



UNIVERSITI PUTRA MALAYSIA

**SOCIODEMOGRAPHIC, PSYCHOSOCIAL AND HEALTH-RELATED
FACTORS AS PREDICTORS OF PHYSICAL ACTIVITY LEVELS
AMONG ADOLESCENTS**

DAN SIEW PENG

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

**SOCIODEMOGRAPHIC, PSYCHOSOCIAL AND HEALTH-RELATED
FACTORS AS PREDICTORS OF PHYSICAL ACTIVITY LEVELS AMONG
ADOLESCENTS**

By

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February 2008

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A cross-sectional study was conducted to determine factors associated with physical activity levels of four hundred, 13 year-old adolescents in Kuantan, Pahang. Physical Activity Questionnaire for Older Children (PAQ-C) was used to assess physical activity levels among the participants. Data on sociodemographic, psychosocial and health related factors were collected using self-administered questionnaire. The respondents comprised of 41.8% males and 58.2% females encompassed 56.2% Malays, 42.0% Chinese, and 1.8% Indians. Results indicated that more than one third of the respondents were in the low physical activity level category, most (61.5%) were in the moderate category and only 3.0% of the respondents were in the high physical activity level category. Males were more physically active than females ($\chi^2=23.667$, $p=0.0001$). Female adolescents (45.1%) were twice as likely as male respondents (22.1%) to fall in the low physical activity level category. The association between physical activity level and ethnicity was not significant. However, there was a significant interaction effect of sex and ethnicity in mean physical activity score ($F=8.343$, $p=0.004$). Malay males have a higher mean



physical activity score compared to Chinese males while Chinese females have a higher mean physical activity score than Malay females. There were no significant association between sociodemographic factors and physical activity except father's total years of schooling ($r=0.105$, $p<0.05$). Health-related factors studied (body mass index, smoking and eating behaviors) were found not correlated with physical activity. For psychosocial factors, physical activity was found positively and moderately correlated with physical activity self-efficacy ($r=0.496$, $p=0.0001$) and peer influence ($r=0.468$, $p=0.0001$). A low and positive relationship was found between physical activity with family influence ($r=0.298$, $p=0.0001$) and beliefs for physical activity outcome ($r=0.207$, $p=0.0001$) while a negative and weak relationship was found between physical activity and depression ($r=-0.116$, $p=0.021$). Moreover, respondents who have better perception of their current health status were more physically active ($\chi^2=21.062$, $p=0.0001$). Physical activity was found not correlated with perception of weight status and body parts satisfaction. However, a negative relationship was found between physical activity and body size discrepancy ($r=-0.143$, $p<0.01$). Multivariate analyses for the prediction of physical activity showed that physical activity self-efficacy, sex and peer influence were found to be significant in explaining physical activity among adolescents. This study suggests that physical activity intervention should include physical activity self-efficacy and social influence components in intervention designed to promote regular physical activity in adolescence.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

FAKTOR-FAKTOR SOSIODEMOGRAFI, PSIKOSOSIAL DAN FAKTOR BERKAITAN DENGAN KESIHATAN SEBAGAI PERAMAL KEPADA TAHAP AKTIVITI FIZIKAL DALAM KALANGAN REMAJA

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Satu kajian keratan-rentas telah dijalankan untuk menentukan faktor-faktor yang berkaitan dengan tahap aktiviti fizikal bagi empat ratus orang remaja, berumur 13 tahun di Kuantan, Pahang. *Physical Activity Questionnaire for Older Children (PAQ-C)* digunakan untuk menilai tahap aktiviti fizikal di kalangan peserta. Data-data untuk faktor sosiodemografi, faktor psikososial dan faktor berkaitan dengan kesihatan dikumpulkan dengan menggunakan **borang** soal selidik isi sendiri. Responden ini merangkumi 41.8% lelaki dan 58.2% perempuan termasuk 56.2% Melayu, 42.0% Cina dan 1.8% India. Keputusan menunjukkan bahawa lebih daripada satu pertiga daripada responden adalah dalam kategori tahap aktiviti fizikal rendah, **kebanyakan** (61.5%) adalah dalam kategori sederhana dan hanya 3.0% daripada responden adalah dalam kategori tahap aktiviti fizikal tinggi. Lelaki adalah lebih aktif daripada perempuan ($\chi^2=23.667$, $p=0.0001$). Responden perempuan (45.1%) adalah dua kali lebih banyak daripada responden lelaki (22.1%) dalam kategori tahap aktiviti fizikal rendah. Perkaitan di antara tahap aktiviti fizikal dan kumpulan etnik adalah tidak signifikan. **Walau bagaimanapun**, terdapat kesan interaksi



