



UNIVERSITI PUTRA MALAYSIA

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

TAHEREH MOKHTARI

FPSK(m) 2014 53



**FACTORS ASSOCIATED WITH BODY WEIGHT STATUS AMONG
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

All material contained within the thesis, including without limitation text, logos, icons, photographs and all other artwork, is copyright material of Universiti Putra Malaysia unless otherwise stated. Use may be made of any material contained within the thesis for non-commercial purposes from the copyright holder. Commercial use of material may only be made with the express, prior, written permission of Universiti Putra Malaysia.

Copyright © Universiti Putra Malaysia



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



© COPYRIGHT UPM

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

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

By

TAHEREH MOKHTARI

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
ANTARA PELAJAR IRAN DI SEBUAH UNIVERSITI KERAJAAN
MALAYSIA**

Oleh

TAHEREH MOKHTARI

Disember 2014

Pengerusi: Rosita Jamaluddin, PhD
Fakulti: Perubatan dan Sains Kesihatan

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.

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Mater of Science. The members of the Supervisory Committee were as follows:

Rosita Jamaluddin, PhD

Associate Professor
Faculty of Medicine and Health Science
Universiti Putra Malaysia
(Chairman)

Hazizi Abu Saad, PhD

Associate Professor
Faculty of Medicine and Health Science
Universiti Putra Malaysia
(Member)

BUJANG BIN KIM HUAT, PhD

Professor and deputy Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

Declaration by Members of Supervisory Committee

This is to confirm that:

The research conducted and the writing of this thesis was under our supervision;
Supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate
Studies) Rules 2003 (Revision 2012-2013) are adhered to.

Signature: _____
Name of
Chairman of
Supervisory
Committee: _____

Signature: _____
Name of
Member of
Supervisory
Committee: _____



TABLE OF CONTENTS

ABSTRACT	Page
ABSTRAK	i
ACKNOWLEDGEMENTS	ii
APPROVAL	iii
DECLARATION	iv
LIST OF TABLES	vi
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xiii
	xiv

CHAPTER

1	INTRODUCTION	1
	1.1 Background	1
	1.2 Statement of the Problem	3
	1.3 Significance of the Study	3
	1.4 Research Questions	4
	1.5 Objectives	4
	1.5.1 General Objective	4
	1.5.2 Specific Objectives	4
	1.6 Hypotheses	5
	1.6.1 Null Hypothesis	5
	1.7 Conceptual Framework	5
2	LITERATURE REVIEW	8
	2.1 Body weight Status	8
	2.2 Complications of Excess Body Weight	9
	2.3 Prevalence of Overweight and Obesity	9
	2.3.1 Prevalence of Overweight and Obesity in Malaysia	9
	2.3.2 Prevalence of overweight and Obesity in Iran	10
	2.4 Association between Socio Demographic Factors and Body weight Status	10
	2.4.1 Age	10
	2.4.2 Gender	11
	2.4.3 Marital Status	11
	2.4.4 Income and Education	12
	2.5 Association between Life Style Factors and Body weight Status	13
	2.5.1 Smoking Status	13
	2.5.2 Physical Activity	15
	2.6 Association between Dietary Factors and Body weight Status	16
	2.6.1 Dietary Intake and Dietary Pattern	16
	2.6.2 Food Environment	18
	2.6.3 Meal Skipping and Snacking	18

2.7	Association between Psychological Factors and Body weight Status	18
2.7.1	Depression	18
2.7.2	Anxiety	21
3	METHODOLOGY	22
3.1	Introduction	22
3.2	Research Design	22
3.3	Study location	22
3.4	Study Population	23
3.5	Inclusion and Exclusion Criteria	24
3.6	Sample Size	24
3.7	Sampling design	24
3.8	Ethical Approval	26
3.9	Research Instruments	26
3.9.1	Questionnaire	26
3.9.1.1	Demographic Factors	27
3.9.1.2	Life Style Factors	27
A.	Smoking Status	27
B.	Physical Activity Level	27
3.9.1.3	Dietary Factors	29
A.	Dietary Intake (Three days food record)	29
B.	Food Scoring (Food Frequency Questionnaire)	30
C.	Dietary Pattern (Food Frequency Questionnaire)	31
D.	Skipping Meals and Snacking	32
3.9.1.4	Psychological factors	32
A.	Depression	32
B.	Anxiety	33
3.9.2	Anthropometric Measurements	33
A.	Weight and Height Measurement	33
B.	Body Mass Index	34
3.10	Pre-test	34
3.11	Response rate	35
3.12	Statistical Analysis	35
3.13	Factor analysis and dietary pattern derivation	36
4	RESULT AND DISCUSSION	38
4.1	Introduction	38
4.2	Socio-Demographic Factors of the Respondents	38
4.3	Life Style Factors	39
4.3.1	Smoking Status	39
4.3.2	Physical Activity Levels	40
4.4	Dietary Factors	41
4.4.1	Dietary Intake	41
4.4.2	Accuracy of reported energy intakes	44
4.4.3	Food Scoring	45
4.4.4	Dietary pattern	47
4.4.5	Meal Skipping and Snacking	51

4.5	Psychological Factors	52
4.5.1	Depression and Anxiety	52
4.6	Anthropometric Measurements	54
4.7	Association between Socio Demographic Characteristics and BMI	55
4.8	Association of Life Style Factors and BMI	61
4.8.1	Smoking status and BMI	61
4.8.2	Physical activity level and BMI	64
4.9	Association of dietary factors and BMI	65
4.9.1	Dietary intake and BMI	66
4.9.2	Dietary pattern and BMI	68
4.10	Correlation between psychological factors and BMI	70
4.10.1	Depression, anxiety and BMI	70
4.11	Association of socio demographic factors, life style factors, dietary factors, psychological factors and BMI	71
4.12	Regression Analysis of BMI	73
4.13	Implication	75
5	CONCLUSION	76
5.1	Summary	76
5.2	Conclusion	77
5.3	Limitations, Strengths and Recommendations	77
	REFERENCES	79
	APPENDICES	
A	Ethical approval letter	100
B	Consent form	102
C	Questionnaires	104
	BIODATA OF STUDENT	120
	PUBLICATION	121

LIST OF TABLES

Table		Page
3.1	Smoking Status Definitions (GATS, 2011)	27
3.2	MET Values of Each Domain (GPAQ Analysis Guide)	28
3.3	GPAQ Analysis Classification	28
3.4	Categories of the Accuracy of Reported Energy Intake (Goldberg, 1991)	30
3.5	Beck Anxiety Scale Scoring (Beck, 1988)	31
3.6	Food Groupings Used in the Dietary Pattern Analysis (Hosseini-Esfehani, 2012)	32
3.7	Beck Depression Inventory Scoring (Beck, 1961)	33
3.8	Beck Anxiety Scale Scoring (Beck, 1988)	33
3.9	BMI Classification (WHO 2001)	34
3.10	Internal consistency of research instruments	35
3.11	Statistical Test of Factor Analysis Definition	37
4.1	Distribution of subjects according to Socio-demographics (n=311)	39
4.2	Smoking Status and Duration Based on the Frequency of Smoking	40
4.3	Physical Activity Level	41
4.4	Dietary intakes of the students	43
4.5	Characteristics of Under-, Accurate-, and Over Reporters	44
4.6	Ascending Level of Food Scoring of the students	45
4.7	Total Variance Explained	48
4.8	KMO and Bartlett's Test	48
4.9	Distribution of Factor Loading Matrix from the Food Frequency Questionnaire for the Major Factors	49
4.10	The Dietary Pattern Mean of Mean Composite Score Calculation	50
4.11	Mean of Mean Composite Score of Dietary Patterns	50
4.12	Meal Skipping Patterns of the Students	51
4.13	Depression and Anxiety	53
4.14	Mean Values of Anthropometric Measurements	54
4.15	BMI Classifications of the students	54
4.16	Relationship between Gender and Body Weight Status	55
4.17	Relationship between Marital Status and Body Weight Status	56

4.18	Relationship between Living Status and Body Weight Status	56
4.19	Relationship between Program of Study and Body Weight Status	57
4.20	Correlations between Age, Income and BMI	57
4.21	Mean Differences between BMI and Socio Demographic Characteristics	59
4.22	Relationship between Smoking Status and Body Weight Status	61
4.23	Relationship between Smoking Duration and Body Weight Status	62
4.24	Mean Difference between Smoking Status, Smoking Duration and BMI	63
4.25	Correlation between physical activity and BMI	64
4.26	Mean Differences between BMI and Physical Activity	65
4.27	Correlation between BMI and Dietary Intake	66
4.28	Mean Differences between Dietary Intake and BMI	67
4.29	Correlation between Dietary Pattern and BMI	69
4.30	Correlations between Depression, Anxiety and BMI	70
4.31	The Association between Factors and BMI	71
4.32	The Associations of the Factors with BMI	72
4.33	The Important Findings of the Study	72
4.34	Regression analysis of BMI	73

LIST OF FIGURES

Figure		Page
1.1	Conceptual Framework	7
3.1	The Map of Universiti Putra Malaysia	23
3.2	Sampling design of the Study	25
3.2	Research Instruments	26



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 $25.0 \text{ kg}/\text{m}^2$ and $30.0 \text{ kg}/\text{m}^2$ are considered as overweight and obesity respectively. The BMI classification also includes underweight, which includes BMI below $18.5 \text{ kg}/\text{m}^2$, and normal weight, which includes BMI within the range of 18.5 to $24.9 \text{ kg}/\text{m}^2$ (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 $25 \text{ kg}/\text{m}^2$ and $30 \text{ kg}/\text{m}^2$ (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.



