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(RESEARCH ARTICLE)

# A cross-sectional investigation into the prevalence and contributing factors of obesity among undergraduate students at the University of Buraimi. Oman

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## Abstract

Obesity has emerged as a significant global health issue, impacting millions of individuals and contributing to chronic illnesses such as diabetes, cardiovascular diseases, and specific types of cancer. According to the World Health Organization (WHO), obesity rates have nearly tripled since 1975, with over 1.9 billion adults classified as overweight and 650 million as obese as of 2016. This epidemic is not confined to high-income countries; it also affects low- and middle-income nations, driven by urbanization, sedentary lifestyles, and poor dietary choices. In Oman, the prevalence of obesity is particularly alarming, with 66% of adults categorized as overweight or obese, especially among women. The rapid economic development and a shift towards energy-dense, processed foods have intensified this problem, resulting in an increase in non-communicable diseases (NCDs) and substantial economic repercussions.

This research utilized a quantitative, cross-sectional approach to investigate the prevalence of obesity and its associated factors among university students at the University of Al-Buraimi (UOB). A non-probability, convenience sampling method was employed to recruit 154 students aged 18 to 24 over a four-month period (February to May 2023). Data collection was conducted through Google Forms, ensuring the anonymity and confidentiality of participants. Descriptive statistics were analyzed using SPSS version 25. The results indicated a notable gender disparity, with 82.5% of participants being female and 17.5% male. Additionally, the study revealed trends related to weight, such as a higher prevalence of overweight individuals among males (30.8%) and a significant rate of underweight females (19.2%). Marital and smoking statuses were found to be significantly linked to weight outcomes, whereas factors such as age, financial status, and physical activity did not show significant correlations.

**Result**: The study provides a comprehensive demographic and health profile of university students, revealing notable gender, age, and academic disparities. The sample was predominantly female (82.5%), with males comprising only 17.5%, indicating a significant gender imbalance. Participants were evenly split between ages 18–20 (52.6%) and 21–24 (47.4%). Academically, nearly half were from the College of Health Sciences (48.7%), followed by Engineering (22.7%), Business (18.2%), and Law (10.4%). Most students were in their 3rd year (29.9%), single (88.3%), and from medium-income families (81.2%). Parental education levels were similar, with most mothers (39%) and fathers (26.6%) having secondary education.

In terms of weight classification, 50.3% of students fell within the normal weight range, while notable proportions were categorized as underweight, overweight, or obese. The prevalence of overweight was higher among men (30.8%) compared to women (17.6%), whereas women showed a greater tendency towards being underweight (19.2% versus

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11.5% for men). The rates of obesity were nearly identical across genders, with 11.5% of men and 12% of women classified as obese. Chi-square analysis indicated significant associations between weight outcomes and marital status ($p = 0.016$) as well as smoking status ($p = 0.003$). However, no significant correlations were identified with respect to gender, age, financial status, family history of obesity, fast-food consumption, or physical activity levels. These findings highlight the importance of marital and smoking statuses in influencing weight outcomes, suggesting a need for focused health interventions to address these factors.

**Conclusion:** The study emphasizes the importance of targeted measures to address the issues of obesity and underweight among university students. It is essential to implement public health initiatives, enact policy reforms, and foster community engagement to promote healthier lifestyle choices and mitigate the long-term health and economic repercussions of obesity both in Oman and globally.

**Keywords:** Obesity; Overweight; Prevalence; Risk factors; Contributing factors; Students

## 1. Introduction

Obesity has become a prominent global health concern, impacting millions of people across various age groups and geographical locations. It is defined by an excessive accumulation of body fat that poses significant health risks, contributing to numerous chronic illnesses such as diabetes, cardiovascular diseases, and specific types of cancer. The World Health Organization (WHO) identifies obesity as a critical public health challenge, noting that its prevalence has nearly tripled since 1975[1]. By 2016, more than 1.9 billion adults were classified as overweight, with 650 million categorized as obese worldwide[2]. This epidemic is not limited to high-income countries; low- and middle-income nations are also witnessing a swift increase in obesity rates, largely driven by urbanization, sedentary behaviors, and poor dietary choices.[3]