yang signifikan bagi jantina dan kumpulan etnik dalam min skor aktiviti fizikal ($F=8.343$, $p=0.004$). Lelaki Melayu mempunyai min skor aktiviti fizikal yang lebih tinggi berbanding dengan lelaki Cina sedangkan perempuan Cina mempunyai min skor aktiviti fizikal yang lebih tinggi daripada perempuan Melayu. Tiada **perkaitan** yang signifikan didapati di antara faktor-faktor sosiodemografi dan aktiviti fizikal kecuali jumlah tahun pendidikan bagi bapa ($r=0.105$, $p<0.05$). Faktor-faktor berkaitan dengan kesihatan yang dikaji (**indeks** jisim badan, merokok dan tingkah laku makan) adalah didapati tidak berkaitan dengan aktiviti fizikal. Bagi faktor-faktor psikososial, aktiviti fizikal didapati berkait secara positif dan sederhana dengan keyakinan diri dalam aktiviti fizikal ($r=0.496$, $p=0.0001$) dan pengaruh rakan ($r=0.468$, $p=0.0001$). Satu **perkaitan** yang rendah dan positif didapati di antara aktiviti fizikal dengan pengaruh keluarga ($r=0.298$, $p=0.0001$), **dan** kepercayaan bagi hasil aktiviti fizikal ($r=0.207$, $p=0.0001$) sedangkan satu **perkaitan** yang negatif dan lemah didapati di antara aktiviti fizikal dan kemurungan ($r=-0.116$, $p=0.021$). Tambahan pula, **responden** yang mempunyai persepsi status kesihatan yang lebih baik adalah lebih aktif ($\chi^2=21.062$, $p=0.0001$). Aktiviti fizikal adalah didapati tidak berkait dengan persepsi terhadap status berat badan dan kepuasan bahagian-bahagian badan. **Walau bagaimanapun**, satu **perkaitan** yang negatif didapati di antara aktiviti fizikal dan diskrepansi saiz badan. Analisis multivariansi untuk ramalan aktiviti fizikal menunjukkan bahawa keyakinan diri dalam aktiviti fizikal, jantina dan pengaruh rakan adalah signifikan dalam menerangkan aktiviti fizikal dalam kalangan remaja. **Kajian ini mencadangkan intervensi aktiviti fizikal seharusnya mengandungi komponen keyakinan diri dalam aktiviti fizikal and pengaruh sosial semasa merancang intervensi bagi tujuan menggalakkan aktiviti fizikal dilakukan dengan lebih kerap di kalangan remaja.**

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I certify that an Examination Committee has met on 28th February 2008 to conduct the final examination of Dan Siew Peng on her Master of Science thesis entitled “Sociodemographic, Psychosocial and Health-Related Factors as Predictors of Physical Activity Levels among Adolescents” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the student be awarded the degree of Master of Science.

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DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

DAN SIEW PENG

Date: 10 April 2008



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CHAPTER 1

INTRODUCTION

Many lifestyle habits are established during childhood and adolescence. Adolescence is a significant period of human growth and maturation whereby it is a time of rapid changes in physical, psychosocial, and cognitive development and many adult patterns are established (WHO, 1995). Further, adolescence is also defined as a complex stage of development in which a number of physical changes and psychosocial challenges converge (WHO, 2000; Kretchmer and Zimmermann, 1997).