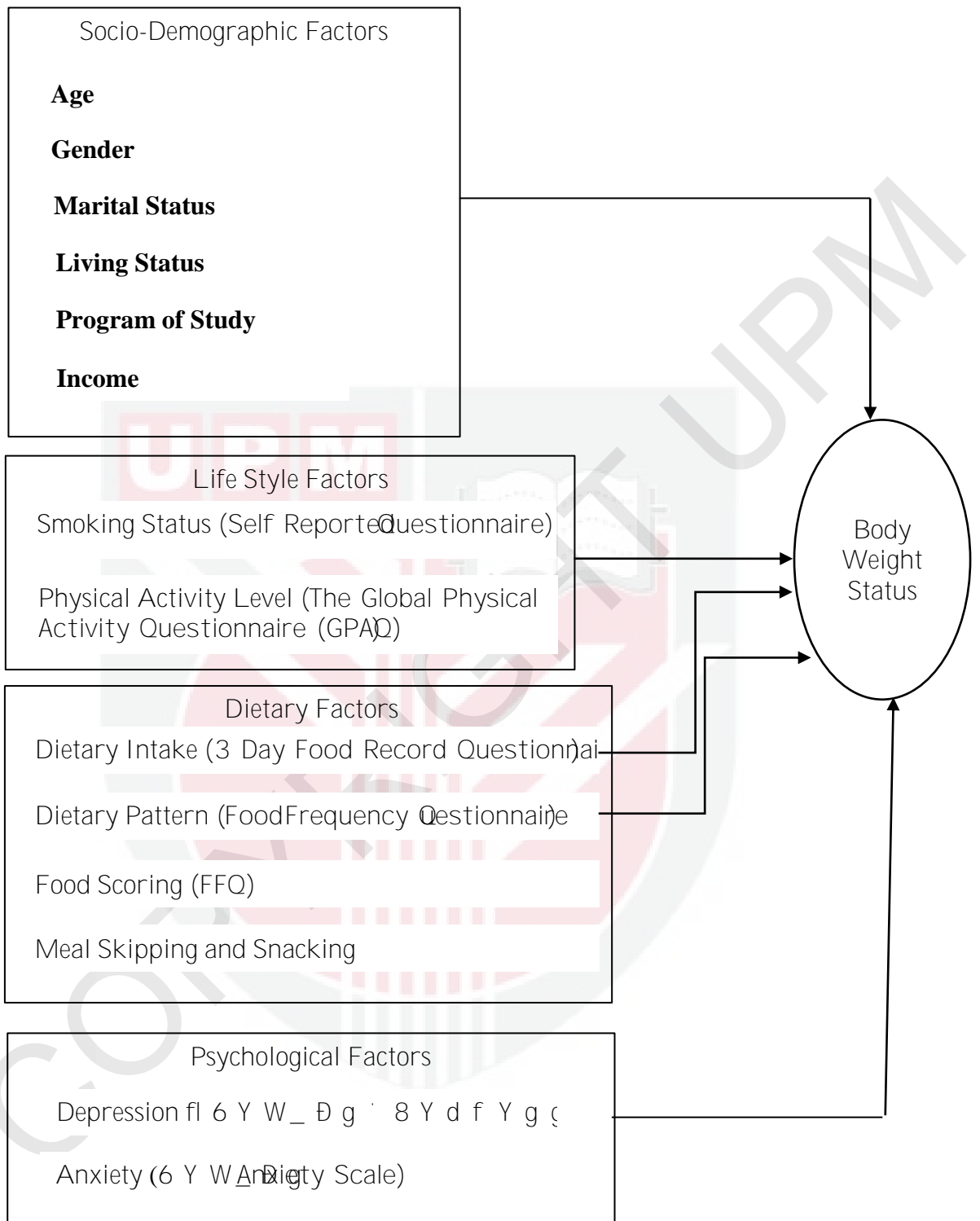


Figure 1.1 Conceptual Framework

REFERENCES

- Adams, T. B., Moore, M. T., & Dye, J. (2007). The relationship between physical activity and mental health in a national sample of college females. *Women & Health, 45*(1), 69-85.
- Aekplakorn, W., & Moøsuwan, L. (2009). Prevalence of obesity in thailand. *Obesity Reviews, 10*(6), 589-592.
- Al-Hazzaa, H. M., Abahussain, N. A., Al-Sobayel, H. I., Qahwaji, D. M., Musaiger, A. O. (2012). Lifestyle factors associated with overweight and obesity among saudi adolescents. *BMC Public Health, 12*, 354-2458-12-354. doi:10.1186/1471 2458-12-354.
- Al Qauhiz, N. M. (2010). Obesity among saudi female university students: Dietary habits and health behaviors. *The Journal of the Egyptian Public Health Association, 85*(1-2), 45-59.
- Alizadeh, M., & Ghabili, K. (2008). Health related lifestyle among the iranian medical students. *Res Biol Sci, 3*(1), 4-9.
- Al-Rethaiaa, A. S., Fahmy, A. A., & Al-Shwaiyat, N. M. (2010). Obesity and eating habits among college students in saudi arabia: A cross sectional study. *Nutrition Journal, 9*(39), 1-10.
- Amini, M., Rezvanian, H., Gouya, M., Delavari, A., Alikhani, S., & Mahdavi, A. (2008). Association of body mass index and abdominal obesity with marital status in adults. *Archives of Iranian Medicine, 11*(3), 274-281.
- Amundson, D. E., Djurkovic, S., & Matwiyoff, G. N. (2010). The obesity paradox. *Critical Care Clinics, 26*(4), 583.
- Apostolopoulou, M., Savopoulos, C., Michalakis, K., Coppack, S., Dardavessis, T., & Hatzitolios, A. (2012). Age, weight and obesity. *Maturitas, 71*(2), 115-119.
- Azadbakht, L., & Esmailzadeh, A. (2008). Dietary and non-dietary determinants of central adiposity among tehrani women. *Public Health Nutrition, 11*(5), 528-534.
- Azadbakht, L., Mirmiran, P., Hosseini, F., & Azizi, F. (2005). Diet quality status of most tehranian adults needs improvement. *Asia Pacific Journal of Clinical Nutrition, 14*(2), 163-168.
- Azizi, F., Esmailzadeh, A., & Mirmiran, P. (2004). Obesity and cardiovascular disease risk factors in tehran adults: A population-based study. *East Mediterr Health J, 10*(6), 887-897.
- Ayatollahi, S., & Ghorehshizadeh, Z. (2010). Prevalence of obesity and overweight among adults in iran. *Obesity Reviews, 11*(5), 335-337.

- Bakhshi, E., Eshraghian, M. R., Mohammad, K., Foroushani, A. R., Zeraati, H., Fotouhi, A., . . . Seifi, B. (2008). The positive association between number of children and obesity in Iranian women and men: Results from the national health survey. *BMC Public Health*, 8(1), 213.
- Bakhshi, E., Mohammad, K., Eshraghian, M. R., & Seifi, B. (2010). Factors related to obesity among Iranian men: Results from the national health survey. *Public Health Nutrition*, 13(09), 1389-1394.
- Barnes, L. A., Opitz, J. M., & GilbertaBarnes, E. (2007). Obesity: Genetic, molecular, and environmental aspects. *American Journal of Medical Genetics Part A*, 143(24), 3016-3034.
- Barrett, A. (2012). Depression and its relationship to physical activity and obesity.
- Bauman, A., Bull, F., Chey, T., Craig, C. L., Ainsworth, B. E., Sallis, J. F., Pratt, M. (2009). International journal of behavioral nutrition and physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, 6, 21.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56(6), 893.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56(6), 893.
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck depression inventories-IA and-II in psychiatric outpatients. *Journal of Personality Assessment*, 67(3), 588-597.
- Beck, A. T., Ward, C., & Mendelson, M. (1961). Beck depression inventory (BDI). *Arch Gen Psychiatry*, 4(6), 561-571.
- Beydoun, M. A., & Wang, Y. (2010). Pathways linking socioeconomic status to obesity through depression and lifestyle factors among young US adults. *Journal of Affective Disorders*, 123(1), 52-63.
- Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology*, 43(8), 667-672.
- Bin Zaal, A., Musaiger, A., & D'Souza, R. (2009). Dietary habits associated with obesity among adolescents in Dubai, United Arab Emirates. *Nutr Hosp*, 24(4), 437-444.
- Blumenthal, J. A., Babyak, M. A., Doraiswamy, P. M., Watkins, L., Hoffman, B. M., Barbour, K. A., . . . Waugh, R. (2007). Exercise and pharmacotherapy in the treatment of major depressive disorder. *Psychosomatic Medicine*, 69(7), 587-596.

