UNIVERSITI PUTRA MALAYSIA

PREVALENCE OF OVERWEIGHT AND OBESITY WITH THEIR ASSOCIATED FACTORS AMONG IRANIAN STUDENTS IN KUALA LUMPUR, MALAYSIA

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By

LEILA BABAZEKRI

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree Master of Science

August 2014

DEDICATION

I dedicate this thesis to

The lord of time & age Imam Zaman[A.J]

My most beloved mother for all her true love favor, effort and encouragement

The soul of my father may his soul rest in peace,

My lovely sister,

and all overweight and obese children, adolescents, adults and who suffer from overweight and obesity.

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

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Chairman: Haji Muhammad Hanafiah bin Juni, M.D. MPH
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Background: In recent decades, the prevalence of obesity in children and adolescent has risen worldwide. A high prevalence of adolescence overweight and obesity cases has been reported in developing countries undergoing nutritional transition and developed countries. Adolescents overweight and obesity usually lead to adulthood overweight and obesity. The aim of this study was to investigate the prevalence of overweight and obesity and its associated risk factors among Iranian students age 14 to 18 attending Iranian schools in Kuala Lumpur. **Methodology:** A cross sectional study was conducted among 161 students age 14 to 18 years old from 5 Iranian schools. Simple random sampling method used for data collection. A validated self-administrated questionnaires with 4 sections including socio demographic factors, psychological factors (depression, anxiety, stress), eating behavior (emotional, external, restrained) and physical activity. Data was analyzed by SPSS version 21. **Result:** Prevalence of overweight and obesity was 49.7%.There is a significant difference in stress (t=-4.72, p=0.001), depression (t=-5.44, p=0.001), anxiety (t=-2.76, p=0.007), emotional eating (t=-5.38, P=0.001) and physical activity (χ^2=14.964, P=0.0001) among overweight and obese students with non-overweight and obese students. Multiple logistic regression analysis showed that physical activity OR=0.29, 95% CI (0.14-0.62) is a protective factor for overweight and obesity among students and Stress OR=1.14, 95% CI (1.03-1.25), depression OR=1.11, 95% CI (1.3-1.9), emotional eating OR=1.13, 95% CI (1.06-1.20) contributed significantly as a risk factor for overweight and obesity among respondents. **Conclusion**: The present study reported high prevalence of overweight and obesity among Iranian students in secondary and high school in Kuala Lumpur. There is therefore an urgent need to set up most intervention programs targeting good diet habits and physical activity and psychological consultation for Iranian adolescents in schools in Kuala Lumpur.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Kedoktoran Falsafah

PREVALEN BERAT BADAN BERLEBIHAN DAN OBESITI SERTA FAKTOR-FAKTOR YANG BERKAITAN DALAM KALANGAN PELAJAR IRAN DI KUALA LUMPUR, MALAYSIA

