity participation among young Saudi Arabians.

While nearly two-thirds of the respondents in this study had low levels of physical activity and sport participation, it is also important to note that 26% of respondents had engaged in physical activity and sport, thus meeting the guideline recommendations. In this study the result confirmed that low percentages of students who meet the recommended guidelines (60 minutes per day of physical activity), than the other saudi studies which confirmed a higher level of physical activity. The differences between the two studies is most likely due to different methods for measuring the levels of physical activity and sport, and the sample size.

Additional analysis found that 49% of this highly active cohort were registered with soccer organisations, which comprised mainly government-run soccer clubs. Also,43% of this high-participation cohort received encouragement from friends (see Table B-12 and B-13 for details). This result demonstrates not only the importance of organised programs as a means of attracting and retaining participants, but also the increased participation that arises from the support provided by ‘significant 'others. That is, for this study, participation is enhanced when social support is provided, and where there is ready access to sport facilities with structured competitions and programs.

8.2.4 Active transport.

The widespread occurrence of sedentary lifestyles among Saudi Arabian youth is also evident when examining the modes of transport used by the respondents. Walking, together with cycling, was not popular, with only 16% of students indicating

they walk when travelling from home to school. Additionally, less than 6% of students used a private bus when travelling to school. The majority of respondents in this study were more often transported from home to school, and school to home, by car. This can be explained by four factors: (1) every household in Saud Arabia has access to a private motor vehicle (2) family members are always available to drive students to school (3) public transportation is often not available, or inaccessible, and (4) there is a perceived lack of safe and secure walking paths (Alshmaly 2006). These results are only slightly below the figures for youth in the USA and Australia, where an average of 17% of respondents travel actively to and from school by walking (Dollman, Norton et al., 2005; Lewis, Dollman et al., 2007). This low figure for the numbers of young people walking to and from school is consistent with the exponential growth in the global use of motor vehicles to transport household members over short distances. These results are also consistent with studies undertaken which confirmed that the declining use of public transportation and an increased use of motor vehicles to commute to work were linked to declining physical activity levels (WHO,2011). The ways in which this trend might be reversed for Saudi Arabian youth is addressed in Chapter 9.

8.2.5 Differences between respondent groups.

There were differences in the levels of physical activity among the different respondent cohorts, but they were in every instance trivial. The data indicates that the physical activity and sport practices of respondents were not differentiated on the basis of the type of school attended, their age, grade level, and region. This can be contrasted with studies that found differentiated levels of physical activity based on these social demographics (Al-Hazzaa et al., 2014; Dumith et al.,.2011; Heisz et al., 2015; Maguire & Edwards, 2011). For example, Dumith et al. (2011) confirmed that physical activity change during adolescence and found there was a decline in physical activity

participation at older age levels. Other studies found public school students tend to be more active compared to private school students (Al-Hazzaa et al., 2014).

8.2.6 Physical activity and sport participation: Conclusion.

The initial figures from this study indicate that more than 80% of respondents undertook some type of physical activity and sport during the seven days prior to the study. However, these figures need to be treated with caution since most of this activity was of low intensity. When compared to international guidelines on activity levels that generated a health benefit, the results were low. This study found that 74% of respondents (those identified with low and moderate levels of physical activity) did not meet these recommended guidelines for physical activity participation, refer to the Australia's physical activity guidelines for young people aged 12–18 (Department of Health and Ageing, 2014). Additionally, it was found PlayStation games was the second most popular activity among respondents (42%), thus confirming the sedentary lifestyles adopted by most of the respondents in this study. Only 26% of respondents had a high level of physical activity participation. It was also found that 49% of these high-activity respondents were registered with sport organisations.

Overall, this study found that the level of physical activity and sport participation among the respondents was low. This suggests that most Saudi Arabia male high school students face many constraints that hinder their participation in physical activity and sport programs. So, what might these constraints be, and how might they explain these low levels of participation?. The next section discusses the constraints that may have influenced the physical activity levels of Saudi Arabia high school students.

8.3 Constraining Influences

The following discussion explores the overall effect of constraints on respondents' participation in physical activity and sport. It begins with a brief review of the key results. It then moves into a detailed analysis of the main constraints under three operational headings, which are first, intrapersonal constraints, second, interpersonal constraints, and finally, structural constraints.

8.3.1 Overview of constraints.

As noted in chapters 2 and 3, international studies suggest that the lack of participation in physical activity and sport constitutes a serious public health problem among youth. A majority of adolescents and children do not obtain the level of daily participation in physical activity that is recommended by many health associations (Casper et al., 2011; Cavill et al., 2001; Richard, Troiano et al., 2008). This study into male Saudi Arabian high school students delivered similar results to previous studies that identified low participation levels.

There are many factors at work that constrain young people's involvement in physical activity and sport, including (1) intrapersonal constraints (2) interpersonal constraints and (3) structural constraints (Crawford and Godbey,1987; Crawford et al., 1991). A number of specific constraint variables have been documented in other studies, including lack of knowledge, lack of partners, lack of facilities and accessibility, and lack of time (Alexandris et al., 2002; Fees, Trost, Bopp & Dzewaltowski, 2009; Fulton et al., 2011; Hohepa,Schofield & Kolt, 2006). This study has examined each of the above constraint dimensions, and the findings are discussed in the following sections.

It is worth noting that the statistical results of this study show that the mean scores for the constraints item rated less than 4.00. This suggests that while the impact of the constraints on the respondents was not strong, there are issues that clearly hinder

the respondents' participation in physical activity and sport. The higher mean scores for some constraints may therefore indicate an underlying anxiety about how best to engage with physical activity programs. Additionally, the relatively low mean scores for the constraints may be due to weaknesses in the self-report measurement as noted in chapters 2,3, and 4.

8.3.2 Intrapersonal constraints.

Intrapersonal constraints are "primarily concerned with subjective perceptions or assessments of appropriateness and relevance of participation in a given leisure activity by the individual in question" (Godbey et al., 2010, p. 121). In this study 'lack of knowledge'(e.g. where, when, and who can teach me) was rated as the highest intrapersonal constraint factor, with an adjusted mean score of 2.85. This finding is not consistent with some studies. For instance, Casper et al. (2011) found that a lack of knowledge was perceived as the lowest-ranked constraint. In general, though, a lack of knowledge of physical activity participation opportunities, and their availability, is likely to constrain participation among young people. A decision to act , and especially to allocate resources to a physical task, demands access to information, and a subsequent appraisal of its utility. An awareness of what opportunities are available is a significant step for youth in developing healthy and active lifestyles (Heinrich et al., 2011; Keating et al., 2010; Kulinna & Silverman, 2000). Further analysis of the data found respondents with low physical activity and sport have a higher rating of lack of knowledge and respondents with high physical activity and sport have a lower score of lack of knowledge. ANOVA results indicated that there is a significant ($p<0.001$) difference of lack of knowledge among the different physical activity and sport participation groups. More specifically, it was found from Tukey's multiple comparison test that only low and high physical activity groups are significantly different ($p<0.001$),

but the effect size of these differences was trivial. Secondly, from summary statistics it was found that the respondents who participated with organisation club has high score in lack of knowledge and from independent samples t test, we found that the difference in lack of knowledge score was significantly different between respondents who participated with organisation and non-organisation sport club ($p<0.001$), but the effect size of these differences was trivial.

A lack of knowledge of these opportunities can be a heavy constraint on a decision to participate. The program may be run by consummate professionals, the facilities may contain the most up to date equipment, programs and the participation costs have been subsidised by the local government authority, but all of these positive attributes will be undermined by limited knowledge of its availability, and little understanding of its personal and social benefits.

8.3.3 Interpersonal constraints.

Interpersonal constraints involve social interaction considerations, and include factors such as lack of partner, lack of parental encouragement and lack of encouragement from significant others*(e. g . My friends do not like participating in physical activity, My friends do not have time, and There is nobody to participate with me),* refer to Table 7.20 (Crawford & Godbey, 1987).A number of research studies have found that social connectedness – especially support from friends and peer groups – are important in increasing participation levels (King, Tergerson & Wilson, 2008; Palisano et al., 2009; Wilson & Dollman, 2007). In further support of this finding, Palisano et al. (2009) found that a high percentage of youth participated in sport activities with their friends and others outside the home. The results of this study also indicate that respondents were more likely to participate when they received support and encouragement from friends. Hashim et al. (2008), who found that positive peer

interaction was very important for enjoyment during physical activity participation, both within and outside school.

More specifically, Crawford and Godbey (1987) have suggested that the lack of supportive partners can often be a major constraint, and can result from different levels of skills, dissimilarity of preferences, different capabilities, and different timetables. However, the findings from this study showed that 'the lack of partner' factor, with a mean score of 2.40, was not a highly rated constraint on participation in physical and sport activities. This finding is also inconsistent with some previous studies (Fulton et al., 2011; Hohepa et al., 2006; Wang et al., 2010). For example, Wang et al. (2010) examined perceived motivators and constraints among regular players of basketball games. One hundred and twelve basketball players from three different cities in central California (in the public facilities) aged over 18 years participated in this study. Eighteen per cent of these players said it was difficult to find friends to play with, and that this was a barrier to continued participation in the game. Budruk et al. (2009) reported that lack of partner was a major constraint on participation in sport and recreation activities. Hohepa et al. (2006) investigated the physical activity contexts among New Zealand high school students, and also found that lack of peer and social support were key constraints on participation in physical activity. Similar research found that respondents reported that a lack of social support prevented their participation in sport (Alexandris, 1998; Fulton et al., 2011; Jackson & Rucks, 1995).

Support and encouragements from families—specifically fathers—is also thought to play a significant role in socialising children into physical activity and sport. The result of this study confirms this proposition. A low proportion of respondents (13.6 %) received support and encouragement from their fathers, see Appendix B Table B.8. This result is consistent with the findings of Palen et al. (2010) lack of parental support

was the most common interpersonal constraint to leisure participation among respondents. Parents also helped to strengthen their children's leisure attitudes, values and behaviours (Shifman et al., 2012; Kowalski & Lankford, 2010; Liechty, Freeman & Zabriskie, 2006; Palen et al., 2010). Seabra et al. (2013) found that children and adolescents who received more encouragement and support from their parents increased their participation levels. This means that a lack of parental support will act as a constraint on participation.

The result of this study also found that there was a lack of physical education teacher encouragement during physical education class time. Only 2.9% of respondents of this study said they obtained encouragement from their physical education teacher. High quality physical education class include the PE teacher as a key factor for enabling and promoting youth physical activity (Cardon et al., 2012; Lawson, 2008). The low level of encouragement from the PE teacher result in this study is consistent with other studies which found that teachers enhanced students' engagement, and promoted a positive class environment (Goudas, Biddle, Fox & Underwood, 1995; Theeboom, De Knop & Weiss, 1995; Deci & Ryan, 1985; Deci et aI., 1991). Fairclough and Stratton (2005) found that physical education classes at school provided an environment for regular and structured physical activity participation to take place. In addition, Ntoumanis (2005) found that participants reported more motivationally optimal experiences in physical education than did the non-participants. Whisenant and Jordan (2008) also found that coaches played a critical role in influencing the level of enjoyment athletes experienced. It is also worth noting that 5.2% of respondents in this study received greatest encouragement to participate in physical activity and sport from coaches. See Table B-8 for further details.

Overall, this study indicates that lack of social support was, in some instances, influential in constraining physical activity and sport participation levels of youth and adolescents. This result partially confirms previous findings that show that partner availability, peer support, and ongoing encouragement can contribute to increase in participation levels (Fulton et al., 2011; King, Tergerson & Wilson, 2008; Palen et al., 2010; Palisano et al., 2009; Wang et al., 2010).

8.3.4 Structural constraints.

Structural constraints are one of the most frequently mentioned as constraints that hinders participation. They were first proposed by Crawford and Godbey (1987). Structural constraints are defined as 'intervening factors between leisure preference and participation'(Crawford & Godbey, 1987, p. 123).

In this study, structural constraint dimension had the highest rating of the three dimensions. The specific findings for this study indicate that facilities and related services were the highest constraints. The facilities and accessibility factor, with a mean score of 3.04, was the highest factor across all the constraint factors. And, within this factor a number of items received even higher ratings. For example, the ' facilities inadequate' - which referred to not enough or some facilities not being available – obtained a mean score of 3.60. The 'facilities crowded' item also rated highly with a mean score of 3.47. In view of the relatively low mean scores obtained for the intrapersonal and interpersonal dimensions, it appears that structural constraints, especially the facilities / accessibility factor, is one important explanation for the low participation levels of respondents. When combined with a lack of knowledge, it is likely that participation will be low.