Body mass index: Considerations for practitioners. Retrieved Retrieved from www.cdc.gov/obesity/downloads/bmiforpractitioners.pdf.

Bornstein, S., Schuppenies, A., Wong, M., & Licinio, J. (2006). Approaching the shared biology of obesity and depression: The stress axis as the locus of gene–environment interactions. *Molecular Psychiatry*, 11(10), 892-902.

Bostanci, M., Ozdel, O., Oguzhanoglu, N. K., Ozdel, L., Ergin, A., Ergin, N., Karadag, F. (2005). Depressive symptomatology among university students in denizli, turkey: Prevalence and sociodemographic correlates. *Croat Med J*, 46(1), 96-100.

Broom, D. H., & Warin, M. (2011). Gendered and class relations of obesity: Confusing findings, deficient explanations. *Australian Feminist Studies*, 26(70), 453-467.

Camões, M., Lopes, C., Oliveira, A., Santos, A. C., & Barros, H. (2010). Overall and central obesity incidence in an urban portuguese population. *Preventive Medicine*, 50(1), 50-55.

Carrera, P. M., XIANG, G., & Tucker, K. L. (2007). A study of dietary patterns in the mexican-american population and their association with obesity. *Journal of the American Dietetic Association*, 107(10), 1735-1742.

Case, A., & Menendez, A. (2009). Sex differences in obesity rates in poor countries: Evidence from south africa. *Economics & Human Biology*, 7(3), 271-282.

Cawley, J., Markowitz, S., & Tauras, J. (2004). Lighting up and slimming down: The effects of body weight and cigarette prices on adolescent smoking initiation. *Journal of Health Economics*, 23(2), 293-311.

Center for Chronic Disease Prevention and Health Promotion.(2011). *Chronic disease- obesity- at A glance*. National Center for Chronic Disease Prevention and Health Promotion.

Centers for Disease Control and Prevention. (2012). *Health, united states*.

Centers for disease control and prevention.(2012). Higher education and income levels keys to better health, according to annual report on nation's health. Retrieved.

Chang, V. W., & Lauderdale, D. S. (2005). Income disparities in body mass index and obesity in the united states, 1971-2002. *Archives of Internal Medicine*, 165(18), 2122.

Chapelot, D. (2011). The role of snacking in energy balance: A biobehavioral approach. *The Journal of Nutrition*, 141(1), 158-162. doi:10.3945/jn.109.114330; 10.3945/jn.109.114330.

Chee, S., Zawiah, H., Ismail, M., & Ng, K. (1996). Anthropometry, dietary patterns and nutrient intakes of malaysian estate workers. *Mal J Nutr*, 2(2), 112-126.

- Chen J, Campbell TC, Tunyao L and Peto R. (1990). *Diet, lifestyle and mortality in china: A study of the characteristic of 65 chinese counties*. Oxford: Oxford University Press.
- Chen, L., Wang, L., Qiu, X. H., Yang, X. X., Qiao, Z. X., Yang, Y. J., & Liang, Y. (2013). Depression among chinese university students: Prevalence and socio-demographic correlates. *PloS One*, 8(3), e58379.
- Cho, Y., Shin, A., & Kim, J. (2011). Dietary patterns are associated with body mass index in a korean population. *Journal of the American Dietetic Association*, 111(8), 1182-1186.
- Cho, J., & Juon, H. S. (2006). Assessing overweight and obesity risk among korean americans in california using world health organization body mass index criteria for asians. *Preventing Chronic Disease*, 3(3), A79.
- Chou, S., Grossman, M., & Saffer, H. (2004). An economic analysis of adult obesity: Results from the behavioral risk factor surveillance system. *Journal of Health Economics*, 23(3), 565-587.
- Cilli, M., De Rosa, R., Pandolfi, C., Vacca, K., Cugini, P., & Bella, S. (2003). Quantification of sub-clinical anxiety and depression in essentially obese patients and normal-weight healthy subjects. *Eating and Weight Disorders: EWD*, 8(4), 319-320.
- Collaboration, A. P. C. S. (2007). The burden of overweight and obesity in the asia-pacific region. *Obes Rev*, 8(3), 191-196.
- Craft, L. L., Freund, K. M., Culpepper, L., & Perna, F. M. (2007). Intervention study of exercise for depressive symptoms in women. *Journal of Women's Health*, 16(10), 1499-1509.
- Dahl, E., Ivar Elstad, J., Hofoss, D., & Martin-Mollard, M. (2006). For whom is income inequality most harmful? A multi-level analysis of income inequality and mortality in norway. *Social Science & Medicine*, 63(10), 2562-2574.
- Dastgiri, S., Tutunchi, H., Ostadrahimi, A., & Mahboob, S. (2007). Sensitivity and specificity of a short questionnaire for food insecurity surveillance in iran. *Food & Nutrition Bulletin*, 28(1), 55-58.
- Davis, E. M., Rovi, S., & Johnson, M. S. (2005). Mental health, family function and obesity in african-american women. *Journal of the National Medical Association*, 97(4), 478.
- De Wit, L., Luppino, F., van Straten, A., Penninx, B., Zitman, F., & Cuijpers, P. (2010). Depression and obesity: A meta-analysis of community-based studies. *Psychiatry Research*, 178(2), 230-235.

- Dietrich, A., Federbusch, M., Grellmann, C., Villringer, A., & Horstmann, A. (2014). Body weight status, eating behavior, sensitivity to reward/punishment, and gender: Relationships and interdependencies. *Frontiers in Psychology*, 5
- Dinas, P., Koutedakis, Y., & Flouris, A. (2011). Effects of exercise and physical activity on depression. *Irish Journal of Medical Science*, 180(2), 319-325.
- Do Carmo, I., Dos Santos, O., Camolas, J., Vieira, J., Carreira, M., Medina, L., . . . Galvão-Teles, A. (2008). Overweight and obesity in Portugal: National prevalence in 2003–2005. *Obesity Reviews*, 9(1), 11-19.
- Dong, C., Sanchez, L., & Price, R. (2004). Relationship of obesity to depression: A family-based study. *International Journal of Obesity*, 28(6), 790-795.
- Dowda, M., Ainsworth, B. E., Addy, C. L., Saunders, R., & Riner, W. (2001). Environmental influences, physical activity, and weight status in 8-to 16-year-olds. *Archives of Pediatrics & Adolescent Medicine*, 155(6), 711.
- Dragan, A., & Akhtar-Danesh, N. (2007). Relation between body mass index and depression: A structural equation modeling approach. *BMC Medical Research Methodology*, 7(1), 17.
- El Ansari, W., Stock, C., & Mikolajczyk, R. T. (2012). Relationships between food consumption and living arrangements among university students in four european countries-A cross-sectional study. *Nutr J*, 11, 28.
- Esmaily, H., Azimi-Nezhad, M., Ghayour-Mobarhan, M., Parizadeh, M. R., Safarian, M., Parizadeh, M. J. Javad, H. (2009). Association between socioeconomic factors and obesity in iran. *Pakistan Journal of Nutrition*, 8(1), 53-56.
- Esmailzadeh, A., & Azadbakht, L. (2008). Major dietary patterns in relation to general obesity and central adiposity among iranian women. *The Journal of Nutrition*, 138(2), 358-363.
- Esmailzadeh, A., Kimiagar, M., Mehrabi, Y., Azadbakht, L., Hu, F. B., & Willett, W. C. (2007). Dietary patterns and markers of systemic inflammation among iranian women. *The Journal of Nutrition*, 137(4), 992-998.
- Esteghamati, A., Khalilzadeh, O., Rashidi, A., Meysamie, A., Haghazali, M., Asgari, F., Gouya, M. M. (2009). Association between physical activity and insulin resistance in Iranian adults: National surveillance of risk factors of non-communicable diseases (SuRFNCD-2007). *Preventive Medicine*, 49(5), 402-406.
- European Men's Health Forum. (2007). *Obesity in men: A major problem for europe. EMHF fact sheet.*

