Obesity Among University Students: A cross-Sectional Study in Ajman, UAE

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ABSTRACT

Objectives: This research was conducted to determine the proportion of obesity among university students and the factors associated with it.

Materials and Methods: A cross sectional study was conducted among students enrolled in the preclinical years, in the six academic programs. A validated, self-administered questionnaire with domains such as socio-demographic characteristics, self-reported physical activity, dietary habits, and anthropometric measurements was used. Height and weight were measured and Body Mass Index was calculated and categorized according to WHO criteria. The data were analyzed by SPSS 21, Descriptive analysis and Chi square test were performed.

Results: Out of 233 participants, 181 (78.4%) were <20 years and majority of them were females (172, 76.8%). 142 (60.9%) were 1st year students and 111 (46.7%) were from Eastern Mediterranean region. Among the total, 41 (17.6%) were having overweight and 16 (6.9%) with obesity. 65% performed physical activity in the last month, of which 100 (66%) performed vigorous physical activity. 212 (95.5%) reported a diet history of mixed Diet. No significant association was noted except for gender and year of study with BMI where 34.6% of males were overweight & obese compared to females (21.5%) and 29.6% of them were 1st year students as compared to the 2nd year students (16.5%). Overweight and obesity were found more among participants who were not doing physical activity (32.1%) as compared to those doing physical activity (20.4%), of which obesity was less among those who performed vigorous activity (19%). Participants who follow vegetarian diet (80%) had normal BMI as compared to the mixed diet followers of 59%.

Conclusion: Almost a one fourth was found to be overweight and obese. A statistically significant association between obesity and year of study was observed. Participants who follow a mixed diet had noticed with higher percentage of overweight and obesity as compared to those students on a vegetarian diet. There is a need to address the obesogenic environment to the university students and the students need to be involved in promoting healthy lifestyles.

Keywords: Obesity, preclinical, medical students, BMI
INTRODUCTION

Obesity has been defined as abnormal or increased fat accumulation and the crude population measure of obesity is the Body Mass Index (BMI). BMI is used as a measure to categorize underweight, overweight and obesity in adults. According to WHO a BMI of 30kg/m² or more is considered as obese. Obesity was considered as a problem of developed countries but is now on the increase in the developing countries as well. It has been identified as a major public health issue, affecting more than one in five adults in the United States. WHO report states that more than 300 million are obese and that at least 2.8 million people die each year as a result of diseases due to excess weight or obesity. The worldwide prevalence of obesity has doubled between 1980 and 2008. In 2008, 10% of men and 14% of women across the globe were obese, compared with 5% for men and 8% for women in 1980.

The prevalence of obesity has its highest rate in the WHO Regions of the Americas (26% for obesity in both sexes) and its lowest rate in the WHO Region of South-East Asia (3% for obesity in both sexes). In the Europe Region, the Eastern Mediterranean Region and in the Region of Americas, over 50% of women are overweight. For all three of these regions, roughly half of overweight women are obese (23% in Europe, 24% in the Eastern Mediterranean, 29% in the Americas). In the WHO European region the prevalence of obesity has tripled in most of the since 1980s and it has increased the risk of cardiovascular diseases and cancer. In the WHOEMRO region, the highest levels of obesity are reported in Egypt, Bahrain, Jordan, Kuwait, Saudi Arabia and United Arab Emirates in adults. The prevalence of obesity ranges between 74% and 86% in women and between 69% and 77% in men. A study conducted among university students in Iran reported a mean BMI of 21.7 in men with 12.4% of the students had a BMI more than 25 kg/m². The prevalence of overweight was 31%, and obesity was 23.3% in a study conducted in Saudi Arabia and in UAE it was 24% and 7.5%.

In all WHO regions, women are more likely to be obese than men. In the WHO regions for Africa, Eastern Mediterranean and South-East Asia, women have roughly doubled obesity prevalence than men. The prevalence of obesity is 7% for both genders combined. Women’s obesity is significantly higher than men’s, with the exception of high-income countries, where it is similar. In low- and lower-middle-income countries, obesity among women is approximately double than among men.

Obesity has been identified as a major risk factor for numerous chronic diseases such as diabetes mellitus, cardiovascular diseases, hypertension, stroke and cancer. Obesity causes physical and psychological disabilities in the affected individuals. Globally, 44% of diabetes, 23% of ischemic heart disease and between 7% and 41% of certain cancer burdens are attributable to obesity.

