A Study to Determine the Association Between Obesity, Physical Inactivity and Diet Among Medical Students in University of Cyberjaya

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ABSTRACT

Introduction: In Malaysia, the prevalence of obesity is gradually increasing. Currently according to studies conducted among Malaysian medical students in 2005 and the NHMS report in 2015, the prevalence of obesity among Malaysians aged 15 years and older and Malaysians aged 18 years and older was reported to be 11.7% and 30% respectively. Many lifestyle factors such as poor dietary practices and reduced physical activity have been known to augment the risk for developing obesity. This study thus aimed to determine whether there was any relationship between obesity, physical activity and diet among medical students in University of Cyberjaya.

Materials and Methods: A Cross-sectional study was conducted in University of Cyberjaya, Cyberjaya, Selangor. A simple random sampling of medical students over 18 years old and without pre-existing illness such as asthma, cardiovascular disease and diabetic condition was selected. Data were collected by answering questionnaires online. Out of 158 students who participated, the majority of them were female (69.6%). This can be accounted to the fact that most of the undergraduate students in University of Cyberjaya were female (62.2%).

Results: In this study, the lowest prevalence 8.2% were found to be obese (BMI ≥ 30.0 kg/m²); 10.0% of females and 4.2% of males. 11.4% of respondents were in overweight status (BMI 25.0-
29.9 kg/m²). Normal students (BMI 18.5-24.9 kg/m²) accounted for the highest, 64.6% of the total. 15.8% of the students were found to be underweight (BMI < 18.5 kg/m²). However, Chi-squared test revealed there is no association for these two main objectives; between dietary practice and obesity (p=0.316) and between physical activity and obesity (p=0.244).

**Conclusion:** Our study revealed that obesity has the lowest prevalence compared to other BMI status. It was found that most medical students in the University of Cyberjaya have a normal weight. In addition, we concluded that the lack of association may have been due to the study being conducted predominantly among youngsters who have a higher metabolic rate as opposed to those who are older. This study was done online which acts as a limitation and may have affected the results of the study.

**Keywords:** Obesity, Dietary Practice, Physical activity, BMI Status

**INTRODUCTION**

Obesity and its related disorders are a growing epidemic in both developing and developed countries. Obesity by definition is having a BMI over 30 kg/m². A variety of factors, including
physical inactivity diet, genetic predisposition, physiological and behavioural factors, are implicated as contributing factors to obesity [1].

In Malaysia, the prevalence of obesity is gradually increasing. Currently according to studies conducted among Malaysian medical students in 2005 [1] and the NHMS report in 2015, the prevalence of obesity among Malaysians aged 15 years and older and Malaysians aged 18 years and older was reported to be 11.7% and 30 % respectively in a national study [2].

Obesity and sedentary lifestyles are also a major health issue among adults in the United States of America. Based on the research that has been done, it shows physical activity has an inverse proportion with body mass index (BMI), abdominal circumference and weight gain [3].

Poor eating habits have also been seen to augment the risk for developing obesity, which in turn give rise to a lot of high-risk health disorders, such as heart disease, diabetes and hypertension [4]. It is thus of the utmost importance to address Obesity and its potential risk factors.

This study thus aims to gage the risk of obesity among preclinical UOC medical students and determine the association between obesity and physical activity and dietary practices respectively.

MATERIALS AND METHODS

Sample
The study was conducted in the University of Cyberjaya (UOC), Selangor among preclinical medical students. All students in year 1 and 2 of the MBBS program, UOC are included and are randomised using simple random sampling.

**Inclusion criteria**

1st and 2nd year preclinical medical students of the age 18 years and older.

**Exclusion criteria**

Pre-existing illnesses such as asthma, cardiovascular diseases, diabetic condition

Non voluntary

**Sample size**

After consideration of 10% for non-respondents, the maximum number of sample sizes for this study was 180 however due to constraints posed by the Coronavirus pandemic our study only reached 88% of the total sample size which was 158.

**Data collection**

This study was approved by CRERC Approval team (UOC/CRERC/ER/241) from University of Cyberjaya, Malaysia. A consent form was attached to the survey before they could begin to answer the questions where we elaborated upon the importance of the data collected from the survey and ensured the confidentiality of individuals' data acquired.
**Instruments**

We used Pretested self-administered questionnaires to collect data questionnaires, with sections A, B and C and a total of 24 questions.

Section A is about socio demographic data which consist of 7 questions asking age, gender, race, religion, weight, height and having any pre-existing condition such as diabetes mellitus, cardiovascular disease, and asthma.