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Latar Belakang: Dekad kebelakangan ini, prevalen obesiti di kalangan kanak-kanak dan remaja telah meningkat secara mendadak di seluruh dunia. Kes-kes prevalen remaja berlebihan berat badan dan obesiti yang tinggi telah dilaporkan di negara-negara sedang membangun yang mengalami peralihan pemakanan dan di negara-negara maju. Berat badan berlebihan dan obesiti semasa remaja biasanya membawa kepada berat badan berlebihan dan obesiti ketika dewasa. Tujuan kajian ini adalah untuk menyiasat prevalen berat badan berlebihan dan obesiti serta faktor-faktor risiko yang berkaitan dalam kalangan pelajar Iran berumur 14 hingga 18 yang menghadiri sekolah Iran di Kuala Lumpur. **Metodologi**: Satu kajian keratan rentas telah dijalankan di kalangan 161 pelajar berumur 14 hingga 18 tahun dari 5 buah sekolah Iran. Kaedah persampelan rawak mudah digunakan untuk pengumpulan data. Borang soal selidik yang dijawab sendiri telah disahkan dengan 4 bahagian termasuk faktor-faktor sosio-demografi, faktor-faktor psikologi (kemurungan, kebimbangan, tekanan), tingkah laku pemakanan (emosi, pengaruh luar, penghalang) dan aktiviti fizikal. Data dianalisis dengan menggunakan SPSS versi 21. **Keputusan:** Prevalen berat badan berlebihan dan obesiti adalah 49.7%. Kajian mendapati bahawa terdapat perbezaan yang signifikan terhadap tekanan (t=-4.72, p=0.001), kemurungan (t=-5.44, p=0.001), kebimbangan (t=- 2.76, p= 0.007), pemakanan emosi (t=-5.38, p=0.001) dan aktiviti fizikal (χ^2 = 14.964, p= 0.0001) dalam kalangan pelajar yang berlebihan berat badan dan obes dengan pelajar-pelajar yang tidak berlebihan berat badan dan obes. Analisis regresi logistik menunjukkan bahawa aktiviti fizikal OR = 0.29, 95% CI (0,14-0,62) adalah faktor pelindung untuk berat badan berlebihan dan obesiti di kalangan pelajar. Tekanan OR = 1.14, 95% CI (1.03-1.25), kemurungan OR=1.11, 95% CI (1.3-1.9), pemakanan emosi OR =1.13, 95% CI (1.06-1.20) menyumbang secara signifikan sebagai faktor risiko untuk berat badan berlebihan dan obesiti dalam kalangan responden. **Kesimpulan:** Kajian ini telah melaporkan prevalen berat badan berlebihan dan obesiti yang tinggi di kalangan pelajar Iran di sekolah menengah dan tinggi di Kuala Lumpur. Oleh itu, terdapat keperluan segera untuk merancang program intervensi yang mensasarkan tabiat pemakanan dan aktiviti fizikal yang baik serta perundingan psikologi untuk remaja Iran di sekolah-sekolah Kuala Lumpur.

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APPROVAL

I certify that a Thesis Examination Committee has met on 25 August 2014 to conduct the final examination of Leila Babazekri on her thesis entitled "Prevalence of Overweight and Obesity and Associated Factors among Iranian Students Age 14 To 18 Attending Iranian Schools in Kuala Lumpur" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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LIST OF ABBRIVIATIONS

BMI	Body Mass Index
CDC	Centers for Disease Control and Prevention
Cm	Centimeter
DASS	Depression And Anxiety Stress Scales
DEBQ	Diet Eating Habit Questionnaire
E.U.	European Union
IOTF	International Obesity Task Force
IPAQA	International Physical Activity Questionnaire For Adolescence
HABITS	Health and Behavior in Adolescents Study
Kg	Kilogram
NCHS	National Center For Health
NHLIB	National Heart, Lung, and Blood Institute
SCI	The Statistical Center of Iran
SD	Standard Deviation
SES	Socio Economic Status
UN	United Nation
UNISEF	United Nations Children's Fund
USA	United States of America
USDHHS	U.S. Department of Health & Human Services
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

World Health Organization defined adolescent as young people age between 10 to 19 years old. The number of adolescents has increased globally, and a trend is expected to continue to increase to 1.3 billion slightly through 2050. Around 85% of adolescent's live in developing countries and 50% of the adolescent's population in the world lives in Asia. In absolute numbers, India is home to more adolescents – around 243 million than any other country. It is followed by China, with around 200 million adolescents (UNICEF, 2012).

Adolescents are the largest population in Iran. Over 60% of Iran's population were under 30 years old and nearly 40% were adolescents (UNICEF, 2012). In 2006, Iran census showed that 15 million people, or 21.90% of the population, were 10 to 19 years old. Of this number, 65.13% live in urban areas, 34.69% in rural areas and 0.13% are nomadic. Comparing between and 2006 census with 1986 indicates that the population of adolescents, in proportion to the total population, has decreased by 2.5%. The numbers of adolescents living in urban areas have increased by 26% (UNICEF, 2012).