The factors associated with obesity include age, gender, ethnicity, culture, food habits, life style factors, and lack of physical activity. Assessing the nutritional status of young adults is a vital tool and an indicator of diet quality. An unaccepted diet with high content of macronutrient is closely related to a higher prevalence of overweight and obesity. A diet which contains high quality and appropriate quantity, in young adult can have a good effect on the health of the individual. A deviation from this can result in over or underweight. In most of the countries, researches on obesity have mainly been done among vulnerable population such as elderly, women, and children. Young adults especially students tend to have undesirable diet either in the form of over or under eating. Major economic changes lead to changes in eating and physical activity and quality of life in people in Arabian populations. Combination of high fat diet and sedentary life style play a major role in the causation of obesity. Understanding the magnitude of obesity and factors associated with it, is important to plan and implement the interventions for preventing this public health issue.

Despite the worldwide rise in obesity among the young and the benefit of early detection and risk modification, the features, magnitude or epidemiological characteristics of obesity has rarely been studied in the UAE even among students in health profession. To fill this gap, a research was conducted to assess the distribution of obesity and associated factors among students in Gulf Medical University.
MATERIALS AND METHODS

A cross-sectional study was conducted among 233 preclinical students of Medicine, Dentistry, PharmD, Bachelor of Biomedical sciences, Health sciences and Physical therapy in Gulf Medical University, Ajman, UAE. All preclinical students studying in Gulf Medical University, any nationality, both gender, and above the age of 18 years were included. Those who were not willing to participate in the research were excluded. Approval obtained from GMU Ethics and Research committees, and permission was obtained from the Deans of respective colleges before the start of the study. Purpose of the study was explained to the participants and a questionnaire was distributed to all those who had consented to participate in the study. A questionnaire was designed to collect the data, Socio-demographic characteristics recorded include: age, gender, discipline, year of study, and nationality. Anthropometric measurements such as height and weight were recorded. The participation in physical activity had been assessed by their weekly frequency of activity, inquiring into the types of activity, intensity and duration. The subjects who engaged in activities at least three times per week had been defined as regular physical activity group, those with once per week, as irregular physical activity, and the others as sedentary. Dietary habits had been assessed by inquiring about type of food consumed in the past one week, frequency, and quantity, history of weight loss diet, and special diet, junk food consumption had been elicited. Medical history had been assessed for any self-reported chronic diseases such as hypertension, diabetes, heart and renal diseases, medications and family history. Anthropometric parameters like height (in cm) and weight (in kg) had been measured by researchers using stadiometer. The instruments and measurement procedures had been standardized. Body mass index calculated from this data. Information was collected on socio demographic characteristics, details of physical activity, and diet history which had been elicited in detail. Completed questionnaires were collected immediately after the study. Data were fed into Excel spread sheet and transferred to SPSS 21 version for analysis. Descriptive analysis was performed and Chi-square test was done to determine the association between obesity and factors associated with it. The statistical significance is considered at p <0.05.

RESULTS

The present research was conducted among 233 students enrolled in various programs such as MBBS, DMD, BPT, Pharm D, BHS, and BBMS to determine the proportion of obesity among them and its association with socio-demographic characteristics, physical activity, and Dietary factors.

Table 1: Distribution of Socio-demographic characteristics of the participants’ (N=233)

<table>
<thead>
<tr>
<th>Socio-demographic Characteristics</th>
<th>Groups</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years’</td>
<td>&lt;20 years</td>
<td>181</td>
<td>78.4</td>
</tr>
<tr>
<td></td>
<td>≥20 years</td>
<td>50</td>
<td>21.6</td>
</tr>
<tr>
<td>Gender’</td>
<td>Male</td>
<td>52</td>
<td>23.2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>172</td>
<td>76.8</td>
</tr>
<tr>
<td>Program</td>
<td>MBBS</td>
<td>59</td>
<td>25.3</td>
</tr>
<tr>
<td></td>
<td>DMD</td>
<td>59</td>
<td>25.3</td>
</tr>
<tr>
<td></td>
<td>BPT</td>
<td>13</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Pharm D</td>
<td>44</td>
<td>18.9</td>
</tr>
</tbody>
</table>
Table 1 describes the Socio-demographic characteristics of the participants. Out of 231 participants 181 (78.4%) were in the age group less than 20 years and 50 (21.6%) were greater than or equal to 20 years. Participants were from different programs such as MBBS, DMD, BPT, Pharm D, BHS, and BBMS. Participants from 1\textsuperscript{st} year were 142 (60.9%) and 2\textsuperscript{nd} year 91 (39.1%). The nationality of participants was categorized according to WHO region-wise, 53 (22.7%) were from Africa region, from the region of America were 6 (2.3%), from Eastern Mediterranean region were 111 (47.6%), from European region were 10 (4.3%), South East Asia region were 48 (20.6%) and from Western Pacific region were 5 (2.1%). Of the total participants, 8 (3.6%) students were married and 216 (96.4%) single.

