

## CHAPTER ONE – INTRODUCTION

Introduction

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Review of School based physical activities in other countries

## CHAPTER I

### **Introduction**

The Organisation for Economic Co-Operation and Development (OECD) released a statement in 2008 through the Centre for Educational Research and Innovation (CERI) in which it said, *“Mens sana in corpore sano” - “A Healthy Mind in a Healthy body”*. This world famous quotation by Decimus Iunius Iuvenalis, a Roman orator and poet, shows that 2000 years ago people had already made the connection between the body's health and that of the mind. Today, the neurosciences are examining the nature of this connection and its potential application to individual and societal needs. The Transfer Center for Neuroscience and Learning in Ulm is one of the research institutions investigating this issue. To this purpose, the Center's researchers are working on several projects concerning physical activity and cognitive functions.

There is growing scientific evidence that physical activity not only keeps the body healthy, but also affects the mind. According to various studies, physical activity has demonstrated positive affects on brain structures and chemicals and thus influences higher cognitive processes like improved attention span, learning and memory (Coe et. al.,2007). Studies have shown that physical activity can positively affect an adolescents ability concerning planning, decision making, coping with stress, correcting mistakes – all processes that are highly relevant for daily life, and are also required at school (Davis et. al., 2007). Other studies including those by Castelli et. al., have found that physical activity stimulates the growth of cells in the hippocampus, a brain structure involved in learning.

Increases in physical fitness were positively related to academic achievement. Associations were demonstrated in total academic achievement, mathematics and reading achievement thus suggesting that aspects of physical fitness may be globally related to academic performance in preadolescents. (Castelli et. al, 2007).

Furthermore, studies have found that physical activity enhances the concentration of certain neurotransmitters and thereby acts positively on general well being, motivation and self-consciousness. (Medina, 2008).

When one considers that worldwide obesity in children has been identified by the World Health Organisation (WHO) as a public health problem on the rise, particularly in the Western World the statement from the OECD takes on significant importance. In 2004, figures from the Health Promotion Unit Ireland indicated that one in five Irish boys and girls are overweight and one in twenty are obese. (HPU, 2004). In addition, it was suggested that the age of onset of obesity in children across the world is falling and a child is twice as likely to be an obese adult, if obese in childhood (HPU,2004).

More recently, figures from the Irish Health Promotion Unit in 2008 indicate that children aged between 5-12 years – 11% are overweight and 11% are obese. (SLAN, 2008). With the launch of the National Teens Food Survey in Dublin this year figures are showing that 11% of teenagers aged 13-17 years are overweight and 8% are obese (O'Neill, 2008).

The problem of obesity is at epidemic proportions amongst Irish adults and children and it looks set to continue growing at a rate of 1% every year. (HPU, 2008). The trend and scale of obesity in Irish children and adolescents must be addressed as a matter of urgency to avoid the high costs and huge burden that will be placed on our healthcare system in future years as a result of increased levels of poor health amongst the population. One of the key factors influencing obesity in Irish youths is lack of physical activities. Less than half of teenagers aged 15-17 years take part in regular physical activity, and the HPU reports that the fat content of schoolchildren's diet is much higher than desired and is significantly high in fat, energy dense snacks (HPU,2004).

A study on the Health Behaviour in Irish School-Aged Children (HBSC), 2006 was published by the Department of Health and Children and provides the most up to date scientific data for Ireland.

The HBSC study is a cross-national research study with over 40 participating countries and regions and is run on a 4-year academic cycle, conducted in collaboration with WHO. The study aims to get new insights into, and increase our understanding of health behaviors, well-being and lifestyles in young people in different countries. This is the third time that the Department of Health and Children has funded the Irish phase of this important study. Ireland's continued participation will ensure the comparability of the data with previous Irish surveys as well as comparisons with Ireland's European neighbours. (HBSC Study, 2006).

Children were asked about their participation in exercise in their free time. In particular, 53% of children (48% in 2002) reported exercising four or more times a week while 11% exercise less than weekly (12% in 2002). However, this masks some substantial age and gender differences. Overall 7% of boys and 14% of girls are exercising less than weekly while 63% of boys and 43% of girls are exercising four or more times per week. Exercise participation decreases with age: exercising four or more times per week decreases from 64% of 10-11 year olds and 59% of 12-14 year olds to 42% of 15-17 year olds. (HSBC, 2006).

This decrease is apparent between both genders but is particularly noticeable among girls (dropping from 58% of 10-11 year olds, through 51% of 12-14 year olds to 28% of 15-17 year olds). (HBSC Study, 2006).

Statistics from Northern Ireland in 2000 indicated that one in three boys and one in four girls aged 12 were overweight (Ross et al., 2000). In 2004, the number of overweight schoolchildren in the UK was almost two million, of which about 700,000 are obese, according to a study carried out by the International Obesity Taskforce. Over 25% of girls and 20% of boys were overweight. (International Obesity Task Force, (IOTF) 2004).

More recently in January 2008, statistics from the NHS in the UK, report that 16% of children aged 2 to 15 are classified as obese. This represents an overall increase from 11 per cent in 1995. Despite the overall increase since 1995, the proportion of girls aged 2 to 15 who were obese decreased between 2005 and 2006, from 18 per cent to 15 per cent (NHS, 2008).

