



UNIVERSITI PUTRA MALAYSIA

***FACTORS ASSOCIATED WITH BODY WEIGHT STATUS AMONG
IRANIAN STUDENTS IN A MALAYSIAN PUBLIC UNIVERSITY***

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FPSK(m) 2014 53



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IRANIAN STUDENTS IN A MALAYSIAN PUBLIC UNIVERSITY**

By

TAHEREH MOKHTARI

**Thesis Submitted to the school of Graduate studies,
Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of
Master of Science**

December 2014

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This thesis is dedicated to my wonderful parents who have made sacrifices in order for me to become who I am.



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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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December 2014

Chair: Associated Professor. Rosita Jamaluddin, PhD
Faculty: Medicine and Health Sciences

University students are essential targets for the elevation of healthful lifestyles due to the fact that they help produce findings that can diminish the risks of lifestyle disorders later in life. The weight statuses of these students are believed to be greatly influenced by socio-demographic, lifestyle, dietary and psychological factors. The main aim of this study therefore, was to bring to light the associations between the above-mentioned factors and university students' weight statuses. The 311 participants of this study were selected through simple random sampling method and the data was collected through a questionnaire comprising 4 sections aimed at identifying the participants' demographic factors, smoking status, physical activity level, dietary intake, dietary pattern, depression and anxiety levels. The results of the study indicated that there was significant associations between BMI and energy intake ($r= 0.281$, $p =0.000$), carbohydrate ($r= 0.310$, $p =0.000$), protein ($r= 0.208$, $p =0.000$), fat ($r= 0.198$, $p =0.000$), western dietary pattern ($r = 0.13$; $p =0.01$), physical activity ($r= -0.14$; $p = 0.009$), anxiety ($r = - 0.15$; $p \leq 0.01$), age ($r = 0.19$; $p \leq 0.01$), gender ($\chi^2 = 43.03$, $p=0.001$), marital status ($\chi^2 = 8.8$, $p=0.03$) and income level ($r = 0.22$; $p \leq 0.01$) of the students. Multivariate regression analysis for the prediction of body weight status demonstrated that gender, carbohydrate intake, age, physical activity, anxiety, income level, mix dietary pattern and smoking status had significant effects on BMI. In conclusion, the etiology of obesity and overweight is complex and a large number of factors affected BMI including energy intake, physical activity, psychological status, environment, culture and economic status. Investigation of the factors associated with body weight status is a necessary consideration in planning obesity interventions.

Abstrak tesis yang dikemukakan kepada senat Universiti Putra Malaysia
Sebagai memenuhi keperluan untuk Ijazah Master Sains

**FAKTOR YANG BERKAITAN DENGAN STATUS BERAT BADAN
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Pelajar universiti adalah sasaran yang berpotensi untuk peningkatan gaya hidup yang sihat disebabkan mereka dapat mengemukakan hasil kajian bagi pengurangan risiko penyakit gaya hidup pada masa hadapan. Status berat badan pelajar dipercayai amat dipengaruhi oleh faktor sosio-demografi, gaya hidup, pemakanan dan psikologi. Tujuan utama kajian ini adalah untuk menghubungkan faktor-faktor tersebut dengan status berat badan pelajar. Seramai 311 pelajar Iran dipilih melalui persampelan rawak mudah untuk kajian ini. Data dikumpulkan melalui soal selidik yang terdiri daripada empat bahagian bertujuan untuk mengenalpasti faktor demografi, status merokok dan tahap aktiviti fizikal, pengambilan diet dan corak pemakanan serta tahap kemurungan dan keresahan para peserta. Dalam kajian ini, didapati bahawa terdapat perkaitan yang signifikan antara BMI dan pengambilan tenaga ($r = 0,281$, $p = 0.000$), karbohidrat ($r = 0,310$, $p = 0.000$), protein ($r = 0,208$, $p = 0.000$), lemak ($r = 0,198$, $p = 0.000$), corak diet barat ($r = 0.13$; $p = 0.01$), aktiviti fizikal ($r = -0,14$; $p = 0.009$), keresahan ($r = -0.15$; $p = 0.01$), umur ($r = 0.19$; $p = 0.01$), jantina ($\chi^2 = 43,03$, $p = 0.001$), status perkahwinan ($\chi^2 = 8.8$, $p = 0.03$) dan tahap pendapatan ($r = 0.22$; $p = 0.01$) pelajar. Analisis regresi multivariat untuk ramalan status berat badan menunjukkan bahawa jantina, pengambilan karbohidrat, umur, aktiviti fizikal, keresahan, tahap pendapatan, corak diet campuran dan merokok mempunyai kesan yang besar ke atas BMI. Kesimpulannya, etiologi obesiti dan berat badan berlebihan adalah kompleks dan sebilangan besar faktor memberi kesan kepada BMI termasuk pengambilan tenaga, aktiviti fizikal, status psikologi, persekitaran, budaya dan status ekonomi. Kajian terhadap faktor yang berkaitan dengan status berat badan perlu dipertimbangkan dalam menangani obesiti.