The comparatively high score in the lack of facilities/accessibility factor was not unexpected, because nearly 40% of respondents identified the street as the most popular

place for physical activity and sport participation. This suggests that respondents were forced to play in generic and sometimes unsafe environments since there were so few purpose-built spaces available. This finding is consistent with Al Agili & Park (2012) who confirmed that Saudian adolescent males practised sport activity after school in the streets and empty lots. Nichol, Pickett and Janssen (2009) confirmed that an attractive and accessible school leisure environment is a significant resource for promoting physical activity and sport. Although school sport facilities provide a safe place for participation, many respondents indicated that they had limited access to these facilities (see Appendix B Table B.9). Also, there is evidence of government failing to provide sufficient organisation and guidance, this problem has been recognised in other Saudi studies, where a lack of sport facilities was seen as a main constraints for both young and old Saudi citizens (see chapter 2 and 3).

The above findings confirm the critical importance of appropriate facilities in enabling young people to engage in physical activity and sport programs. It is supported by the finding of Van Herzele and Wiedemann (2003), who found that the quantity and quality of sport facilities – including the provision of green spaces - affected citizens' patterns of activities, and modes and frequencies of everyday recreation. Thus, this result identifies an opportunity for the Saudi Arabian General Presidency for Youth Welfare and Municipal Council to target the young age group and provide more multi-sport community centres that cater for soccer, swimming, and other sport opportunities, as well as provide more support with sport participation programs.

This study also supports the findings of several studies (Drakou et al.,. 2008; Shifman et al., 2012).For example, Drakou et al. (2008) revealed that the lack of facilities was the second highest constraint cited by university students. Kocak et al. (2002), who examined physical activity levels and sport participation among Turkish

junior high school students, found lack of sport facilities was the major reason reported for not participating in sport.

The lack of facilities for sport participation thus has a significant role in hindering respondents' physical activity and sport participation. Several studies have identified a positive association between facility accessibility and young people's physical activity involvement (Ammouri., 2007; De Vet et al., 2011; Drakou et al.,. 2008; Evenson et al., 2006; Kubayi et al., 2013; Palen et al., 2010; Utter et al., 2006). That is, while greater accessibility tends to deliver additional participation, a lack of access does the opposite. Nearby parks and playing fields also increase young people's interest in physical activity outside home, whereas a lack of appropriate spaces and places does the opposite (Roemmich et al., 2006).

While this study shows that limited facilities and problems with accessibility were key constraints that impacted on their participation levels, it did not find that financial issues or a lack of time were a major barrier to participation. This finding thus only partly replicates other studies that looked at structural constraints, all of which found that facilities, financial issues (Humbert et al., 2006; Kowalski & Lankkford, 2011), and time (Casper et al., 2011; Flood & Parker, 2014; Palen et al., 2010; Jung-Woong et al., 2009) were influential in shaping young people's participation in physical activity and sport.

Time is an especially important issue to address because lack of time is usually cited as a major barrier to participation (Dovey et al., 1998). However, the finding of this study found time to be a weak constraint, and thus inconsistent with a number of international studies which found that a lack of time was a major constraining factor (Casper et al., 2011; Jackson & Witt, 1994; Kocak et al., 2002; Palen et al., 2010). Jung-Woong et al. (2009) found that the most dominant constraint on physical activity

participation was lack of time, while in a local Saudi Arabian study, Al-Refaee and Al-Hazzaa (2001) found that lack of time was cited as the major constraint, with 70% of the respondents reporting this factor as a hindrance to participation. Similar results also emerged from a study by Casper et al. (2011), who indicated that the most important constraint perceived by middle-school students was time. Additionally, Palen et al. (2010) found that the most commonly mentioned structural constraint by tenth grade boys was competing demands on time, such as chores, schoolwork and sibling care.

Financial factors are an increasingly important contributor to increased participation levels in physical activity and sport, while the influence of economic factors on participation levels in physical activities and sport initially seems to be an important influence on people's decisions to engage in physical recreation and sport programs (Hill, Sallis & Peters, 2004; Pratt, Macera, Sallis, O'Donnell & Frank, 2004). A Canadian study found that the children of families on low incomes are associated with considerably lower participation rates in sport (Statistics Canada, 2009). A study by Butcher et al. (2008) investigated the correlates and physical activity guideline compliance among adolescents and found that those from low income families were less likely to meet recommended physical activity participation guidelines than those from higher-income backgrounds. There is evidence from other studies that the financial factor was an issue that decreased their physical activity and sport participation levels. For example, Steenhuis et al. (2009) investigated financial factors and prices as a barrier to participation in physical activity by low income men. But In this study, the financial factors were not important issues. This finding may be explained by not only the lack of non-sport facilities availability in Saudi communities - such as community recreation centres and sport programs – but also because of the low fees to be involved in sport

programs. Also there are no previous studies of Saudis that show that physical activity and sport participation is heavily constrained by financial factors.

The relative low level of the financial and time related constraints may also be a function of the lack of knowledge as an intrapersonal constraint. If respondents had lack of knowledge of where to participate and how to learn activities, then they are unlikely to see lack of finances or time as a major constraint. This reinforces the hierarchical nature of leisure constraints theory, where intrapersonal constraints will often hinder participation, even where interpersonal and structural constraints are low

Overall, the results showed that the most highly rated structural constraint factor was the lack of sport facilities. The items within this factor that were rated as most constraining were first, inadequate facility, second, crowded facility, and finally, poorly maintained facility.

The influence of grade level differences on perceived constraints was examined by studies of high school students. Humbert et al. (2008) found several differences in constraints among students in grades 11 and 12. The study suggests that part-time employment among secondary school youth is a major reason for decreased involvement in physical activity. The study also suggests that middle-school educators should work to ensure that their students understand that leading a physically active lifestyle can benefit all aspects of their health and well-being. Allison et al. (1999) found that the nature of the constraints faced by high school students in different grade levels was different. For example, students in grade 9 faced constraints such as a lack of support from family and friends and a fear of injury. Students in grade 11 were constrained more by cost and a lack of time (for example, due to study and work commitments).

8.3.5 Inter-group comparisons and relationships.

Inter-group differences between constraint variables were explored from four perspectives, which are first, the student's physical activity and sport participation levels, second, their age and grade level, third, their school attended, and finally, their residential location. The results of this study indicated that the differences in the ratings among the respondents were trivial when differentiated by the participation levels, age, grade level, type of school attended, and their residential location. While the results from the analysis of differences among groups of respondents indicated that there was a statistically significant difference in constraints based on all the four perspectives mentioned above, and thus confirmed the hypotheses, the effect size indicates these differences had little impact on levels of participation.

The results of this study thus challenges the results of inter-group comparisons where both intrapersonal and interpersonal constraints, increase with advancing age (Alexandris et al., 2003; Alexandris & Carroll, 1997; Jackson, 1993). In general, research findings have indicated that constraints are not similarly experienced by all ages. Casper et al. (2011) found significant differences in constraints to physical activity and sport participation among different age subgroups. Biddle et al. (2011) found that different categories of constraints were related to individual psychological factors among different age groups. Beyond age, though, most are likely to have only small or small-to-moderate effects. Also, there are some studies that found fewer constraints at lower grade levels among high school students (Allison et al., 1999; Tae, 2007). While this study found some significant differences, the effect sizes were trivial, these differences may be based on the limited range of respondents. There were all in high school in the same city and the age range was only four years and grade level was three

years. This means that researchers will have a more homogeneous group of respondents to study.

Some studies show disparate perspectives ranging from negative and positive to weak relationships between constraints and physical activity participation (Alexandris et al., 2008; Hubbard & Mannell, 2001; Elkins & Beggs 2007; Trapp et al., 2012; Oyeyemi et al., 2014; White, 2008).

Overall, there were some statistically significant differences and relationships between constraints according to the range of demographic variables and respondent participation levels. However, the differences were all 'trivial', so the overall analysis indicates the respondents were a generally homogeneous group.

8.3.6 Summary of constraint influences.

The results of this study suggest that the participation of Riyadh male high school students in physical activity and sport was mainly constrained by first, a lack of knowledge of the activities and programs available, second, a lack of support, especially from parents and coaches, and third, a lack of facilities and poor accessibility to the ones currently operating. Structural constraints had the highest ratings across all socio-demographic cohorts, including age and grade level, school attended, and the residential location of respondents. Therefore, the low participation levels appeared to be mainly due to a lack of knowledge, but also compounded by limited social support, the lack of a suitable physical environment, and a lack of easily accessible and useable facilities for sport.

There was also a perceived low level of encouragement from parents, physical education teachers and coaches, and this suggests that both intrapersonal and interpersonal dimensions were underlying influences on the low levels of participation. These problems were heightened by the structural dimension which indicated a lack of

facilities as a major barrier to participation. The findings demonstrated a weak negative relationship between structural constraints and physical activity participation levels. In other words, the stronger the structural constraints, the lower the level of student participation in physical activity and sport.

This result is consistent with most studies of physical activity and sport participation, which suggests that the more significant the structural constraint, then all other things being equal, the lower the level of participation (Casper et al., 2011; Flood & Parker, 2014; Kowalski & Lankkford, 2011). There were some statistically significant differences between constraints according to the range of demographic variables, and respondent participation levels but the differences were all 'trivial'. On balance, the analysis indicates the respondents were a generally homogeneous group.

8.4 Motivational Influences

The discussion on motivations explores the overall effect of the motivations on respondents' participation in physical activity and sport. It begins with a brief review of the key results. It then moves into a detailed analysis of the main motivations under three operational headings, which are first, the body-related dimension, second, the competence and satisfaction dimension, and finally, the intrinsic dimension.

8.4.1 Overall view of motivations.

As explained in chapters 2 and 3, the lack of participation in physical activity and sport constitutes a serious public health problem among youth. Many international studies have raised issues about the high proportion of adolescents and children who do not obtain satisfactory levels of daily physical activity (Casper et al., 2011; Cavill et al., 2001; Richard, Troiano et al., 2008). This study, involving male Saudi Arabian high school students, has found similar results. Despite the respondents' high level of motivation to participation on physical activity and sport, they had low levels of

participation. The impact of constraints (which were discussed above) contributed significantly to this low level of physical activity.

Chapter 4 discussed the range of factors that motivate young people's involvement in physical activity and sport. A number of specific motivation variables have been documented in other studies, including fun, skill development, challenge, fitness, opportunity to make friends, and socialisation (Chang, 2003; Havitz et al., 2013; Iannotti et al., 2013; Soares et al., 2013). This study has applied Frederick and Ryan's (1993) MPAM that includes(1) body-related dimension (2) competence and satisfaction dimension, and (3) intrinsic dimension. Each of these dimensions were examined, and the findings are discussed in the following sections.

All students reported a wide range of motivation dimensions regarding their participation in sport and physical activities. The adjusted mean scores for all motivation items ranged from 3.19 to 4.71. These are surprisingly high scores for two reasons. First, they were higher, on average than any single constraint factor, and second, they not mirrored in high levels of participation. This suggests that a high level of motivation amongst the students was not sufficient to overcome the constraints that negatively influenced participation. These constraints were found in each of three hierarchical dimensions, which were first intrapersonal constraint (e.g. lack of knowledge), second interpersonal constraints (e. g. lack of social supports), and third structural constraints (e. g. lack of facilities).

8.4.2 Body-related motivation dimension.

The body-related dimension refers to the desire to develop one's physical appearance and level of fitness (Frederick & Ryan, 1993). Specific body-related dimensions such as – appearance, health and social approval – which are further interconnected to fitness and appearance have been documented as a motivators for

physical activity in previous studies (Sibley et al., 2013; Iannotti et al., 2012; Litt et al.,2011; Orti & Donaghy, 2004).This study has produced similar results. In particular, the body-related dimension was cited by the male high school students in Riyadh as one of the strongest motivators.

The result of this study showed that the adjusted mean score of body-related dimension was high, with most important items ('I want to be physically fit) with adjusted mean scores of 4.69, and ('I want to improve my cardio fitness') with adjusted mean scores of 4.71 out of 5.00 respectively. This finding is consistent with previous studies including Ball et al. (2014) who used EMI-2 to measure motivation of physical activity participation among adults. They found that the primary motive for participation was appearance, health benefits, stress and weight management. Similarly, Kilpatrick et al. (2005) found that the strongest motives related to exercise behaviour among respondents were health and appearance.

Hannus and Laev (2011) investigated the motives of aerobics participants in relation to the perceived and preferred leadership behaviour of aerobics instructors. In seven exercise clubs from 87 aerobics participants (aged between 16–59 years old). The findings were that in aerobics participants, appearance and health-related factors are ranked higher than other motives such as enjoyment. However, these findings need to be treated cautiously in the context of this study. This is because organised sport programs generally attract young people with an interest in building up their level of mastery, socialising with like-minded individuals, enjoying the camaraderie, and being stimulated by a completive contest. Health and appearance are often relegated to minor status in organised sporting clubs.

