



UNIVERSITI PUTRA MALAYSIA

***FACTORS ASSOCIATED WITH OVERWEIGHT AND OBESITY
AMONG POSTGRADUATE AFRICAN STUDENTS IN UPM, 2017***

NURA TUKUR

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**FACTORS ASSOCIATED WITH OVERWEIGHT AND OBESITY
AMONG POSTGRADUATE AFRICAN STUDENTS IN UPM, 2017**

By

NURA TUKUR

**Dissertation Submitted to the Department of Community Health , Faculty of
Medicine and Health Sciences, Universiti Putra Malaysia in Fulfillment of the
Requirements for the Degree of Master of Public Health**

August 2017

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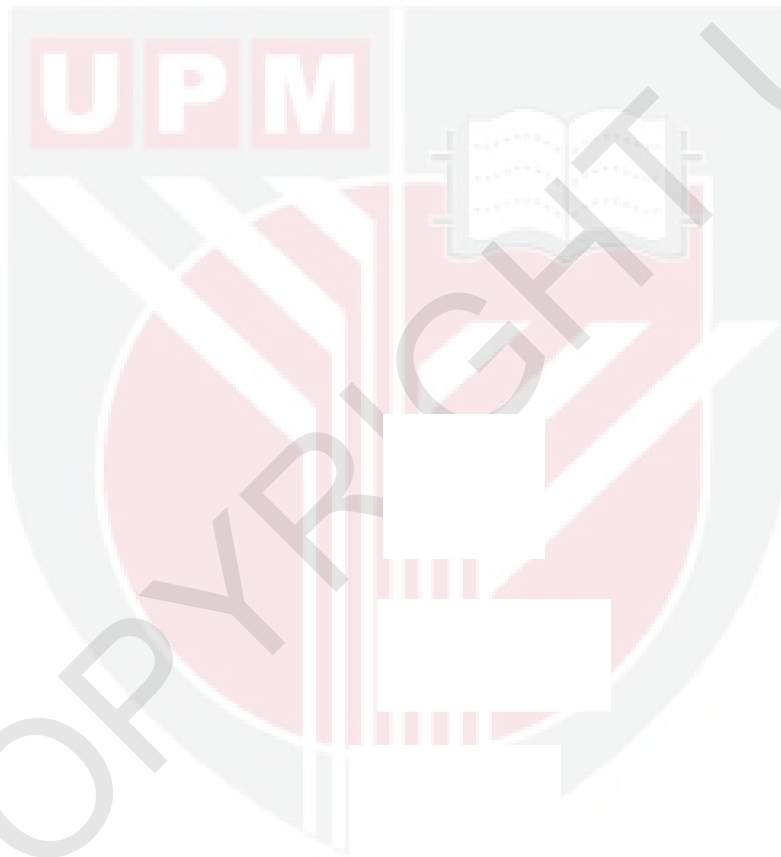
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DEDICATION

This study is dedicated to Almighty Allah who gave me the wisdom and strength to go through the challenges of this study. This study is also dedicated to my parents, whose good examples have taught me to work hard for the things that I desire to accomplish.



Abstract of dissertation presented to the Department of Community Health,
Universiti Putra Malaysia in fulfillment of the requirement for the
Degree of Master of Public Health

**FACTORS ASSOCIATED WITH OVERWEIGHT AND OBESITY AMONG
POSTGRADUATE AFRICAN STUDENTS IN UPM, 2017**

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August 2017

Chairman : Dr. Suriani Binti Ismail, MD, MPH, PhD
Faculty : Medicine and Health Sciences

Introduction: Globally, overweight and obesity are the major public health problem. World Health Organization (WHO) estimated about 1.9 billion adults were overweight out of which more than 600 million were obese in 2014. In a foreign country, student's lifestyle and behaviour including eating pattern changes very quickly leading to unhealthy habits, which may have negative effect on their health. The changes in the body mass index (BMI) of a foreign student is influenced by various complex factors involving exposure to more stress, sedentary lifestyle, accessibility and availability to familiar food, limited finances, irregular class schedules and overload, and spending more time on studying with less physical activities leading to increased or decreased intake of food or dependence of fast food with less nutritional value.

Objectives: The objective of the study was to determine the factors associated with overweight and obesity among postgraduate African students in UPM.