Table 2: Distribution of participants’ anthropometric characteristics (N=233)

<table>
<thead>
<tr>
<th>Socio-demographic Characteristics</th>
<th>Groups</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (in cms)</td>
<td>≤150.9</td>
<td>14</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>151.0-160.9</td>
<td>76</td>
<td>32.6</td>
</tr>
<tr>
<td></td>
<td>161.0-170.9</td>
<td>97</td>
<td>41.6</td>
</tr>
<tr>
<td></td>
<td>≥171.0</td>
<td>46</td>
<td>19.7</td>
</tr>
<tr>
<td></td>
<td>≤50.9</td>
<td>58</td>
<td>24.9</td>
</tr>
<tr>
<td>Weight (in kg)</td>
<td>51.0-70.9</td>
<td>126</td>
<td>54.1</td>
</tr>
<tr>
<td></td>
<td>71.0-90.9</td>
<td>37</td>
<td>15.9</td>
</tr>
<tr>
<td></td>
<td>≥91.0</td>
<td>12</td>
<td>5.2</td>
</tr>
<tr>
<td>BMI</td>
<td>Under Weight (≤18.50)</td>
<td>39</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>Normal (18.51-24.99)</td>
<td>137</td>
<td>58.8</td>
</tr>
<tr>
<td></td>
<td>Over Weight (25.0-29.99)</td>
<td>41</td>
<td>17.6</td>
</tr>
<tr>
<td></td>
<td>Obese (≥30.0)</td>
<td>16</td>
<td>6.9</td>
</tr>
</tbody>
</table>

With regard to anthropometric measurements of the participants, height was categorized into four groups. Of the participants 97 (41.6%) were between 161.0-170.9
With regard to weight of the participants, 126 (54.1%) were between 51.0-70.9 kg, and 12 (5.2%) were ≥91.0 kg. Body Mass Index (BMI) was calculated and categorized according to WHO criteria. Of the total participants, underweight (≤18.50) were 39 (16.7%), Normal weight (18.51-24.99) were 137 (58.8%), Over Weight (25.0-29.99) were 41 (17.6%) and Obese (≥30.0) were 16 (6.9%). Details are given in table 2.

Among the participants, 25 (10.7%) gave history of smoking. Out of the participants who have smoking history, smoked cigarette were 21 (84%), shisha 24 (96%), midwakh 9 (36%) and smokeless form 3 (12%). Of the ever smokers, 14 (56%) were current smokers.

It was observed that 100 (66%) were performing vigorous physical activity, whereas 52 (34%) were performing only moderate level physical activity. Details are given in figure 2.

Of the total participants’ majority were with a diet history of mixed Diet 212(95.5%).

For students aged <20 years, 29 (16%) were underweight, 104 (57.5%) normal weight and 48 (26.5%) were overweight and obese. While students aged ≥20 years, 10 (20%) reported as underweight, 37 (62%) normal, and 9 (18%) as overweight and obese. The association observed was not statistically significant.

Male students reported to have higher percent of overweight and obesity 18 (34.6%) than female students who reported to have obesity 37 (21.5%). The association observed was statistically significant (p value for participant Students of BHS program reported to have higher BMI 10 (38.5%), followed by BBMS 9 (28.1%), Pharm D 12
(27.3%), MBBS 13 (22%), DMD 12 (20.3%), and BPT reported as the least students to have obesity and overweight 1 (7.7%). Majority of the 1st year students were overweight and obese 42 (29.6%) than 2nd year students 15 (16.5%). The association observed was statistically significant (p value ≤0.05). Students from the Eastern Mediterranean region found to be overweight and obese 35 (31.5%), followed by students from the African region 14 (26.4%). Data showed that majority of the married students were overweight and obese 3 (37.5%) while 50 (23.1%) of single were overweight and obese. Details are given in table 3.

