Chapter I

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

It is estimated that as many as 1.9 million deaths worldwide are attributable to physical inactivity, and that inactivity is a key risk factor in the development of most chronic diseases and cancers. This is alarming particularly because it is known that physical activity patterns track from childhood into adulthood.

There is some evidence to suggest that school-based physical activity interventions are effective in increasing the number of children engaged in moderate to vigorous physical activity, as well as how long they spend engaged in these activities. There is also evidence to suggest that these interventions reduce the amount of time spent watching television. This review included 44 studies that evaluated the impact of school-based interventions focused on increasing physical activity among 36,593 children and adolescents (WHO 2004a).
Participants were between the ages of six and 18 living in Australia, South America, Europe, China, and North America. Duration of interventions ranged from 12 weeks to six years. No two school-based physical activity promotion programs had the same combination of interventions. Furthermore, the duration, frequency, and intensity of interventions varied. School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6 to 18.

There is some evidence that school-based physical activity interventions are effective in increasing duration of physical activity from five to 45 min more per day, reducing time spent watching television from five to 60 min less per day, and increasing maximal oxygen uptake or aerobic capacity, reflecting physical fitness level of an individual (WHO, 2008).

The evidence also suggests that children exposed to school based physical activity interventions are approximately three times more likely to engage in moderate to vigorous physical activity during the school day than those not exposed. At a minimum, a combination of printed educational materials and changes to the school curriculum that promote physical activity during school hours result in positive effects for these outcomes. School-based interventions are not effective in increasing
physical activity rates among adolescents, or in reducing systolic
and diastolic blood pressure, blood cholesterol, body mass index,
and pulse rate (WHO, 2008).

1.2 PHYSICAL ACTIVITY BY WHO

International public health and health promotion
organizations have identified the health risks across the lifespan
associated with physical inactivity. The World Health
Organization (WHO) estimates that 1.9 million deaths throughout
the world are attributable to physical inactivity and at least 2.6
million deaths are a result of being overweight or obese (WHO
2004a).

Globally, physical inactivity is estimated to cause 10% to
16% of cases each of breast cancer, colon, and rectal cancers as
well as type 2 diabetes, and 22% of coronary heart disease and
the burden of these and other chronic diseases has rapidly
increased in recent decades (WHO 2004a). In addition, the
literature indicates that an elevated body mass index (BMI)
places children and adolescents at greater risk for cardiovascular
disease (CVD) as adults (Haque 2008; USDHHS 2008), and that
diet and physical activity are important factors in maintaining a
healthy BMI range (Elgar 2005).
Recognizing the unique opportunity that exists to formulate and implement an effective strategy to reduce deaths and disease burden worldwide substantially by improving diet and promoting physical activity. The promotion of physical activity is an essential public health and health promotion strategy to improve the health of individuals and populations (WHO 2004a).

In fact several systematic reviews have been published highlighting the benefits of physical activity among healthy children (Armstrong, 1994). To ensure sustained progress toward major improvements in chronic disease prevention, the WHO called on public health organizations within and between countries to work collaboratively with key partners, including educators and health professional bodies, educational institutions, consumer groups, the research community, and the private sector, in providing a comprehensive strategy to promote physical activity among children and adolescents (WHO 2004a).

The WHO specifically identified schools as a target setting for the promotion of physical activity among children and youth. To this end, activities include the provision of collaboration on the development of health-related curricula; educational policy and guideline development; professional development
opportunities for educators and other partners; and, research, evaluation, and knowledge exchange to facilitate the development of evidence-informed policies, programs, and practices.

1.3 IMPORTANCE OF PHYSICAL FITNESS AND PHYSICAL ACTIVITY

Physical fitness (PF) and physical activity (PA) are deemed to be important supportive components for the maintenance of a healthy quality of life and can contribute to the holistic development of the child (Pate et al, 1999:364). Researchers such as Baranowski et al (1992:S237); Shropshire and Carrol (1998:156); Pate et al (1999:364); Baranowski, et al (2000); Beets and Pitetti, (2004:1796) and Matton et al. (2006:1114) mention in this regard that low physical activity and fitness are associated with various risk factors for cardiovascular illnesses. Regular exercise also appears to improve psychological well-being and the development of a positive self-image, resulting, in general, in better health (Marsh & Johnson, 1994:83; Marshall et al., 1998:910).

Sallis and Patrick (1994:307) and Winnick (2005:406) proposed physical activity guidelines for adolescents which required them to perform activities of a moderate intensity for at
least 30 minutes daily. These guidelines also stated that they should perform continuous exercise at a moderate to high intensity level at least three times a week.

