Gender Differences in Body Mass Index, Underweight, Overweight and Obesity among University Students

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Abstract: **Health is a major public issue where body mass index is a particularly important aspect in youth for a developing state like Terengganu, Malaysia. The body mass index or BMI can be used as an indicator for the health status of a population. The aim of the research is to identify the average BMI among university students in Terengganu by gender. Data are collected by 523 of respondents from Universiti Sultan Zainal Abidin Students' (UniSZA) consisting of 117 males and 406 females from July to August 2018 using questionnaires. The data is analyzed separately in this study among male and female respondents in the university. The results show that 12% of female respondents have been suffering from chronic energy deficiency, underweight range, or under nutrition and considered as a common phenomenon in Terengganu especially for the female population.**

Keywords **–Body Mass Index, Underweight, Overweight, Obesity, University Students, Gender, Malaysia**

I. INTRODUCTION

The awareness about the consequences of overweight and obesity mostly among university students are well known. Therefore, they are likely to set their ideal body weight set point through cognitive signals [1]. Unfortunately, students who are exposed to media images that depict the thin-ideal body has been linked to young women's dissatisfaction with their own bodies [2]. Additionally, being a university student has a strong impact on a person's lifestyle and often lead to unhealthy eating habits [3]. Poor eating habits are a significant concern among the young adults who are making transition from secondary life into university life [4]. The fifth leading risk of global deaths is overweight and obesity, worldwide, with obesity increasing more since 1980. More than 1.4 billion adults of 20 years old and older were overweight in 2008. In addition, an obese (BMI>30 kg/m2) person, most will get hypertension, heart disease, diabetes mellitus, cardiovascular disease, gallbladder disease and various types of cancer [5]. One indicator that can be used to indirectly certify the health status of respondents is body mass index which helps to identify their body size[6]. At the same time, monitor planning interference help to prevent disease.

On the other hand, the study on the prevalence of nutritional status among a population is mainly to measure the health status of that nation. It is particularly important for developing countries like Malaysia where health and medically related reforms are being actively implemented.

Currently, the major public health problems are overweight and obesity, and globally, there is a growing prevalence of overweight and obesity in both developing and developed countries [7]. According to the studies by A Meta-Analysis of Weight Gain in the Freshman Year of College observed that first-year university students have significant weight gain, followed by a steady increase in weight gain[8].

In Malaysia, researchers have to measure the BMI profile among USM main campus students in Minden, Penang)[9]and socio-demographic, lifestyle, dietary and psychological factors are elements that can gain students' weight [10]. Efforts have been made to counter this problem and BMI can be used as an alternative to evaluate the efficiency of these measures. The aim of the study is to identify the average BMI of the university students in Malaysia by gender.

II. DATA AND METHODS

2.1 Data collection

The quantitative study is done among university students in University Sultan Zainal Abidin (UniSZA), aged between 18-25 [11]and have active enrolment status. Total of respondents in this study is 523 consisting of male and female students. This data is collected from a July 18 until August 17,2018, where all respondents answer questionnaires within the time given and the data is reported in statistical format. The questionnaires are collected on August 17, 2018, and data collected are then exported to an Excel spreadsheet for data cleaning and analysis.

2.2 Measurement

The body mass index was calculated as the ratio of weight in kilograms divided by the square of height in meters, i.e. BMI=weight (kg) (height (m)) ^{2}. Sociodemographic of the respondents are also collected. In this study, we use only weight, height, and BMI in calculating the prevalence among university students in UniSZA. The body mass index is categorized into six groups as follows: underweight, <18.50; normal weight, >18.50-24.99; overweight, >25.00; obesity class I-III, >30.00-40.00[12].

2.3 Statistical analysis

In this research, male and female students are analyzed separately. Descriptive statistics are utilized for height, weight, and BMI among males and females. The categories of BMI are carried out with frequency distributions for finding the prevalence of underweight, normal, overweight and obese class I-III individual for both genders.

III. RESULTS

The current study indicates BMI status and genders participants of 523 respondents of university students consisting of 406 females and 117 males. The sample of males and females are separately analyzed.

The overall mean age and BMI of the male and female participants are 21.5 years old, 16.833 kg/m^2 and 16.667 kg/m^2 respectively. The mean BMI of male respondents is slightly higher with 16.667 kg/m^2 compared to female respondents with 16.667 kg/m^2 (Table 3.1). The mean BMI of UniSZA respondents is lower than the mean BMI among USM students which is about 21.844±4.13 kg/m^2 male students compared to female students 20.054±2.96kg/m^2[9]. The full spectrum of the highest sustainability, conceptualized by the university in the region and striving hard to achieve global most sustainable university status is USM.

The mean BMI of the male and female respondents are 16.833 kg/m^2 and 16.667 kg/m^2 respectively. The BMI among university students (males and females together) is 16.75 kg/m^2, which is the middle range for male and female but close to male BMI (Table 3.1)

Table 3.2 shows the prevalence of body size among university respondents. The underweight, normal, overweight, obese class I-III among the university respondents (males and females together) are 11%, 55%, 22%, and 11% respectively. The prevalence among the respondents of underweight among female and male students is 12% and 7% respectively. More than half of percentage among male and female are 54% and 60% within normal. The prevalence of overweight among female respondents (23%) is higher compared to male respondents (19%). Only 11% of female and 15% of the male are found to be obese class I-III (Table 3.2).