The results of this study reveal a keen acknowledgement of the body-related benefits of physical activity and sport. Interestingly, the high mean scores for the body-

related motives had a small negative correlation with levels of participation. As a result they contradict other studies which found that the desire for healthy bodies was associated with high levels of physical activity in youth (Sibley et al., 2013; Iannotti et al., 2012; Litt et al., 2011). Frederick and Ryan (1993) also showed that people who participated in fitness activities had higher levels of body-related motivation. Hence, according to these studies body-related motivations were important drivers of participation, and were strengthened when linked to the desire for personal improvement, health maintenance and social approval (Ball et al., 2014; Cecchini et al., 2002; Hannus & Laev., 2011; Kilpatrick et al., 2005; Soares et al., 2013; Vasickova et al., 2014).

Overall, the results of this study indicate that respondents had high body-related motives (see Table 7.26a). While this suggests that there is an understanding of the value of physical activity and sport, and how it builds healthy bodies and cardiovascular fitness, it did not lead to high levels of physical activity and sport participation. It appears that a fusion of intrapersonal, interpersonal and structural constraints had a strong influence on participation, and consequently neutralised the impact of high body-related motivation.

8.4.3 Competence and satisfaction motivation dimension.

Competence factor refers to skill development, competition and challenge (Frederick & Ryan, 1993). Perceived competence especially plays an important role in motivating people to engage in physical activities and sport (Barnettet al., 2013; Deci & Ryan, 2008; Frederick & Ryan, 1993; Ntoumanis, 2001; Stoddenet al., 2008; Sibley et al., 2013).

In this study there is wide range of motivation factors, with the adjusted mean scores ranging from 3.19 to 4.71.The adjusted mean score for the competence and

satisfaction factor was 4.30, with the most important items of competence and satisfaction being skill development with adjusted mean score of 4.65, competition with adjusted mean score of 4.51 and challenge with adjusted mean score of 4.54. The overall score for the competence and satisfaction factor demonstrates that respondents have a high level of motivation.

In this study, the results suggest that there is an understanding of the value of physical activity and sport, and especially the motivational role played by the opportunity for skill development. However, despites these positive perceptions, they did not lead to high levels of physical activity and sport participation.

8.4.4 Intrinsic motivation dimension.

The intrinsic factor refers to the fun and enjoyment that can be derived from physical activity and sport participation, and its association with physical activity and sport engagement by youth (Bagoien & Halvari, 2005; Buckworth et al., 2007; Cooper et al., 2012; Frederick & Ryan, 1993; Luka, 2013; Tsorbatzoudis et al., 2006). In this study the adjusted mean score for the intrinsic factor was 4.31, with the most important item being 'I enjoy this activity', with an adjusted mean score of 4.52.

Normally, a high mean score for the intrinsic factor is associated with high levels of participation, while low scores are linked to low levels of participation (Cooper et al., 2012; Gao et al., 2013; MacPhail et al., 2008). Davey et al. (2009) confirmed that enjoyment motive strongly influenced participation, and found a positive relationship with high exercise performance. Litt, Lannotti and Jing (2011) found that having fun is a major reason for engagement in physical activity. Similarly, Sibley et al. (2013), using the Motives for Physical Activity Measure–Revised (MPAM-R),found that stronger intrinsic motivation directly influenced the performance of college students. This finding is consistent with other studies (Campbell et al., 2001; Ferrer-

Caja and Weiss, 2000). However, this study found that that while there was an understanding of the value of physical activity and sport – and especially its capacity to engender fun and enjoyment - it did not lead to high levels of physical activity and sport participation. This result is similar to the findings of Frederick and Ryan (1993) who found that despite high levels of intrinsic motivation there were low levels of participation.

Overall, the results of this study showed that all three motivation factors were rated highly. The highest important variables were skill development, competition, and challenge. However, the high motivation factor ratings did not appear to have a positive impact on overall participation levels, and were unable to counteract low participation levels influenced by the lack of suitable facilities and the difficulties in accessing them.

8.4.5 Inter-group comparisons and relationships.

In this study the inter-group differences between motivation variables and participation levels, age and grade level, school attended and residential location were explored. The relationship between motivation variables and participation, and motivation and non-participation levels of physical activity has received considerable critical attention. For example, a number of studies have observed the relationship between motivation factors influencing physical activity participation levels among gender and age groups (Bopp et al., 2006; Campbell et al., 2001; Johnson, 2009; Lawman et al., 2011; Litt et al., 2011; Richards, Reeder & Darling, 2004; Ryan et al., 1997; Jo Salmon, 2010). The analysis of differences among groups of respondents indicated that there was not a statistically significant difference in motivations based on respondent's participation levels, age and grade level, and residential location. Therefore the results did not confirm the hypotheses, On the other hand, there was a statistically significant difference in motivations based on respondent's type of school

attended, which confirmed hypotheses H6e (see Table 7.46). However, the effect size indicates that this difference was trivial and had little impact. Thus, the overall analysis indicates the respondents were a generally homogeneous group.

8.4.6 Summary of motivation influences.

This result of this study suggests that there are high levels of motivation among male high school students and a strong interest in physical activity and sport participation. All three motivation dimensions had relatively high ratings across all the respondent groups, with no differences among any of the independent variables except type of school and this difference, which, although statistically significant, was trivial.

However, the high motivation ratings did not lead to high levels of participation in physical activity and sport. This result is surprising, but it also makes sense in view of the fact that structural constraints were frequently cited as a major obstacle to participation. Lacks of a suitable physical environment, and a lack of easily accessible and useable facilities, were viewed as problematic.

Therefore, despite an acknowledgement that being active, playing games, and being fit and healthy was a good thing, there were low levels of physical activity participation. This is a cause for concern, since it indicates that, although the desire to participate is strong, there are other factors preventing these young male high school students from regularly engaging in physical activity and sport programs. In this study, the motivation items were all rated highly, indicating that the respondents appeared to have high levels of interest, even though there were low levels of participation. This may reinforce the fact that structural constraints have a bigger influence than motivations in this study.

8.5 Interplay Between Motivations, Constraints and Physical Activity

A number of studies have investigated the relationship between motivations, constraints and physical activity participation level and found that motives have a marked effect on participation levels. However, the studies also show disparate perspectives, including negative, positive, and weak relationships, between motivations, constraints and physical activity participation levels (Alexandris et al., 2002; Alexandris et al., 2011; Alexandris & Carroll, 1997; Bopp et al., 2006; Hubbard & Mannell, 2001; Litt et al., 2011; Jung-Woong et al., 2009; Shaw et al., 1991).

8.5.1 Motivation and levels of physical activity.

The results from this study indicated that that there was a small but significant negative relationship between total motivation and physical activity participation level. That is, high levels of motivation factor ratings were associated with low levels of physical activity participation. This negative correlation is surprising because a higher level of motivation would normally produce a higher level of participation. This result confirmed the validity of hypothesis H5a, but it was a small correlation.

The results of this study are not consistent with most studies on physical activity and sport participation (Alexandris et al., 2002; Campbell et al., 2001; Ferrer-Caja & Weiss, 2000; Jung-Woong et al., 2009; Lawman et al.,. 2011; Litt et al., 2011). Most of previous research found a strong positive relationship between motivation factors and physical activity and sport participation level among different genders and age groups. For example, Litt et al. (2011) confirmed that social motivations were positively associated with physical activity, but only for female adolescents. They also found a strong and positive relationship between physical activities and health motivation factor for all adolescents. Another study by Lerner et al. (2011) using interviews to evaluate the correlation and motives for Physical Activity Measure (MPAM-R) to evaluate the

strength of five motives for participating in physical activity found that intrinsic motivational factors (e.g., fun (37%) and enjoyment (29.9%) were the primary positive correlates of physical activity/sport participation for both genders, but more so for male respondents than the female respondents. Some studies have also reported that no relationship existed between motivation and participation in physical activity among participants (Hubbard & Mannell, 2001; Iannotti et al., 2013).

The negative direction of the correlation between motivation and levels of physical activity and sport participation was not expected because a higher level of motivation would normally produce a higher level of participation. This suggests that high levels of motivation may not always be able to overcome the impact of constraints. It appears that the respondents in this study had to deal with a number of constraints at the same time which diminish the impact of their motivation to increase physical activity and sport participation levels (e.g. lack of facilities and lack of encouragement).

8.5.2 Constraints and motivation.

The results from this study indicated that there is no inverse relationship (as you would expect), or any relationship between the constraints and motivation variables. In other words, high constraints were not associated with low levels of motivations, and neither were low constraints associated with high levels of motivation. Hypothesis H3 was thus not confirmed.

These results are consistent with other studies that found no strong empirical evidence to support the relationship between constraints and motivation (Alexandris & Carroll, 1999; Alexandris et al., 2002; Alexandris et al., 2011; Alexandris et al., 2008;Hubbard & Mannell, 2001;Jung-Woong et al., 2009;Iso-Ahola & Mannell, 1984; Stodolska, 2000). However, they also contradict other studies that found a negative relationship between constraints and motivations. Jung-Woong et al. (2009), for

example, confirmed that there were negative correlations between constraints and motivation. Alexandris et al. (2011) explored the effect of constraints on motivation, activity attachment, and future behaviour of recreational skiers. The findings of this study revealed a negative relationships between constraints and motivation. In another study by Alexandris et al. (2002), it was found that intrapersonal constraints predicted the levels of intrinsic motivation among Greek adults. For example, high levels of individual/psychological constraints, and high lack of interest-related constraints were connected with low levels of intrinsic motivation.

8.5.3 Constraints and levels of physical activity

The results from this study indicated that that there was a small but significant negative relationship between total constraints and physical activity participation level. That is, high levels of constraints factor ratings were associated with low levels of physical activity participation. This result confirmed the validity of hypothesis H2a, but it was a small correlation.

The results of this study are consistent with most studies on physical activity and sport participation. For example, Alexandris and Carroll (1997), noted a negative relationship between constraints and physical activity participation. Jung-Woong et al. (2009) investigated constraints, motivations and physical activity participation levels among Korean youth and also found a negative correlation between constraints and physical activity.

The negative direction of the correlation between constraints and levels of physical activity and sport participation was expected because a higher level of constraints would normally reduce the level of physical activity and sport participation. This suggests that high levels of motivation may not always be able to overcome the impact of constraints as discussed in above section.

8.6 Integrating the Results

The key findings for this research are that constraints appear to be hindering participation even though there is a high level of motivation. Although there are some small differences based on demographic variables, these differences were quite small and had little effect on the overall levels of physical activity. The discussion that follows aims to consolidate the findings, and use them to construct a visual model that encapsulates the scope of the relationships between the variables examined in the previous sections of this chapter.

8.6.1 Influences on levels of physical activity.

Figure 8.2, which summarises the methodological framework for this study, is a reproduction of Figure 5.1, and illustrates the relative importance and consequent influence of constraints, motivations and demographics on levels of physical activity and sport participation for the respondents in this study. Constraints clearly had the strongest influence on participation, with structural constraints in general, and the lack of facilities in particular, being a strong barrier to participation. Motivations were rated highly, but they were unable to offset or negate the forces associated with the structural constraints. In addition, demographic variables had only a trivial effect on the overall differences of levels of physical activity.

Figure 8.2 illustrates that the main influence on the relatively low level of participation of the Saudi Arabian respondents are the constraints, with particular emphasis on structural constraints (hence, the dark heavy line in Figure 8.2 indicating the greatest influence). Interpersonal constraints are also a barrier to participation, although the influence may be less important than the structural constraint (hence the lower density line in the diagram).