Prevalence of overweight and obesity has highly increased and seriously affected both developing and developed countries (Kelishadi, 2007;Nugent, 2008). According to Centers for Disease Control and Prevention (CDC) report, approximately 18% of adolescents in the USA were overweight, and obese (CDC, 2007).

Obesity is associated with significant mortality and morbidity, including cardiovascular diseases, respiratory, psychological morbidities gastrointestinal and endocrine (Ferreira, *et al.,* 2005). Many factors contribute to the increasing prevalence of overweight and obesity including genetic, environment, lifestyle, low physical activity and even financial factors (Sidik & Rampal, 2009). Recently Iran is dealing with an increasing number of overweight and obesity same other countries. Iran is a middle income, and developing country, facing a quick epidemiological transition. Recently, a high prevalence of overweight and obesity has been reported in Iran (Maddah & Nikooyeh, 2010).

Adolescents seek uniqueness while struggling for self-responsibility; acceptance is concerned about their appearance. Unfortunately, despite the common belief that they strive to have greater control of their life styles including eating patterns, food intake (Spear, 2007), increasing number of overweight and obesity among them still is high (NCHS, 2012; WHO, 2013). Worldwide food habit transition, sedentary lifestyle, media domination effects, food advertisements, and in one world westernization showed more influence on adolescents than personal concerns.

Adolescence is one of the critical periods in the development of obesity (Gordon-Larsen *et al.,* 2004; Maddah & Nikooyeh, 2010). The worldwide prevalence of adolescents overweight and obesity increased from 4.2% in 1990 to 6.7% in 2010. This trend is expected to reach 9.1% or 60 million, in 2020 (Onis, *et al.,* 2010). Moreover,

it is estimated that by 2015, nearly 2.3 billion adults will be overweight and more than 700 million will be obese (WHO, 2005). Reports in US showed the prevalence of obesity among adolescents aged 12 to 19 years increased from 5.0% to 18.1%. According to the 2003-2004 National Health and Nutrition Examination Survey, 17.1% of adolescents 2-19 years of age (over 12.5 million) were overweight in the USA (Ogden *et al.,* 2006).

The number of obese adolescents in the United States continues to be on the rise and prevalence of adolescent obesity has more than tripled among African American adolescents (Ogden *et al.,* 2012). Recent reports show high prevalence of obesity among adolescents in the European Union which is the second highest rate of adolescent's obesity is in Europe, with 19% (Lobstein, Baur, & Uauy, 2004).

Obesity is now the most common nutritional disease in Iran (Maddah, 2009), especially adolescents overweight and obesity is an increasing problem. However, the data on the prevalence of overweight and obesity among adolescents are limited (Amini, Omidvar, & Kimiagar, 2007).

There are many risk factors, which are responsible for weight gain and obesity among adolescents some of them include low level of physical activity (Mota *et al.,* 2008), unhealthy eating patterns (Sebastian, Cleveland, & Goldman, 2008), excessive use of television (Driskell *et al.,* 2008), high soft drink consumption (Harrington, 2008), breakfast skipping (Mota *et al.,* 2008) and inappropriate frequency of family meals and home food environment (Franko, *et al.,* 2008). In addition, It is argued that an unhealthy lifestyle might be an important factor that contributes to overweight and obesity among adolescents (Farooqi & O'Rahilly, 2000). Education and socioeconomic status affect the prevalence of obesity, but the effects may be diametrically opposite in different populations around the world (Maddah & Nikooyeh, 2010).

It has been shown that obesity and overweight in adolescents can be a major reason for being overweight in adulthood (Manios *et al.,* 2007). Adolescence is considering having an important role in the development of obesity and is related to morbidity and mortality in adulthood (Ferreira & Henry, 2005). Furthermore, obesity that begins in adolescence often extends into adulthood and becomes a permanent condition (Schmidt, 2003). Obesity during adolescence has significant psychosocial costs in addition to the above mentioned health outcomes and health care costs. There is a breadth of research that suggests that adolescents overweight and obesity may impact the quality of life, daily activities and functioning of adolescents (Olshansky *et al.,* 2005). Adolescents who are obese have a greater propensity to feel shame, self-blame and have low self-esteem (Schmidt, 2003). Obese adolescents are more likely than non-obese youth to be teased and bullied by their peers. Preventing Childhood Obesity (Koplan, Liverman, & Kraak, 2005) and obese youth are also at increased risk for depression than non-obese youth (Schmidt, 2003).