Table 3: Association between participant’s Socio-demographic characteristics and level of BMI (N=233)

<table>
<thead>
<tr>
<th>Socio-demographic Characteristics</th>
<th>Groups</th>
<th>Under weight</th>
<th>Normal</th>
<th>Overweight &amp; Obese</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Age in years*</td>
<td>&lt;20 years</td>
<td>29</td>
<td>16.0</td>
<td>104</td>
<td>57.5</td>
</tr>
<tr>
<td></td>
<td>≥20 years</td>
<td>10</td>
<td>20.0</td>
<td>31</td>
<td>62.0</td>
</tr>
<tr>
<td>Gender*</td>
<td>Male</td>
<td>4</td>
<td>7.7</td>
<td>30</td>
<td>57.7</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>33</td>
<td>19.2</td>
<td>102</td>
<td>59.3</td>
</tr>
<tr>
<td>Program</td>
<td>MBBS</td>
<td>8</td>
<td>13.6</td>
<td>38</td>
<td>64.4</td>
</tr>
<tr>
<td></td>
<td>DMD</td>
<td>10</td>
<td>16.9</td>
<td>37</td>
<td>62.7</td>
</tr>
<tr>
<td></td>
<td>BPT</td>
<td>--</td>
<td>--</td>
<td>12</td>
<td>92.3</td>
</tr>
<tr>
<td></td>
<td>Pharm D</td>
<td>11</td>
<td>25.0</td>
<td>21</td>
<td>47.7</td>
</tr>
<tr>
<td></td>
<td>BBMS</td>
<td>7</td>
<td>21.9</td>
<td>16</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>BHS</td>
<td>3</td>
<td>11.5</td>
<td>13</td>
<td>50.0</td>
</tr>
<tr>
<td>Year of Study</td>
<td>1st Year</td>
<td>25</td>
<td>17.6</td>
<td>75</td>
<td>52.8</td>
</tr>
<tr>
<td></td>
<td>2nd Year</td>
<td>14</td>
<td>15.4</td>
<td>62</td>
<td>68.1</td>
</tr>
<tr>
<td>Nationality groups</td>
<td>African</td>
<td>13</td>
<td>24.5</td>
<td>26</td>
<td>49.1</td>
</tr>
<tr>
<td></td>
<td>American</td>
<td>2</td>
<td>33.3</td>
<td>4</td>
<td>66.7</td>
</tr>
<tr>
<td></td>
<td>Eastern Mediterranean</td>
<td>17</td>
<td>15.3</td>
<td>59</td>
<td>53.2</td>
</tr>
<tr>
<td></td>
<td>European</td>
<td>2</td>
<td>20.0</td>
<td>6</td>
<td>60.0</td>
</tr>
<tr>
<td></td>
<td>South East Asian</td>
<td>5</td>
<td>10.4</td>
<td>38</td>
<td>79.2</td>
</tr>
<tr>
<td></td>
<td>Western Pacific</td>
<td>--</td>
<td>--</td>
<td>4</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>--</td>
<td>--</td>
<td>5</td>
<td>62.5</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>36</td>
<td>16.7</td>
<td>130</td>
<td>60.2</td>
</tr>
</tbody>
</table>

Table 4: Association between participant’s lifestyle factors and level of BMI (N=223)

<table>
<thead>
<tr>
<th>Personal Habits</th>
<th>Groups</th>
<th>Under weight</th>
<th>Normal</th>
<th>Overweight &amp; Obese</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Smoking</td>
<td>Ever</td>
<td>4</td>
<td>16.0</td>
<td>12</td>
<td>48.0</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>35</td>
<td>16.8</td>
<td>125</td>
<td>60.1</td>
</tr>
</tbody>
</table>
Table 4 shows the association between life style factors and BMI. Among the ever smokers, 9 (36%) noticed to be overweight and obese. On the other hand, among never smokers 48 (23.1%) were in the overweight and obese category. There was no statistically significant association between ever smokers and never smokers with BMI categorization.

Of the total participants 31 (20.4%) students who performed exercise were overweight and obese. Whereas, students who did not perform exercise 26 (32.1%) were in overweight and obese. The association observed was not statistically significant between physical activity and BMI.

It was observed that, of them who performed moderate level physical activities, 11 (21.2%) were underweight, 29 (55.8%) had normal BMI, and 12 (23.1%) of them were overweight and obese. Among the participants who performed vigorous level physical activities, 15 (15%) were underweight, 66 (66%) had normal BMI, and 19 (19%) were overweight and obese. No statistically significant association was observed between the level of physical activity and BMI categorization.

Of the participants who practice vegetarian diet, Underweight was 1 (10%), Normal weight 8 (80%), and Overweight 1(10%). None of them were in obese category. Of the total mixed diet consumers, Underweight were 32 (15.1%), Normal weight 125 (59%) Overweight 39 (18.4%) and Obese 16 (7.5%). Most of the students with a vegetarian diet were found to be normal weight and none obese. Students with the habit of mixed diet a few of them were with normal weight as compared to the percentage of students who were on vegetarian diet but a higher percentage of them were overweight, obese and underweight as compared to those students who follow vegetarian diet. No statistically significant association was observed between type of diet and BMI category.