ACKNOWLEDGEMENTS

I would like to thank Dr. Rosita Jamaluddin, my knowledgeable, conscientious, caring and gracious supervisor. This work would not have been possible without her helpful guidance, unfailing support, and unstinting encouragement. I also would like to thank my co supervisor Dr. Hazizi Bin Saad for his constructive feedbacks throughout the research process.

This dissertation would not have been possible without the love, support, and encouragement I received from my parents, brother and sisters. Only now am I beginning to realize how much my parents sacrificed so that I could attend university. I do not have words to adequately describe my deep gratitude for all they have provided me, though I hope to show them in the years to come.

I would also like to thank the School of Graduate Studies' cooperation and support, which made it possible for me to finish this work.

A special thanks to my friend Mr. Ariyo Movahedi.

I certify that a Thesis Examination Committee has met on 31 December 2014 to conduct the final examination of Tahereh Mokhtari on her thesis entitled "Factors Associated with Body Weight Status among Iranian Students in a Malaysian Public University " 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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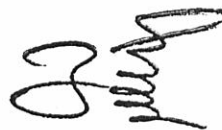
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LIST OF ABBREVIATIONS

BMI	Body Mass Index
WHO	World health organization
CDC	Center for disease control and Prevention
GPAQ	Global physical activity Questionnaire
FFQ	Food frequency questionnaire
NOO	National Obesity Observatory
WC	Waist circumference
WHR	Waist to hip ratio
EI	Energy intake
BMR	Basal metabolic rate
DRI	Dietary reference intake
NHANES	National Health and Nutrition Examination Survey
NHS	National Statistics
HSS	Health and Human Service
MDD	Major Depressive Disorder
DYLYS	Disability Adjusted Life Years
NESDA	Netherland's Study of Depression and Anxiety

CHAPTER 1

INTRODUCTION

1.1 Background

World Health Organization (WHO) in 2006 defined obesity as “an abnormal and immoderate accumulation of fat that may have negative effect on health” (WHO, 2006). The U.S. Center for Disease Control and Prevention (CDC) defines the terms obesity and overweight as “ranges of weight that are greater than what is generally considered healthy for a given height” (U.S. Centers for Disease Control and Prevention, 2011).

Two types of obesity have been identified by researchers in this area, which are categorized as general and abdominal obesity, evaluated by the Body Mass Index (BMI) and Waist Circumference (WC) or Waist Hip Ratio (WHR) respectively (Xu et al., 2011). Body Mass Index (BMI), is determined by the relationship between one’s weight and height that is, a person's weight in kilograms divided by the square of his height in meters (kg/m^2) (WHO, 2006). BMI greater than 25.0 kg/m^2 and 30.0 kg/m^2 are considered as overweight and obesity respectively. The BMI classification also includes underweight, which includes BMI below 18.5 kg/m^2 , and normal weight, which includes BMI within the range of 18.5 to 24.9 kg/m^2 (CDC, 2012). National obesity observatory (NOO) has suggested that although BMI is not a direct measurement of body adiposity, it is considered as a valid method because of its correlation with direct measures of body fat (NOO, 2009).