Table3.1: Mean value of body mass index (BMI) among female and male UniSZA students

	Female	**Male**	**Overall**
n	406	117	523
Underweight	49 (12%)	8(7%)	11%
Normal	220(54%)	70(60%)	55%
Overweight	93(23%)	22(19%)	22%
Obese Class I	24(6%)	14(12%)	7%
Obese Class II	15(4%)	1(1%)	3%
Obese Class III	5(1%)	2(2%)	1%
Mean	16.667	16.833	16.75

Table 3.2: Frequency distribution of body size among university students by gender

BMI	**Female frequency (%)**	**Male frequency (%)**	**Male & Female together (%)**
Underweight	49(12%)	8(7%)	11%
Normal	220(54%)	70(60%)	55%
Overweight	93(23%)	22(19%)	22%
Obese Class I	24(6%)	14(12%)	7%
Obese Class II	15(4%)	1(1%)	3%
Obese Class III	5(1%)	2(2%)	1%

IV. DISCUSSION

The important anthropometric index is body mass index (BMI), and it is commonly used for determining the nutritional status of a nation. In this study, we identify the average BMI status among students of University Sultan Zainal Abidin by gender. The mean BMI of the male respondents is 16.83 kg/m^2, the mean body size of male respondents is within underweight. The samples are classified into six categories according to body size on the basis of BMI, we found 7% of male students suffer from chronic energy deficiency (CED), more than 59% are healthy, on the other hand, 15% is an obese class I-III and nearly 19% of male respondents are overweight. The overall mean age and BMI of the female participants are 21.5 years old, and 16.667 kg/m^2 respectively. The mean BMI of male respondents is slightly higher with 16.667 kg/m^2 compared to female respondents 16.667 kg/m^2 (Table 3.1). The mean BMI of UniSZA respondents is lower than the mean BMI of USM students which is about 21.844±4.13 kg/m^2 male students compared to female students 20.054±2.96kg/m^2[9]. The mean BMI of students of University Putra Malaysia (UPM) compared with the current study is slightly higher than the current study which was 22.17±3.41 kg/m^2[13]. The University Putra Malaysia is one of the universities located at the central part of Malaysia.

The Malaysia Demographic and Health Survey [14] data shows the percentage is higher in the age group 18-25 years old (34.1%). In MDHS, Malays are reported to have a higher prevalence of underweight compared to Chinese (5.6%). In contrast, 9% of female respondents are underweight as compared to 2% of the male respondents. This higher rate of underweight respondents is expected since females are more cautious about their weight status than males due to the new societal perceptions which encourage females to be slender. Self-evident pictures of movie stars and models in fashion magazines and mass media have a solid effect on girls' body shape and image perception [1]. Mostly female respondents are affected especially when they are influenced by Korean Artists and see the shapes and weight of actress or models as the perfect body shape and figure to accomplish. Females with such ideal body weight perception can be at risk of developing eating disorders [15].

The result of this study also indicates that overweight and obesity are common among female respondents. The prevalence of overweight and obesity class I-III among the female respondents is 18% and 9% respectively as compared to 4% and 7% respectively among the male respondents. These results are similar to the results of a study among Nairobi County, Kenya [1]. The prevalence of overweight and obese among the respondents is 22% and 11% respectively and this is less than university students in other developing countries like Egypt (24%, 8.8%) [16], Nigeria (10%) [17], Bangladesh (7.20%, 0.27%) [18], Pakistan (13%-52.6%) [19]. World Health Organization shows that more than 1.9 billion adults are overweight[20]. Over 650 million are obese compared with WHO's report in 2014, the overall has decreased as the population of 3.4 billion adults dies each year[21].

The result shows that both genders of respondents are within underweight. In my opinion, the respondents mostly are at a normal range of BMI categories. It is because having practicing a healthy lifestyle and maybe their influence with the ideal actress or model. In addition, the majority of the respondents who participate in this survey are females.

V. CONCLUSION

Therefore, we conclude that the prevalence of underweight, normal, overweight and obesity class I-III among university respondents in Terengganu, also observed the gender among university respondents. Data are collected using Google Form within a month among UniSZA students. The percentage of underweight, normal, overweight and obese class I-III among university respondents are 11%, 55%, 22%, and 11%, respectively. The prevalence of underweight among male is higher than that of the female. We also observed that the mean BMI of female respondents is larger than that of male students, the mean body size of both genders of respondents is within underweight.

Study limitation: There are many limitations in this study, namely, (1) we consider only students of UniSZA, in Terengganu, but, there are many other public universities, for example, UMT, IPG, and UiTM. Therefore, the present data can't be addressed as a representative of the whole of Terengganu or Malaysia. In the near future, it is recommended for another researcher to do a large-scale study. (2) We consider only university students; this study cannot represent the young people population in Terengganu. However, it might be considered in our future study.

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