Method: A cross-sectional study was conducted among postgraduate African students in UPM. Data was collected using pre-tested self-administered structured questionnaire. The questionnaire consist of four sections, which include: a) socio-demographic, b) behavioural factors (International Physical Activity Questionnaire – IPAQ), c) eating pattern and d) psychological factors (The short version of the Depression, Anxiety and Stress Questionnaire – DASS). Weight and height was measured and converted to BMI. The study analysis was done using Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics (frequency and percentage) was used to summarise categorical data while continuous variables like age were converted into categorical. The association between two categorical variables was done using Chi square. At the end multiple logistic regression was used to determine predictors of overweight and obesity.

Results: Five hundred and fifty nine students participated in this study out of which 432 (77.3%) were males and 127 (22.7%) were females. The proportion of overweight and obesity were 30.4% and 6.1% respectively. In multiple logistic regression, the significant predictors were: advancing age, with age group of 30 – 39 years (AOR=2.209; 95%CI=1.048 – 4.657) and 40 – 49 age group (AOR=2.530; 95%CI=1.043 – 6.134), being male gender (AOR=2.037; 95%CI 1.130 – 3.672), being married (AOR=3.686; 95%CI=1.783 – 7.620), low physical activity level (AOR=2.478, 95%CI=1.191 – 5.157) and alcohol consumption (AOR=2.999, 95%CI=1.667 – 5.396).

Conclusion: The significant predictors of overweight and obesity were advancing age, being male gender, being married, low physical activity, and alcohol consumption. Campaigns to increase awareness about the importance of health as well as the danger of alcohol consumption among students. Physical activity exercises/competition among the students.

Keywords: Overweight, Obesity, Associated factors, African students, Malaysia.

Abstrak disertasi yang dikemukakan kepada Jabatan Kesihatan Komuniti,
Universiti Putra Malaysia sebagai memenuhi keperluan untuk
Ijazah Sarjana Kesihatan Awam

**FAKTOR YANG BERKAITAN DENGAN BERLEBIHAN BERAT BADAN
DAN OBESITI PELAJAR PASCASISWAZAH KETURUNAN AFRIKA DI
UPM, 2017**

Oleh

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Fakulti : Perubatan dan Sains Kesihatan

Pengenalan: Di peringkat global, berat badan berlebihan dan obesiti adalah antara masalah utama kesihatan awam. Pertubuhan Kesihatan Sedunia (WHO) menganggarkan kira-kira 1.9 bilion orang dewasa berlebihan berat badan, yang mana lebih daripada 600 juta adalah obes pada tahun 2014. Apabila di negara asing, gaya hidup dan tingkah laku pelajar termasuk corak pemakanan berubah dengan cepat dan membawa kepada tabiat yang tidak sihat, yang mungkin memberi kesan negatif terhadap kesihatan mereka. Corak pemakanan seorang pelajar asing dipengaruhi oleh pelbagai faktor yang kompleks yang melibatkan pendedahan kepada tekanan, gaya hidup yang tidak aktif, kebolehcapaian dan ketersediaan makanan biasa, kewangan terhad, jadual kelas yang tidak teratur dan beban yang banyak, dan menghabiskan lebih banyak masa untuk belajar dan kekurangan aktiviti fizikal membawa kepada peningkatan atau penurunan pengambilan makanan atau pergantungan kepada makanan segera dengan nilai nutrisi yang rendah.

Objektif: Objektif kajian ini adalah untuk menentukan faktor-faktor yang berkaitan dengan berlebihan berat badan dan obesiti di kalangan pelajar pascasiswazah di UPM.

Kaedah: Kajian keratan rentas telah dijalankan di kalangan pelajar Afrika pascasiswazah di UPM. Data dikumpul menggunakan borang soal selidik yang diisi oleh peserta sendiri yang terdiri daripada empat bahagian iaitu: sosio-demografi, faktor tingkah laku, corak pemakanan dan faktor psikologi. Boring tersebut ialah *International Physical Activity Questionnaire - IPAQ*, *Dietary pattern was assessed using frequency of eating in 24 hours and of eating outside*. The short version of the *Depression, Anxiety and Stress Questionnaire - DASS*. Borang pro-forma digunakan oleh penyelidik untuk mengukur berat dan ketinggian. Analisa kajian dilakukan dengan menggunakan *Statistical Package for Social Sciences (SPSS)* versi

23. Statistik deskriptif (kekerapan dan peratusan) digunakan untuk meringkaskan data kategori manakala pembolehubah yang berterusan seperti umur telah diubah menjadi kategori. Hubungan antara dua pembolehubah kategori dilakukan dengan menggunakan ujian *Chi square*. Akhirnya, regresi logistik berganda digunakan untuk menentukan faktor peramal berat badan berlebihan dan obesiti.