Obesity and being overweight are considered as the fifth leading global death risks. At least 2.8 million adults have passed away in consequence of obesity. Additionally, 44% of diabetic difficulties, 23% of ischemic heart disease difficulty and approximately 7% to 41% of assured cancer troubles are due to weight disorders. It has been claimed that obesity and overweight have an accelerating rate globally and it is estimated that 1 billion and 300 million adults are overweight and obese with body mass indices (BMI) greater than 25 kg/m^2 and 30 kg/m^2 (WHO, 2010).

According to the Asia Pacific Cohort Study Collaboration and Ministry of Health Singapore findings, the prevalence of obesity is within the range of 0.3 to 3.4% among Asians, Indians, Filipinos, the Japanese and the Chinese and 4.7 - 9.1% among Thais (Aekplakorn & Mo-Suwan, 2009) and Hong Kong Chinese (Asia Pacific Cohort Study Collaboration, 2007). Based on the cross-sectional population-based research carried out in Malaysia, the prevalence of obesity among Malaysians ranging in age between 15 years and above was 11.7% in total. The findings showed that the obesity prevalence among Malays (13.6%) and Indians (13.5%) was the highest followed by the indigenous group of “Sarawak Bumiputra” (10.8%) and the Chinese (8.5%) (Rampal et al., 2007).

According to the findings of the study conducted in Iran, the all-inclusive prevalence of obesity and overweight is 13.7% and 29% respectively (Esmaeily et al., 2009). The reported percentage of obesity in rural areas is 21% different from urban areas (31%) in Iran (Hajian-Tilaki & Heidari, 2007). It is posited that the prevalence of obesity has increased rapidly as a result of changes in people's lifestyle during the recent years (Hajian-Tilaki & Heidari, 2007).

Obesity and overweight has a multifaceted etiology. Sue (2007) posits that the imbalance between the energy intake of foods and energy expenditure of physical activity is the primary cause of obesity. The secondary or indirect causes of obesity include the incorporation of social, cultural and economical circumstances surrounded by eating and physical activity patterns. Furthermore, energy dense foods such as some types of bread, burgers, cheese and carbonated canned drinks consumed highly during a day or late at night are believed to be contributory factors for weight gaining (Bin Zaal, 2009).

Many researchers maintain that an obesogenic environment by which both children and adults lead to obesity epidemic is characterized by omnipresence of unhealthy food choices, over consumption of these types of foods, and sedentary lifestyle on the increase. Environmental factors are also believed to play a pivotal role in choosing unhealthy eating patterns among university students (Dowda et al., 2001).

In addition, it is suggested that the proliferation of shopping centers, vending machines and fast food markets and appliance stores has supported unhealthy eating habits alarmingly (King et al., 2007). Cost of foods and availability are two criteria with which the students make their own food choices (Šatalic et al., 2007; Gan et al., 2011). Eating habits and nutritional status of students have been found to be negatively associated with students' lack of knowledge about healthy food choices (Gan et al., 2011).

University students are on target for the elevation of healthful lifestyles potentiality, with which the risk of lifestyle-related disorders might be reduced later in life (Von Bothmer & Fridlund, 2005). According to the conducted studies, university students repeatedly fail to fulfill the suggested intakes of fruits and vegetables (Huang et al., 2003; Moy et al., 2009). They also have the tendency to consume calorie-dense snacks high in fat (Kremmyda et al., 2008; Yahia et al., 2008). They also more frequently skip meals, especially breakfast and are more prone to fast food consumption (Alizadeh & Ghabili, 2008).