The IOTF stated that EU childhood obesity was “out of control”. A major focus of IOTF is to alert the world of the growing health crisis caused by shocking raises in worldwide levels of obesity. IOTF’s mission is to alert relevant worldwide agencies concerning the urgency of this problem and to encourage governments to take appropriate actions without further delay. With 14 million children in the EU overweight and 3 million obese the number of children affected by overweight and obesity is rising at more than 400,000 a year and affects almost one in four across the entire EU. (IOTF, May 2004)

These statistics were released at an IOTF workshop of childhood obesity experts in Prague during the European Congress on Obesity, where the IOTF’s report to the World Health Organization on the global crisis was launched. Worldwide one in 10 children is overweight, a total of 155 million and around 30-45 million are classified as obese.

In Europe the report found that childhood obesity has increased steadily in this region with the highest prevalence in southern European countries. In northern Europe an overweight prevalence of 10–20% was found for children, while in southern Europe the prevalence was 20–35%. Recent surveys found that 36% of 9-year-olds in mainland Italy and Sicily were overweight or obese, while in Greece the prevalence was 26% in boys and 19% in girls aged 6–17 years. In Spain, 27% of children and adolescents were affected while in Crete 39% of children aged 12 were found to be overweight. In the UK the figure reached 20% of children. (IOTF, 2004).

The World Health Organisation (WHO) has stated that childhood obesity is already epidemic in some areas and on the rise in others. On a global level, WHO estimate that 22 million children under five are overweight. These figures are a cause for concern, (World Health Organisation, 2007).

In 2007, the Health Promotion Unit published the most recent Statistics of Lifestyle, Attitudes and Nutrition (SLAN) and reported that obesity rates in men and women are on the increase. Figures showed that 36% of respondents reported themselves as being overweight and 14% reported being obese, according to body mass index (BMI). These figures have increased from 31% in 1998 to 33% in 2002 to 36% in 2007 (SLAN, 2007). Obesity is estimated to cause around 2,000 premature deaths each year among an Irish population of around 4 million (Dept of Health and Children, 2005).

The Chairman of the Irish Obesity Taskforce that was set up in March 2004, said that the group was particularly concerned about the figures demonstrating that childhood obesity had become one of the most prevalent childhood diseases in Europe, with overweight and obesity affecting more than 300,000 children in Ireland alone (NTO, 2005).

Research conducted by the International Taskforce on Obesity states that on a European level, the prevalence of Obesity in both adults and children is rising at an alarming rate (IOTF, 2003). Worrying figures indicate that more than 50% of the adult population in many European countries is overweight with up to 30% of adults being clinically obese. Obesity among European children is increasing rapidly with as many as one in four affected

in some regions (European Association for the Study of Obesity (EASO), 2006).

The Global Strategy on Diet, Health and Physical Activity published in 2004 stated that the fundamental causes behind the rising levels of childhood obesity are a shift in diet towards increased intake of energy-dense foods that are high in fat and sugars but low in vitamins, minerals and other healthy micronutrients, and a trend towards decreased levels of physical activity. (DPAS, 2004).

The Canadian experience is similar to Europe according to Elliot (2007) where Childhood obesity being a significant public health problem requires innovative public health solutions. Elliot identifies excess body weight as affecting up to 35% of children across Canada, the United States and Europe and states it is linked to a range of comorbidities, including type 2 diabetes, hypertension, cardiovascular disease and some forms of cancer.

As stated by Elliot (2007) overweight children also suffer from psychological and social consequences stemming from a pervasive and serious weight stigma in society (Puhl & Latner 2007).

Based on these findings alone there is ever mounting science based evidence that this problem is global and increasingly extends into the developing world; for example, in Thailand the prevalence of obesity in 5-12 year olds children rose from 12.2% to 15.6% in just two years. (Global Strategy on Diet, Health & Physical Activity, WHO, 2004).

In 2002 the IOT and the EASO published their position paper on Obesity in Europe. This paper also highlighted the startling rate of obesity levels in children throughout Europe. Excess body weight was identified as being the commonest childhood disorder in Europe. Alarming, obesity affects around one child out of six, but in some parts affects one child in three (EASO, 2002, IOTF, 2004)).

The 2002 Position Paper stated that whilst obesity in itself is an avoidable and treatable condition, it is the health issues that arise as a consequence of excessive weight gain that poses the problems.

A survey carried out by Wang and Dietz in 2002 examining the trends of obesity associated diseases in youths and related economic costs was conducted on data collected on youths aged 6-17 years during the period of 1979-1999. They concluded that the increasing frequency of hospital discharges of obesity-associated diagnoses suggests a rising disease burden associated with obesity among children and adolescents. If the prevalence of obesity continues to grow, the disease burden will surely increase further.

The most significant health consequences resulting from childhood obesity includes hypertension, type 2 diabetes, cardiovascular disease, gall bladder disease, certain types of cancer and psychosocial problems in later life, (Wang & Dietz 2004, EASO 2002).