- Faith, M., Butryn, M., Wadden, T., Fabricatore, A., Nguyen, A., & Heymsfield, S. (2011). Evidence for prospective associations among depression and obesity in population-based studies. *Obesity Reviews*,
- Fang, H., Ali, M. M., & Rizzo, J. A. (2009). Does smoking affect body weight and obesity in china? *Economics & Human Biology*, 7(3), 334-350.
- Ferro-Luzzi, A., & Martino, L. (1996). Obesity and physical activity. *Ciba Foundation Symposium*, , 201 207-227.
- Finkelstein, E., Fiebelkorn, I. C., & Wang, G. (2005). The costs of obesity among full-time employees. *American Journal of Health Promotion*, 20(1), 45-51.
- Firdaus, M., Mathew, M. K., & Wright, J. (2006). Health promotion in older adults: The role of lifestyle in the metabolic syndrome. *Geriatrics*, 61(2), 18-22, 24-5.
- Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *JAMA: The Journal of the American Medical Association*, 303(3), 235-241.
- Flynn, M., McNeil, D., Maloff, B., Mutasingwa, D., Wu, M., Ford, C., & Tough, S. (2006). Reducing obesity and related chronic disease risk in children and youth: A synthesis of evidence with 'best practice' recommendations. *Obesity Reviews*, 7(s1), 7-66.
- Forslund, H. B., Torgerson, J. S., Sjöström, L., & Lindroos, A. (2005). Snacking frequency in relation to energy intake and food choices in obese men and women compared to a reference population. *International Journal of Obesity*, 29(6), 711-719.
- Fox, K. R., Stathi, A., McKenna, J., & Davis, M. G. (2007). Physical activity and mental well-being in older people participating in the better ageing project. *European Journal of Applied Physiology*, 100(5), 591-602.
- Gadalla, T. (2009). Association of obesity with mood and anxiety disorders in the adult general population. *Chronic Diseases in Canada*, 30(1), 29-36.
- Galobardes, B., Lynch, J., & Smith, G. D. (2007). Measuring socioeconomic position in health research. *British Medical Bulletin*, 81-82, 21-37. doi:10.1093/bmb/ldm001
- Galvii, M., Wareham, N., & Rennie, K. (2001). Physical activity patterns in a nationally representative sample of adults in ireland. *Public Health Nutrition*, 4(5A), 1107-1116.
- Gan, W., Mohd, N., Zalilah, M., & Hazizi, A. (2011). Differences in eating behaviours, dietary intake and body weight status between male and female malaysian university students. *Mal J Nutr*, 17(2), 213-228.

- Gao, S. K., Beresford, S. A., Frank, L. L., Schreiner, P. J., Burke, G. L., & Fitzpatrick, A. L. (2008). Modifications to the healthy eating index and its ability to predict obesity: The multi-ethnic study of atherosclerosis. *The American Journal of Clinical Nutrition*, 88(1), 64-69.
- Gavin, A. R., Simon, G. E., & Ludman, E. J. (2010). The association between obesity, depression, and educational attainment in women: The mediating role of body image dissatisfaction. *Journal of Psychosomatic Research*, 69(6), 573-581.
- Gibson, R. S. (2005). *Principles of nutritional assessment* Oxford University Press.
- Gigante, D. P., França, Giovanni Vinícius Araújo de, Sardinha, L. M. V., Iser, B. P. M., & Meléndez, G. V. (2011). Temporal variation in the prevalence of weight and obesity excess in adults: Brazil, 2006 to 2009. *Revista Brasileira De Epidemiologia*, 14, 157-165.
- Glanz, K., Sallis, J. F., Saelens, B. E., & Frank, L. D. (2005). Healthy nutrition environments: Concepts and measures. *American Journal of Health Promotion*, 19(5), 330-333.
- Global adult tobacco survey*. (2011). Malaysia
- Grimm, P. Field Work/Data collection process. *Wiley International Encyclopedia of Marketing*,
- Guedes, D. P., Legnani, R. F. S., & Legnani, E. (2013). Reasons for physical exercise practice in university students according to body mass index. *Revista Brasileira De Atividade Física & Saúde*, 17(4), 270-274.
- Guo, X., Warden, B., Paeratakul, S., & Bray, G. (2004). Healthy eating index and obesity. *European Journal of Clinical Nutrition*, 58(12), 1580-1586.
- Hajian-Tilaki, K., & Heidari, B. (2007). Prevalence of obesity, central obesity and the associated factors in urban population aged 20–70 years, in the north of iran: A population based study and regression approach. *Obesity Reviews*, 8(1), 3-10.
- Hajian-Tilaki, K. O., & Heidari, B. (2010). Association of educational level with risk of obesity and abdominal obesity in iranian adults. *Journal of Public Health (Oxford, England)*, 32(2), 202-209. doi:10.1093/pubmed/fdp083 [doi]
- Hamrik, Z., Sigmundová, D., Kalman, M., Pavelka, J., & Sigmund, E. (2013). Physical activity and sedentary behaviour in czech adults: Results from the GPAQ study. *European Journal of Sport Science*, (ahead-of-print), 1-6.
- Hankin, B. L., & Abramson, L. Y. (2001). Development of gender differences in depression: An elaborated cognitive vulnerability–transactional stress theory. *Psychological Bulletin*, 127(6), 773.
- Haslam, D., & James, W. Obesity lancet 2005; 366: 1197–209. *CrossRef, PubMed, Web of Science® Times Cited*, 782.

- Heo, M., Pietrobelli, A., Fontaine, K. R., Sirey, J. A., & Faith, M. (2005). Depressive mood and obesity in US adults: Comparison and moderation by sex, age, and race. *International Journal of Obesity*, 30(3), 513-519.
- Herrera, H., Rebato, E., Arechabaleta, G., Lagrange, H., Salces, I., & Susanne, C. (2003). Body mass index and energy intake in venezuelan university students. *Nutrition Research*, 23(3), 389-400.
- Herva, A., Laitinen, J., Miettunen, J., Veijola, J., Karvonen, J., Läksy, K., & Joukamaa, M. (2006). Obesity and depression: Results from the longitudinal northern finland 1966 birth cohort study. *International Journal of Obesity*, 30(3), 520-527.
- Hetherington, M. M. (2007). Cues to overeat: Psychological factors influencing overconsumption. *Proceedings of the Nutrition Society*, 66(01), 113-123.
- Hosseini-Esfahani, F., Djazaieri, S., Mirmiran, P., Mehrabi, Y., & Azizi, F. (2012). Which food patterns are predictors of obesity in tehranian adults? *Journal of Nutrition Education and Behavior*, 44(6), 564-573.
- Huang, T. T. K., Harris, K. J., Lee, R. E., Nazir, N., Born, W., & Kaur, H. (2003). Assessing overweight, obesity, diet, and physical activity in college students. *Journal of American College Health*, 52(2), 83-86.
- Huda, N., & Ahmad, R. (2010). Preliminary survey on nutritional status among university students at malaysia. *Pakistan Journal of Nutrition*, 9(2), 125-127.
- Institute of Medicine (US). Panel on Macronutrients, & Institute of Medicine (US). Standing Committee on the Scientific Evaluation of Dietary Reference Intakes. (2005). *Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids* Natl Academy Pr.
- Jayawardena, R., Swaminathan, S., Byrne, N. M., Soares, M. J., Katulanda, P., & Hills, A. P. (2012). Development of a food frequency questionnaire for sri lankan adults. *Nutr J*, 11(1), 63.
- Jeffery, R. W., & Rick, A. M. (2002). Cross-sectional and longitudinal associations between body mass index and marriage-related factors. *Obesity Research*, 10(8), 809-815.
- Jeffery, R. W., & Utter, J. (2003). The changing environment and population obesity in the united states. *Obesity Research*, 11(S10), 12S-22S.
- Jensen, M. D., Ryan, D. H., Hu, F. B., Stevens, F. J., Hubbard, V. S., Stevens, V. J., Wolfe, B. M. (2013). 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults.
- John, U., Meyer, C., Rumpf, H. J., & Hapke, U. (2005). Relationships of psychiatric disorders with overweight and obesity in an adult general Population. *Obesity*, 13(1), 101-109.