Keputusan: Lima ratus lima puluh sembilan pelajar mengambil bahagian dalam kajian ini yang mana 432 (77.3%) adalah lelaki dan 127 (22.7%) adalah perempuan. Kadar berat badan berlebihan dan obesiti masing-masing adalah 30.4% dan 6.1%. Dalam regresi logistik berganda, mendapati (faktor peramal yang penting ialah: umur, yang meninbat, telah berkahwin, tahap aktiviti fizikal yang rendah, dan penggunaan alkohol.

Kesimpulan: faktor peramal yang penting ialah: umur, yang meninbat, telah berkahwin, tahap aktiviti fizikal yang rendah, dan penggunaan alkohol.

Kata kunci: Berlebihan berat badan, Obesiti, Faktor, pelajar Afrika, Malaysia

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I certify that the Dissertation Examination Committee has met on the 2nd August 2017 to conduct the final examination of Nura Tukur on his dissertation entitled “Factors Associated with Overweight and Obesity among Postgraduate African Students in UPM, 2017” 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 Public Health.

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LIST OF ABBREVIATIONS

AOR	Adjusted Odds Ratio
BAT	Brown Adipocytes
BIA	Bioelectric Impedance
BMI	Body mass index
CDC	Centre for Disease Control
CI	Confidence Interval
COPD	Chronic Obstructive Pulmonary Disease
COR	Crude Odd ratio
CT	Computerized Tomography
CVD	Cardiovascular disease
DASS	Depression, Anxiety, Stress Scale
DEXA	Dual Energy X-ray Absorptiometry
df	Degree of Freedom
DM	Diabetes Mellitus
EASO	European Association for the Study of Obesity
F	F-value
f	frequency
FAO	Food and Agriculture Organization of the United Nations
IPAQ	International Physical Activity Questionnaire
MET	Metabolic Equivalent of Task
MRI	Magnetic Resonance Imaging
N	Total number
n	number in the sub-group
NCD	Non-communicable disease

NIH	National Institute of Mental Health
OR	Odds Ratio
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
UPM	Universiti Putra Malaysia
US	United States
WAT	White Adipocytes
WC	Waist Circumference
WHO	World Health Organization
WHR	Waist – Hip Ratio

CHAPTER 1

INTRODUCTION

This chapter describes the background, reason, and significance of the study. In addition, the general and specific objectives, as well as the hypothesis of the study are presented.

1.1 Background of the Study

The World Health Organization (WHO) defines overweight and obesity as a condition in which there is an abnormal or excessive accumulation of fat in the body leading to impairment of health. Energy disproportion between calories consumed and expended as a result of an increased intake of foods high in energy and fat, changes in diets and physical inactivity as well as a sedentary lifestyle is the cardinal cause of overweight and obesity (WHO, 2016). The individual choice of food is portrayed as a complex process involving a multiplicity of Influencing factors, such as socio – economic factors, cultural effects, accessibility and availability of food as well as educational level and age (Cheli Vettori, Covolo, Savegnago Mialich, & Jordao, 2014). It is well known that maintaining a normal body weight is of utmost importance of good health and reduces the chances of developing long-term health problems. Adverse nutritional outcomes, such as overweight and obesity are related to chronic heart diseases, stroke, diabetes (type 2), osteoarthritis and some cancers (Hovhannisyan, Pierce, & Amirkhanyan, 2009).

Overweight and obesity are considered as the fifth leading risk for deaths worldwide and not less than 2.8 million adults died every year (EASO, 2016). Also, the rates of obesity worldwide are predicted to rise and by 2025, 18% of men and 21% of women will be obese globally, according to the latest study by Non-Communicable Disease Risk Factor Collaboration (NCD-RisC). The study also reported an increase in the number of obese people from 105 million in 1975 to 641 million in 2014. The world has more overweight than underweight people, and latest remain serious public health problems in the poorest countries. In South Asia, almost a quarter of the population is underweight, in Central and East Africa about 12% of women and 15% of men are underweight. Also in India and Bangladesh, more than a fifth of men and quarter of women are underweight. (NCD-RisC) et al. 2016).