Increased risks of dyslipidaemia, insulin resistance, breathlessness, sleep apnoea, asthma, osteo-arthritis, hyperuricaemia and gout, reproductive hormone abnormalities, polycystic ovarian syndrome, impaired fertility, and lower back pain have also been reported as long-term consequences. (EASO, 2002). Overweight children are likely to become overweight adults, with a greater risk of cardiovascular disease, diabetes and other disorders Lauer & Clarke, 1989).

In addition, as overweight children become overweight adults, the diseases associated with obesity and health care costs are likely to increase even more and place an economic burden on society. (Wang & Dietz 2002).

Until recently, most medical concerns about children's hearts involved birth defects. But as advances in noninvasive testing have made it possible to evaluate children's hearts and blood vessels, health professionals have discovered that some disease processes, such as hardening of the arteries, once thought to be predominantly adult health concerns can in fact begin in childhood (Strong & Malcom, 1999). One major risk factor for heart attack and stroke in adults is hypertension, or high blood pressure (Chobanian et.al, 2003).

Obesity is an important contributor to developing high blood pressure not only in adults, but also in children and adolescents (Falkner & Daniels 2004). Type 2 diabetes, until recently regarded as a weight-related disease of old age, is now being reported in children in several European countries, including the UK, Sweden and Poland.

Other complications of excess weight in childhood are hypertension, adverse blood lipid profiles, sleep apnoea, orthopaedic problems and psychological ill health, which may be expressed in eating disorders, poor social relations and educational disadvantages. (Kumanyika et.al, 2002).

It is estimated that obesity is costing on average about 8% of overall health budgets and represents an enormous burden both in individual illness, disability and early mortality as well as in terms of the costs to employers, tax payers and society (IOTF 2002).

**Table 1 – Examples of direct costs in EU compared with the USA**

<b>Country</b>	<b>Direct costs in Europe (millions)</b>	<b>% health expenditure</b>
England (1995)	816 (+3,279 indirect)	1.5%
France (1992)	640-1,323	1.5%
Germany (1996)	10,600	
Portugal (1996)	23	3.5%
Netherlands (1981-1989)	454	4%
USA	US\$ 70,000	7%

*Source: IOTF collated data; converted Jan 2002 - unadjusted for inflation.*

### **Literature Review:**

Although recommendations have been published on physical activity, diet and health (WHO Strategy on Diet, Physical Activity and health, 2004), it is worthwhile noting that obesity has dramatically increased within the last ten years (SLAN, 2008). It has been previously suggested that children and teenagers should aim to be physically active for at least 30-60 minutes, most days of the week. (Pate, Bratt et al., (1995). Alternatively, it was suggested that participants involved in physical activity, whether it be adolescents or adults, accumulate 5-10 minute bouts of moderate activity throughout the day, accumulating a total of at least 30 minutes (Blair, Connelly, 1996).

However, current guidelines given by the UK Department of Health recommend that children and young people should achieve a total of at least 60 minutes of at least moderate intensity physical activity each day to receive health benefits. (UK, DOH 2004). The American College of Sports Medicine (ACSM) also states that children and adolescents should engage in 60 minutes or more of physical activity (ACSM, 2006) hence supporting these guidelines. One of the most common pastimes for the youth of today is spending time watching television, which can be a powerful contributor to obesity in children as well as reduced physical activity levels (Hussey, Gormley, Bell 2001).

Participating in physical activity should be enjoyable, varied, safe, effective and developmentally suitable. It is essential that children learn fundamental motor skills and develop health related physical fitness as early as possible,

which should in turn be integrated into their lives from an early age. It can be as a result of these early influences that can facilitate the adherence of an active lifestyle during teenage years through to adult hood. Adults including parents, teachers and guardians can play an essential role and can have an effect on children's eating and physical activity behaviors. Parental knowledge, attitudes and behaviors related to healthy diet and physical activities can be an important influence in creating role models (Lin Yang, Telama & Laakso, 1996).

There is growing evidence of the importance of physical activity for the older person to promote longevity and better quality of life. (Talbot, 2001). Physical fitness is especially important for older adults to cope with everyday tasks and unexpected demands such as hills, uneven ground and trips. Establishing in children an appreciation for the health benefits of physical activity could ensure that in the future more of the older population will continue to participate in physical activity and harvest the health related benefits and increases in longevity (Talbot, 2001).

It is apparent that changes need to be made to the Irish health, education and community service systems that will better support parents and schools to encourage and promote healthy eating and physical activity in children's day to day lives.

O'Melia (2007), who carried out a study specific to Irish school children found in her study, which included investigations concerning weekend activities of children (males and females aged 12 years), that over half of

the participants (54.9%) reported 2 hours of sport and outdoor activities and the rest of their time was spent equally between homework, computer games and watching television (Table 2).

**Table 2 . Participants' report of weekend activities:**

<b>Weekend Activities</b>	<b>Frequency</b>	<b>%</b>
<b>2 Hours sport/Outdoor Activities</b>	303	54.9
<b>2 Hours Computer games</b>	91	16.5
<b>2 Hours Homework</b>	65	11.8
<b>2 Hours watching TV</b>	60	10.9
<b>Don't Know</b>	33	6

n<sub>total</sub> = 552  
Source: O'Melia

Concerning weekday activities (Table 3 ), there were noted similarities in the option chosen for the hour of outdoor sport/activity (38.8%) and the hour of homework (37.3%).