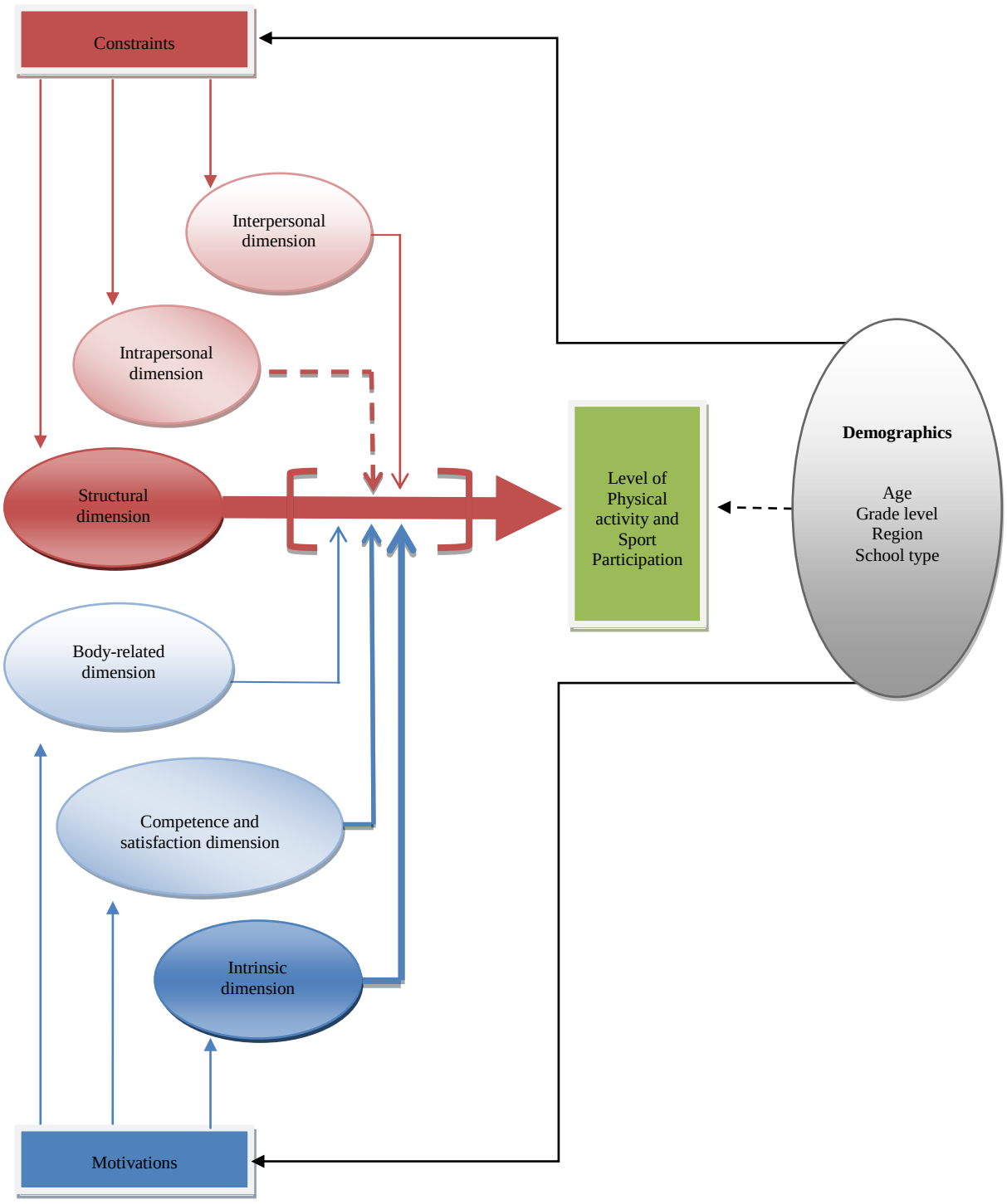


*Figure 8.2.*Constraint, motivational and demographic influences on physical activity and sport participation in Saudi Arabia.

The respondents' ratings of motivation are high but this does not lead to corresponding levels of physical activity participation. The solid line from the three motivation factors in Figure 8.2 is blocked by the influence of the constraints, particularly the structural constraints. That is, the structural constraints appear to block the effect of the high motivation, which would be expected to influence the level of physical activity in a positive way.

Although statistically significant differences were found for the demographic characteristics of respondents, these differences were quite small. The soft line between the demographic characteristics and the constraints and motivations in Figure 8.2 illustrates the limited influence that demographics have on the respondents' levels of physical activity.

8.6.2 Importance of results.

These results are important for a number of reasons. First, this study not only adds to the research on constraints and motivations of physical activity and sport participations in Saudi Arabia, it is also the first study to concentrate on the physical activity constraints and motivations influences in Riyadh City- Saudi Arabia. The other studies of physical activity in Saudi Arabia (Amin et al., 2011; Al-Hazzaa, 2004, Al-Hazzaa et al., 2013 and 2014) provide relevant background information but do not concentrate on physical activity constraints and motivations. In addition, the results make a valuable contribution to public policy for nations and communities that have similar cultural traditions and do not give a high priority to organised sports and athletic contests. Very few studies have addressed the physical activity and a sport practice of Saudi Arabian adolescents and what it is that constrains their participation levels on the one hand and motivates them to participate on the other.

Second, a major contribution to theory in this research was the validation of the research framework. This framework can be used to guide public policy and other developments associated with the encouragement of young people's participation in physical activity and sport. The framework identifies the focus for potential strategies to be adopted by Saudi Arabian government sectors. There is a need to minimise the negative effect of the constraints so that the relatively high level of motivation can lead to increased levels of physical activity and sport.

Third, there is also the potential for the framework from this study to be applied in other settings. The understanding of the relative influence of constraints, motivations and demographics would assist governments to develop public policy and programs to address some of the chronic problems of low levels of youth participation in physical activity and sport. The development of the questionnaire in Arabic also provides a research tool that has been tested and can be applied in other Arabic speaking settings.

8.7 Limitations

This thesis, as with any study, has some limitations that influenced the interpretation of the results and provide a direction for future research.

- The first limitation was this study focuses only on male high school students of Riyadh City, Saudi Arabia. The results may not be generalisable to females and may not be generalisable across other cities in Saudi Arabia. Other big cities of Saudi Arabia such as Jeddah and Dammam need more research to find out if the male high school students have low physical activity and sport participation.
- The second limitation was data for this study were collected in the winter, but the results may have been different if the study had been conducted in the summer. There may be a need to collect data in other seasons to find out if the levels of participation among the group of age (16-19) is still low.

- The third limitation was this study did not ask respondents about their intensity level during their participation in all physical activities (see chapter 3). Instead the intensity was interpreted via the type of activity MET value, as noted in chapter 6. *, (refer to chapter 6 for more details of this issue).* Another element of using the MET level, as explained in chapter 6, was the inclusion of Play Station games haves in the overall calculation of physical activity and sport participation level. Including this single popular sedentary activity in the overall level of physical activity and sport participation, would reduce the overall level of participation. Future studies of this kind should only include the various physical activity and sport activities in the calculation of the physical activity and sport participation level. Future studies should also consider using a more robust measure of intensity so there is less reliance on MET levels. For instance, use of accelerometers would provide a more accurate measure of intensity. The fourth limitation was, because this was the first study of this kind in Riyadh city, and there was limitation of local studies to compare. However, the researcher used many other studies from a variety of countries and settings to provide relevant background and context.
- The fifth limitation was the conceptual model of this study needs more work to determine the variables associated with lack of physical activity such as cultural traditions, self-efficacy, perceived competence and social context in which activity occurs.

This thesis has provided a foundation for future application of the proposed models to investigate the constraints and motivations of physical activity participation in different cities in Saudi Arabia (e.g. Jeddah and Dammam) and other Arabic speaking locations.

8.8 Chapter Summary

The purpose of this chapter was to synthesise the result of this study and assess the relative importance the constraints and motivations that influence physical activity and sport participation levels of Saudi Arabia male high school students in Riyadh city. This chapter discussed the findings in the context of the study's objectives and the literature. This summary of the chapter is structured according to the following four categories of findings: physical activity participation levels, the constraint and motivation variables that most influence respondents' participation levels, the relationships between constraints, motivations and physical activity participation levels, and the differences in constraint and motivation variables and physical activity participation levels based on respondents' socio-demographics.

To sum up, 74% of respondents had a low or moderate level of physical activity participation, and did not meet international guidelines for participation in physical activity and sport. In addition, there was evidence of a lack of walking activity to travel to and from school.

A number of constraints were found to have impacted on young people's involvement in physical activity and sport andinfluential in shaping the levels of participation. Lack of knowledge (an intrapersonal constraints), lack of social support (an interpersonal constraints), and lack of facilities (a structural constraint) were seen to be the major barriers to physical activity and sport participations. The findings on this study also indicate a high popularity for the street as the place for physical activity and sport participation. It demonstrates the lack of facilities in many settings around the city. Thus, a lack of facilities for sport participation played a significant role in decreasing physical activity and sport participation levels of respondents. Conversely, the results showed that three motivation dimensions were rated highly, indicating that the

respondents appeared to have high levels of motivation even though there were low levels of participation. While all three motivation dimensions were rated by younger adults and adolescents as one of the most important reasons for physical activity, they appeared to have had little impact on participation levels.

Based on findings from this study, there were some statistically significant relationships between constraints, motivations, and physical activity participation levels but the correlations were all small. The differences among the respondents according to the range of demographic variables and respondent participation levels were all 'trivial' so the overall analysis indicates the respondents were a generally homogeneous group. A summary of these finding are listed in Table 8.1.

Table 8.1

Summary of Findings

Item	**Findings**
Physical activity and sport participation level	74% of respondents did not meet international guidelines for participation in physical activity and sport
Transported from home to school	77.8%regularly use a car to move around the city
Popular place for participation	39.8% identified the street as the most popular location for physical activity and sport participation
Constraints	Lack of facilities and lack of accessibility were rated as the highest constraints
Motivations	Body-related, Competence and satisfaction, and Intrinsic factors were rated as high levels of motivation
Inter- group relationships	Relationships among many variables were significant but all correlations were small
Inter- group differences	Differences were all 'trivial' so the overall analysis indicates the respondents were a generally a homogeneous group

Overall this study shows that the lack of purpose-built sport facilities in the city of Riyadh, Saudi Arabia, constitutes a major structural constraint on physical activity and sport participation. It is a significant barrier to high school student participation in physical activity and sport programs, both during school and after school. Unless this major obstacle is attended to, it will be difficult for government authorities to deliver an increase in participation levels in the near future, and, as a result, it will perpetuate the tendency for Saudi Arabian adolescents to adopt unhealthy lifestyles.

Chapter 9: Conclusion

9.1 Introduction

This thesis aimed to investigate the patterns of physical activity and sport among Saudi Arabian adolescents and, in doing so, identify and better understand the factors that both constrain their levels of participation and that motivate them to participate. The purpose of this chapter is to provide conclusion of this study and covers four sections – The first is to provide a summary of key findings of this study. The second is focusing on recommendations. The third is the research Significance and contribution to Knowledge. The fourth is the implications for this study and future research.

9.2 Overview of the Key Findings

The key finding of this study is that 74% of the respondents did not meet the guidelines for participation levels on physical activity and sport, which was designated as 60 minutes of moderate- to vigorous-intensity physical activity every day. On the other hand, only 26% met the guideline, refer to the Australia's physical activity guidelines for young people aged 12–18 (Department of Health and Ageing, 2014).

Three factors were responsible for the low levels of physical activity and sport participation. They were (1) lack of knowledge, (2) lack of social support, and (3) lack of purpose-built facilities and accessibility. The findings from this study also show a significant negative relationship between total constraints and physical activity participation levels. Surprisingly, motivation variables also had a negative relationship with respondents' physical activity participation levels, with high levels of motivation variables associated with low levels of physical activity participation. Most other studies show a positive relationship (Litt et al., 2011; Lerner et al., 2011). Further, there was no relationship between the constraint and motivation variables.

The findings indicate statistically significant differences between all age groups, grade levels and regions in rating of constraints in physical activity and sport participation, but the effect size of these differences were trivial. Overall, the respondents were homogeneous. The key findings of the study are summarised in chapter 8 , see Table 8.2.

Overall, this study shows that the level of participation in physical activity and sport remains low, and confirms the gloomy picture of Saudi Arabia youth participation in physical activity and sport. It is a problematic issue that needs urgent action.

The results of this study are in accord with other studies that examined the patterns of physical activity and sport participation in Saudi Arabia. Several studies have revealed increasing levels of physically inactive among adolescents during their high school years (Al-Hazzaa et al., 2014; Alkmies, 2010). Other studies confirmed that current physical activity and sport participation levels in the Saudi Arabia, particularly in high school students is decreasing (Al-Hazzaa et al., 2013; Mahfouz et al., 2008; Mostafa & Khashaba, 2011). In general, 45% of Saudi Arabian boys had low levels of physical activity (Al-Hazzaa et al., 2013) and the current study provides even more alarming insights about physical activity and sport participation. All the studies over the last 30 years have confirmed that the lifestyles of Saudi communities have become more sedentary, and eating habits have become less healthy. From this study, the results indicates that the physical activity and sport participation is not only low but, getting worse. While this study identified high levels of motivations, respondents still exhibited high levels of inactivity. Unless this inactivity problem is immediately attended to, it will be difficult for government authorities to deliver an increase in participation levels in the near future. As a result, it will perpetuate the tendency for Saudi Arabian adolescents to default to unhealthy lifestyle practices.