Physical activity is defined as “any bodily movement produced by skeletal muscles that result in energy expenditure beyond resting expenditure (Thompson et al., 2003; Caspersen et al., 1985). Exercise is a subset of physical activity that is planned, structured, repetitive, and purposeful in the sense that improvement or maintenance of physical fitness is the objective” (Thompson et al., 2003). Physical activity during childhood and adolescence is crucial as it contributes to normal skeletal development and is necessary for young adults to attain and maintain an appropriate bone mass (Lasheras et al., 2001). Moreover, physical activity is a modifiable risk factor and it is protective against cardiovascular disease, type 2 diabetes, hypertension, obesity, osteoporosis, and certain cancers (Kohrt et al., 2004; Thompson et al., 2003; Breslow et al., 2001; Hambrecht et al., 2000), as well as promotes mental health (Peluso and Andrade, 2005).



Although the health benefits of physical activity have been well documented, there is evidence that modern society is generally inactive and this affects children and adolescents as well (Lasheras et al., 2001). For example, a report by the US Surgeon General indicated that almost 50.0% of the US children aged 12-21 years were not physically active on a regular basis (U.S. Department of Health and Human Services, 1996). In addition, data from the US National Youth Risk Behavior Survey indicated that there was a dramatic decline in the percentage of youth participating in daily physical educational classes from 42.0% in 1991 to 27.0% in 1997 (CDC, 1997a).

Like other countries, Malaysians were also found to be physically inactive. The findings from National Health and Morbidity Survey II (MOH, 1997) indicated that the prevalence of adequate exercise among Malaysians was only 11.6%. This sedentary lifestyle among the adult Malaysians is also extended into its pediatric population. A study on school children in Kuching, Sarawak aged 10 to 11 years old reported that 46.7% of the children exercised 2-3 times per week and only 10% exercised daily. On the other hand, 18.3% of the children exercised once a week and 8.3% did not exercise at all (Bong, 2003). Among 13 year-old adolescents, 44% were in the sedentary category, while the remaining 33.3% and 22.7% were in the moderately active and very active category, respectively (Lim, 2005).

Physical inactivity has a major role to play in energy imbalance leading to obesity (Ismail, 2002). Overweight and obesity are emerging as serious health problems and have reached epidemic proportions globally. The prevalence of overweight and obesity is increasing at an alarming rate and is seriously affecting both developed and



developing countries (WHO, 1998). Most countries in Asia including Malaysia are facing the double burden of undernutrition and overnutrition both exerting considerable stress on the health system. WHO (2000) reported that 17.6 million children and 300 million adults in developing countries are obese. The prevalence of overweight and obesity generally rises from childhood to adulthood (Florentino, 2002).

There are many factors that influence physical activity patterns including biological, sociodemographic (Aarnio et al., 2002; Lasheras et al., 2001; Sallis et al., 1996), environmental (Gomez et al., 2004; Sallis et al., 1996), psychosocial (Monge-Rojas et al., 2002; Lasheras et al., 2001; Vilhjalmsson and Thorlindsson, 1998; Sallis et al., 1996), and health-related factors (Bourdeaudhuij et al., 2005; Paavola et al., 2004; Story et al., 1998). For example, adolescents from a high socioeconomic background have been found to be more active than their lower socioeconomic counterparts. Similarly, male adolescents are reported to be more active than their female counterparts (Lasheras et al., 2001; Vilhjalmsson and Thorlindsson, 1998; Sallis et al., 1996). In addition, psychosocial factors which encompass peers' and parents' influences, self-efficacy and body image are important determinants of physical activity patterns among adolescents (Monge-Rojas et al., 2002; Lasheras et al., 2001; Anton et al., 2000).