In Oman, the problem of obesity has become a major challenge, reflecting global trends. The National Nutrition Survey reveals that 66% of adults in Oman are categorized as overweight or obese, especially with a notable prevalence in women[4]. This rise can be linked to swift economic development and changes in lifestyle in recent decades. Conventional diets, previously rich in fruits, vegetables, and whole grains, have mostly been replaced by energy-rich, processed foods that contain high levels of sugars and fats[5]. Additionally, an increase in physical inactivity, fueled by increased reliance on technology and automobiles, has exacerbated this problem. The prevalent issue of obesity in Oman is associated with a rising rate of non-communicable diseases (NCDs), which intensifies the burden on the healthcare system.[6]

The worldwide economic effects of obesity are significant. It is estimated that obesity accounts for about 2.8% of the worldwide GDP as a result of healthcare costs and reduced productivity [7]. In Oman, the financial burden is relatively high, with substantial resources allocated to tackling health problems linked to obesity, such as diabetes and hypertension.[8].The increasing rates of childhood obesity are particularly alarming, as they indicate a forthcoming surge in non-communicable diseases (NCDs) and healthcare expenses. In 2016, over 340 million kids and teenagers aged 5 to 19 were categorized as overweight or obese globally, highlighting the critical requirement for preventative actions[9].

Efforts to combat obesity require a multifaceted approach, including public health campaigns, policy interventions, and community engagement. In Oman, initiatives such as the National Strategy for Nutrition and Physical Activity aim to promote healthier lifestyles and reduce obesity rates [10]. Globally, strategies like sugar taxes, improved food labeling, and urban planning to encourage physical activity have shown promise. However, addressing obesity demands sustained commitment from governments, healthcare providers, and individuals to create environments that support healthy choices.

Obesity is a complex and pervasive issue with profound health, social, and economic implications in Oman and worldwide. Tackling this epidemic requires comprehensive strategies that address its root causes, including dietary habits, physical inactivity, and socioeconomic factors. By prioritizing prevention and early intervention, nations can mitigate the impact of obesity and improve the quality of life for millions of individuals.

## 2. Material and Methods

### 2.1. Research Design

The research utilized a quantitative, cross-sectional approach to investigate the prevalence and contributing factors of obesity among university students. This methodology was selected to gather data at a specific moment, facilitating the examination of the relationships among various variables.

### 2.2. Study Setting

The study was carried out at the University of Al-Buraimi (UOB). This location was chosen because of its close geographical location and the researchers' prior knowledge of the institution, which enabled easier access to participants and simplified the process of data collection.

### 2.3. Sampling Technique

A non-probability, convenience sampling method was employed to select participants who satisfied the inclusion criteria. This approach was selected due to its cost-effectiveness, ease of implementation, and suitability for accessing the target population within the designated timeframe of the study.

### 2.4. Inclusion Criteria

The research involved male and female students between the ages of 18 and 24 who are currently enrolled at the University of Al-Buraimi. This particular age range was chosen to concentrate on young adults, a demographic that is frequently overlooked in studies related to obesity.

### 2.5. Duration of the Study

The study was conducted over four months, from February 2023 to May 2023.

### 2.6. Ethical Considerations

The study was granted approval by the UOB research committee. All participants provided written informed consent after a thorough explanation of the study's objectives and methodologies. Anonymity and confidentiality of the participants were preserved by gathering data without the inclusion of names or any identifying details.

### 2.7. Validity

The effectiveness and accuracy of the research tool were guaranteed through a review and validation process conducted by two experts from UOB. This procedure affirmed the tool's reliability and its suitability for the objectives of the study.

### 2.8. Data Gathering and Analysis Procedure

Data collection was conducted through Google Forms, which were disseminated to students following the acquisition of their informed consent. Participants were guaranteed that their responses would remain confidential. A total of 154 students completed the questionnaire, which required approximately 5 minutes to complete. The gathered data were encoded and analyzed using descriptive statistics to discern patterns and trends. The analysis was performed using version 25 of the Statistical Package for the Social Sciences (SPSS) software.