9.3 Recommendations

In this study the evidence shows that a lack of facilities and accessibility were major constraints on the adolescents' physical activity and sport participation. This replicates the findings of other studies (Casper et al., 2011; Kocak et al., 2002). Because of constraints surrounding adolescents discourage physical activity and sport participation, the problem affects not only individuals but also society as a whole. To achieve future improvements in physical activity and sport participation, development work needs to be supported by well-resourced government sector programs directed at local communities.

The results of this study provide both a theoretical and practical solutions for the physical inactivity problem. In particular, it provides a strategic direction for government policy that aims to encourage people to participate more regularly, and more intensively, in physical activity and sport. These strategic possibilities are presented below.

9.3.1 Theoretical.

The study was framed using the models of constraints proposed by Crawford and Godbey (1987) and Crawford et al. (1991) which organises constraints into a hierarchical model with three dimensions based on: (1) intrapersonal, which refer to individual/psychological factors such as lack of knowledge and lack of interest; (2) interpersonal, which refer, for example, to lack of partners for the activity or support to participate in the activity (e.g. siblings, peers, parents- family, teachers, coaches) and (3) structural, which refer to facilities and services, accessibility, finance, and time. The findings of this study supported this theory with facilities being the most serious barrier to physical activity participation (with adjusted mean 3.04), refer to Table 7.20a. One key surprise from the findings was that despite the reported high motivation ratings (all

the motivation dimensions had adjusted mean scores >4.30,refer to Table 7.26a)there was low level of physical activity and sport participation among high school students – probably hinting to the fact that they had to overcome the structural constraints of lack of facilities. In sum, this is the first study which confirms that use and application of the constraints theory with specific reference to Saudi Arabian population.

9.3.2 Practical

As previously noted, a significant initiative was undertaken by the Saudi Arabian government in 1974 when a decision was made to establish a youth welfare system under the name 'General Presidency of Youth Welfare'(Alsweden, 1995). This agency put forward a number policies for increasing physical activity and sport participation levels among community members. These policies aimed to:

- Contribute to youth education from an Islamic perspective.
- Develop youth sport and physical activities in all Saudi cities by establishing sport facilities and expanding recreational programs, and by establishing special programs for the disabled.
- Encourage and support private sector participation to achieve the organisation's goals and programs by building sport centres and recreational spaces, and by supporting the operations of sport clubs.
- Deliver specific recreational and sport activities to community groups.
- Develop sport coaching and administrator programs.
- Support the construction of sport facilities.
- Introduce sport programs on behalf of the Olympic Committee of Saudi Arabia (Alshamri, 2001; Ghamlas, 1995).

While these policies are strategically coherent, and theoretically workable they have not delivered on their promises, or resulted in a more physically active school

community. This is because of poor implementation characterised by lack of resources. There appears to be a need to review the implementation of the policy for increasing young people's participation in physical activity and sport. In addition, there needs to be greater consultation between Government sectors, including the General Presidency for Youth Welfare, municipal councils, the Ministry of Education, the Ministry of Health and the Ministry media. The results from this research have been used to advance the following recommendations for implementation by the Saudi Arabian government:

- This study identified some constraints factors that influenced young people's physical activity and sport participation. The governments should take these factors, especially structural constraints, into consideration if they want to address the very low levels of youth physical activity and sport participation. These factors should be addressed by the General Presidency for Youth Welfare, municipal councils and ministries of education and health, and media strategies.
- There should be private-public partnerships between different ministries such as Ministry of Health, municipal councils and the General Presidency for Youth Welfare to enhance national infrastructure development targeted at encouraging and facilitating physical activity and sport participation. One good example is from New Zealand', SPARC – an organisation whose goal is to lead change by shaping sport and recreation policy and providing increased levels of funding in sport and physical recreation. To do so, SPARC partners with various government departments and agencies to ensure they achieve their objectives and outcomes, provides leadership in research and the development and implementation of evidence-based policies that recognise the importance of sport and physical recreation. Furthermore SPARC works collaboratively with different health, education and other agencies to promote greater participation in

physical recreation and sport through policy development, advocacy and support, in line with the objectives of the New Zealand Health Strategy (SPARC, 2014). The Saudi Arabian government can follow the good example from SPARC so as to benefit from private-public partnerships – which can also enhance physical activity and sport policy implementation.

- The Saudi Arabian government must have access to current information about the importance of physical activity and sport participation, including the latest research related to health and sport. This information can be used to educate young people about the ways in which physical activity can assist them to overcome problems associated with inactivity.
- Municipal councils should provide the land for the construction of sport facilities, the General Presidency for Youth Welfare should provide working professionals in the field of sport, as well as the development of programs and, finally, the media should encourage people to visit these facilities and participate in sporting activities.
- In order for the education ministry to increase students' physical activity and sport participation, it should improve sport facilities and programs in schools, and build community awareness of the importance of participation in sport activities in schools, and cooperate with other governments sectors such as the Ministry of Health, General Presidency for Youth Welfare to create sports programs in schools as well as out of school.
- Opportunities should be provided to public-private sector partnerships so as to facilitate the faster development of sports and physical activity infrastructures such as stadiums, playgrounds, training fields, sports academies, leisure community centres etc. The not-for-profit sector plays an important role in

developing sport and in meeting community expectations regarding physical activity and sporting competitions. For example, personnel from Australian sport, such as education, and health and community service agencies indicated that partnerships achieve goals that the individual partners could not achieve individually, foster innovation, and share knowledge and expertise (Tower, Jago & Deery, 2006). Strong partnerships between sport venues and sport associations will contribute to the social capital of the community by developing community networks that build community cohesion (Driscoll & Wood, 1999). Also, this can greatly contribute to the establishment of a sustainable infrastructure of sport facilities for all.

- In order for the government sectors mentioned above to develop their strategies for solving the problems of sport participation, they must cooperate with researchers who are specialists in this area.

Table 9.1

Strategies to Increase the Participation Levels

Strategy	Sector
Consideration the constraint factors especially structural constraints.	The General Presidency for Youth Welfare Municipal councils Ministries of education and health Media
Cooperative goal shared by all government sectors.	All above
The measurement instrument developed in this research can be used by all the government sectors.	All above
Given the necessary information about the importance of physical activity and sport participation.	All above
Provide the land for the construction of sport facilities.	Municipal councils
Provide working professionals in the field of sport and supervision.	The General Presidency for Youth Welfare
Encourage people to visit these facilities and participate in sporting activities.	Media
Improve sport facilities in schools and continuing awareness of the importance of participation in sport activities in schools.	Ministries of education
Opportunities should be provided to the private sector to invest in sport fields.	The General Presidency for Youth Welfare Municipal councils
Develop their strategies for solving the problems of sport participation.	All above
Build sport community centres, and establish.	The General Presidency for Youth Welfare Municipal councils

9.4 Research Significance

Despite, Saudi Arabian government policy initiatives to promote community engagement in physical activities and sporting competitions. the levels of participation are low. Health professionals and researchers and academics are continually challenged to find ways to encourage people to become physically active, while obesity and inactivity are now a major concern for government officials and policymakers (Al-Hazzaa et al., 2013; Mahfouz et al., 2008; Mostafa & Khashaba, 2011). The provision of suitable physical activity and sport facilities, and access to the existing facilities

requires significant and permanent attention to improve physical activity participation levels among the country's young people. However, this will occur only with the implementation of educational campaigns that promote the personal and social benefits that come with participation.

9.5 Research Contribution to Knowledge

The current study contributes to the body of knowledge relating to young people's participation in physical activity and sport, specifically in Saudi Arabia. In addition, the results are expected to make valuable contributions to public policy for nations and communities that have faced similar constraints on physical activity and sport participations, but who have hitherto not given a high priority to organised sport and related athletic contests. Very few studies have addressed the physical activity and sport practices of Saudi Arabian adolescents and the factors that constrain their participation levels and motivate them to participate.

Previous research on constraints and motivations on physical activity and sport participation levels has provided a great deal of knowledge concerning the constraints and motivation factors affecting male high school students' physical activity and sport participation levels. Several constraints and motivations models have been suggested in past research; also, some of these models have been empirically validated in the physical activity and sport participation level (Casper et al.,2011; Cooper et al., 2012; Molanorouzi et al., 2014; Palen et al., 2010). However, these models have not been sufficiently tested and validated in the Saudi Arabian context particularly among high school student who lived in Riyadh city. The findings indicate there is a significant lack of sport facilities that could help governments to raise their people' physical activity and sport participation.

By directing attention to the role that government can play in enhancing people's physical activity and sport participation levels, and improving their health and fitness, this study offers significant contributions to a small but growing body of research on the problem of low physical activity and sport participation levels, and what can be done about it. The contributions that this research project can make to this body of knowledge are outlined below:

- The study provides evidence regarding the key constraint factors that affect male high school student on their participation levels. These factors were identified and integrated from different dimensions including: interpersonal, intrapersonal, and structural constraints. The relationships between the identified dimensions and physical activity and sport participation were tested and their impact was validated within this research setting related to constraints on physical activity and sport participation.
- The study provides evidence regarding the key motivation factors that affect male high school student on their participation levels. These factors were identified and integrated from three motivations dimensions including: body-related, competence and satisfaction, and intrinsic dimensions. The relationships between the identified dimensions and physical activity and sport participation were tested and their impact was validated within this research setting related to motivations on physical activity and sport participation.

9.6 Implications for Future Research

Based on the results of this study, a few directions for future research into constraints and motivations for physical activity participation are proposed. The results from this research suggest that the following issues deserve further attention:

- The conceptual model of this study could be retested on other ethnic groups such as Indians, Pakistanis, Egyptians and Sudanese, who are ranked as the highest categories of other nationalities that live in Saudi Arabia. Comparisons between Saudi students and other ethnic groups as mentioned would help to understand similarities and differences in the level of constraints, motivations and physical activity and sport participation among those other ethnic groups (international).
- The current study compared constraint and motivation variables according to respondents' age, grade level, type of school and region lived in. Other studies should also consider gathering more respondent data such as gender. This will help to understand similarities and differences level of constraints, motivations and physical activity and sport participation among females.
- There could also be a benefit in expanding the study to other cities and rural communities in Saudi Arabia to understand similarities and differences across the country.
- Qualitative studies can be conducted to acquire an in-depth understanding of the importance of the physical activity participation constraints and motivations perceived by the high school students.
- The major constraint was the lack of facilities. Further research should conduct an audit of physical activity and sport facilities and programs to determine the current level of services so a benchmark can be established to guide further developments.

In conclusion, a better understanding of the major constraints and motivations for physical activity and sport participation by male high school students in Riyadh City, Saudi Arabia, will help professionals to enact policies that focus on high school students. This study provides data that can contribute to the development of policy and

programs to encourage greater physical activity participation by young people in Saudi Arabia.

The research also contributes to the development of the conceptual framework for future research. Constraints and motivations for physical activity participation in Saudi Arabia need regular review in order to assist physical education departments, the General Presidency for Youth Welfare and municipal councils, to contribute to health and sport participation success. This can only be a good thing.

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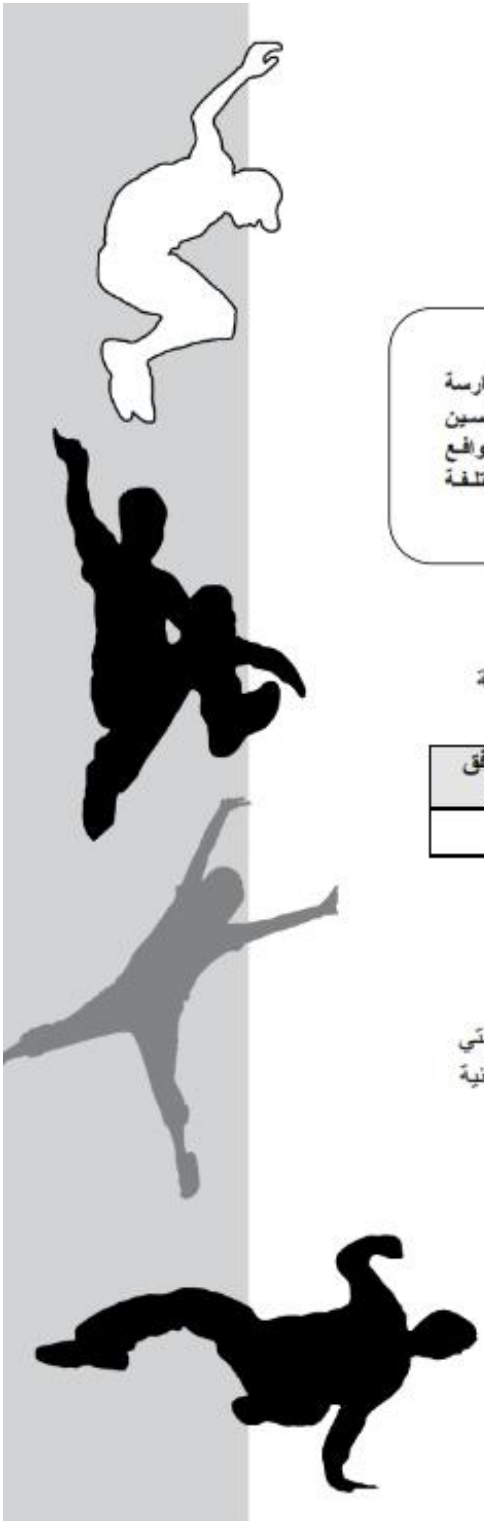
Appendices

Appendix A-1: Questionnaire (Arabic version)



☐ مدرسةحكومية

☐ مدرسةأهلية

هذهالأستبانة عن ...