DISCUSSION

Obesity is increasing across the globe due to dietary changes and lack of physical activity. Obesity has been identified as a major risk factor of most of the non-communicable diseases. In the present study, of the total participants, pattern of BMI showed that normal weight were 137 (58.8%), when compared to a research done among Lebanese university students showed that majority of the students (64.7%) were of normal weight. The similar observation may be attributable to the fact that the students choice of eating healthier food and intake of colored vegetables and fruits. In the present study, overweight students were 41 (17.6%) and obese were 16 (6.9%) and this observation was similar to a research conducted among students from Al-Najah National University showed a prevalence of overweight and obesity as 20.1% and 4.6% respectively. Whereas in a research conducted among medical students in the University of Crete reported that approximately 63% female students were overweight category. According to a research done on university students in Bahrain, the prevalence of obesity among students was 19.4%. In a study conducted in Kuwait University the prevalence rate of overweight and obesity was reported as 32% and 8.9%, respectively. This similarity may be due to more or less similar eating habits in the neighboring countries.

Among the participants, 25 (10.7%) reported history of smoking. A research conducted among Greek university students showed that significantly a few of the medical students smoked. The reason for this result is that medical students would have better knowledge and have better health behavior than students from other disciplines.

In our study we found that 36% of ever smokers were obese, and 23.1% of never smokers were obese. Our study showed no clear association between ever smokers and never smokers with BMI levels. The reason behind this finding could be because of the underreporting of smoking habit, as students feel embarrassed to admit their smoking status. This was inversely proven in another studies, where there was significant...
association between smoking and BMI levels 27,28.

Of the total participants, any kind of physical activity was performed in the last month by 152 (65%). In a research conducted among Italian university students, out of 734 students only 28 males (7.4%) 83 females (23.4%) did not practice any physical activity. The similarity in the findings may be due to the increase in enthusiasm of the students to stay physically healthy and mentally active.

Students performing moderate activity were 34 % and vigorous activity 66%. This was comparatively higher than students in other Gulf countries such as a study conducted in Saudi Arabia among health college students where 20.8% of students were performing vigorous intensity activity and those performing moderate intensity activity were 30.9%. Majority of the students consumed mixed diet (95.5%). Similar observation was in a study conducted among Malaysian students where 5.3% were vegetarian.

In the present study the association showed no statistical significance between age and BMI. This may be due to less number of participants aged ch as a study conducted in Saudi Arabia among health college students where 20.8% of students were overweight and obesity. The similarity in the findings may be due to less number of participants aged 20 years. However, Other studies have shown strong association between age and BMI. Studies have shown higher prevalence of obesity in males than females, which was in agreement with our study. This could be due to the fact that females care more about their personal appearance than males.

There was no association between the programs in which they are studying and obesity. This could be due to different levels of stress between different programs. In our study there was clear significance between year of study and obesity in which first year students showed increased prevalence of obesity. It can be due to the fact that they have entered into a new program and are more stressed.

In our study, we found no significant association between the nationality and overweight and obesity. In contrast to that, another study showed association between nationality and BMI where the estimated prevalence of obesity exceeded 50% in men from Tonga and in women from Kuwait, Kiribati, Federated States of Micronesia, Libya, Qatar, Tonga, and Samoa. In the current study, the association between marital status and BMI was not statistically significant. However, a study done in Saudi Arabia showed that married woman is more likely to be overweight and obese.

The limitations of the study include, it was conducted among students of pre-clinical years of all programs and from one university and the sample size is small, therefore it is not representative of all students in the UAE. No attempt was made to confirm the accuracy of self-reported data on habits and physical activity.

CONCLUSION

This research was conducted among 233 pre-clinical year students to determine the proportion of obesity among university students. It was concluded that among the participants 17.6% were overweight and 6.9% were obese. It was observed that 26.5% of students aged <20 years were overweight and obese. Male students reported to have higher percentage of overweight and obesity. Students of BHS program were reported to be overweight and obese. Students from Eastern Mediterranean region were found to be overweight and obese. Gender and year of study showed a statistically significant association. The association observed was not statistically significant between physical activity, type of diet and BMI levels.

The present research provides an overview of the BMI levels among pre-clinical students of health care professions and recommends a nation-wide research among university students to obtain generalizable results. Research on students of health care and Non-health care professions may be conducted to obtain a pattern of overweight and obesity and for comparison. A prospective study on the factors associated with overweight and obesity may be conducted to assess the obesogenic factors in the UAE.