- Jolliffe, D. (2011). Overweight and poor? on the relationship between income and the body mass index. *Economics & Human Biology*, 9(4), 342-355.
- Jones-Smith, J. C., Gordon-Larsen, P., Siddiqi, A., & Popkin, B. M. (2011). Cross-national comparisons of time trends in overweight inequality by socioeconomic status among women using repeated cross-sectional surveys from 37 developing countries, 1989-2007. *American Journal of Epidemiology*, 173(6), 667-675.
- Jorm, A. F., Korten, A. E., Christensen, H., Jacomb, P. A., Rodgers, B., & Parslow, R. A. (2003). Association of obesity with anxiety, depression and emotional well-being: A community survey. *Australian and New Zealand Journal of Public Health*, 27(4), 434-440.
- Kant, A. K., Andon, M. B., Angelopoulos, T. J., & Rippe, J. M. (2008). Association of breakfast energy density with diet quality and body mass index in american adults: National health and nutrition examination surveys, 1999-2004. *The American Journal of Clinical Nutrition*, 88(5), 1396-1404.
- Kaphingst, K. A., Bennett, G. G., Sorensen, G., Kaphingst, K. M., O'Neil, A. E., & McInnis, K. (2007). Body mass index, physical activity, and dietary behaviors among members of an urban community fitness center: A questionnaire survey. *BMC Public Health*, 7(1), 181.
- Katon, W., & Ciechanowski, P. (2002). Impact of major depression on chronic medical illness. *Journal of Psychosomatic Research*, 53(4), 859-864.
- Kaufman, A., Augustson, E. M., & Patrick, H. (2012). Unraveling the relationship between smoking and weight: The role of sedentary behavior. *Journal of Obesity*, 2012, 735465.
- Kelishadi, R., Alikhani, S., Delavari, A., Alaedini, F., Safaie, A., & Hojatzadeh, E. (2008). Obesity and associated lifestyle behaviours in iran: Findings from the first national non-communicable disease risk factor surveillance survey. *Public Health Nutrition*, 11(03), 246-251.
- Kerver, J. M., Yang, E. J., Obayashi, S., Bianchi, L., & Song, W. O. (2006). Meal and snack patterns are associated with dietary intake of energy and nutrients in US adults. *Journal of the American Dietetic Association*, 106(1), 46-53.
- Keski-Rahkonen, A., Kaprio, J., Rissanen, A., Virkkunen, M., & Rose, R. J. (2003). Breakfast skipping and health-compromising behaviors in adolescents and adults. *European Journal of Clinical Nutrition*, 57(7), 842-853.
- Kessler, D. A. (2010). *The end of overeating: Taking control of the insatiable american appetite* Rodale.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R., Wang, P. S. (2003). The epidemiology of major depressive disorder: Results from the national comorbidity survey replication (NCS-R). *Jama*, 289(23), 3095-3105.

- Kessler, R. C., Merikangas, K. R., & Wang, P. S. (2007). Prevalence, comorbidity, and service utilization for mood disorders in the United States at the beginning of the twenty-first century. *Annu. Rev. Clin. Psychol.*, 3, 137-158.
- Khambalia, A., & Seen, L. (2010). Trends in overweight and obese adults in Malaysia (1996–2009): A systematic review. *Obesity Reviews*, 11(6), 403-412.
- Khor, G. L., Zalilah, M. S., Phan, Y. Y., Ang, M., Maznah, B., & Norimah, A. K. (2009). Perceptions of body image among Malaysian male and female adolescents. *Singapore Medical Journal*, 50(3), 303-311.
- Kim, J., Lee, J. E., & Jung, I. (2012). Dietary pattern classifications and the association with general obesity and abdominal obesity in Korean women. *Journal of the Academy of Nutrition and Dietetics*, 112(10), 1550-1559.
- King, K. A., Mohl, K., Bernard, A. L., & Vidourek, R. A. (2007). Does involvement in healthy eating among university students differ based on exercise status and reasons for exercise. *Californian Journal of Health Promotion*, 5(3), 106-119.
- Kjøllestad, M. R., Holmboe-Ottesen, G., Mosdøl, A., & Wandel, M. (2010). The relative importance of socioeconomic indicators in explaining differences in BMI and waist: Hip ratio, and the mediating effect of work control, dietary patterns and physical activity. *British Journal of Nutrition*, 104(08), 1230-1240.
- Ko, M. (2007). The comparison in daily intake of nutrients, dietary habits and body composition of female college students by body mass index. *Nutrition Research and Practice*, 1(2), 131-142.
- Kremmyda, L. S., Papadaki, A., Hondros, G., Kapsokefalou, M., & Scott, J. A. (2008). Differentiating between the effect of rapid dietary acculturation and the effect of living away from home for the first time, on the diets of Greek students studying in Glasgow. *Appetite*, 50(2), 455-463.
- Kuan, P., Ho, H., Shuhaili, M., Siti, A., & Gudum, H. (2011). Gender differences in body mass index, body weight perception and weight loss strategies among undergraduates in Universiti Malaysia Sarawak. *Malaysian Journal of Nutrition*, 17(1).
- Lasserre, A. M., Chiolero, A., Paccaud, F., & Bovet, P. (2007). Worldwide trends in childhood obesity. *Swiss Medical Weekly*, 137(9/10), 157.
- Lavie, C. J., De Schutter, A., Patel, D., Artham, S. M., & Milani, R. V. (2011). Body composition and coronary heart disease mortality—An obesity or a lean paradox? *Mayo Clinic Proceedings*, 86(9), 857.
- Lavie, C. J., & Ventura, H. O. (2011). Weighing in on obesity and the obesity paradox in heart failure. *Journal of Cardiac Failure*, 17(5), 381-383.

- Leyfer, O. T., Ruberg, J. L., & Woodruff-Borden, J. (2006). Examination of the utility of the beck anxiety inventory and its factors as a screener for anxiety disorders. *Journal of Anxiety Disorders*, 20(4), 444-458.
- Lissner, L., & Heitmann, B. L. (1995). Dietary fat and obesity: Evidence from epidemiology. *European Journal of Clinical Nutrition*, 49(2), 79-90.
- Liu, C., Xie, B., Chou, C., Koprowski, C., Zhou, D., Palmer, P., . . . Sun, X. (2007). Perceived stress, depression and food consumption frequency in the college students of china seven cities. *Physiology & Behavior*, 92(4), 748-754.
- Lopez, K. N., & Knudson, J. D. (2012). Obesity: From the agricultural revolution to the contemporary pediatric epidemic. *Congenital Heart Disease*.
- Luppino, F. S., de Wit, L. M., Bouvy, P. F., Stijnen, T., Cuijpers, P., Penninx, B. W., & Zitman, F. G. (2010). Overweight, obesity, and depression: A systematic review and meta-analysis of longitudinal studies. *Archives of General Psychiatry*, 67(3), 220.
- Lykouras, L., & Michopoulos, J. (2011). Anxiety disorders and obesity. *Psychiatrike*, 22(4), 307-313.
- Lyles III, T. E., Desmond, R., Faulk, L. E., Henson, S., Hubbert, K., Heimburger, D. C., & Ard, J. D. (2006). Diet variety based on macronutrient intake and its relationship with body mass index. *Medical General Medicine*, 8(3), 39.
- Ma, J., & Xiao, L. (2009). Obesity and depression in US women: Results from the 2005–2006 national health and nutritional examination survey. *Obesity*, 18(2), 347-353.
- Ma, J., & Xiao, L. (2010). Obesity and depression in US women: Results from the 2005–2006 national health and nutritional examination survey. *Obesity*, 18(2), 347-353.
- Mahmood, S., Perveen, T., Najjad, M., Yousuf, N., Ahmed, F., & Ali, N. (2013). Overweight and obesity among medical students of public sector's institutes on karachi. *Pakistan.J.Obes.Wt.Loss Ther*, 3(1), 157.
- Mama, S. K. (2009). *The relationship between body image and physical activity in african american women* ProQuest.
- Margetts, B. M., & Nelson, M. (1997). *Design concepts in nutritional epidemiology* Oxford University Press.
- Maskarinec, G., Novotny, R., & Tasaki, K. (2000). Dietary patterns are associated with body mass index in multiethnic women. *The Journal of Nutrition*, 130(12), 3068-3072.