## 3. Results

The study concentrated on Baccalaureate students enrolled at the University of Buraimi, situated in the Buraimi region, comprising a total of 154 participants. The data were meticulously analyzed to correspond with the objectives and hypotheses of the research, thereby ensuring a comprehensive understanding of the results. Following the data collection phase, all responses were compiled into a master coding sheet to promote organized and precise analysis.

The data were processed and examined utilizing SPSS version 25, which facilitated a thorough statistical evaluation and the detection of essential patterns and trends. This chapter delineates the results of the analysis, providing insights into the research questions and emphasizing significant findings.

**Table 1** Frequency and percentage distribution of sociodemographic characteristics n=154

| Demographic Variables | Components | F | % |
|---|---|---|---|
| Gender | Male | 27 | 17.5 |
| | Female | 127 | 82.5 |
| Age in years | 18-20 | 81 | 52.6 |
| | 21-24 | 73 | 47.4 |
| Collage | Health Science | 75 | 48.7 |
| | Engineering | 35 | 22.7 |
| | Business | 28 | 18.2 |
| | Law | 16 | 10.4 |
| Year of study | 1st | 28 | 18.2 |
| | 2nd | 44 | 28.6 |
| | 3rd | 46 | 29.9 |
| | 4th | 36 | 23.4 |
| Marital status | Single | 136 | 88.3 |
| | Married | 14 | 9.1 |
| | Divorced | 2 | 1.3 |
| | Widower | 2 | 1.3 |
| Mother's Educational | Illiterate | 22 | 14.3 |
| | Primary | 31 | 20.1 |
| | Preparatory | 11 | 7.1 |
| | Secondary | 60 | 39 |
| | Collegiate | 30 | 19.5 |
| Father's Educational | Illiterate | 20 | 13 |
| | Primary | 30 | 19.5 |
| | Preparatory | 11 | 7.1 |
| | Secondary | 41 | 26.6 |
| | Collegiate | 30 | 19.5 |
| Financial status | Upper class | 17 | 11 |
| | Medium class | 125 | 81.2 |
| | Lower class | 12 | 7.8 |
| Family history of obesity | Yes | 31 | 20.1 |
| | No | 85 | 55.2 |
| | Don't know | 38 | 24.7 |

The study's participant demographic was predominantly female, constituting 82.5% of the total sample, whereas males represented 17.5%. This reveals a notable gender disparity. Participants were divided into two age categories: those aged 18–20 years, who comprised 52.6%, and those aged 21–24 years, accounting for 47.4%. This suggests a fairly balanced distribution within the younger adult demographic.

A significant portion of the participants, nearly half, hailed from the College of Health Sciences, which had the highest representation at 48.7%. This was succeeded by the College of Engineering at 22.7%, the College of Business at 18.2%, and the College of Law at 10.4%. The participants were also distributed across various academic years, with the largest group in their third year (29.9%), followed closely by the second year (28.6%), fourth year (23.4%), and first year (18.2%).

The overwhelming majority of participants were single, comprising 88.3%, while a smaller fraction were married (9.1%), divorced (1.3%), or widowed (1.3%). In terms of parental education, most mothers had attained secondary education (39%), followed by primary education (20.1%), collegiate education (19.5%), illiteracy (14.3%), and preparatory education (7.1%). Fathers exhibited similar educational attainment, with the highest percentage also having secondary education (26.6%), followed by primary (19.5%), collegiate (19.5%), illiterate (13%), and preparatory (7.1%).

Regarding economic status, the majority of students identified as belonging to the middle-income class (81.2%), while 11% classified themselves as upper class and 7.8% as lower class. A small proportion of students reported a family history of obesity (20.1%), while 55.2% indicated no such history, and 24.7% were uncertain.