هذهالأستبانةعبارةعناشياءكثيرةقدتكونعانقأودافعقيممارسة الرياضةوالأنشطةالبدنيةلدىالأفرادالممارسينأوغيرالممارسين وبالتاليهذهالاستبانةسوفتقومبالتحققمنهذهالعوائقأوالدوافع عنطريقطرحبعضالأسئلةالتيلهاعلاقةبموثراتوعناصرمختلفة

كيفية استكمال الأستبانه؟

جميع الأسئلة يمكن الإجابة عليها بوضع دائرة على الإجابة المناسبة

أوافق بشدة	أوافق	غير متأكد	لا أوافق	غير موافق بشدة
(1)	2	3	4	5

عزيزي الطالب ...

آمل قراءة كل سؤال بدقة ومن ثم اختيار الإجابة المناسبة لك والتي تشعر أنها فعلاً عائق لك في المشاركة في الأنشطة الرياضية والبدنية داخل أو خارج المدرسة .

علما أنه لا توجد إجابة صح أو خطأ .

قياس عوائق ودوافع ومستوى المشاركة في الأنشطة الرياضية و البدنية

عزيزي الطالب...

من فضلك أجب على هذه الأسئلة ومن ثم أرجعها إلى الشخص الذي قام بتوزيعها لك,حيث أن إجابتك ستكون في محل الاهتمام ونجاح هذه الدراسة .

ويعرف النشاط البدني في العموم بأنه "أي حركة جسدية التي تنتجها عضلات الهيكل العظمي الذي ينتج في نفقات الطاقة" (كاسيبرسين، باول، وكرستينسون، 1985؛هوزوآخرون، 2003). النشاط الرياضي يعتبر جزء فرعي ن الانشطة البدنية وتعرف بانها " انشطة منظمة تنافسية وذلك باستخدام القواعد،الانظمة وجداول زمنية تسجيل نتائج (كوكلي، 2004)

القسم الأول:

هذا القسم من الأسئلة يتكون من جزئيين.الجزء الأول خاص بعوائق المشاركة في الأنشطة الرياضية والبدنية . والجزء الثاني خاص بدوافع المشاركة في الأنشطة الرياضية والبدنية .

الجزء الأول: العبارات التالية ترتبط بعوائق المشاركة في النشاط الرياضي والبدني . يرجى الإشارة إلى أي مدى كنت تتفق مع كل عبارة بوضع دائرة حول الرقم المناسب من كل العوامل المذكورة أدناه. (1) أوافق بشدة ، (2) أوافق (3) أو غير متأكد (4) لا أوافق أو (5) لا أوافق بشدة.

م	إعاقتي عن المشاركة في الأنشطة الرياضية و البدنية بسبب :	أوافق بشدة	أوافق	غير متأكد	لا أوافق	لا أوافق بشدة
1	تجعلني أشعر بالتعب الشديد	1	2	3	4	5
2	أنا أخاف من الإصابة	1	2	3	4	5
3	أنا غير مقتنع من وضع سلوك أفراد المجتمع	1	2	3	4	5
4	أنا أشعر بالتعب في وقت الفراغ	1	2	3	4	5
5	لدي أسباب صحية تمنعني	1	2	3	4	5
6	لا أكون مرتاح عند المشاركة	1	2	3	4	5
7	غير مناسبة وكافية لي	1	2	3	4	5
8	لا أعرف أين أمارس الأنشطة الرياضية والبدنية	1	2	3	4	5
9	لا يوجد لدي أي شخص يقوم بتدريبي وتعليمي	1	2	3	4	5
10	لا أعرف أين أستطيع تعلم الأنشطة الرياضية و البدنية	1	2	3	4	5
11	مهاراتي ليست كافية	1	2	3	4	5
12	الملاعب والأندية الرياضية بعيدة جداً عن مكان سكني	1	2	3	4	5

م	إعاقتي عن المشاركة في الأنشطة الرياضية و البدنية بسبب :	أوافق بشدة	أوافق	غير متأكد	لا أوافق	لا أوافق بشدة
13	الملاعب والأندية الرياضية مزدحمة بالناس	1	2	3	4	5
14	الملاعب والبرامج الرياضية غير كافية أو البعض غير متوفر	1	2	3	4	5
15	لا أحب الأنشطة الرياضية أو البدنية الموجودة حاليا	1	2	3	4	5
16	جدولي الزمني غير مناسب للمشاركة في الأنشطة الرياضية والبدنية	1	2	3	4	5
17	المواصلات تستغرق وقت طويل حتى الوصول إلى الأندية والملاعب الرياضية	1	2	3	4	5
18	لا يوجد اي فرصة سواء ملاعب أو برامج في الحي الذي أسكن فيه أو قريبة من مقر سكني	1	2	3	4	5
19	لا أملك سيارة	1	2	3	4	5
20	رسوم الاشتراك في الأندية الرياضية تكون غالية جدا	1	2	3	4	5
21	لم أستمتع بها من قبل	1	2	3	4	5
22	لا أريد إفساد (تخريب) روتيني اليومي	1	2	3	4	5
23	لست مهتم بها	1	2	3	4	5
24	أصدقائي ليس لديهم الوقت	1	2	3	4	5
25	عدم وجود شريك أو زميل	1	2	3	4	5
26	أصدقائي لا يحبون المشاركة	1	2	3	4	5
27	ليس لدي الوقت بسبب الالتزامات العائلية	1	2	3	4	5
28	ليس لدي الوقت بسبب الدراسة	1	2	3	4	5
29	ليس لدي الوقت بسبب الالتزامات الاجتماعية	1	2	3	4	5

الجزء الثاني: العبارات التالية ترتبط بدوافع المشاركة في النشاط الرياضي و البدني . يرجى الإشارة إلى أي مدى كنت تتفق مع كل عبارة بوضع دائرة حول الرقم المناسب من كل العوامل المذكورة أدناه . (1) أوافق بشدة ، (2) أوافق أو (3) غير متأكد (4) لا أوافق أو (5) لا أوافق بشدة.

م	أنا أشارك في الأنشطة الرياضية و البدنية بسبب:	أوافق بشدة	أوافق	غير متأكد	لا أوافق	لا أوافق بشدة
1	أنا أريد أن تكون بنيتي الجسمانية مناسبة وقوية	1	2	3	4	5
2	أنا أريد أن أخفف من وزني	1	2	3	4	5
3	أنا أريد أن أتعامل بشكل جيد مع الضغوطات	1	2	3	4	5
4	أنا أريد تحسين وتطوير مثاليتي	1	2	3	4	5
5	أنا أريد مزيد من الطاقة	1	2	3	4	5
6	أريد أن أحدد و أبني عضلاتي	1	2	3	4	5
7	أريد أن أكون جذاب للآخرين	1	2	3	4	5
8	أريد تحسين مظهر جسمي	1	2	3	4	5
9	أشعر بالقبح إذا لم أمارس الأنشطة الرياضية	1	2	3	4	5
10	أريد أن أحسن من لياقتي البدنية	1	2	3	4	5
11	أريد أن أكون بأفضل حال حين مزاولة أنشطتي اليومية	1	2	3	4	5
12	أحب المنافسة	1	2	3	4	5
13	أريد الحصول على مهارات جديدة	1	2	3	4	5
14	أريد تحسين وتطوير مهاراتي الحالية	1	2	3	4	5
15	أحب التحدي وتجاوز الصعوبات	1	2	3	4	5
16	أريد المحافظة على مهاراتي الحالية	1	2	3	4	5
17	أحب الإثارة من المشاركة	1	2	3	4	5
18	للمرح	1	2	3	4	5
19	أعتقد أنها جديرة بالاهتمام ومفيدة	1	2	3	4	5
20	تجعلني سعيد	1	2	3	4	5
21	أحب أن أمارس هذه الأنشطة	1	2	3	4	5
22	أجدها محفزة	1	2	3	4	5
23	أستمتع عندما اشترك في الأنشطة الرياضية	1	2	3	4	5

القسم الثاني:

هذا القسم يحتوي على اثني عشر سؤالا لها علاقة بقياس مستوى ممارسة النشاط الرياضي والبدني بك.

السؤال الأول :أي من الأنشطة الرياضة والبدنية التاليةمارستها فيمعظم أسابيع الدراسة ؟ **(الرجاء عدم اختيار أكثر من ثلاثة أنواع من الأنشطة الرياضية والبدنية).**

نوع النشاط الرياضي والبدني							
1	كرة القدم	6	السباحة	11	التزلج على الماء	16	الجري
2	كرة الطائرة	7	المشي	12	التخييم	17	الجودو
3	كرة السلة	8	الجمباز	13	القولف	18	ركوب الدراجة
4	التنس	9	تمارين اللياقة	14	كرة اليد	19	ركوب الخيل
5	تنس الطاولة	10	تدريب أوزان	15	ألعاب القوى	20	سوني (العاب الالكترونية)

السؤال الثاني : من الأنشطة الرياضة أوالبدنية التي قمت بمزاولتها.كم مرة شاركت في النشاط الرياضي والبدني خلال الأسبوع الدراسي ؟ **(الرجاء ضع دائرة على أفضل إجابة تراها مناسبة لك) .**

0 مرة	مرة واحدة	مرتين	ثلاث مرات	أربع مرات	خمس مرات	ستة مرات	سبعة مرات	أكثر من سبع مرات
1	2	3	4	5	6	7	8	9

السؤال الثالث: من الأنشطة الرياضة أوالبدنية التي قمت بمزاولتها. كم متوسط الوقت الذي تقضيه في المشاركة في النشاط خلال المرة الواحد ؟ **(الرجاء ضع دائرة على أفضل وقت قضيته في مزاولة النشاط)**

الوقت بالدقيقة			
1	أقل من 30 دقيقة	2	من 30 إلى 60 دقيقة
3	من61 إلى 90 دقيقة	4	أكثر من 91 دقيقة

السؤال الرابع:من الأنشطة الرياضة أو البدنية التي قمت بمزاولتها. أين تمارس هذه الأنشطة في أغلب الأحيان ؟(**الرجاء ضع دائرة على أفضل إجابة تراها مناسبة**).

مكان ممارسة النشاط الرياضي والبدني			
1	المدرسة	5	المركز الصحي الخاص بالحي
2	البيت	6	الشارع
3	النادي الذي تنتمي إليه	7	الاستراحة
4	النادي الصحي المشترك فيه	8	في البيت والمدرسة

السؤال الخامس: معظم الأيام أذهب وأرجع من المدرسة بواسطة ...
(الرجاء اختيار إجابة واحدة فقط)

الوسيلة							
1	بواسطة السيارة	2	بواسطة الباص	3	بواسطة المشي	4	بواسطة الدراجة

السؤال السادس : هل أنت حاليا تشارك في أنشطة رياضية أو بدنية منظمة (مثال : نادي , فريق المدرسة , فريق الحي أو تحت إشراف مدرب)

حالة المشاركة					
1	نعم مازلت مشارك	2	نعم كنت مشارك	3	لا لم أشارك

السؤال السابع : أنا شاركت في ...

أشارك في	
1	**منظمات رياضية و بدنية (مثل نادي , فريق المدرسة , نادي صحي ، تحت إشراف مدرب)**
2	**غير منظمات رياضية وبدنية (مثل الحي , في الحدائق العامة , في المنزل)**

السؤال الثامن : دائما أشارك مع ...

أشارك مع									
1	بمفردي	2	زميلي	3	أبي	4	أخي	5	قريبي

السؤال التاسع: من أكثر شخص يقوم بدعمك وتشجيعك لممارسة الأنشطة الرياضية والبدنية داخل وخارج المدرسة؟ **(الرجاء ضع دائرة على أفضل إجابة مناسبة لك).**

أجد التشجيع من					
1	صديقي	2	أبي	3	أخي
4	قريبي	5	مدرس التربية البدنية	6	المدرب
7	بمفردي				

السؤال العاشر: هل يوجد في مدرستك الملاعب والأدوات الخاصة بلعبتك المفضلة ؟

يوجد بها			
1	نعم	2	لا

السؤال الحادي عشر: هل يسمح لك استخدامها؟

يسمح لي			
1	نعم	2	لا

السؤال الثاني عشر: عائلتي تؤمن بأن هناك فوائد كثيرة في المشاركة في الأنشطة الرياضية والبدنية ؟

عائلتي تؤمن بأن هناك فوائد كثيرة في مشاركة في الأنشطة الرياضية والبدنية				
أوافق بشدة	أوافق	غير متأكد	لا أوافق	لا أوافق بشدة
1	2	3	4	5

القسم الثالث :

هذا القسم يحتوي على أسئلة لها علاقة بتحديد الحالة الاجتماعية الخاصة بك.