As physical activity is one of the cornerstones of many chronic diseases, along with dietary and behavioral changes, one of the major rationales for promoting physical activity in children and adolescents is to establish regular activity patterns that can be maintained throughout life (Epstein and Goldfield, 1999; Sallis et al., 1992).



Problem Statement

Physical activity during childhood and adolescence is imperative as it exerts many health benefits. However, studies have repeatedly reported that there are many children and adolescents who are physically inactive (Monge-Rojas et al., 2002; Frary and Johnson, 2000; Vilhjalmsson and Thorlindsson, 1998). In addition, sedentary behavior often originates in childhood and adolescence which may persist into adulthood resulting in many adult chronic diseases (Aarnio, 2003; Monge-Rojas et al., 2002; Lasheras et al., 2001; Sallis et al., 1992). Hence, it is important to develop physical activity habits early in life as a means of increasing the probability of an active lifestyle in later life.

The health consequences of physical inactivity have been carefully documented (Kohrt et al., 2004; Thompson et al., 2003; Breslow et al., 2001; Hambrecht et al., 2000), yet studies on what factors are associated with physical activity particularly among adolescents are less well understood. Moreover, a large number of studies have shown a marked decline in physical activity during adolescence (Pahkala et al., 2006; Jago et al., 2005; Kimm et al., 2002), making young people at this stage of life an important target group to focus on.

Hence, there is a need to study and understand factors that affect physical activity levels of adolescents since adolescents' physical activity has important health consequences that will persist into adulthood. The present study focuses on the determination of



factors that affect physical activity levels of adolescents. A better understanding of the determinants of physical activity is crucial for the development of effective intervention strategies for instilling lifelong healthy physical activity habits.

The following are the research questions that are addressed in this study: -

1. What is the physical activity level of adolescents?
2. Do sociodemographic, health-related and psychosocial factors influence physical activity levels among adolescents?

Significance of the Study

Physical activity during childhood and adolescence is crucial as it exerts many health benefits and has protective effects on several chronic diseases as well as premature mortality (Clemmens and Hayman, 2004; Lahti-Koski et al., 2002; Hanley et al., 2000; MOH, 1999). However, many studies have shown a marked decline in physical activity during adolescence (Pahkala et al., 2006; Jago et al., 2005; Kimm et al., 2002). Since there is a lack of information on physical activity among Malaysian adolescents, this study may provide some useful information on physical activity levels and factors that influence physical activity levels of the adolescents as well as information for future studies.

The results of the present study can contribute and update the descriptive data on physical activity and other health related factors such as smoking, eating behaviors and

Body Mass Index (BMI) status of the adolescents. These data can be used as references by schools authorities, community leaders, and other researchers in planning healthy lifestyle programs for the adolescents.

Adolescence is a unique period in life since it is a time of intense physical, psychosocial, and cognitive development (WHO, 2000). Each of these changes influences adolescent participation in physical activity (McCabe and Ricciardelli, 2004). However, the determinants of physical activity level are less well understood particularly among Malaysian adolescents. Although there were studies on determinants of physical activity, these studies were only focused on a particular dimension of physical activity for example psychosocial factors (Deflandre et al., 2004; Monge-Rojas et al., 2002; Schmitz et al., 2002), socioeconomic factors (Gorden-Larsion et al., 1999; Sallis et al., 1996), and health-related behaviors (Paavola et al., 2004) respectively. The present study will cover most of these factors together including sociodemographic factors, health-related factors and psychosocial factors. The results of this study can provide a more holistic picture of the factors that affect physical activity of adolescents.

In addition, the findings of the study can point toward future research or intervention strategies for increasing physical activity and decreasing inactivity among adolescents. Besides, the results of the study would also be useful for the school authorities and program planners in readdressing the needs, interests and desires of the adolescents during physical education classes and co-curricular activities.