**Table 2** Frequency and percentage distribution of height, weight, and BMI

| | | | **Classification of BMI** | | | | **Total** |
|---|---|---|---|---|---|---|---|
| | | | **Underweight** | **Normal weight** | **Overweight** | **Obese** | |
| SEX | Male | Count | 3 | 12 | 8 | 3 | 26 |
| | | % Within SEX | 11.5% | 46.2% | 30.8% | 11.5% | 100% |
| | Female | Count | 24 | 64 | 22 | 15 | 125 |
| | | % Within SEX | 19.2% | 51.2% | 17.6% | 12% | 100.0% |
| Total | | Count | 27 | 76 | 30 | 18 | 151 |
| | | % Within SEX | 17.9% | 50.3% | 19.9% | 11.9% | 100% |

Table 2 reveals that a significant proportion of students are categorized as having a normal weight, while a considerable number are identified as underweight, overweight, or obese. Among male students, the prevalence of overweight is notably higher at 30.8%, in contrast to 17.6% among female students. The obesity rates are relatively comparable between genders, with 11.5% of males and 12% of females classified as obese. Additionally, a greater percentage of female students, specifically 19.2%, are classified as underweight, compared to 11.5% of their male counterparts. Nevertheless, the majority of female students fall within the normal weight range. In summary, males exhibit a higher tendency towards being overweight, whereas females are more frequently underweight. Importantly, over half of the student population (50.3%) is within the normal weight category, indicating that a substantial segment adheres to healthy weight standards. The elevated percentage of underweight females (19.2%) raises important concerns regarding potential nutritional or health-related challenges that may require attention.

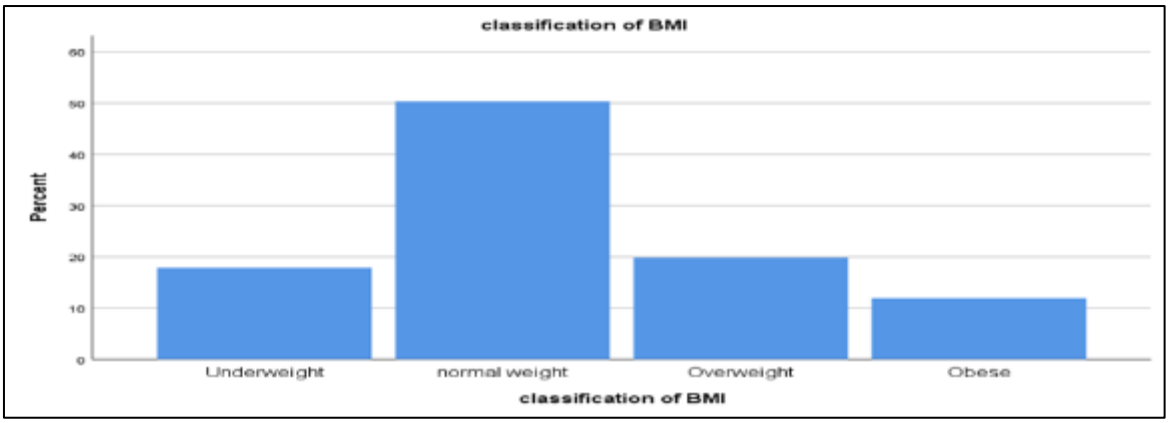


**Figure 1** Frequency and percentage distribution of height, weight, and BMI

The distribution of Body Mass Index (BMI) among university students provides valuable information regarding their weight status. A small fraction of students is categorized as underweight, which may suggest underlying nutritional or health issues. The majority of students are situated within the normal weight range, indicating a generally healthy weight status. Nevertheless, a notable portion of students is classified as overweight, pointing to possible lifestyle or dietary difficulties. Furthermore, a smaller percentage of students falls into the obese category, emphasizing the necessity for focused health interventions.