WHO defines Body Mass Index (BMI) as the body weight in kilogram (kg) divided by the square of height in meters (m^2). Underweight means BMI less than $18.5 \text{ kg}/m^2$, while a range of $18.5 \text{ kg}/m^2$ to less than $25 \text{ kg}/m^2$ is considered as normal weight, BMI of $25 \text{ kg}/m^2$ to less than $30 \text{ kg}/m^2$ is overweight and the obesity range falls at or higher than $30 \text{ kg}/m^2$ (WHO, 2015). The raised in BMI is considered as a major risk factor for developing non-communicable diseases (NCDs). Hence, the significant of NCDs is steadily increasing and by far the leading global cause of death. (WHO, 2009). The common risk factors, responsible for most of the major NCDs are unhealthy diets and

lifestyle. Based on present trends by the year 2020 NCDs are predicted to account for 73% of deaths and 60% of the disease burden. The report further stated that over the period of 30 years the burden of disease from NCDs for developing and newly industrialized countries was predicted to increase by more than 60% by 2020 (WHO, 2008). Hence, more than 190 countries agreed on global mechanisms to reduced avoidable NCDs burden in 2011, which include a global action plan for the prevalence and control of NCDs 2013 to 2020, the aim of this plan is to reduce the numbers of premature death from NCDs by 25% by 2025 (Vineis, Stringhini, & Porta, 2014).

In a foreign country, student's lifestyle and behaviour including eating pattern changes very quickly leading to unhealthy habits, which may have a negative effect on their health (Hovhannisyan et al., 2009). The eating pattern of a foreign student is influenced by a complex of factors involving exposure to more stress, sedentary lifestyle, accessibility and availability to familiar food, limited finances, irregular class schedules and overload, and spending more time on studying with less physical activities leading to increased or decreased intake of food or dependence of fast food with less nutritional value and high in sugar or fat (Mahfouz et al., 2016). In relation to this, the postgraduate African students in Universiti Putra Malaysia (UPM) faces similar circumstances.

In line with the above introduction, several studies have reported the association between many factors and unhealthy body weight status (overweight and obesity) for instance the socio-demographic factors (Kabir, Said, & Ismail, 2014, Peltzer et al., 2014, Nwachukwu et al., 2010, Adienbo et al. 2012, Zarei, Taib, & Zarei, 2013, etc.), behavioral factors such as physical activity level, smoking and alcohol consumption (Zarei et al., 2013, Teo, Nurul-Fadhilah, Aziz, Hills, & Foo, 2014, Sayon-Orea, Martinez-Gonzalez, & Bes-Rastrollo, 2011), eating pattern (Bezerra, Curioni, & Sichieri, 2012, Seguin, Aggarwal, Vermeulen, & Drewnowski, 2016, Perez-Cueto, Verbeke, Lachat, & Remaut-De Winter, 2009, and Yildiz et al., 2011 etc.) and psychological factors (Bodenlos, Lemon, Schneider, August, & Pagoto, 2011, Babazekri, Hanafiah Juni, Afiah M.Z., & Fattah Azman, 2014, Chen & Qian, 2012). Consequently, this study aims to further investigate the association between these factors and overweight and obesity among African postgraduate students in UPM.

1.2 Problems Statement

Overweight and obesity has a serious negative impact on health, which is associated with hypertension, coronary heart diseases, stroke, type 2 diabetes as well as some cancers of breast, colon, prostate, endometrium and gall bladder. Overweight and obesity are accounted for 5% of all death worldwide. Overweight and obesity can also lead to serious physical, behavioural, social, psychological, and economic consequences (WHO 2008 and 2015). Hence, as the body mass index of an individual increase so as the mortality rates (Flegal, Bk, Orpana, & Graubard, 2013). In a report by McKinsey in 2014, it was estimated that the global economy loses 2 trillion USD per year due to obesity and this makes it almost as damaging as smoking or an armed conflict (McKinsey, 2014).