Section B is based on diet and eating habits which consist of 8 questions asking about how many days the respondent consume fruits and vegetable in a week, how many servings of fruit and vegetable that the respondent consume in a day. Next, the question about number of glasses taken by respondent in a day. Lastly, question about confirming respondent’s knowledge about ‘Suku-suku separuh’, a food diet planned by Ministry of Health Malaysia.

Section C is about physical activity which consists of 8 questions mentioning how long the respondent does vigorous, moderate, low physical activity in a day by hours and in a week by days. Other than that, there is a question about how many hours per day that the respondent take a rest.

We will be distributing the questionnaire online.

**Pre-test**

We pretested the questionnaires on a few students from the faculty of medicine prior to the pandemic. Those who participated in the pre-tests were excluded from the main study later on.

**Data analysis**

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We utilised SPSS version 23 for data analysis. Descriptive statistics were used to depict the prevalence and sociodemographic data. Pearson’s chi square was used to determine whether there was a significant association between obesity, physical activity, and diet. For all tests, a p-value of <0.05 was deemed statistically significant.

RESULTS

Prevalence of obesity among University of Cyberjaya medical students

A total of 158 respondents participated in this study. Based on the data tabulated in Table I, 64.6% of students have normal weight, 15.8% of the students are underweight, whereas 11.4% are overweight and 8.2% are obese. So, the prevalence of obesity is only 8.2% out of 158 students participated.

Table I: Prevalence of obesity among medical students of University of Cyberjaya

<table>
<thead>
<tr>
<th>BMI status</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>25</td>
<td>15.8</td>
</tr>
<tr>
<td>Normal</td>
<td>102</td>
<td>64.6</td>
</tr>
<tr>
<td>Overweight</td>
<td>18</td>
<td>11.4</td>
</tr>
<tr>
<td>Obese</td>
<td>13</td>
<td>8.2</td>
</tr>
<tr>
<td>Total</td>
<td>158</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Association between diet and obesity
The data obtained in section 2 of the questionnaire, are tabulated in table II. The result shows that 89.2% of the students were having poor dietary intake while 10.8% had good dietary intake.

The association between dietary practice and obesity status is calculated in table III. The P-value is 0.316 > 0.05, thus the null hypothesis was not rejected, indicating that there was no association between dietary practices and obesity. The Chi-square value was 0.574 (Degree of freedom = 1), thus the null hypothesis was not rejected and that there is also no association between dietary practices and obesity.

Table II
Prevalence of dietary practice among students of UOC

<table>
<thead>
<tr>
<th>Dietary practice</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>17</td>
<td>10.8</td>
</tr>
<tr>
<td>Poor</td>
<td>141</td>
<td>89.2</td>
</tr>
<tr>
<td>Total</td>
<td>158</td>
<td>100</td>
</tr>
</tbody>
</table>

Table III: Association between dietary practice and obesity status.

<table>
<thead>
<tr>
<th>Dietary practice</th>
<th>Obesity status</th>
<th>Total (n%)</th>
<th>Chi square value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 30kg/m², n (%)</td>
<td>≥ 30kg/m², n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>15 (88.2)</td>
<td>2 (11.8)</td>
<td>0.574</td>
<td>0.316</td>
</tr>
<tr>
<td>Poor</td>
<td>130 (92.2)</td>
<td>11 (7.8)</td>
<td>141 (100)</td>
<td></td>
</tr>
</tbody>
</table>
Association between physical activity and obesity

The result (table IV) shows that 94.5% of the students were physically inactive but had a BMI less than 30kg/m^2 while 89.4% of the students were physically active with less than 30kg/m^2. The p value is 0.244 > 0.05, thus the null hypothesis was not rejected indicating that there was no association between physical activity and obesity. The chi square value was 1.357 (degrees of freedom = 1) thus the null hypothesis was not rejected and there was no association between physical activity and obesity.