Excessive daily intake that is related to dietary pattern is highly associated with the prevalence of obesity and many studies have recently focused on the consumption of fruits, vegetables, fat, fiber, fast foods, drinks and sugar energy along with dietary pattern (McClain et al., 2009). Physical activity participation is also considered as a significant factor in the prevention of obesity (Flynn et al., 2006).

According to the above introduction, studies have shown that many factors are associated with unhealthy body weight status such as socio demographic factors (Wang & Beydoun, 2007, Zhao et al., 2008) socio economic status (Sanigorski et al., 2007), dietary pattern, dietary intake, physical activity level, life style (Mokdad et al., 2005) and psychological factors (John et al., 2005; Jorm et al., 2003, Pouliou &

Elliot, 2010). This study therefore, aims to further investigate the association between these factors and overweight and obesity.

1.2 Statement of the Problem

Obesity is a disorder in which excess body fat is accumulated in the body and can result in serious physical, psychological, health, behavioral, social and economical consequences (WHO, 2006). Extra body fat can have negative impact on self-confidence and cause a wide range of co-morbidities such as hypertension, type 2 diabetes, cardiovascular diseases and multiple cancers which lead to reduced quality of life and life expectation and also cause people to spend billions of dollars in health care expenses (Swinburn, 2004).

The lifestyle of university student adheres to unhealthy dietary pattern and physical inactivity. The factors such as socio demographic and socio-economic status, food consumption patterns, intake of nutrients and dietary habits, knowledge, physical activity, smoking habits, depression and anxiety can have an impact on the student's weight status. The main aim of this study is to investigate the effect of the named factors on weight status of adult students.

This study was conducted among Iranian students due to several reasons. Firstly, a review of literature shows that very few studies conducted previously investigated the weight status of Iranian student living abroad (Zarei et al., 2014). Secondly, unfamiliarity with dietary pattern of non-Iranian students would cause a lot of difficulties in the process of the research. Last but not least, the findings of this research could make possible the comparison between the dietary pattern and weight status of Iranian students living in Iran and the students living abroad with the purpose of generating more information regarding the factors associated with body weight status.

Living in a foreign country might bring about drastic changes into the lifestyle of students. It has been demonstrated by the findings of previous studies that students are very likely to develop unhealthy dietary patterns following their arrival at a foreign country especially during the first year of residency (Zarei et al., 2014). With academia as the primary focus, the consumption of nutritional meals and the need to exercise regularly do not appear very high on their priority list. Study and social demands leave many university students making food choices primarily on taste, convenience, or peer influence.

1.3 Significance of the Study

It is posited that promotion of healthy lifestyles among university students is of high importance on account of the fact that it might result in reduction of the hazard of lifestyle-related disorders later in life (Gan et al., 2011). It is essential to examine whether the weight gain among university students is due to the switch from high school to college living or other specific demeanors. Moving away from family home makes it possible for university students to face difficulty in controlling their eating habits. It has been suggested that living away from family home leads to

development of poor eating behavior (Papadaki et al., 2007). The body of knowledge on eating habits, dietary pattern, dietary intake, socio demographic characteristics, body weight status, anxiety, smoking status and depression among Iranian university students is quite limited due to the small amount of research among this population. Therefore, this study aims to obtain a preliminary understanding of the differences in the above-mentioned factors among Iranian male and female university students so that future intervention can be planned in order to improve the nutritional status and provide nutrition education for university students.

1.4 Research Questions

1. What is the current body weight status of Iranian students at Universiti Putra Malaysia?
2. Do socio demographic factors (age, gender, marital status, living status, program of study, and income), life style factors (smoking status, physical activity level), dietary factors (dietary intake, dietary pattern) and psychological factors (depression and anxiety) contribute to the weight status of the Iranian students of University Putra Malaysia?

1.5 Objectives

1.5.1 General Objective

To determine the factors associated with body weight status among Iranian students in Universiti Putra Malaysia.