Obesity has virtually doubled since 1980 globally (WHO, 2016). Accordingly, in a research conducted to assess the prevalence of overweight/obesity and its associated factors among university students from 22 universities in 22 low, middle income and emerging economy countries, a high (18.95%) prevalence of overweight in male than in female (14.1%) was reported. While obesity was 5.8% in male and 5.2% in female, the overall overweight and obesity were 22% (Peltzer et al., 2014). Another study conducted among university students in Enugu, Nigeria noted a higher prevalence of underweight among female (9.4%) than male (4.7%) and lower prevalence of overweight (4%) and obesity (0.9%) in female than in male with 8% and 7% respectively (Nwachukwu et al., 2010). Whereas, in a study conducted among seven (7) African countries reported a higher prevalence of obesity in female among all age group in 5 countries: Benin, Djibouti, Ghana, Mauritania and Morocco (Manyanga, El-Sayed, Doku, & Randall, 2014).

Student's lifestyle adheres to irregular eating pattern and physical inactivity. Consequently, eating pattern and physical activity of students in a foreign country becomes their exclusive responsibility (Perez-Cueto et al. 2009 and Zarei, Taib, and Zarei 2013). In addition, the statements were supported in a study carried out among students in Jazan University, which revealed 80% of students reported changes in their eating habit, 8.6% improved, 71.6% worsened and almost 86.2% reported changes in their weight (Mahfouz et al., 2016). Again, about 85% of students reported changes in their diets in a study reported by (Perez-Cueto et al., 2009).

Since 2013 the numbers of foreign students in Malaysia are increasing dramatically (Zarei et al. 2013). In Universiti Putra Malaysia (UPM), there is a total of 815 postgraduate African students in the 2016/2017 academic year. The Previous study conducted on factors associated with weight status focused only on Iranian students in UPM. However, considering the high prevalence of overweight and obesity and its implications for health and economy now and future, there is need to assess the weight status and associated factors among postgraduate African students in UPM. Furthermore, the findings of this study can be used in producing more facts concerning the factors associated with overweight and obesity among African students in UPM.

1.3 Significance and Benefits of Study

A person has the ability to maintain or harm their own health, as they are responsible for what they eat and avoid. It is for this reason that a person needs to ensure they maintain a healthy eating pattern and lifestyle. The weight of a person affects their health, as overweight and obesity are associated with increased risk of many acute and chronic conditions like hypertension, stroke, coronary atherosclerosis, type 2 diabetes, cancer, chronic obstructive pulmonary disease (COPD), gall bladder disease etc (Singh, Bhsc, and Medicine 2008; Savegnago Mialich et al. 2014 and Mahfouz et al. 2016). Management of these diseases is associated with a high financial cost and is of great burden not only on the person but on the nation in general. A healthy lifestyle has become an important preventive measure against overweight and obesity (Samaranayake, Ong, Leung, & Cheung, 2012).

It is vital to study whether the overweight and obesity among postgraduate university students are as a result of the changes from high school to college lifestyle or other specific behaviours. Moving away from home, student's lifestyle and behaviour including eating pattern alter very quickly leading to unhealthy habits, which may have a negative effect on their health (Hovhannisyan et al., 2009). Therefore, this study aims to determine factors associated with weight status among postgraduate African students in UPM. The finding can be used to plan preventive measures, thereby, focusing on the significant factors of its predictors among postgraduate African students.

1.4 Research Question

- a) What is the prevalence of overweight and obesity among postgraduate African students in UPM?
- b) What are the factors that influence overweight and obesity of postgraduate African students in UPM?
- c) What are the predictors of overweight and obesity among postgraduate African students in UPM?

1.5 Objectives

1.5.1 General objective

To determine factors associated with overweight and obesity among postgraduate African students in UPM.

1.5.2 Specific objectives

- a) To measure the prevalence of overweight and obesity among postgraduate African students in UPM.
- b) To identify the socio-demographic characteristics, behavioural factors, eating pattern, and psychological factors of the respondents.
- c) To determine the association between socio-demographic factors, behavioural factors, eating pattern, and psychological factors with overweight and obesity among the respondents.
- d) To determine the predictors of overweight and obesity among postgraduate African students.

1.6 Research Hypotheses

The alternate hypotheses of the study are:

- a) There is a significant association between socio-demographic factors (age, gender, nationality, marital status and financial support) with overweight and obesity among the respondents.

- b)** There is a significant association between behavioural factors (level of physical activity, smoking, and alcohol consumption) with overweight and obesity among the respondents
- c)** There is a significant association between eating pattern (frequency of eating per day and of eating outside) with overweight and obesity among the respondents
- d)** There is a significant association between psychological factors (depression, anxiety, and stress) with overweight and obesity among the respondents.



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