**Table 3. Participants' report of week day activities:**

<b>Week day Activities</b>	<b>Frequency</b>	<b>%</b>
<b>1 Hour Sport/Outdoor Activities</b>	214	38.8
<b>1 Hour Homework</b>	206	37.3
<b>1 Hour Computer Games</b>	63	11.4
<b>1 Hour TV Watching</b>	14	2.5
<b>Don't Know</b>	55	10

n<sub>total</sub> = 552  
Source: O'Melia

O' Melia also reported that weekly school activities revealed a mixed result (Table 4 ) with 36.6% reporting two hours of activity, 34.1% reporting three hours of activity and 21.7% reported four hours of activity.

**Table 4. Participants' report of weekly hours of school activity:**

<b>Weekly hours school activity</b>	<b>Frequency</b>	<b>%</b>
<b>2 Hours</b>	202	36.6%
<b>3 Hours</b>	188	34.1
<b>4 Hours</b>	120	21.7
<b>5 Hours</b>	8	1.4
<b>Don't Know</b>	34	6.2

$n_{\text{total}} = 552$

Source: O'Melia

Weekly hours of activity outside school showed 57.2% performed two hours of activity with 57.5% boys and 42.4% girls (Table 5).

**Table 5. Participants' report of weekly activity outside school:**

<b>Weekly hrs outside activity</b>	<b>Frequency</b>	<b>%</b>	<b>% Boys</b>	<b>% Girls</b>
<b>2 Hours</b>	316	57.2	57.5	42.5
<b>3 Hours</b>	146	26.4	10.6	33.0
<b>4 Hours</b>	55	10	19.9	10.1
<b>5 Hours</b>	11	2	2.8	4.4
<b>Don't Know</b>	24	4.3	9.4	10.0

$n_{\text{total}} = 552, n_{\text{boys}} = 342, n_{\text{girls}} = 210$

Source: O'Melia

Concerning involvement of family activities, 70.1% reported 2 hours of activity for per week, with diminishing results as the hours accumulate and with 10.7% reporting a 'Don't Know' (Table 6). 15.6% of the females that participated applied the 'don't know' option which O' Melia reported was quite high in relation to all the other options.

**Table 6. Participants' report of weekly family activities:**

<b>Family activity's</b>	<b>Frequency</b>	<b>%</b>	<b>% Boys</b>	<b>% Girls</b>
<b>2 Hours</b>	387	70.1	62.1	37.9
<b>3 Hours</b>	82	14.9	18.8	25.5
<b>4 Hours</b>	16	2.9	13.5	11.1
<b>5 Hours</b>	8	1.4	3.5	9.9
<b>Don't Know</b>	59	10.7	2.1	15.6

$n_{\text{total}} = 552, n_{\text{boys}} = 342, n_{\text{girls}} = 210$

Source: O'Melia

One key factor in the probable cause of inactive lifestyles of children may be the decline in opportunities for children to move about safely and independently on foot or by bicycle in the communities where they live.

In the UK, annual mileage travelled on foot and cycle among children of school age declined by over 25% and 40 % respectively over the two decades of the 1980s and 1990s (Hillman, 1999). Rising motorization, perceived risk of accident or injury from traffic, and the disappearance, or perceived disappearance, of safe urban spaces where children may walk, cycle and play, all appear to be important factors constricting childhood mobility today (Hillman 1999).

In England the Health Education Authority (HEA) is the lead body in Health Promotion. Its work is divided into three main areas:

- Advising the government on health promotion strategy
- Working with professionals on practical projects designed to improve health
- Working with and for members of the public.

In 1997 the HEA began a process of expert consultation and review of the evidence surrounding the promotion of health-enhancing physical activity for young people. The aim of this process was to produce a policy framework from a public health perspective that would maximise the opportunity for young people to participate in a lifetime of regular health-enhancing physical activity.

In 1999, HEA made new recommendations to the UK government concerning the promoting of health-enhancing physical activity for young people aged between 5 years and 18 years.

These were the first comprehensive recommendations to be made in England for the promotion of health-enhancing physical activity with young people. Health-enhancing physical activity was identified as incorporating a wide range of activities, such as walking to school, dancing, playing, as well as more structured forms of exercise and sport, which contribute to health. It was identified that policy documents promote physical activity with young people (for example, NCC Curriculum Guidance 5, Physical Education (PE) National Curriculum, 'Raising the Game') but they all come from a variety of different perspectives, such as sports participation, sports performance, physical education and health education.

It is worthwhile to highlight some of the key points and recommendations from that policy framework.

### **How active should young people be?**

For improved health the HEA set out two main recommendations, identified as primary (main) and secondary (subsidiary) recommendations. These are applicable to all young people and are not exclusive to the primary or secondary age range.

The recommendations were intended to take into account the current physical activity patterns and lifestyles of young people, so that they represent attainable goals that are appropriate for young people.

The recommendations were based on current scientific evidence and expert opinion, but it is acknowledged that neither the minimal nor the optimal amount of physical activity for young people could be precisely defined at that time. Expert opinion strongly supported these recommendations until further research could lead to refinements (Troiano 2002).