1.5.2 Specific Objectives

1. To determine the socio demographic factors (age, gender, marital status, living status, program of study, and income), life style factors (smoking status, physical activity level), dietary factors (dietary intake, dietary pattern, food scoring, skipping meal and snacking), psychological factors (depression and anxiety) and anthropometric measurements of subjects.
2. To determine the associations between socio demographic factors (age, gender, marital status, living status, program of study, and income), life style factors (smoking status, physical activity level), dietary factors (dietary intake, dietary pattern) and psychological factors (depression and anxiety) and body weight status of subjects.
3. To determine the contribution of socio demographic factors (age, gender, marital status, living status, program of study, and income), life style factors (smoking status, physical activity level), dietary factors (dietary intake, dietary pattern) and psychological factors (depression and anxiety) toward body weight status of subjects.

1.6 Hypotheses

1.6.1 Null Hypothesis

1. There is no significant association between socio demographic factors (age, gender, marital status, living status, program of study, and income), life style factors (smoking status, physical activity level), dietary factors (dietary intake, dietary pattern) and psychological factors (depression and anxiety) and body weight status of subjects.
2. There is no significant contribution between socio demographic factors (age, gender, marital status, living status, program of study, and income), life style factors (smoking status, physical activity level), dietary factors (dietary intake, dietary pattern) and psychological factors (depression and anxiety) toward body weight status of subjects.

1.7 Conceptual Framework

The cost of obesity is considerable from several perspectives including direct costs of treatments, impalpable costs that have an impact on overall health, work-related absenteeism and premature death and economic cost (WHO, 2000). In developed countries, 2-7% of total health care estimated costs were related to obesity financial costs in the 1990s (WHO, 2000). Medical care costs in association with obesity added up to approximately \$147 billion in 2008 in the United States alone. There is a proven need for increased accessibility to preventative medicine, enhancement in health care and targeted initiatives in order to begin to have a positive influence on the proceeding obesity epidemic (CDC 2011).

A vast assortment of personal behaviors affects an individual's well being. In total, the health of population is under the influence of these behaviors. According to the studies carried out in this area, several factors contribute to obesity such as demographic factors including age, gender, marital status, living status, education level, and income level (Hajian-Tilaki et al., 2007; Shahin et al., 2011; Sanigorski et al., 2007; Pikhart et al., 2007), life style factors such as smoking status, physical activity, dietary intake, dietary pattern (Slattery et al., 2006, Bakhshi et al., 2010, Fang et al., 2009) and psychological factors namely depression and anxiety (Maskarinec et al., 2000, Herva et al., 2006, Van Reedt Dortland et al., 2010).

Many researchers have found that foods with higher energy content had an enhanced risk of overweight (Wolongevicz et al., 2010, Jones-Smith et al., 2011). Moreover, there are some contradictory results regarding the relation between dietary pattern and obesity, that is, the healthier dietary patterns were found to be inversely associated with extreme weight (Murtaugh et al., 2007, Esmailzadeh et al., 2008).

Smoking and diet combined with physical activity are known to be the two main destructive behaviors to the health of the US population leading to obesity (Mokdad et al., 2005). Based on the conducted studies, obesity is related to physical activity level (Firdaus et al., 2006). Many recent researches that have been conducted with regard to the association of obesity and anxiety showed either no association or increased rates of anxiety in obese individuals (John et al., 2005; Jorm et al., 2003).

Depression and obesity have a U shaped relationship, which means that it can justify both overweight and underweight phenotypes (De Wit et al., 2010). It is suggested that further studies play a vital role in illuminating the direction of the association between depression and obesity (Luppino et al., 2010).

Figure 1.1 presents the conceptual frame of this study. This cross sectional study will look into factors associated with weight status from behavioral (life style) and demographical perspectives. This study focuses on individual behaviors, socio economic, and obesogenic influences besides the particular focus on the association of physical activity and dietary pattern on weight status. The achieved direction of this study would be helpful to fulfill and enhance the nutritional interventions and would be a useful action plan for university students. Moreover, it has a significant role in the improvement of eating habits, dietary patterns, regular exercise and weight management and results in sufficient health care among the university adult students.