Objectives of The Study

General Objective

To determine factors associated with physical activity levels among adolescents

Specific Objectives

1. To assess physical activity levels, sociodemographic factors, health-related factors, and psychosocial factors of adolescents.
2. To examine the association between sociodemographic factors (sex, ethnicity parents' total years of education, household income, and household size) and physical activity levels among adolescents.
3. To examine the association between body mass index and physical activity levels among adolescents
4. To examine the association between smoking and physical activity levels among adolescents
5. To examine the association between eating behaviors (dieting, bulimia and food preoccupation and oral control) and physical activity levels among adolescents.
6. To determine the association between psychosocial factors (perception of current health status, physical activity self-efficacy, social influence, beliefs for physical activity outcomes, depression and body image perception and dissatisfaction) and physical activity levels among adolescents
7. To determine the contribution of sociodemographic factors, health-related factors and psychosocial factors toward physical activity levels among adolescents

Null Hypotheses

Ho1: There is no significant association between physical activity levels and the following sociodemographic factors among adolescents

- i) sex
- ii) ethnicity
- iii) parents' total years of education
- iv) household income
- v) household size

Ho2: There is no significant association between physical activity levels and the following health-related factors among adolescents

- i) body mass index
- ii) smoking
- iii) eating behaviors

Ho3: There is no significant association between physical activity levels and the following psychosocial factors among adolescents

- i) perception of current health status
- ii) physical activity self-efficacy
- iii) social influence
- iv) beliefs for physical activity outcomes
- v) depression
- vi) body image perception and dissatisfaction

Ho4: There is no significant contribution of sociodemographic factors, health-related factors, and psychosocial factors toward physical activity levels among adolescents.



Conceptual Framework

Physical activity during childhood and adolescence has received much attention as it exerts many health benefits particularly with regard to disease prevention. Unfortunately, there are still many children and adolescents who are physically inactive. Hence, determining factors that influence physical activity among adolescents is imperative since it has important health consequences that will persist into adulthood. However, no one variable is dominant in influencing physical activity among adolescents (Sallis et al., 1992) since the determinants of physical activity among adolescents are known to be multidimensional (Baranowski et al., 1998; Vilhjalmsson and Thorlindsson, 1998; Sallis et al., 1992).

The purpose of the present study was to determine factors associated with physical activity levels among adolescents. Many studies reported that physical activity was associated with sociodemographic factors such as sex, ethnicity, parents' educational levels, and household income (Lasheras et al., 2001; McMurray et al., 2000; Gordon-Larson et al., 2000; Vilhjalmsson and Thorlindsson, 1998; Sallis et al., 1996). Besides, BMI status was also found to be correlated with physical activity (Lahti-Koski et al., 2002; Bellisle and Rolland-Cachera, 2000). Other health-related factors such as smoking and eating behaviors were also shown to influence physical activity (Paavola et al., 2004; Kjelsas and Augestad, 2004; Aarnio et al., 2002; Lahti-Koski et al., 2002; Story et al., 1998). Further, psychosocial factors are also potential factors that may be associated with physical activity levels among adolescents. Many studies reported that psychosocial factors such as self-efficacy, social influences, depression, perception of

body image, and perception of health status predict physical activity among adolescents as well (Aarnio et al., 2002; Schmitz et al., 2002; Monge-Rojas et al., 2002; Vilhjalmsson and Thorlindsson, 1998; Sallis et al., 1996).

As shown in Figure 1, this study covers three aspects that may influence physical activity levels among adolescents including sociodemographic factors, health-related factors, and psychosocial factors. Sociodemographic factors which include sex, household size, parents' educational level, and ethnicity are believed to affect physical activity levels among adolescents. Health-related factors encompassing smoking, eating behaviors and BMI (weight status) have been shown to influence adolescents' physical activity levels. Eating behaviors covered three dimensions namely dieting, bulimia and food preoccupation, and oral control. Psychosocial factors as a whole covered six aspects such as perception of health status, self-efficacy, social influence (family and peer), beliefs on physical activity outcomes, depression, and body image perception and dissatisfaction. In short, sociodemographic factors, health-related factors and psychosocial factors were hypothesized as contributors to physical activity levels among adolescents.