The primary recommendations from the HEA state that;

- *Children and teenagers should engage in physical activity of at least moderate intensity for one hour per day.*
- *Young people who are currently inactive should engage in some form of physical activity for at least half an hour per day at a moderate intensity.*

It is worth highlighting that the main recommendation was for every child to engage in at least an average of one hour of physical activity per day.

Although the majority of younger people are currently meeting the criterion of 30 min of moderate physical activity per day on most days of the week, childhood overweight and obesity is increasing in the UK. The UK's Health Education Authority's survey of Young People and Health found that only 15 per cent of girls and 29 per cent of boys aged 11-16 took part in exercise every day in their free time. (HEA, 1999).

Examples of moderate intensity activities for all young people can include brisk walking, cycling, swimming, most sports, or modern dance.

Activities may be carried out as part of traveling to and from school, physical education, games, sport, leisurely activities in school or at home with friends or family. For younger children, activities can be carried out as part of daily play such as at an indoor play centre, outdoor play grounds or simply by running around in a park.

Such activity may be performed in a continuous fashion or intermittently accumulated throughout the day. Given that young people have demonstrated patterns of intermittent activity, emphasising the accumulation of physical activity over the day seems a practical approach.

At least twice a week, some of these activities should help to enhance and maintain muscular strength and flexibility, and bone health.

Evidence suggests that regular participation in strength and weight-bearing activities such as strength and weight training improve bone mineral density and can reduce the long-term risk of osteoporosis. (Layne & Nelson, 1999). Muscular strength is particularly important, as it is required to perform activities of daily life, such as lifting and carrying, bending and twisting.

Trunk strength and muscular flexibility may be associated with reduced risk of injury and back pain in later life. (Mc Gill, 2002). This is especially important since scientific reports and epidemiological studies have shown that atherosclerosis begins in childhood (Strong & Malcom, 1999).

Kirk (2005) proposed that there are structural problems with the delivery of physical education and school sport in England. It is argued these problems became evident through a review of research on the importance of early learning experiences for lifelong participation in physical activity (Kirk 2005). As patterns of behaviour are often established early in life (i.e. early learning experiences), those who do not participate in regular physical activity in childhood are perhaps less likely to engage in physical activity in adulthood (Kuh & Cooper, 1992).

Activities for younger children that enhance strength include play, such as climbing, skipping or jumping. For adolescents, they might include structured exercise, such as body conditioning, yoga or resistance exercises. Weight-bearing activities that promote bone health include gymnastics, modern dance such as street dance and hip-hop, aerobics, skipping, and sports such as basketball. A variety of activities are important to develop strength in a wide range of muscles and bones. Activities that promote cooperative learning have additional social skill benefits for the participants (Dyson 2004).

According to Troiano (2002) by encouraging increased physical activity young people can achieve a balance between energy intake and expenditure, and at the same time establish healthy behaviour that may continue into adulthood.

From a health perspective, there are three main rationales for encouraging young people to take part in regular physical activity (HEA, 1999):

1. *To optimise physical fitness, current health and well-being, and growth and development*
2. *To develop active lifestyles that can be maintained throughout adult life*
3. *To reduce the risk of chronic diseases of adulthood.*

The important factor for health is the encouragement of physical activity as a regular behaviour, rather than concentrating on the development of fitness as an outcome.

Many modifiable risk factors for cardiovascular disease have been identified in childhood. These include the link between physical inactivity and obesity. According to Graves and Miller (2003) most biomedical cardiovascular risk factors (e.g., high blood lipids, high blood pressure, diabetes) require behavioural interventions.

Research has identified that it is not necessary to perform high intensity activity in order to gain health benefits (ACSM 2006). Activities that are performed at a moderate level, equivalent to brisk walking, are beneficial to health. The key factor for health is the total amount of activity in which a young person participates.

**Benefits of physical activity:**

Physical activity can have multiple beneficial health outcomes in young people for their current and future health and well being. According to the recommendations listed by the HEA these benefits include:

- Improved self-esteem, especially in those with initially low self-esteem and those with learning difficulties.
- Reduction in overweight and obesity, when combined with a balanced diet and healthy lifestyle.
- Improvements in moral and social skills especially when participating in group activities and being part of a team. However, the potential psychological benefits for some young people can, however, be limited by an over-emphasis on competitive performance
- Increased energy levels and ability to cope with daily tasks as well as improved concentration levels.
- Reduction in stress levels and symptoms of depression and anxiety.
- Improved cognitive performance and classroom behaviour

Recent research has also identified a favorable relationship between physical activity and a range of factors associated with metabolic syndromes such as hypertension, obesity, insulin resistance, impaired lipid and lipoprotein profile (Steele, Brage, Corder, Wareham, Ekelund 2008).

In contrast to the benefits, physical activity can increase the risk of musculo-skeletal injuries although most injuries that do occur are the result of over-training, particularly around puberty.