- Mattisson, I., Wirfält, E., Gullberg, B., & Berglund, G. (2001). Fat intake is more strongly associated with lifestyle factors than with socio-economic characteristics, regardless of energy adjustment approach. *European Journal of Clinical Nutrition*, 55(6), 452-461.
- McClain, A. D., Chappuis, C., Nguyen-Rodriguez, S. T., Yaroch, A. L., & Spruijt-Metz, D. (2009). International journal of behavioral nutrition and physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, 6, 54.
- McLaren, L. (2007). Socioeconomic status and obesity. *Epidemiologic Reviews*, 29, 29-48.
- Mehta, N. K., & Chang, V. W. (2011). Secular declines in the association between obesity and mortality in the united states. *Population and Development Review*, 37(3), 435-451.
- Mehta, N., & Preston, S. (2012). Continued increases in the relative risk of death from smoking. *American Journal of Public Health*, 102(11), 2181-2186.
- Millen, B. E., Pencina, M. J., Kimokoti, R. W., Zhu, L., Meigs, J. B., Ordovas, J. M., & D'Agostino, R. B. (2006). Nutritional risk and the metabolic syndrome in women: Opportunities for preventive intervention from the framingham nutrition study. *The American Journal of Clinical Nutrition*, 84(2), 434-441.
- Mirmiran, P., Azadbakht, L., & Azizi, F. (2005). Dietary quality-adherence to the dietary guidelines in tehranian adolescents: Tehran lipid and glucose study. *International Journal for Vitamin and Nutrition Research*, 75(3), 195-200.
- Mirmiran, P., Esmailzadeh, A., & Azizi, F. (2006). Diet composition and body mass index in tehranian adults. *Asia Pacific Journal of Clinical Nutrition*, 15(2), 224.
- Mirnalini, K., Zalilah, M., Safiah, M., & Tahir, A. MD. haslinda et al. (2008). energy and nutrient intakes: Findings from the malaysian adult nutrition survey (MANS). malaysian. *J.Nutr*, 14, 1-24.
- Mishra, G., McNaughton, S., Bramwell, G., & Wadsworth, M. (2006). Longitudinal changes in dietary patterns during adult life. *British Journal of Nutrition*, 96(04), 735-744.
- Mohammad, K. (2000). Changes observed in the pattern of smoking in iran during 1991. *Ournal, Hakim* 197, 290.
- Mohamud, W., Musa, K. I., Khir, A., Ismail, A., Ismail, I. S., Kadir, K. A., . . . Ali, O. (2011). Prevalence of overweight and obesity among adult malaysians: An update. *Asia Pac J Clin Nutr*, 20(1), 35-41.
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2005). Correction: Actual causes of death in the united states, 2000. *Jama*, 293(3), 293-298.

- Moy, F., Surin, J., Ismail, Y., Mahad, R., Tie, F., & Wan Ismail, W. (2009). Breakfast skipping and its associated factors among undergraduates in a public university in kuala lumpur. *Malaysian Journal of Nutrition*, 15(2), 165-174.
- Murakami, K., Sasaki, S., Okubo, H., Takahashi, Y., Hosoi, Y., & Itabashi, M. (2007). Dietary fiber intake, dietary glycemic index and load, and body mass index: A cross-sectional study of 3931 japanese women aged 18–20 years. *European Journal of Clinical Nutrition*, 61(8), 986-995.
- Murtaugh, M. A., Herrick, J. S., Sweeney, C., Baumgartner, K. B., Guiliano, A. R., Byers, T., & Slattery, M. L. (2007). Diet composition and risk of overweight and obesity in women living in the southwestern united states. *Journal of the American Dietetic Association*, 107(8), 1311-1321.
- Musaiger, A. O., Bader, Z., Al-Roomi, K., & D'Souza, R. (2011). Dietary and lifestyle habits amongst adolescents in bahrain. *Food & Nutrition Research*, 55, 10.3402/fnr.v55i0.7122. Epub 2011 Sep 9.
- Nair, M., Paul, M. K., & John, R. (2004). Prevalence of depression among adolescents. *The Indian Journal of Pediatrics*, 71(6), 523-524.
- Nakhaee, N., Divsalar, K., & Bahreinifar, S. (2011). Prevalence of and factors associated with cigarette smoking among university students: A study from iran. *Asia-Pacific Journal of Public Health / Asia-Pacific Academic Consortium for Public Health*, 23(2), 151-156. doi:10.1177/1010539509338730; 10.1177/1010539509338730
- National Obesity Observatory.(2009). *Body mass index as a measure of obesity*. ()
- Nazemi, S., & Chaman, R. (2012). Prevalence of smoking among universities students of shahroud in 2010. *Open Journal of Preventive Medicine*, 2(2), 235-239.
- Newby, P. K., Muller, D., Hallfrisch, J., Andres, R., & Tucker, K. L. (2004). Food patterns measured by factor analysis and anthropometric changes in adults. *The American Journal of Clinical Nutrition*, 80(2), 504-513.
- Newby, P. K., Muller, D., Hallfrisch, J., Qiao, N., Andres, R., & Tucker, K. L. (2003). Dietary patterns and changes in body mass index and waist circumference in adults. *The American Journal of Clinical Nutrition*, 77(6), 1417-1425.
- Nojomi, M., & Najamabadi, S. (2006). Obesity among university students, tehran, iran. *Asia Pacific Journal of Clinical Nutrition*, 15(4), 516.
- Novotny, R., Daida, Y. G., Acharya, S., Grove, J. S., & Vogt, T. M. (2004). Dairy intake is associated with lower body fat and soda intake with greater weight in adolescent girls. *The Journal of Nutrition*, 134(8), 1905-1909.

- Obesity and overweight. (2013). Retrieved Retrieved from <http://www.who.int/mediacentre/factsheets/fs311/en>.
- Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the united states, 1999-2004. *JAMA: The Journal of the American Medical Association*, 295(13), 1549-1555.
- Ogden, C. L., Yanovski, S. Z., Carroll, M. D., & Flegal, K. M. (2007).The epidemiology of obesity.*Gastroenterology*, 132(6), 2087.
- Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2012).Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *Jama*, 307(5), 483-490.
- Oguntibeju, O., Orisatoki, R., & Truter, E. (2010). The relationship between body mass index and physical activities among medical students in saint lucia. *Pakistan Journal of Medical Sciences*, 26(4), 827-831.
- Okubo, H., Sasaki, S., Murakami, K., Kim, M., Takahashi, Y., Hosoi, Y., & Itabashi, M. (2008). Three major dietary patterns are all independently related to the risk of obesity among 3760 japanese women aged 18–20 years. *International Journal of Obesity*, 32(3), 541-549.
- Onyike, C. U., Crum, R. M., Lee, H. B., Lyketsos, C. G., & Eaton, W. W. (2003). Is obesity associated with major depression? results from the third national health and nutrition examination survey. *American Journal of Epidemiology*, 158(12), 1139-1147.
- Oza, S., Thun, M. J., Henley, S. J., Lopez, A. D., & Ezzati, M. (2011). How many deaths are attributable to smoking in the united states? comparison of methods for estimating smoking-attributable mortality when smoking prevalence changes. *Preventive Medicine*, 52(6), 428-433.
- Palmer, M. A., Capra, S., & Baines, S. K. (2009). Association between eating frequency, weight, and health. *Nutrition Reviews*, 67(7), 379-390.
- Pantic, I., Malbasa, M., Ristic, S., Turjacanin, D., Medenica, S., Paunovic, J., & Pantic, S. (2011). Screen viewing, body mass index, cigarette smoking and sleep duration in belgrade university student population: Results of an observational, cross-sectional study. *Rev Méd Chile*, 139(7), 896-901.
- Papadaki, A., Hondros, G., A Scott, J., & Kapsokefalou, M. (2007). Eating habits of university students living at, or away from home in greece. *Appetite*, 49(1), 169-176.
- Paradis, A., Godin, G., Perusse, L., & Vohl, M. (2009).Associations between dietary patterns and obesity phenotypes. *International Journal of Obesity*, 33(12), 1419-1426.

- Park, S. Y., Murphy, S. P., Wilkens, L. R., Yamamoto, J. F., Sharma, S., Hankin, J. H., . . . Kolonel, L. N. (2005). Dietary patterns using the food guide pyramid groups are associated with sociodemographic and lifestyle factors: The multiethnic cohort study. *The Journal of Nutrition*, 135(4), 843-849.
- Peixoto, Maria do Rosário Gondim, Benício, M. H. D., & Jardim, Paulo César Brandão Veiga. (2007). The relationship between body mass index and lifestyle in a brazilian adult population: A cross-sectional survey. *Cadernos De Saúde Pública*, 23(11), 2694-2740.
- Piernas, C., & Popkin, B. M. (2010). Snacking increased among U.S. adults between 1977 and 2006. *The Journal of Nutrition*, 140(2), 325-332.
- Pikhart, H., Bobak, M., Malyutina, S., Pajak, A., Kubinova, R., & Marmot, M. (2007). Obesity and education in three countries of the central and eastern europe: The HAPIEE study. *Central European Journal of Public Health*, 15(4), 140.
- Popkin, B. M. (2009). *The world is fat: The fads, trends, policies, and products that are fattening the human race* Penguin.
- Popkin, B. M., Zizza, C., & Siega-Riz, A. M. (2003). Who is leading the change?: US dietary quality comparison between 1965 and 1996. *American Journal of Preventive Medicine*, 25(1), 1-8.
- Pouliou, T., & Elliott, S. J. (2010). Individual and socio-environmental determinants of overweight and obesity in urban canada. *Health & Place*, 12(2), 389.
- Pryer, J. A., Vrijheid, M., Nichols, R., Kiggins, M., & Elliott, P. (1997). Who are the 'low energy reporters' in the dietary and nutritional survey of british adults? *International Journal of Epidemiology*, 26(1), 146-154.
- Puhl, R., Peterson, J., & Luedicke, J. (2012). Fighting obesity or obese persons? public perceptions of obesity-related health messages. *Int J Obesity*,
- Qian, Y., & Fan, J. G. (2005). Obesity, fatty liver and liver cancer. *Hepatobiliary Pancreat Dis Int*, 4(2), 173-177.
- Rajabizadeh, G., Ramezani, M. A., Roohafza, H., Pourdanghan, N., Khosravi, A., Rabiei, K., Zarfeshani, S. (2011). Association between cigarette smoking and socio-demographics, lifestyle and mental health factors in a sampled iranian population. *Southeast Asian Journal of Tropical Medicine and Public Health*, 42(4), 977.
- Rashidi, A., Mohammadpour-Ahramjani, B., Vafa, M., & Karandish, M. (2005). Prevalence of obesity in iran. *Obesity Reviews*, 6(3), 191-192.
- Reilly, J. J. (2007). Childhood obesity: An overview. *Children & Society*, 21(5), 390-396.