Meredith and Welk (1999:53) proposed a health-promoting level of activity where children should be active for 45 minutes, three times a week, and adolescents twice a week for 30 minutes. According to these researchers, no distinction should be made between moderate and high intensity activities in order to encourage children to participate in a more active lifestyle. They stated that children and adolescents had to learn that physical activity are important for everyone and that it is not limited to top athletes only. Furthermore, that not only high-intensity activity could provide health-promoting advantages but moderate physical activity as well.

The literature indicated that the physical activity levels of both boys and girls dropped during the teen years and in early adulthood (Riddoch & Boreham, 1995:87; Myers et al., 1996:855; Leslie et al., 2001:255; Neumark-Sztainer et al., 2003:803). Engelbrecht (2001:45) found that, in a mainly lower socio-economic group in the North-West province, 73,3% of girls between the ages of 13 and 15 years were low active and that there was a decrease in their physical activity levels from 13 to
15 years. Regarding gender differences in physical activity levels, a number of researchers showed that boys were more active than girls and boys participated more in activities of a higher intensity (Myers et al., 1996:854; Crocker et al., 2000:391; Ganley & Sherman, 2000:86; Chan et al., 2003:794; Neumark-Sztainer et al., 2003:803; Hamlin & Ross, 2005:34; Romero, 2005:256).

1.4 DETERMINANTS OF PHYSICAL ACTIVITY

Determinants of physical activity among children
Increasing physical activity among children and adolescents is difficult as behavior is influenced by several factors including: personal factors; institutional, community, and public policy; and the physical environment (CIHR 2004). Lindquist 1999, basing their work on Kohl 1998, provided a typology for understanding the multitude of factors that may influence children’s physical activity patterns. This classification considers determinants at four levels: physiological, psychological, socio cultural, and ecological.

1.5 PHYSIOLOGICAL DETERMINANTS

Physiological determinants of physical activity among children and adolescents include age, gender, and ethnicity (Hudson 2008). Specifically, girls have been found to be less active than boys, older children and adolescents less active than
younger children, and black girls less active than white girls (Adams 1995).

1.6 PSYCHOLOGICAL DETERMINANTS

Psychological determinants of physical activity include confidence in one’s ability to engage in exercise (self efficacy), perception of physical or sport competence having a positive attitude toward physical activity, enjoyment of physical activity, and perceiving benefits from engaging in physical activity. Conversely, perceived barriers to physical activity, such as lack of time or feeling tired, are negatively associated with physical activity among adolescents (Sallis 2000).

1.7 SOCIO CULTURAL DETERMINANTS

Socio cultural influences include support for and participation in physical activity of peers and siblings, parental level of physical activity, parental support, and parental income. Ecological determinants of physical activity include access to play spaces, facilities, availability of equipment, and transportation to activities or programs. In addition, time spent outdoors in the early years is positively correlated with physical activity levels among children (Sallis 2000).
1.8 ROLE OF GENDER IN PHYSICAL ACTIVITY

Gender also played a role in the choice of activities, where boys preferred team activities and girls indoor activities and interacting with few friends. It also appeared that the physical activity levels of children tracked into their adult years, meaning that if someone was classified as being low active in childhood, such a person would be similarly classified in their adulthood. Thus, children had to be encouraged to be physically active so that they could develop the necessary attitudes, values and skills to maintain an active lifestyle in adulthood (Scott, 1998). For leisure activities, daily tasks or sport, they indicated that a poor nutritional level was associated with weaker physical fitness where strength muscle, flexibility and balance were important requirements. Thus, good nutrition played an important role in how the body functioned, and the more energy that the body required; the more important optimal nutrition became (Scott, 1998).

1.9 FACTORS INFLUENCING PHYSICAL ACTIVITY

Besides nutrition there are also other factors which influence physical activity and physical fitness in adolescents. Research indicates that children from lower socio-economic environments and rural areas have higher levels of physical
activity compared to children from high socio-economic environments, because they perform quite a number of domestic tasks which result in high energy expenditure and in consequence increases their level of activity (Sharma, 2009).

However, children in rural communities often do not participate in sport as a result of the lack of access to sports facilities. Besides this it appears that there are other barriers and limitations, such as domestic responsibilities, lack of information, perceptions of little talent or skills and time constraints, which result in these children not being regularly physically active or participating in sport (Sharma, 2009).

Children from a middle socio-economic environment indicated that they had other things to do with their time and regarded an overload of homework as an obstacle to being physically active. A positive attitude towards physical activity contributed to an increased participation in both physical education classes and extra-mural physical activities. According to the researchers such self-driven activities required less external control and these children were therefore more motivated to participate in physical activities.