However, some activities and sports can increase the risk of accidents, including road accidents, falls, collisions and other trauma. (Hootman et. al 2001)

There are a number of determinants affecting young people's participation in physical activity. Firstly, enjoyment is particularly important and is consistently associated with participation and adherence of a physical activity programme. Factors that influence the enjoyment of physical activities will vary between individuals and groups. (Sallis et.al, 1992)

Secondly, there is a consistent association between some key psychological variables and physical activity in youth: feelings of competence, control and autonomy; self- efficacy (confidence); the existence of positive attitudes to physical activity; having personal goals that focus on personal effort and improvement; perceptions of increased benefits and decreased barriers to physical activity. (Sallis et. al, 1992).

There is substantial evidence that family and peer support correlated with physical activity levels of young people, and that access to appropriate environments can enhance participation in physical activity by young people. (Chen & Zu, 2005), (Lin Yang, Telama & Laakso, 1996).

Major differences exist between males and females in relation to some of these variables. Females consistently show lower levels of perceived competence; higher levels of perceived barriers or costs; and lower levels of enjoyment. (Vilhjalmsson & Kristjansdottir, 2003).

Mass media, cultural factors, and youth sports organisations can influence physical activity in young people. Gender and socio-economic inequalities in physical activity participation among young people appear to reflect inequalities in the broader society. The most thoroughly evaluated interventions are health-related physical education programmes in primary schools, although most data comes from the United States.

Whilst studies have tended to focus on physiological outcomes, there is recent evidence that an appropriately designed, delivered and supported PE curriculum can enhance current levels of physical activity and can improve physical skill development (Penney & Jess, 2004). Interventions that focus on the family, environment and policy development have also shown some evidence of success (HEA, 2008).

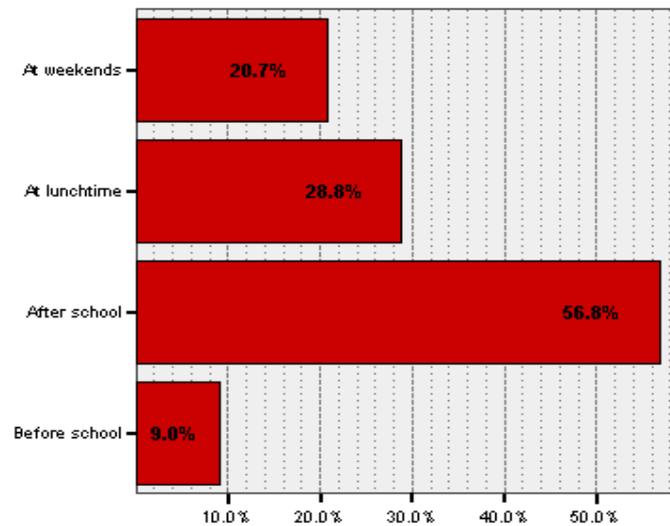
### **Current statistics for Ireland.**

An Irish study of physical activity levels of Dublin teenagers found that up to 25 per cent of 15-17 year olds are either overweight or obese. (Take Part Study Dublin City University, 2004). Over 60 per cent of the sample group, taken from the Eastern Area Health Board, travelled to school by car or by bus and between 60 and 70 per cent of them watched two or more hours television per day. Sixty-five per cent of 15-17 year olds are not physically active (Take Part Study, 2004).

A comparative cross sectional study in the Health Service Executive (HSE) - Northern Area region was conducted in 2005. A total of 1508 students (42% female; 58% male) participated in this physical activity study.

Findings from this study showed that 56 percent of 15-17 year olds did not meet current recommendations for physical activity and were classified as not regularly active. 62% of females were significantly less likely to meet minimum physical activity recommendations than males (Take PART IHF-HSENA report, 2005). Research is currently being conducted in the HSE-Midlands and the HSE-North Eastern regions. It is hoped that this research will provide comparative data and a more comprehensive view of the participation levels, aerobic fitness, physical health indices and determinants of physical activity in this age group.

According to recent research by Sharkey (2007) a total of 72.2% of county Dublin primary schools offer extra-curricular sports activities, 56.8% providing these activities after school hours (figure 1). The most commonly offered extra-curricular sports activity to boys and girls is GAA Football, with a percentage of 29.7%. The most offered activity (in all schools) offered to boys only is also GAA Football, with a percentage of 15.3%; the most offered activity to girls only is swimming, with a percentage of 15.3%. 28.8% of extra-curricular activity is provided during lunchtime while weekends accounted for 20.7%. Extra-curricular activity is also offered before school starts in the morning in 9% of all County Dublin primary schools. Promoting these opportunities at the primary level can increase the chance that children will continue to participate in PE through their teens and into adulthood (Talbot 2001, Puhl et al,1990).



*Figure 1 Timing of Extra-curricular activities in Dublin Primary schools (Sharkey, 2007)*

There have been a number of environmental and social changes over the past few decades that have influenced the activity levels of children and adolescents. Activity in today's world consists of more sedentary based activities such as television and computer games. In addition, the main form of travel is motor vehicles rather than walking or cycling. This has significantly reduced physical activity for most of the population (Daley, 2002).

Regular participation in moderate physical activity is an essential component of a healthy lifestyle. A sedentary lifestyle can have implications on physical, cognitive, and psychosocial development, (US Surgeon General, 1996).