1 - العمر

1	16 سنة	2	17 سنة	3	18 سنة	4	19 سنة

2 - ترتيبك من بين إخوانك الذكور

1	أنا الوحيد من إخوتي ذكر
2	أنا الأكبر من الأبناء
3	أنا الثاني في ترتيب الأبناء
4	أنا الثالث في ترتيب الأبناء
5	أنا الرابع في ترتيب الأبناء
6	أنا ترتيبي بين إخوتي الأبناء يكون بعد الرابع

3- المستوى التعليمي الحالي لك.

1	أولي ثانوي	2	ثاني ثانوي	3	ثالث ثانوي

4 - المستوى التعليم لوالدك

1	أقل من الثانوية	2	الثانوية العامة	3	دبلوم	4	بكالوريوس	5	دراسات عليا (ماجستير – دكتوراه)

5 - منطقة السكن الدائم

1	شمال الرياض	2	جنوب الرياض	3	غرب الرياض	4	شرق الرياض	5	وسط الرياض

6 - الدخل المالي الشهري لوالدك			
1	من 3500 إلى 7000 ريال شهريا	2	من 7500 إلى 10.000 ريال شهريا
3	من 10.500 إلى 14.000 ريال شهريا	4	أكثر من 14.000 ريال شهريا

7 - ما هو تقدير التحصيل العلمي للسنة الماضي ؟									
1	ممتاز	2	جيد جدا	3	جيد	4	مقبول	5	راسب

8 - هل تملك سيارة ؟			
1	نعم	2	لا

9 - نوع المدرسة					
1	مدرسة حكومية	2	مدرسة أهلية	3	أخرى

شكراً على حسن تعاونك أخي الطالب في إكمال هذه الأستبانة والمشاركة في نجاح هذه الدراسة

Appendix A-2: Questionnaire (English version)

☐ Public school

☐ Private school

What is this survey about?

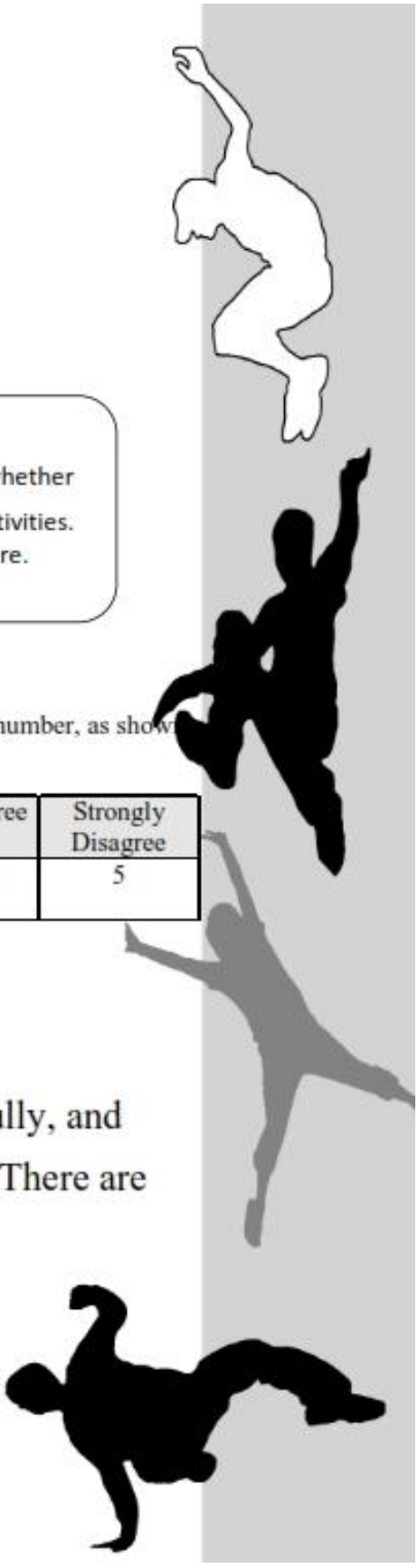
This survey relates to which factors influence whether or not people participate in sport and physical activities. It seeks to identify how influential these factors are.

How to fill in the survey…….

All the questions can be answered by circling a number, as show

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
(1)	2	3	4	5

Please read each question carefully, and answer as accurately as you can. There are no 'right' or 'wrong' answers.



Constraints, motivations and physical activity participation level scale

Please complete the following questions, and then return the survey to the person who distributed it to you .Your responses will remain confidential.

Definition of physical activity

Broadly speaking physical activity is defined as "any bodily movement produced by skeletal muscles that results in energy expenditure". Physical activity in daily life can be categorized into occupational, sports, conditioning, household, or other activities (Caspersen, Powell & Christenson, 1985; Hoos et al., 2003).Sport is a sub-set of physical activity, and is defined as: structured and competitive activity, using rules, associations, schedules, scoring, record keeping, and timing (Coakley, 2004).

Section A: This section has two parts which relate to the constraints and motivations that influence participation in physical activities and sport.

Part One instructions: The following statements relate to factors constraining or preventing your participation in physical activity and sport. (Please indicate which statement you agree with by *circling* the most suitable number for each factor in terms of: (1) strongly agree, (2) agree, (3) not sure, (4) disagree, or (5) strongly disagree).

Item	*I am constrained from participating in sport and physical activity* ***because:***	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1	It makes me feel tired.	1	2	3	4	5
2	I'm afraid of getting hurt.	1	2	3	4	5
3	I'm not happy in social situations.	1	2	3	4	5
4	I feel too tired for recreation.	1	2	3	4	5
5	I've health-related problems.	1	2	3	4	5
6	I'm not confident.	1	2	3	4	5
7	I'm not fit enough.	1	2	3	4	5
8	I don't know where to participate.	1	2	3	4	5
9	I'm don't have anyone to teach me.	1	2	3	4	5
10	I don't know where I can learn it.	1	2	3	4	5
Item	*I am constrained from participating in sport and physical activity* ***because:***	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

11	I'm not skilled enough.	1	2	3	4	5
12	Facilities are poorly kept.	1	2	3	4	5
13	Facilities are crowded.	1	2	3	4	5
14	Facilities are inadequate.	1	2	3	4	5
15	I don't like the activities offered.	1	2	3	4	5
16	The schedule/timetable does not fit with mine.	1	2	3	4	5
17	Transportation takes too much time.	1	2	3	4	5
18	There's no opportunity near my home.	1	2	3	4	5
19	I have no car.	1	2	3	4	5
20	I can't afford it.	1	2	3	4	5
21	I've not enjoyed it in the past.	1	2	3	4	5
22	I want to maintain my routine.	1	2	3	4	5
23	I'm not interested.	1	2	3	4	5
24	My friends don't have time.	1	2	3	4	5
25	I've nobody to participate with me.	1	2	3	4	5
26	My friends don't like participating.	1	2	3	4	5
27	I don't have time due to family needs.	1	2	3	4	5
28	I don't have time due to studies or work.	1	2	3	4	5
29	I don't have time due to social commitments.	1	2	3	4	5

Part Two Instructions: The following statements are related to your motivations for participating in physical activity and sport. (Please***circle*** the extent to which you agree with each statement below as either: (1) strongly agree, (2) agree, (3) not sure, (4) disagree, or (5) strongly disagree).

Item	*I participate in physical activity and sport* ***because:***	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
1	I want to be physically fit.	1	2	3	4	5
2	I want to lose or maintain weight.	1	2	3	4	5
3	I want to cope better with stress.	1	2	3	4	5
4	I want to improve my appearance.	1	2	3	4	5
5	I want to have more energy.	1	2	3	4	5
6	I want to define my muscles.	1	2	3	4	5
7	I want to be attractive to others.	1	2	3	4	5
8	I want to improve my body shape.	1	2	3	4	5
9	I will feel ugly if I don't.	1	2	3	4	5
10	I want to improve cardio fitness.	1	2	3	4	5
11	I want to get better at my activity.	1	2	3	4	5
12	I like the competition.	1	2	3	4	5
13	I want to obtain new skills.	1	2	3	4	5
14	I want to improve existing skills.	1	2	3	4	5
15	I like the challenge.	1	2	3	4	5
16	I want to keep up my current skill level.	1	2	3	4	5
17	I like the excitement of participation.	1	2	3	4	5
18	It's fun.	1	2	3	4	5

Item	*I participate in physical activity and sports* ***because:***	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
19	I think it's interesting.	1	2	3	4	5
20	It makes me happy.	1	2	3	4	5
21	I like to do this activity.	1	2	3	4	5
22	I find this activity stimulating.	1	2	3	4	5
23	I enjoy this activity.	1	2	3	4	5

Section B:This section has 12 parts which are related to your participation level in physical activity and sport.

Part One Instructions: Which of the following sport and physical activities do you participate in most frequently during a school week? (Please ***do not circle*** more than *three* sport or physical activities).

Type of sport and physical activities	*Item*
Soccer	1
Volleyball	2
Basketball	3
Tennis	4
Table tennis	5
Swimming	6
Walking	7
Gymnastics	8
Aerobics (water, step, dance)	9
Weight training	10
Water skiing	11
Camping	12
Golfing	13
Handball	14
Athletics	15
Running	16
Martial Arts (e.g. self-defense, karate, and Judo)	17
Bicycling	18
Horse riding	19
Play station games	20

Part Two Instructions: Overall, how many times did you participate in physical activity and sport during a school week? (Please ***circle***the most appropriate number to suit your best answer).

0 times	1 time	2 times	3 times	4 times	5 times	6 times	7 times	more than 7 times
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Part Three Instructions: Overall, how much time, on average, did you spend participating in the physical activity and sport for each activity time?(Please ***circle***the number that indicates, most closely, the amount of time you spent).

Minutes

30-60 min	1	Less than 30 min	2
61-90 min	3	More than 91 min	4

Part Four Instructions: Overall, where do you usually go to participate in these sport and physical activities? (Please ***circle*** the number that best represents your answer).

Place of activities			
1	School	5	Health Community Center
2	Home	6	Street
3	Club	7	Recreational Place
4	Gym	8	Home and School

Part Five Instructions: On most days, how do you travel to school and back home? (Please ***circle***the number that best represents your answer).

I travel by:							
1	Car	2	Bus	3	Walking	4	Bike

Part Six Instructions: On most days, I participate in the following activities: (Please ***circle*** the number or numbers that are relevant).

I participate in:	
1	Organized physical activity and sport (e.g. club, gym, school, etc.)
2	Non-organized physical activity and sport (e.g. home, street, park, etc.)

Part Seven Instructions: Do you currently participate in organized physical activity and sport (e.g. club, school team, community team, supported by coach structure, etc.)?(Please ***circle*** the number or numbers that are relevant).

Current participation status					
1	Yes I participated	2	I used to participated	3	No I didn't participated

Part Eight Instructions: Relates to with whom you mainly participate. (Please ***circle*** the number or numbers that are relevant).

I participate									
1	Alone	2	With my friends	3	With my father	4	With my brother/s	5	With my relative/s

Part Nine Instructions: Who provided the greatest encouragement for you to participate in physical activity and sport in school and out of school? (Please ***circle*** just one number that best suits your answer).

I have support from					
1	My friend/s	4	My relative	7	By my self
2	My father	5	My Physical Education teacher		
3	My brother/s	6	My coach		

Part Ten Instructions: Dose your school have the facilities for playing your favorite sport and physical activities.

My school has the facilities			
1	Yes	2	No

Part Eleven Instructions: Do you have access to your school's facilities?

I have access to my schools facilities			
1	Yes	2	No

Part Twelve Instructions: My family believes that participation in physical activity and sport produces many benefits.

My family believes in the benefits of participation				
Strongly Agree	Agree	Disagree	Not Sure	Strongly Disagree
1	2	3	4	5

Section C: This section relates to your demographic profile.

Section C Instructions: Please ***circle*** the answer that bests represents your answer to each of the following questions to reflect your social demographical status.