Table IV: Association between physical activity and obesity status among UOC students

<table>
<thead>
<tr>
<th>Physical activity</th>
<th>Obesity status</th>
<th>Total (n%)</th>
<th>Chi square value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 30 kg/m^2, n (%)</td>
<td>≥ 30 kg/m^2, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactive</td>
<td>69 (94.5)</td>
<td>4 (5.5)</td>
<td>73 (100)</td>
<td>1.357</td>
</tr>
<tr>
<td>Active</td>
<td>76 (89.4)</td>
<td>9 (10.6)</td>
<td>85 (100)</td>
<td></td>
</tr>
<tr>
<td>Total (n%)</td>
<td>145 (91.8)</td>
<td>13 (8.2)</td>
<td>158 (100)</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

Among the 158 respondents from the University of Cyberjaya, 25 (15.8%) of them were in the underweight status of BMI, while 102 (64.6%) had a normal BMI reading. Other than that, 8 (11.4%) had an overweight status of BMI, while 13 (8.2%) were noted to be obese. These results are similar to those in a research that was done at a medical college in India. Out of 200 medical
students, 154 (77%) of the students had standard BMI, 14 were (7%) underweight, 29 (14.5%) were overweight and 3 (1.5%) were obese [5].

It should also be noted that the results attained in that research pertaining to the familiarity of obesity among medical students in University of Cyberjaya is 13 (8.2%) was quite similar to the results of a study that had also been conducted within Malaysian medical students in AIMST University where prevalence of obesity amongst respondents was 15 (5.2%) [6].

Based on our study, the majority of medical students from University of Cyberjaya were in non-obese category where 95.8% of male respondent and 90% of female respondents were noted to be non-obese. However, in obese category, there was a higher prevalence of obesity amongst females than males, with 10% of female respondents being obese while only 4.2% of male respondents were noted to be obese. This result corresponds to the study that was conducted at a medical college in India where it showed that obesity was higher in females (21%) when compared to males (11%) [5].

Next, the highest prevalence of obesity related to age was among those who were 21 (14.3%), followed by those below 20 years old (10.5%), 20 years old (9.4%), and those between 22 and above showed the least prevalence of obesity (0.0%). However, our findings are contradicted to a study among medical students at Suraram, India, where a total of 150 students have participated. Unexpectedly, the highest familiarity of obesity is below 20 years old (21.0%) and the lowest is age above 20 (4.0%) [7].

The prevalence of obesity among races shows Indian has the highest (9.8%) followed by Malay (8%), others (7.1%) and the least was Chinese (0%). A similar result was obtained in a study that was done from 290 medical undergraduates of AIMST University in 2012 to determine their
prevalence of obesity. Results showed that out of 290 medical students, obesity was higher in Indians (6.5%) compared to Chinese (3.2%) and Malays (0%) [6]. However, in this study, the prevalence of Chinese was higher than Malay but the familiarity of Indian was the highest, same to our research findings.

Lastly, for the prevalence of obesity among religions shows Hindus has the highest (11.1%) followed by Islam (8.3%), Christian (0%) and Buddhism (0%). Our result was quite same to a study in India in which they assessed the obesity percentage among medical students of G.R. medical students. The results based on religion grouping shows the maximum percentage was in Hindus (10.84%) and others like Muslims, Sikhs, Christians have similar prevalence. (0.0%) [8].

For the second objective, there was no significant association between dietary practice among medical students of University of Cyberjaya and obesity which was similar to a study among medical students in Cameroon where there was no significant connection between dietary practice and body mass index (BMI) [9]. The reasons why the results were different was due to the dietary parameters. We had taken into account, for example, fruits, vegetables and water intake, which may have differed from those considered in the other research cited. They also took into consideration salt intake, fast food and soft drinks which may have contributed to the difference in results obtained.

For the last objective, there is also no association between medical students of University of Cyberjaya physical activity and obesity which is similar to those results of the NHMS indicating that there was no significant connection observed between sedentary lifestyle and overweight among all genders [2]. There may be few reasons that might cause this lack of association, which were conducted online causing some limitations which may have affected the results. Plus, the
study was conducted predominantly among youngsters who have a higher metabolic rate as opposed to those who are older.

CONCLUSION

Our study concluded that the prevalence of obesity among medical students in University of Cyberjaya is quite low (8.2%) which corresponds to the previous study (5.2%) that had been conducted [6].

The study also found that there is no relationship between dietary practice and obesity because of different dietary variables that we included in our study which are fruits, vegetables and water compared to other studies that have a lot more and detailed classes of dietary variables such as carbohydrates, proteins, fat and salt intake. These alone can bring a huge different result in the study.

Moreover, there is also no association between physical activity and obesity. This could have been due to responses being acquired via an online survey with the majority of the respondents being young people.

Therefore, in the future, we can further add to our study by including respondents who are within an older age group (40 years old and above). Other than that, we can increase the sample size in order to ensure significant and reliable results.
ACKNOWLEDGEMENT

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