Churchman carried out an investigation on Children in Urban environments; he stated, "*the undirected exploration of space in movement and play is an important part of childhood development*" (Churchman 1980).

Children who are unable to safely explore their neighbourhood are denied a vital experience – the chance to test themselves socially, mentally and physically in small real-life situations that prepare them for the wider world (Hillman 1999).

Play and recreation are important ingredients in the development of both young children and adolescents. One of the most probable causes for the lack of outdoor physical activity of Irish youths can be the fear, which parents may have for the safety of their children and teenagers.

Historically, Ireland has had a considerable amount of young children who suffered abuse, both sexual and physical, at the hands of authoritative and respected leaders within communities. Unfortunately, there have been a number of Irish sporting activities and organisations associated with child abuse in the past, which, no doubt influenced parent's decisions concerning their children and team sports in a negative way.

In addition, with the perceived threat of a child being abducted, injured or even killed on Irish roads in today's society this certainly can be a deterrent for many parents to allow their children engage in unsupervised physical activity. Figures from the National Road Authority (NRA) indicate that the number of deaths and injuries on Irish roads has increased significantly in recent years impacting on the decline in the number of children and teenagers cycling to and from school. (Road Collusion Facts, 2004)

Schools and communities have the potential to improve the health of young people by providing instruction, programs, and services that promote enjoyable, lifelong physical activity. Schools are an efficient vehicle for providing physical activity instruction and programmes because they reach most children and adolescents (McGinnis, Kanner & DeGraw, 1991), (Kann, et. al, 1995).

The targeting of young people in the promotion of physical activity is more important than ever, as health related s and patterns which are established early in childhood can persist into adult life (Puhl & Latner, 1990).

## **Review of school based physical activities in other countries.**

### *USA*

In 2004 the U.S. Congress established a new requirement that all school districts with a federally funded school meals program develop and implement policies that address nutrition and physical activity for the 2006-2007 school year (Child Nutrition and WIC Reauthorization Act, 2004). The National Alliance for Nutrition and Activity (NANA) convened a work group of more than 50 health, physical activity, nutrition, and education professionals from a variety of national and state organizations to develop a set of model policies for local school districts. There were a number of Physical Activity Opportunities and Physical Education policies developed and amongst them were;

1. Students should receive between 150 and 225 minutes of physical activity to be allocated per week for elementary schools and middle/high schools respectively.
2. Elementary school students should have at least 20 minutes a day of supervised activity breaks preferably outdoors and of a moderate to vigorous intensity.
3. Schools should offer extracurricular physical activity programs which should meet the needs, interests, and abilities of all students, including boys, girls, students with disabilities, and students with special health-care needs.
4. Teachers will no longer use physical activity or withhold opportunities for physical activity as a form of punishment.

5. Improvements, if and where, necessary should be made to facilitate the implementation of safer routes for students to walk and bike to school.
6. School facilities should be available to students, staff, and community members before, during, and after the school day, on weekends, and during school vacations.

Earlier this year, The Physical Activity Guidelines Advisory Committee Report, 2008 was published. The report presented and summarised the advisory committee's review of science relating physical activity to a variety of health outcomes. It also addressed the benefits of physical activity for children and youth amongst other subgroups of the population. (Physical Activity Guidelines Report, 2008)

This report recommended that children and youth participate daily in 60 or more minutes of moderate to vigorous physical activity. Certain specific types of physical activity should be included in an overall physical activity pattern in order for children and youth to gain comprehensive health benefits. These include regular participation in each of the following types of physical activity on 3 or more days per week: resistance exercise to enhance muscular strength in the large muscle groups of the trunk and limbs, vigorous aerobic exercise to improve cardiorespiratory fitness and cardiovascular and metabolic disease risk factors, and weight-loading activities to promote bone health.

However, it is essential that participation is developmentally appropriate in the modes of physical activities to minimise the potential risks of overtraining and injuries (Physical Activity Guidelines Report, 2008).

## **Canada**

In a 2001 report summarised by Dobbins and entitled *“The Effectiveness of School-Based Interventions in Promoting Physical Activity and Fitness Among Children and Youth: A Systematic Review*, it was reported that physical inactivity has been identified as a serious problem and major public health concern for people of all ages.

In 2002, Health Canada released *Canada’s Physical Activity Guide for Children* and *Canada’s Physical Activity Guide for Youth*. These guidelines called for an increase in physical activity levels and a decrease in time spent in sedentary activities for all Canadian children and youth. There are distinct gender differences in physical activity levels, intensity of physical activity and participation in sports. According to the latest Canadian Fitness and Lifestyle Research Institute Physical Activity Monitor, two thirds of Canadian children and youth aged 5 to17, are not active enough to promote good health (Health Canada, 2002).

This data is alarming especially as evidence suggests that; (Katzmarzyk, 2004) (Boreham et.al, 2002).