1-What is your age?							
1	16 years	**2**	17 years	**3**	18 years	**4**	19 years

2-What is your male sequence position within your family?	
1	Only son
2	Oldest son
3	Second oldest son
4	Third oldest son
5	Fourth oldest son
6	Fifth or more oldest son or last

3-What grade level are you in at school?					
1	10^{th}	**2**	11^{th}	**3**	12^{th}

4-What is your father's education level?									
1	Less than high school	2	High school	3	Diploma degree	4	Bachelor degree	5	Postgraduate degree

5-What region of Riyadh do you live?									
1	North Riyadh	2	South Riyadh	3	East Riyadh	4	West Riyadh	5	Middle Riyadh

6-What is your father's monthly income?			
1	US$ 1000-2000	2	US$ 2100-3000
3	US$ 3100-4000	4	US$ 4000 to more

7-What was your cumulative academic GPA last year?									
1	Excellent	2	Well-done	3	Well	4	Accepted	5	Fail

8-Do you have a car?			
1	Yes	2	No

9-What type of school do you attend?					
1	Public school	2	Private school	3	Other

Thanks very much for participating in this research survey

Appendix B

Table B.1

Respondents' Academic Cumulative GPA Last Year

Valid	Frequency	Percentage
Excellent	461	50.7
Well done	278	30.6
Well	148	16.3
Accepted	17	1.9
Fail	5	.6
Missing system	0	0
Total	909	100.0

*(Note: Excellent= 86-100, Well done=76-85, Well=66-75, Accepted = 50-65, Fail =0-49. The numbers refer to the marks obtained by the students.)

The majority of participants (50.7%) achieved excellent GPA inthe most recently completed study year, 30.6% of respondents achieved a well-done GPA, 16.3% of respondents achieved a well GPA, 1.9% of respondents achieved accepted GPA, and there were five participants (0.6%) who failed GPA last year (see Table B.1). The majority of the respondents (81.3%) achieved a result that was excellent or well done.

Table B.2

Respondents' Fathers' Education Level

Valid	Frequency	Percentage
Less than high school	234	25.7
High school	228	25.1
Diploma degree	106	11.7
Bachelor degree	198	21.8
Postgraduate degree	143	15.7
Missing system	0	0
Total	909	100.0

The questionnaire in this study also invited respondents to indicate their father's education and income levels. Table B.2 provides a summary of the respondents' fathers' education level. There were 25.7% of respondents' fathers who had not achieved high school, 25.1% of respondents' fathers had achieved high school; nearly 50 per cent of the respondents' fathers had completed post-secondary education, from diploma to postgraduate degree.

Table B.3

Respondents' Fathers' Monthly Income

Valid	Frequency	Percentage
$1000–2000	287	31.6
$2100–3000	164	18.0
$3100–4000	149	16.4
$4000–more	309	34
Missing system	0	0
Total	909	100.0

Table B.3 provides a summary of the respondents' fathers' monthly income. Over 30 per cent of respondents' fathers' monthly income was less than $2000, 18.0 per cent of respondents' fathers' monthly income was between 2000 and 3000, thus, around 50 per cent of respondents' fathers' monthly income was low level income, which was less than $3000, 16.4% of respondents' fathers' monthly income was medium level income, which was more than $3100, and 34 per cent of respondents' fathers' monthly income was high level income, which was more than $4000. According to Alriyadh. net (2011), the mean Saudi employee salary is $3300, but that of this study was 2,300 thus, the results indicate that the respondents' fathers' monthly income was slightly below the general national average level of Soudi Arabian residents.

Table B.4

Type of Transportation Used Travelling to School and Back Home

Valid	Frequency	Percentage
Car	707	77.8
Bus	53	5.8
Walking	146	16.1
Bike	3	.3
Missing system	3	.2
Total	909	100.0

Most respondents used a car to travel between home and school (77.8%), and only 16.1% of respondents walked to school every day. Just 5.8% of respondents used a bus as transportation to get to school. This result shows that most of the participants used a car to travel to school and back home. (See Table B.4).

Table B.5

Participation of Physical Activity and Sport With Official Sport Organisation

Valid	Frequency	Percentage
Organised physical activity and sport (e.g. club, gym, school)	341	37.5
Non-organised physical activity and sport (e.g. home, street, park)	568	62.5
Total	909	100.0
Missing system	0	.0
Total	909	100.0

Table B.5 provides a summary of respondents' physical activity and sport participation with official sport organisations. Most respondents (62.5%) participated in physical activity and sport by themselves in a place, and not under the control of a sports organisation that had specialists in training (e.g. home, street&park). Conversely,

37.5% of respondents had registered and participated on most days with sports organisations. This result is discussed further in Chapter 8 to understand how the nature of the organisation of activity was used to differentiate between levels of physical activity.

Table B.6

Currently Participate in Organised Physical Activity and sport

Valid	Frequency	Percentage
Yes I participated	347	38.2
Yes I used to participated	250	27.5
No I have not participated	312	34.3
Total	909	100.0
Missing system	0	.0
Total	909	100.0

Table B.6 provides a summary of the current participation status for respondents in physical activity and sport. The results of this table show that around 34.3 per cent of respondents did not use official sport organisations for physical activity and sports participation although around 65.7per cent of respondents were registered with official sport organisation for physical activity and sport participation. In contrast, around 27.5 per cent of respondents experienced some constraints because they had not continued or registered with official sport organisations for physical activity and sports participation. Nearly sixty-two percent of respondents were not currently involved in organised activities.

Table B.7

Mainly Participate With …

Valid	Frequency	Percentage
Alone	149	16.4
My friend	575	63.3
My father	13	1.4
My brother	68	7.5
My relative	104	11.4
Total	909	100.0
Missing system		.0
Total	909	100.0

Table B.7 provides a summary of the main person who usually participated and shared physical activity and sport with respondents during their physical activity and sport session. Most respondents participated with friends (63.3%), and only 16.4% of respondents participated alone. Just 11.4 % of respondents participated with relatives, 7.5% with their brother, and 1.4% of respondents participated with their father.

Table B.8

Providing the Greatest Encouragement to Participate in Sport and Physical Activities in School and Out of School

Valid	Frequency	Percentage
My friend	365	40.2
My father	124	13.6
My brother	76	8.4
My relative	78	8.6
My physical education teacher	26	2.9
My coach	47	5.2
By myself	193	21.2
Total	909	100.0
Missing system	0	.0
Total	909	100.0

The percentages of encouragement to participate in physical activity and sport are provided in Table B.8. Most respondents obtained encouragement from their friends (40.2%), and 21.2% encouraged themselves. Just less than 39 per cent of respondents obtained encouragement from their father, relatives, physical education teacher or coach. The roles and responsibilities of physical education teachers and coaches are important, and will be discussed further in Chapter 8.

Table B.9

School Has the Facilities for Sport and Physical Activities

Valid	Frequency	Percentage
Yes	518	57.0
No	391	43.0
Missing system	0	.0
Total	909	100.0

Table B.10

Accessibility of These Facilities

Valid	Frequency	Percentage
Yes	500	55.0
No	409	45.0
Missing system	0	.0
Total	909	100.0

Tables B.9 and B.10 provide a summary of the respondents' school physical activity and sport facilities access. There were 57 per cent of respondents who indicated their school had sport facilities, and 43 per cent of respondents indicated there were no sport facilities available at school (Table 7.26). In contrast, Table 7.27 explains the accessibility available for those physical activity and sport facilities in their school. Fifty-five per cent said yes they could access facilities, and 45 per cent said they could not access school facilities during free time. The availability of facilities will be discussed further in Chapter 8.

Table B.11

Families Believing that Participation in Physical Activity and Sport Delivers Many Benefits

	N		Mean	Mode	Std. Deviation	Skewness	Kurtosis
	Valid	Missing					
My family believed the participation in physical activity and sport produces many benefits	909	0	4.19	5	1.063	-1.415	1.493

The results in Table B.11 show that families believed participation in physical activity and sport produced many benefits (mean=4.19). This item also had mode of five.

Differences in total motivations based on age, grade level and region

A one-way between-groups ANOVA was conducted to explore the effects of age, grade level and region on level of motivation. No statistical differences were found forthese independent variables on the level of motivation. Participants were divided into four groups according to their age (Group 1: 16yrs; Group 2: 17 years; Group 3: 18 years; and Group 4: 19 years). There was not a statistically significant difference at the $p < .05$ level for the four age groups; $F (3.905) = .359$, $p = .783$. This result did not confirm hypothesis H6b (see Table 7.61).

A one-way between-groups ANOVA was conducted to explore the effect of grade level on level of motivation. Participants were divided into three groups according to their grade level (Group 1: Grade 10; Group 2: Grade 11; and Group 3: Grade 12). There was not a statistically significant difference at the $p < .05$ level for the three grade level groups; $F (3.906) = 2.2$, $p = .106$. This result did not confirm hypothesis H6c (see Table 7.67).

A one-way between-groups ANOVA was conducted to explore the effect of region of Riyadh City lived in on level of motivation. Participants were divided into five groups according to their region of Riyadh lived in (Group 1: North Riyadh; Group 2: South Riyadh; Group 3: East Riyadh; Group 4: West Riyadh; and Group 5: Middle Riyadh). There was not a statistically significant difference at the $p < .05$ level for the five region of Riyadh lived in groups; $F (3.904) = 1.16$ $p = .323$. This result did not confirm hypothesis H6d (see Table 7.61).

Differences in physical activity participation level based on age, grade level and region

A one-way between-groups ANOVA was conducted to explore the effect of age on level of physical activity participation. No significant differences were found for the effect of age and grade level on the level of physical activity. Participants were divided

into four groups according to their age (Group 1: 16 years; Group 2: 17yrs; Group 3: 18yrs; and Group 4: 19 years). There was not a statistically significant difference at the $p < .05$ level for the four age groups; $F (3.905) = 1.456$, $p = .225$. This result did not confirm hypothesis H1b (see Table 7.61).

A one-way between-groups ANOVA was conducted to explore the effect of grade level on level of physical activity participation. Participants were divided into three groups according to their grade level (Group 1: Grade 10; Group 2: Grade 11; and Group 3: Grade 12). There was not a statistically significant difference at the $p < .05$ level for the three grade level groups; $F (3.906) = 2.168$, $p = .115$. This result did not confirm hypothesis H1c (see Table 7.61).

Differences among motivation factors to age, grade level and region

A MANOVA was performed to investigate age, grade level, and region lived of Riyadh City indifferences in motivation among Saudi Arabian male high school students' participation in sport and physical activities. The results showed that there was not a statistically significant difference between age 16, age 17, age 18 and age 19 among Saudi Arabian male high school students on the combined dependent variables of motivation factors. $F (3,903) = .318$, $p = .970$; Wilks' Lambda = .97; partial eta squared = .001 (see Table 6.61). There were no differences between competence and satisfaction, body-related, and intrinsic factoramong Saudi Arabian male high school students' participation in sport and physical activities according to student's age.

Also, the result showed that there was not a statistically significant difference between grade 10, grade 11 and grade 12 respondents on the combined dependent variables of motivation factors. $F (3,904) = 1.17$, $p > .319$; Wilks' Lambda = .99; partial eta squared = .004. There were no differences between competence and satisfaction,

body-related, and intrinsic factoramong Saudi Arabian male high school students' participation in sport and physical activities according to the students' grade level.

Finally, the results showed that there was not a statistically significant difference between the north, south, east, west and middle regions in Riyadh City among Saudi Arabian male high school students on the combined dependent variables of motivation factors.F (3,902) = .988, p > .521; Wilks' Lambda = .92; partial eta squared = .004 (see Table 7.69). There were no differences between competence and satisfaction, body-related, and intrinsic factoramong Saudi Arabian male high school students' participation in sport and physical activities according to the students' region of Riyadh City lived in.

Table B.12 and B-13

*Physical Activity Participation Levels * I participated in soccer organizations andprovided the greats engorgement to your participation in sport and physical activities in school and out of school Crosstabulation*

Physical Activity Participation Levels	**I participated in**		**Total**	***provided the greats engorgement***
	Organized sport and physical activity (e.g. club, gym, school)	**Organized sport and physical activity** (e.g. club, gym, school)		**My friend**
Low level	Count	201	392	227
	% within Physical Activity Participation Levels	33.9%	66.1%	38.3%
Middle level	Count	23	54	34
	% within Physical Activity Participation Levels	29.9%	70.1%	44.2%
High level	Count	117	122	104
	% within Physical Activity Participation Levels	49.0%	51.0%	43.5%
Total	Count	341	568	365
	% within Physical Activity Participation Levels	37.5%	62.5%	40.2%

A crosstabs was conducted to explore the highly active cohort who registered with soccer organizations and received the greats engorgement to physical activity and sport participation. Analysis found that 49% of the highly active cohort was registered with soccer organizations, which comprised mainly government-run soccer clubs. Also, this high-participation cohort received encouragement from friends (43%).

Figure B.1. Social-ecological Model