**Table 3** Association between obesity among UOB students with sociodemographic and lifestyle variables. n=154

| SI No: | Variables | x2 | df | *P* value | Inference |
|---|---|---|---|---|---|
| 1 | Gender | 2.698 | 3 | 0.441 | NS |
| 2 | Age | 5.541 | 3 | 0.136 | NS |
| 3 | Marital status | 20.279 | 9 | 0.016** | S |
| 4 | Financial status | 2.959 | 6 | 0.814 | NS |
| 5 | Family history of obesity | 12.235 | 6 | 0.057 | NS |
| 6 | Smoking status | 19.686 | 6 | 0.003 ** | S |
| 7 | Frequency of fast-food consumption | 12.015 | 12 | 0.444 | NS |
| 8 | The Intensity of Physical Activity | 9.044[a] | 9 | 0.433 | NS |
| **Significant at 0.05 level (2-tailed)*<br>*NS: Not significant S: Significant*<br>***Significant at 0.01 level (2-tailed)* | | | | | |

The key findings from the chi-square analysis reveal both significant and non-significant associations between various variables and the outcome. Gender ($\chi^2$ = 2.698, p = 0.441) and age ($\chi^2$ = 5.541, p = 0.136) do not show statistically significant associations with the outcome. Similarly, financial status ($\chi^2$ = 2.959, p = 0.814), family history of obesity ($\chi^2$ = 12.235, p = 0.057), frequency of fast-food consumption ($\chi^2$ = 12.015, p = 0.444), and intensity of physical activity ($\chi^2$ = 9.044, p = 0.433) are also not significantly related to the outcome.

However, marital status ($\chi^2$ = 20.279, p = 0.016) shows a significant association at the 0.05 level, indicating its potential influence. Additionally, smoking status ($\chi^2$ = 19.686, p = 0.003) is strongly associated with the outcome at the 0.01 level, highlighting its importance. These findings suggest that marital status and smoking status are key factors influencing the outcome, while the other variables do not demonstrate significant relationships.

## 4. Discussion

The current study has identified a positive association between obesity and smoking status. This finding is consistent with the study conducted by AlSulaimi et al. (2023), which reported that obesity and overweight were more prevalent among smokers compared to nonsmokers (59.7% vs. 32.8%, p = 0.01).[11] Additionally, the results of the current study were supported by research conducted by Saeed M. et al. (April 2020) in Eastern Sudan, which included a sample of 594 participants. This study found a significant association between marital status and obesity. According to their findings, being married was a significant risk factor for being overweight or obese, with 58.9% of married participants classified as such. Marital status exhibited a significant association with obesity (p-value = 0.001) and overweight (p-value = 0.005).[12]

In contrast, the current findings differed from a study conducted in Cameroon by Simo et al. (2021), which involved 485 participants. The researchers reported that smoking status had no significant association with obesity (p-value 0.642).[13]

This study indicated that there was no significant association between demographic variables and instances of overweight and obesity. These findings align with those of Dekan et al., who also found no significant relationship between the socio-demographic characteristics of the sample and body mass index, as reflected by a P value greater

than 0.05.[14] Prior to conducting the study, the researchers anticipated that lifestyle factors, such as eating habits and physical activity, would show a more significant association with obesity.

## 5. Conclusion

This study lays the groundwork for future research and interventions focused on weight-related issues among university students. The significant gender imbalance and the high prevalence of underweight females (19.2%) indicate a need for targeted nutritional and health programs to address potential deficiencies. The equal obesity rates across genders (11.5% for males and 12% for females) and the higher prevalence of overweight among males (30.8%) underscore the importance of promoting balanced diets and physical activity.

Future studies should investigate the impact of marital status and smoking rates, as these factors were significantly associated with weight outcomes, to develop tailored interventions. Additionally, expanding the sample to include a more diverse demographic and longitudinal data could offer deeper insights into the factors that influence student health. Proactively addressing these issues can help foster healthier lifestyles and reduce the risk of chronic diseases within this population.

## Compliance with ethical standards

### *Disclosure of conflict of interest*

The authors declare no conflicts of interest. They are solely responsible for the content and writing of the paper.

### *Statement of ethical approval*

Ethical Approval was granted by the Research and Ethics Committee at the College of Health Sciences, University of Buraimi, Oman. This research does not include any studies conducted on animal or human subjects by any of the authors.

### *Statement of informed consent*

The informed consent form was distributed to all prospective participants for their review and completion prior to engaging with the online questionnaire. This consent form contained declarations indicating that their participation was entirely voluntary, and they had the right to withdraw at any point during the study without any repercussions. Additionally, the participants were made aware that their data would be handled with utmost confidentiality, ensuring their privacy was protected.

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