- a) *Increasing physical activity may modify risk factors for chronic diseases among children*
- b) *Physical activity patterns can track from childhood into adulthood*
- c) *Physical inactivity among adults is implicated in several chronic and debilitating diseases, including cardiovascular disease, colon cancer, and diabetes*
- d) *Children are increasingly exhibiting risk-factors for cardiovascular disease, such as obesity, elevated blood lipids, and hypertension*
- e) *Atherosclerotic fatty streaks in the coronary arteries, which are indicative of coronary heart disease, have been found post-mortem in children.*

### ***Australia***

Similar to it's global counterparts Australia is fighting an obesity epidemic. The rate of overweight and obesity among Australian adults has doubled over the past two decades. A National Obesity Taskforce was set up after Australian and state health ministers agreed that overweight and obesity were significant public health problems that threatened the health gains made by the nation in the last century (AIHW, 2004).

The prevalence of type 2 Diabetes is increasing in children and adolescents from certain ethnic groups (including those of Aboriginal and Torres Strait Islander and Middle Eastern backgrounds); the increase appears related to

the high prevalence of obesity in these populations. (NHMRC,2003).

It is possible that the obesity epidemic is also a factor in the increased incidence of Type 1Diabetes (T1D), as it is widely accepted that T1D develops as a result of environmental triggers in genetically predisposed individuals. (Peng & Hagopian, 2006). In early childhood, rapid growth in height and obesity are risk factors for developing T1D, and the “accelerator hypothesis” predicts earlier onset of T1D in heavier children.

According to latest figures published in 2008 – Healthy Weight 2008, it was reported the childhood obesity levels tripled between 1985 and 1995. The problem is now significantly worse with an estimated 1.5 million young people under the age of 18 considered to be overweight or obese.

Type-2 diabetes in Australian primary school children and adolescents is a serious cause for concern with its potential for complications such as heart disease, stroke, limb amputation, kidney failure and blindness. The most significant long-term consequence of obesity in childhood is its persistence into adulthood. Overweight young people have a 50% chance of being overweight adults, and perhaps not surprisingly children of overweight parents have twice the risk of being overweight than those with healthy weight parents. (Healthy Weight Action Agenda, 2008).

In 2004, the Australian government took a proactive role in combating this disease and invested \$116 million in a health promotion campaign – *Building a Healthy Active Australia* (AHMAC, 2004). An important part of

this campaign was the targeting of children and physical activity levels. Physical activity within the school curriculum was increased to a minimum of two hours per week. The Australian Sports Commission managed and promoted extracurricular activities within schools and childcare services. In 2005, the *Active After Schools Communities Program* was introduced to more than 900 primary schools. Between 2008 and through to 2010 it is estimated that this programme will reach over 3,200 primary schools and assist around 150,000 Australian children to become physically active. (AASC Programme, 2005). Children have opportunities to participate in a range of multi skilled activities such as dance, soccer, basketball, circus skills, martial arts, gymnastics, cricket and tennis.

A national event *Walk Safely to School* encourages tens of thousands of children to walk and commute safely to school and is held annually. Other initiatives have seen the introduction of information kits on healthy eating and physical activity guidelines within schools such as the Healthy and active School Communities – A resource kit for schools. The aim is provide support and resources for schools to assist in the promotion of good practice in healthy eating and physical activity for children and youth.

## ***United Kingdom***

The Department of Health, in the United Kingdom published their National Healthy Schools Programme (NHSP) in 2005. The aim of the NHSP is to support children and young people in developing healthy lifestyle patterns that will remain with them into adulthood.

Healthy Schools will promote the health and wellbeing of its pupils and staff through a well planned, taught curriculum in a physical and emotional environment that promotes learning and healthy lifestyle choices (NHSP, A Guide for Schools, 2005). It is envisaged that 75% of schools will achieve the National Healthy School status by 2009. The UK Department of Health stated that the main objectives of the Healthy Schools Programme would be to support schools in adopting a physical activity policy which will ensure that pupils participate in a structured physical activity programme for a minimum of two hours per week. Among the Health School objectives were;

- Pupils should be encouraged to participate in a broad range of extra curricular activities that promote physical activity.
- Pupils should be consulted about the physical activity opportunities offered by the school so as to identify barriers to participation and seek to remove them.
- Schools sports coordinators should be assigned, where possible and involved in the programmes along with the provision of community resources.
- Pupils and staff should be encouraged to walk or cycle to school under safe conditions, utilizing the school travel plan.

- Appropriate training should be provided for those involved in providing physical activities.
- Encourage all staff to undertake physical activity and be good role models to their students.

### **Study Aim and Objectives**

The aim of this study was to survey and gather information concerning the promotion of physical activity to adolescents and teenagers in Dublin based secondary schools.

With the escalating problem of childhood obesity in Ireland it has been established that one of the preventative measures to combat childhood obesity is to increase the amount of physical activity that the youth of today engage in (HBSC, 2006), (ACSM, 2006). An objective of this survey was to establish the number of hours that secondary schools devoted to physical education and to examine what type of activities were being offered to school children as part of their structured physical education curriculum and extra curricular activities.

In addition, information such as the facilities that schools have onsite and/or have local access to, what training and support is given to the physical education staff and whether schools are maximizing the opportunity for young people to be physically active were all important objectives of this study.

This survey was limited to Dublin schools but it is a starting point and could provide the opportunity and interest for further research to be conducted in other counties so comparisons can be made on both a regional and national level.

It is hoped that this study will provide up to date information and that the recommendations made will be considered useful and valuable to those concerned.