More than 90% of diabetes is related to the extra weight (Hossain, Kawar, & El Nahas, 2007). According to the WHO projections, the death related to diabetes will rise by more than 50% globally in the next 10 years. Cardiovascular diseases such as stroke and hypertensive is one of important outcome of overweight and obesity that kill 17 million people worldwide each year (Hossain *et al.,* 2007). Osteoarthritis which is an

example of musculoskeletal disorders is more common in overweight and obese people (Hossain *et al.,* 2007) Different kinds of cancers such as kidney, breast and colon (Renehan, 2008), metabolic syndrome (Moayeri *et al.,* 2006) problems for bones (Obalum *et al.,* 2012), increasing the probability of developing asthma, shortness of breath during exercise, sports or any physical activity (Sutherland, 2008). In addition, overweight adolescents tend to mature earlier and they may be more sexually mature and taller than their peers (Bralić *et al.,* 2012). Adolescent obesity has been linked with psychosocial problems such as lower self-esteem among adolescents (Eisenberg *et al.,* 2003).

1.2 Problem Statement

Obesity is a global problem affecting nearly 300 million people worldwide and it has long been observed that obesity is associated with an increased in mortality and reduced life expectancy (Fontaine *et al.,* 2003). Obesity could be seen among all ages with different health consequences based on the age. Each period of human life has its health importance and adolescence is one of the crucial periods in this regard. Adolescence, age between 12-19 years old, is a unique of development that is filled with both opportunities and challenges in different era. Health patterns that are established in adolescence often carry into the future. Moreover, it has been estimated that 80% of obese adolescents would become obese adults (Hedley *et al.,* 2004). Adolescent's obesity and its associated metabolic complications are rapidly emerging as one of the highest worldwide challenges of the 21st century.

Approximately 110 million adolescents in the world were classified as overweight or obese in 2008 (Cali & Caprio, 2013). The prevalence of overweight and obesity among children and adolescents is gradually increasing worldwide. Prevalence of overweight and obesity has been tripled in adolescents in the last three decades. The percentage of adolescents in the United States who were obese increased from 5% in 1980 to nearly 18% in 2010 (Fryar *et al.,* 2012; Ogden *et al.,* 2012). In addition, more than one third of adolescents were overweight or obese in same time (Ogden *et al.,* 2012). Although the highest prevalence rates of childhood obesity are observed in developed countries, obesity is also increasing in developing countries (Mahfouz *et al.,* 2008). Among developing countries, the prevalence of adolescent's obesity is highest in the west of Asia and in both center and east Europe (James, 2004). In East Asia and southeast Asia, rapid urbanization and socioeconomic development combined with changes in eating habits and in physical activities have led to an increase in obesity in adults, as well as in children (Maddah & Nikooyeh, 2010).

Many factors are involved in obesity and lifestyle has the most impotence among them (Alley, Lloyd, & Shardell, 2010; Karnik & Kanekar, 2012). Lifestyle could be influenced by a few issues which migration is one of them. Previous studies suggest that age at arrival of migrants is a critical variable, and reflective of adaptive capability, education level, and may be important to consider in acculturation to changes of lifestyle, specifically eating habit, physical activity levels and socioeconomic status (Schaafsma & Sweetman, 2001). Students who come from Iran and study in Malaysia are affected by many environmental factors like changes in whether and food habit which affect their lifestyle. These changes in adolescents which affect their eating behavior could have many health consequences in their future life. It is well established that early life eating patterns could be persisted and have an impact role on chronic

diseases that occur later in life; particularly obesity, cardiovascular disease and diabetes (Ball & McCargar, 2003).