Physical fitness and physical activity are positively related, although these relationships are found to be lower among
children. Positive relationships are indicated between high intensity cardiovascular fitness and the physical activity index: aerobic endurance, flexibility and strength and between muscular strength (lower limbs) and cardiovascular fitness (Sharma, 2009).

Only a few intervention studies which referred to the improvement of physical activity of children were found in the literature (Sharma, 2009) presented a lifestyle activity programme for children. (Scott, 1998) presented a walking-based programme in a low socio-economic community. Limited research studies, regarding the improvement of health enhancing physical fitness components such as aerobic capacity, strength and flexibility, among adolescents were conducted.

1.10 NEED OF THE STUDY

Lifestyle choices make adolescents more vulnerable to illnesses, obesity and risk factors, compared to a few years ago. Choices of passive entertainment such as watching television rather than being physically active contribute to the increasingly sedentary problem reported by researchers (Myers et al., 1996:855; Hancox et al, 2004:260).

Physical inactivity is a significant problem in children as well as in adolescents and is associated with risk factors for

Compared to children from higher socio-economic environments, children from lower socio-economic environments do not always have the opportunity to participate in sport and physical activities, since many of them have to spend their free time performing income-generating activities (Prista et al, 1997:455; Kriska, 2000:50).

Other barriers inhibiting them from being physically active include a lack of access to sports facilities, domestic responsibilities, lack of information and time (Coetzee, 2003:87). Economic constraints not only contribute to conditions such as stunting and wasting among children living in low socio-economic environments but might also play a role in these children's physical activity behaviour. Hence the researcher was
undertaken to carry on an initial step to analyse the level of physical activity and exercise intervention programme.

### 1.11 PURPOSE OF THE STUDY

Physical inactivity is one of the leading causes of the major chronic diseases, and largely contributes to the burden of disease, death, and disability in developing and developed countries (WHO 2004a). Elimination of modifiable risk factors including an unhealthy diet, tobacco use, and physical inactivity would prevent 80% of premature heart disease, 80% of premature stroke, 80% of type 2 diabetes, and 40% of cancer (WHO 2008).

Physical inactivity has been identified as a serious problem and major public health concern for people of all ages (Health Canada 2007). In fact, physical activity was labeled as “today’s best buy in public health” almost two decades ago (Morris 1994) with a suggestion that significant savings in health care could result from a mere 10% increase in physical activity population wide (CFLRI, 1997).

Despite these assertions, physical inactivity rates have risen rather than decreased in the past two decades. In addition to significant savings, being physically active is stated to be one of the most important steps people can take to improve their
health. Yet, according to the latest international Health Behaviour in School-aged Children (HBSC) study, less than two-thirds of all young people report participating in sufficient physical activity to meet current guidelines (WHO 2004b).

Keeping in views of the above, the researcher made an attempt to analyse the level of physical activity followed by exercise intervention programme among adolescents.

1.13 STATEMENT OF THE PROBLEM

The purpose of the study was to analyse the level of physical activity and exercise intervention programme among adolescents.

1.14 RESEARCH QUESTIONS

Would the exercise intervention programme improve the selected dependent variables while the presence of covariate (control)?

Would exercise intervention programme differs with control group while improving the selected dependent variables?

1.15 HYPOTHESES

The following research hypotheses were formulated. They are,
1. There was a significant improvement on aerobic endurance, Abdominal strength and endurance, trunk strength and flexibility, upper body strength and endurance, lower back flexibility, grip strength and explosive power among 14-17 year adolescents due to Exercise Intervention Programme.

2. There was a significant difference among experimental and control groups on aerobic endurance, Abdominal strength and endurance, trunk strength and flexibility, upper body strength and endurance, lower back flexibility, grip strength and explosive power among 14-17 year adolescents.

1.16 ASSUMPTIONS

The following were the assumptions of this research:

1. The adolescents completely answered all the survey questions honestly and accurately.

2. The researcher was provided with accurate demographic data by the adolescent upon completion of the survey.

3. The researcher was provided accurate and complete athlete enrollment information by the contact person at the institution involved in the study.
4. Participants complied with the best of their ability to the testing directions.

**1.16 DELIMITATIONS**

1. The scope of the study was restricted to only 14-17 year-old adolescents.

2. The study was delimited to the adolescents those having the background of physical activity.

3. The study was restricted to 500 adolescents students from the schools of Tirunelveli City, Tirunelveli, Tamilnadu, India.