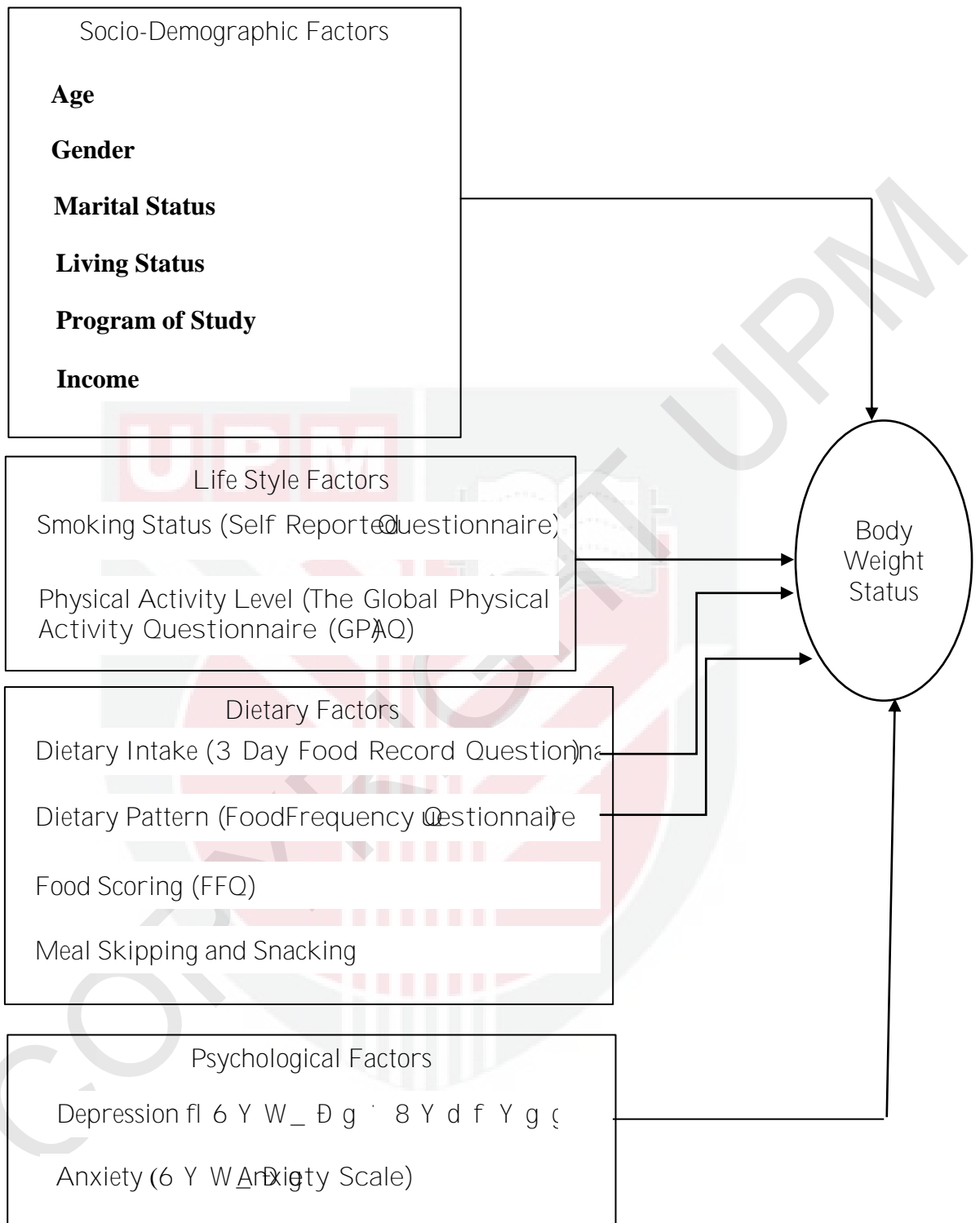


Figure 1.1 Conceptual Framework

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