One of the important factors, which has association with overweight and obesity, is mental health. For instance, adolescents, who are obese, are more likely to experience psychological problems and social stigmatization (Ashlesha Datar & RolandSturm, 2004). Evidence from numerous studies indicates that obese adolescents have a higher incidence of mental health problems, such as depression, anxiety, and poor self-esteem, than do non-obese adolescents (Melnyk *et al.,* 2006; Nemiary *et al.,* 2012). Constantly obese adolescents also had significant higher rates of mental health disorders such as oppositional defiance and depression (Costello *et al.,* 2004). In addition, adolescents with high anxiety as well as depressive symptoms have less healthy active lifestyle beliefs, and active lifestyle (Melnyk *et al.,* 2006). Findings indicate that overweight and obese adolescents are more likely to be the sufferers and perpetrators of verbal, physical and relational bullying than their normal-weight peers (Janssen *et al.,* 2004).

Due to the importance and relationship between overweight and obesity with psychological factors and lack of solid research concerning the emotional factors (depression, anxiety and stress), eating behavior and physical activity to overweight and obesity among the adolescent in Iranian schools in Kuala Lumpur, the present study has been done.

1.3 Justification of Study

Adolescence is an important age for establishing healthy behaviors. Many of habits formed during this developmental stage will last well into adulthood (Cobb, 2010). Moreover, working with families and teachers to enhance a healthy lifestyle (Suarez-Balcazar *et al.,* 2007) would be one more way to support obese adolescents in effecting change and keeping a healthy and active lifestyle for adolescents. Overweight and obesity in adolescents are rising and have become a global issue (WHO, 2006). Recent data indicate that overweight is increasing among adolescents in Iran (Doustmohammadian, Keshavarz, Doustmohammadian, & Ahmadi, 2013; Maddah & Nikooyeh, 2010). However, several studies were carried out to study the prevalence of overweight and obesity among Iranian adolescents but those assessed the association between eating habits, socio-demographic differentials and obesity in this group are very few (Rashidi *et al.,* 2005).

Malaysia in the last few years has become a popular destination for Iranian who are seeking further education or oversees employment. Iran embassy establishes Iranian schools to Iranian students study with their own language. Among these students, life style such as eating habit, physical activity and mental health situation become different from students who live in Iran. Most of study shows people when migrant to other country their life style change and risk of obesity increase among them compare than home country. Accordingly is necessary to know about their psychological, eating behavior and physical activity factors and association with the prevalence of overweight and obesity among students to use in a school program to improve students' health.

1.4 Research Questions

The study seeks to address the following questions:

1. What is the prevalence of overweight and obesity among students age 14 to 18 attending Iranian schools in Kuala Lumpur.
2. What are the factors associated with prevalence of overweight and obesity among students age 14 to 18 in Iranian schools in Kuala Lumpur?

1.5 Objectives of Study

1.5.1 General Objective

The aim of the study is to determine the prevalence of obesity and overweight and its associated factors among Iranian students age 14 to 18 attending Iranian schools in Kuala Lumpur.

1.5.2 Specific Objectives

Specific Objectives of this study are:

1. To determine the prevalence of overweight and obesity of among Iranian students attending Iranian Schools in Malaysia.

2. To determine the socio-demographic factors, physical activity, eating behavior (emotional, external, and restrained) and psychological factors (depression, stress, anxiety).

3. To determine the association between overweight and obesity with following factors: socio-demographic, physical activity, eating behavior, psychological factors: depression, stress and anxiety.

1.6 Research Hypothesis

H1 There is a significant association between overweight and obesity with socio-demographic factors**.**

H2 There is a significant association between overweight and obesity with physical activity.

H3 There is a significant association between overweight and obesity with eating behaviors (emotional, external, restrain).

H4 There is a significant association between overweight and obesity with depression, stress and anxiety.

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