- Rezazadeh, A., Rashidkhani, B., & Omidvar, N. (2010). Association of major dietary patterns with socioeconomic and lifestyle factors of adult women living in tehran, iran. *Nutrition*, 26(3), 337-341.
- Rivenes, A. C., Harvey, S. B., & Mykletun, A. (2009). The relationship between abdominal fat, obesity, and common mental disorders: Results from the HUNT study. *Journal of Psychosomatic Research*, 66(4), 269-275.
- Saarni, S. E., Pietilainen, K., Kantonen, S., Rissanen, A., & Kaprio, J. (2009). Association of smoking in adolescence with abdominal obesity in adulthood: A follow-up study of 5 birth cohorts of finnish twins. *American Journal of Public Health*, 99(2), 348-354. doi:10.2105/AJPH.2007.123851; 10.2105/AJPH.2007.123851
- Safarian, M., Shojaezadeh, M., Ghayour-Mobarhan, M., Esmaeily, H., Nemati, M., Razavi, A. (October, 2013). Investigation of dietary patterns, healthy eating index and traditional risk factors of cardiovascular disease in 35-65 years old adults of mashhad. *Medical Journal of Mashhad University of Medical Sciences*, 56(4), 226-235.
- Şahin, H., Çiçek, B., Yılmaz, M., Ongan, D., İnanç, N., Aykut, M., & Elmali, F. (2011). Obesity prevalence, waist-to-height ratio and associated factors in adult turkish males. *Obesity Research & Clinical Practice*, 5(1), e29-e35.
- Said, S. M., & Ismail, S. (2014). Prevalence and factors associated with overweight and obesity among malaysian post graduate students in a public university. *International Journal of Public Health and Clinical Sciences*, 1(1), 131-140.
- Sakamaki, R., Toyama, K., Amamoto, R., Liu, C., & Shinfuku, N. (2005). Nutritional knowledge, food habits and health attitude of chinese university students—a cross sectional study—. *Nutrition Journal*, 4(1), 4.
- Sanigorski, A. M., Bell, A. C., Kremer, P. J., & Swinburn, B. A. (2007). High childhood obesity in an australian population. *Obesity*, 15(8), 1908-1912.
- Sanlier, N., & Unusan, N. (2007). Dietary habits and body composition of turkish university students. *Pakistan J Nutr*, 6(4), 332-338.
- Sarokhani, D., Delpisheh, A., Veisani, Y., Sarokhani, M. T., Esmaelimanesh, R., & Sayehmiri, K. (2013). Prevalence of depression among university students: A systematic review and meta-analysis study. *Depression Research and Treatment*, 2013.
- Šatalic, Z., Colic Baric, I., & Keser, I. (2007). Diet quality in croatian university students: Energy, macronutrient and micronutrient intakes according to gender. *International Journal of Food Sciences and Nutrition*, 58(5), 398-410.
- Shaneshin, M., Rashidkhani, B., & Rabiei, S. (2012). Accuracy of energy intake reporting: Comparison of energy intake and resting metabolic rate and their relation to anthropometric and sociodemographic factors among iranian women. *Archives of Iranian Medicine*, 15(11), 681-687.

- Shimazu, T., Kuriyama, S., Hozawa, A., Ohmori, K., Sato, Y., Nakaya, N., . . . Tsuji, I. (2007). Dietary patterns and cardiovascular disease mortality in japan: A prospective cohort study. *International Journal of Epidemiology*, 36(3), 600-609.
- Sidik, S. M., & Rampal, L. (2009). The prevalence and factors associated with obesity among adult women in selangor, malaysia. *Asia Pacific Family Medicine*, 8(1), 1-6.
- Silva, M., Laet, C., Nusselder, W. J., Mamun, A. A., & Peeters, A. (2012). Adult obesity and number of years lived with and without cardiovascular disease. *Obesity*, 14(7), 1264-1273.
- Simon, G. E., Rohde, P., Ludman, E. J., Jeffery, R. W., Linde, J. A., Operskalski, B. H., & Arterburn, D. (2010). Association between change in depression and change in weight among women enrolled in weight loss treatment. *General Hospital Psychiatry*, 32(6), 583-589.
- Simon, G. E., Von Korff, M., Saunders, K., Miglioretti, D. L., Crane, P. K., van Belle, G., & Kessler, R. C. (2006). Association between obesity and psychiatric disorders in the US adult population. *Archives of General Psychiatry*, 63(7), 824.
- Singh, G. K., Kogan, M. D., Siahpush, M., & van Dyck, P. C. (2008). Independent and joint effects of socioeconomic, behavioral, and neighborhood characteristics on physical inactivity and activity levels among US children and adolescents. *Journal of Community Health*, 33(4), 206-216.
- Singh, G. K., Siahpush, M., Hiatt, R. A., & Timsina, L. R. (2011). Dramatic increases in obesity and overweight prevalence and body mass index among ethnic-immigrant and social class groups in the united states, 1976–2008. *Journal of Community Health*, 36(1), 94-110.
- Slattery, M. L., Sweeney, C., Edwards, S., Herrick, J., Murtaugh, M., Baumgartner, K., . . . Byers, T. (2006). Physical activity patterns and obesity in hispanic and non-hispanic white women. *Medicine and Science in Sports and Exercise*, 38(1), 33-41.
- Smith, K. V., & Goldman, N. (2007). Socioeconomic differences in health among older adults in mexico. *Social Science & Medicine*, 65(7), 1372-1385.
- Sneve, M., & Jorde, R. (2008). Cross-sectional study on the relationship between body mass index and smoking, and longitudinal changes in body mass index in relation to change in smoking status: The tromso study. *Scandinavian Journal of Public Health*, 36(4), 397-407.
- Soriano, J., Moltó, J., & Manes, J. (2000). Dietary intake and food pattern among university students. *Nutrition Research*, 20(9), 1249-1258.

- Sousa, T. F. d., Nahas, M. V., Silva, D. A. S., Del Duca, G. F., & Peres, M. A. (2011). Factors associated with central obesity in adults from florianópolis, santa catarina: A population based-study. *Revista Brasileira De Epidemiologia*, 14(2), 296-309.
- Stephoe, A., Tsuda, A., & Tanaka, Y. (2007). Depressive symptoms, socio-economic background, sense of control, and cultural factors in university students from 23 countries. *International Journal of Behavioral Medicine*, 14(2), 97-107.
- Stunkard, A. J., Faith, M. S., & Allison, K. C. (2003). Depression and obesity. *Biological Psychiatry*, 54(3), 330-337.
- Sue Kedgley, C. (2007). *Inquiry into obesity and type 2 diabetes in new zealand* Report of the Health Committee.
- Suleiman, A. A., Alboqai, O. K., Yasein, N., El-Qudah, J. M., Bataineh, M. F., & Obeidat, B. A. (2009). Prevalence of and factors associated with overweight and obesity among jordan university students. *Journal of Biological Sciences*, 9(7), 738-745.
- Swinburn, B., Caterson, I., Seidell, J., & James, W. (2004). Diet, nutrition and the prevention of excess weight gain and obesity. *Public Health Nutrition*, 7(1A; SPI), 123-146.
- Tanaka, M., Mizuno, K., Fukuda, S., Shigihara, Y., & Watanabe, Y. (2008). Relationships between dietary habits and the prevalence of fatigue in medical students. *Nutrition*, 24(10), 985-989.
- Tavassoli, A. A., Gharipour, M., Khosravi, A., Kelishadi, R., Siadat, Z. D., Bahonar, A., . . . Sajjadi, F. (2010). Gender differences in obesogenic behaviour, socioeconomic and metabolic factors in a population-based sample of iranians: The IHHP study. *Journal of Health, Population, and Nutrition*, 28(6), 602.
- The NHS Information Centre, Lifestyles Statistics. (2011). *Statistics on obesity, physical activity and diet: England, 2011*.
- The NHS Information Centre, Lifestyles Statistics. (2010). *Statistics on obesity, physical activity and diet*. Englaand, 2010.
- Thompson, F. E., & Subar, A. F. (2008). Dietary assessment methodology. *Nutrition in the Prevention and Treatment of Disease*, 2, 3-39.
- Timlin, M. T., & Pereira, M. A. (2007). Breakfast frequency and quality in the etiology of adult obesity and chronic diseases. *Nutrition Reviews*, 65(6), 268-281.
- Trichopoulou, A., Gnardellis, C., Benetou, V., Lagiou, P., Bamia, C., & Trichopoulos, D. (2002). Lipid, protein and carbohydrate intake in relation to body mass index. *European Journal of Clinical Nutrition*, 56(1), 37-43.