4. The second phase of the study was restricted to fifty adolescents randomly Sankar Higher Secondary School, Sankar Nagar, Tirunelveli, Tamilnadu, India.

5. The selected subjects were divided into two groups randomly as experimental and control groups with 25 subjects each.

6. Group I underwent exercise intervention programme for a period of 12 weeks and group II acted as control.

5. The following dependent variables were selected for the study such as;
Aerobic capacity
Abdominal strength and endurance
Trunk strength and flexibility
Upper body strength and endurance
Lower back flexibility
Grip strength
Explosive power

1.17 LIMITATIONS

The following are some of the major challenges and limitations encountered by the researcher in conducting the study.

1. The applicability of the study may be limited to adolescents with similar demographics.

2. The questionnaire method will be adopted for this study.

3. The general psychological and environmental factors at the time of responding to the questionnaire would have recognized as a limitation.

4. Environmental factors which contribute to the mental ability of the adolescents.
5. Indicial difference and difference in socio-economic states of the adolescents.

6. Psychological factors, food habits, life style etc. could not be controlled.

1.18 SIGNIFICANCE OF THE STUDY

1. The physical activity intervention programme that was developed for this study could be implemented in schools and communities in disadvantaged areas to improve the physical activity and physical fitness status of adolescents.

2. More sports-related skills and abilities included in the programme to improve PF as these kinds of activities seem to interest all the children (boys and girls) the most.

3. The result of the study will help to prepare a separate physical activity programme for boys and girls because their activity interests vary according to their age and maturation stage.

4. The result of the study helps to lead a healthy lifestyle by means of physical activity and knowledge of what sufficient physical activity entails which can be implemented earlier in life.

5. The results of the study helps the adolescents in low socio-economic environments to participate in the physical
activity programme apart from their homework and family responsibilities after school,

6. It helps to educate the teachers on the importance and benefits of such physical activity programmes for learners, in order to motivate them to make time and become involved in such programmes during school hours.

7. The result of the study should educate the parents of children from low socio-economic environments on the importance of participation in physical activity so they cannot only motivate their children to be active, but also understand the importance of physical activity in the development and health of their children.

1.19 DEFINITION OF THE TERMS

Physical Activity

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure (Whitt-Glover, 2009).

Physical Exercise Intervention Programme

It is a programme which leads to lifestyle physical activity have resulted in response to the public health problem of
promoting regular amounts of physical activity to the majority (Whitt-Glover, 2009).

**Adolescents**

It is in the process of developing from a child into an adult (Whitt-Glover, 2009).

**Aerobic Capacity**

Aerobic capacity describes the functional capacity of the cardiorespiratory system, (the heart, lungs and blood vessels). Aerobic capacity refers to the maximum amount of oxygen consumed by the body during intense exercises, in a given time frame (Hebestreit, Helge; Bar-Or, Oded., 2008).

**Abdominal strength and endurance**

Muscular endurance is the ability of a muscle or group of muscles to sustain repeated contractions against a resistance for an extended period of time (Meredith & Welk, 1999).

**Strength**

Strength is the force exerted by the important muscle group of the body in one maximal contraction (Judith, 1985).
Flexibility

Flexibility can be defined as the ability to perform movement with a great range of motion or large amplitude (Uppal, 1992).

Grip Strength

It may be defined as the capacity of a person to exert muscular force of the palm on a standard Grip dynamometer (Johnson and Nelson, 1982).

Explosive power

The ability to expend energy in one explosive act or in a series of strong, sudden movements as in jumping or projecting some object, as far as possible (Kent, 1994).

1.20 ORGANIZATION OF CHAPTERS

Chapter I reviews the specific aims of this research. Additionally, the hypotheses are presented, with a brief discussion of what they mean and some of the literature that supports their inclusion. These hypotheses will be discussed throughout the dissertation, including methodology in how to test them, results of their analysis, and a discussion on what the findings mean.
In order to gain a greater awareness of this area, a review of the evolution of the physical activity programme will be provided in Chapter II. In addition, role of selected factors will be discussed. Numerous obstacles that adolescents encounter during physical activity programme, will be reviewed and conclude Chapter II.

The methodology and measures utilized to answer the current research questions will be outlined in Chapter III. It reviews the conceptual model. Beginning the chapter is a figure that models the various concepts and proposed links among these ideas. Each concept is discussed in the context of previous publications. This is done in order to better understand some of the background behind the inclusion of that particular idea in this research.

In Chapter IV, the results of the research will be presented.

Finally in Chapter V, a discussion of the results, conclusions, and future research recommendations will be offered.