- Tucker, K. L., Chen, H., Hannan, M. T., Cupples, L. A., Wilson, P. W., Felson, D., & Kiel, D. P. (2002). Bone mineral density and dietary patterns in older adults: The framingham osteoporosis study. *The American Journal of Clinical Nutrition*, 76(1), 245-252.
- Tufano, A., Marzo, P., Enrini, R., Morricone, L., Caviezel, F., & Ambrosi, B. (2004). Anthropometric, hormonal and biochemical differences in lean and obese women before and after menopause. *Journal of Endocrinological Investigation*, 27(7), 648-653.
- Tzotzas, T., Vlahavas, G., Papadopoulou, S., Kapantais, E., Kaklamanou, D., & Hassapidou, M. (2010). Marital status and educational level associated to obesity in greek adults: Data from the national epidemiological survey. *BMC Public Health*, 10(1), 732.
- US Department of Health and Human Services, & US Department of Health and Human Services. (2008). Physical activity guidelines for americans.
- Van Belle, G. (2011). *Statistical rules of thumb* John Wiley & Sons.
- Van Reedt Dortland, A., Giltay, E., Van Veen, T., Zitman, F., & Penninx, B. (2010). Metabolic syndrome abnormalities are associated with severity of anxiety and depression and with tricyclic antidepressant use. *Acta Psychiatrica Scandinavica*, 122(1), 30-39.
- Vanheule, S., Desmet, M., Groenvynck, H., Rosseel, Y., & Fontaine, J. (2008). The factor structure of the beck depression inventory-II: An evaluation. *Assessment*, 15(2), 177-187.
- Vartiainen, E., Laatikainen, T., Peltonen, M., Juolevi, A., Männistö, S., Sundvall, J., . . . Puska, P. (2010). Thirty-five-year trends in cardiovascular risk factors in finland. *International Journal of Epidemiology*, 39(2), 504-518.
- Vasheghani-Farahani, A., Tahmasbi, M., Asheri, H., Ashraf, H., Nedjat, S., & Kordi, R. (2011). The persian, last 7-day, long form of the international physical activity questionnaire: Translation and validation study. *Asian Journal of Sports Medicine*, 2(2), 106-116.
- Veldheer, S., Yingst, J., Foulds, G., Hrabovsky, S., Berg, A., Sciamanna, C., & Foulds, J. (2014). Once bitten, twice shy: Concern about gaining weight after smoking cessation and its association with seeking treatment. *International Journal of Clinical Practice*, 68(3), 388-395.
- Von Bothmer, M. I. K., & Fridlund, B. (2005). Gender differences in health habits and in motivation for a healthy lifestyle among swedish university students. *Nursing & Health Sciences*, 7(2), 107-118.

- Voorhees, C. C., Catellier, D. J., Ashwood, J. S., Cohen, D. A., Rung, A., Lytle, L., . . . Dowda, M. (2009). Neighborhood socioeconomic status and non school physical activity and body mass index in adolescent girls. *Journal of Physical Activity & Health*, 6(6), 731-740.
- Wade, T. J., Cairney, J., & Pevalin, D. J. (2002). Emergence of gender differences in depression during adolescence: National panel results from three countries. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41(2), 190-198.
- Wang, Y., & Beydoun, M. A. (2007). The obesity epidemic in the united States—gender, age, socioeconomic, racial/ethnic, and geographic characteristics: A systematic review and meta-regression analysis. *Epidemiologic Reviews*, 29(1), 6-28.
- Wang, Y., Beydoun, M. A., Liang, L., Caballero, B., & Kumanyika, S. K. (2008). Will all americans become overweight or obese? estimating the progression and cost of the US obesity epidemic. *Obesity*, 16(10), 2323-2330.
- Wan Mohamud, W. N., Musa, K. I., Md Khir, A. S., Ismail, A. a., Ismail, I. S., Kadir, K. A., . . . Ali, O. (2011). Prevalence of overweight and obesity among adult malaysians: An update. *Asia Pacific Journal of Clinical Nutrition*, 20(1), 35.
- Wardle, J., & Cooke, L. (2005). The impact of obesity on psychological well-being. *Best Practice & Research Clinical Endocrinology & Metabolism*, 19(3), 421-440.
- Warren, C. W., Riley, L., Asma, S., Eriksen, M. P., Green, L., Blanton, C., . . . Yach, D. (2000). Tobacco use by youth: A surveillance report from the global youth tobacco survey project. *Bulletin of the World Health Organization*, 78(7), 868-876.
- WHO, & Regional Office for the Western Pacific. (2010). Noncommunicable disease risk factors and socioeconomic inequalities - what are the links? A multicountry analysis of noncommunicable disease surveillance data. Retrieved Retrieved from <http://www.wpro.who.int/publications/docs/WHOSSEFINALforupload.pdf>
- Willett, W. (2012). *Nutritional epidemiology* Oxford University Press.
- Wilson, S., Gallivan, A., Kratzke, C., & Amatya, A. (2012). Nutritional status and socio-ecological factors associated with overweight/obesity at a rural-serving US-mexico border university. *Rural & Remote Health*, 12(4)
- Wolongevicz, D. M., Zhu, L., Pencina, M. J., Kimokoti, R. W., Newby, P. K., D'Agostino, R. B., & Millen, B. E. (2010). An obesity dietary quality index predicts abdominal obesity in women: Potential opportunity for new prevention and treatment paradigms. *Journal of Obesity*, 2010, 10.1155/2010/945987. Epub 2010 Jan 5.

- World Cancer Research Fund / American Institute for Cancer Research. (2007). *Food, nutrition, physical activity, and the prevention of cancer: A global perspective.* (). 1759 R St. NW, Washington, DC 20009: The American Institute for Cancer Research.
- World health organisation (2006) "BMI classifications". (2006). Retrieved Retrieved from http://www.who.int/bmi/index.jsp?introPage=intro_3.html
- World Health Organization. (2000). *Obesity: Preventing and managing the global epidemic* World Health Organization.
- World Health Organization.(2013). BMI classification. 2010. Available Fro m <Http://www.Who.int/features/factfiles/obesity/facts/en/.Accessed,27>. World Health Organization.(2011). (2011).*Mental health: Depression.*
- Xu, Q., Anderson, D., & Lurie-Beck, J. (2011). The relationship between abdominal obesity and depression in the general population: A systematic review and meta-analysis.*Obesity Research & Clinical Practice*, 5(4), e267-e278.
- Yahia, N., Achkar, A., Abdallah, A., & Rizk, S. (2008). Eating habits and obesity among lebanese university students. *Nutr J*, 7(32), 1-9.
- Yang, E. J., Kerver, J. M., & Song, W. O. (2005). Dietary patterns of korean americans described by factor analysis. *Journal of the American College of Nutrition*, 24(2), 115-121.
- Yates, D., Moore, D., Daren, S., & Starnes, D. (2008). *The practice of statistics*, bedford.
- Yegenoglu, S., Aslan, D., Erdener, S. E., Acar, A., & Bilir, N. (2006). What is behind smoking among pharmacy students: A quantitative and qualitative study from turkey.*Substance use & Misuse*, 41(3), 405-414.
- Zarei, M., Taib, M., Nasir, M., & Zarei, F. (2013). Lifestyle factors and dietary intake of iranian postgraduate students in universiti putra malaysia (UPM). *Electronic Physician*, 5.
- Zarei, M., Huang, M., Taib, M. N. M., & Zarei, F. (2014). Nutritional status of adolescents attending the iranian secondary school in kuala lumpur, malaysia. *Global Journal of Health Science*, 6(6), p185.
- Zhang, Q., & Wang, Y. (2004). Trends in the association between obesity and socioeconomic status in US adults: 1971 to 2000. *Obesity Research*, 12(10), 1622-1632.
- Zhao, W., Zhai, Y., Hu, J., Wang, J., Yang, Z., Kong, L., & Chen, C. (2008). Economic burden of obesity-related chronic diseases in Mainland China. *Obesity Reviews*, 9(s1).