

## Article

# Evaluation of the Prevalence, Perception, and Factors Associated with Obesity Among Pharmacy Students

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## Abstract

**Background:** Obesity is a growing public health concern among university students and is influenced by lifestyle and behavioral factors. This study assessed the prevalence of being overweight and obesity and their associated lifestyle factors among pharmacy students. **Methods:** A cross-sectional study was conducted among undergraduate pharmacy students at the College of Pharmacy, National University of Sciences and Technology, Muscat, Oman. Data were collected using a validated questionnaire covering sociodemographic characteristics, anthropometric measurements, dietary habits, physical activity, sleep, stress-related behaviors, and obesity perceptions. BMI was calculated from measured height and weight. Descriptive statistics and Chi-square tests were performed using SPSS ( $p < 0.05$ ). **Results:** The sample size of this study was 139. The prevalence of overweight and obesity was 42.4%. More than 46% of students consumed fast food, 41% frequently snacked between meals, and over 43% reported late-night eating. Sedentary behaviors were common, with 64% reporting prolonged sitting. Academic stress affected over 59% of participants, while 37% reported stress-related eating. BMI was significantly associated with stress-related eating ( $p = 0.034$ ) and family history of obesity ( $p = 0.002$ ). **Conclusions:** Overweight and obesity were common among pharmacy students, highlighting the need for targeted university-based interventions.

**Keywords:** obesity; academic stress; sedentary behavior; anthropometric



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## 1. Introduction

Obesity has become one of the most significant worldwide public health issues, affecting people from different age groups and socioeconomic levels. It is defined as excessive fat deposition that poses a high health risk and is measured by body mass index (BMI). Increasing obesity rates are accompanied by an increased risk of chronic diseases, including cardiovascular disease, type 2 diabetes mellitus, some malignancies, and psychosocial consequences such as depression and poor quality of life [1–3]. Over the past years, young adults, specifically university students, have been facing the impact of obesity with a higher prevalence due to the critical changes in lifestyles. Irregular eating habits, higher fast food consumption, lack of physical exercise, poor sleep patterns, and high stress levels are common challenges in the university environment. Together, they contribute to unhealthy weight gain and the development of obesity [4–6].

Among university populations, a particularly relevant group of students is those taking up health-related courses, such as pharmacy. These people, as future medical practitioners, are expected to be well-versed and to promote healthy lifestyle habits. However, the evidence shows that pharmacy students are not the exception, as they are also prone to unhealthy behaviors. Research studies have indicated that pharmacy students often engage in unhealthy eating habits, including irregular meals, excessive intake of processed foods, and the use of dietary supplements without a sound understanding of their risks and benefits [7]. Furthermore, research has shown that unhealthy eating habits and disrupted dietary patterns are common among pharmacy students, highlighting a gap between theoretical perception and actual behaviors [8,9]. This gap raises concerns about their readiness to effectively promote healthy lifestyles to patients in the future. Physical inactivity is another determinant of obesity in university students. Although pharmacy students are aware of the health benefits of exercise, not all engage in physical activity regularly [10]. The unbalanced energy consumption and expenditure, which is enhanced by sedentary living, is a major cause of weight gain and obesity among this group.

Furthermore, obesity is a significant health issue in the Gulf Cooperation Council (GCC) countries, including Oman. Rapid urbanization, dietary changes toward energy-dense foods, and physical inactivity have contributed to rising obesity rates in the region [11,12]. Research has reported the increasing trends of overweight and obesity in both children and adults in Oman in particular, highlighting the growing burden of the condition [13]. What is more, recent studies in Oman targeting university students have revealed alarming rates of obesity and its negative impact on health outcomes and academic success [14].

Due to the multifactorial characteristics of obesity, which involve behavioral, environmental, and lifestyle determinants, the prevalence of obesity and its associated factors among pharmacy students needs to be explored [15,16]. Their eating habits, physical activity, and lifestyle behaviors can be elucidated, which will be essential in developing specific interventions that improve their health and enhance their performance as future health practitioners [17,18]. Furthermore, it is important to consider that obesity among university students is a complex interaction of lifestyle, environmental, and behavioral factors rather than a solitary behavioral pattern [19,20]. Empirical evidence suggests that risk determinants, including unhealthy diet, physical inactivity, poor sleep, psychological stress, and other unhealthy lifestyle behaviors, frequently coexist and interact with one another, resulting in a cumulative effect on weight gain [1,2,21–24].

Numerous published studies have focused on determining the prevalence of obesity and identifying associated factors, whereas comparatively few have evaluated practical interventions to improve lifestyle behaviors in this population [17,18,22]. This highlights the importance of conducting more targeted studies that not only investigate the determinants of obesity but also assess effective strategies for promoting sustainable behavior change among pharmacy students [15,17,18,25].

Therefore, the present study aimed to assess the prevalence of overweight and obesity among pharmacy students and to evaluate their dietary habits, physical activity, sleep and stress-related behaviors, and perceptions toward obesity. In addition, the study sought to identify lifestyle factors associated with overweight and obesity to provide evidence that may support the development of targeted health promotion and obesity prevention strategies within the university setting.

## 2. Materials and Methods

### 2.1. Study Design and Settings

This research was conducted as a pilot cross-sectional study aimed at assessing the prevalence of overweight and obesity and identifying associated lifestyle factors among university students. The study was carried out at the College of Pharmacy, National University of Science and Technology, Muscat, Oman. The study population consisted of undergraduate pharmacy students enrolled in the Bachelor of Pharmacy program from Year 1 to Year 4.

The inclusion criteria consisted of pharmacy students aged 18 years or older who agreed to complete the survey questionnaire. Students who were not enrolled in the pharmacy program, students from other universities, or individuals who declined to participate were excluded from the study. Participation was voluntary, and all participants were informed about the objectives of the research prior to completing the questionnaire. To maintain confidentiality, the questionnaire did not collect personal identifiers such as names or student identification numbers.

### 2.2. Sample Size

The sample size was calculated based on the total number of students enrolled in the Bachelor of Pharmacy program, which was 252. Using a 95% confidence level, a 5% margin of error, and an estimated obesity prevalence of 25%, the minimum required sample size was calculated to be 135 participants. This sample size was considered adequate to estimate the prevalence of overweight and obesity and to evaluate potential associations between BMI and the studied lifestyle variables.

### 2.3. Data Collection Approach

Data was collected after getting ethical approval from the Ethical and Biosafety Committee (EBC) at the College of Pharmacy, National University, with approval number EBS/PRES 0401-COP/GP-02/SP 2025-26. Responses were automatically recorded and stored securely within the Microsoft Forms platform before being exported for statistical analysis. BMI was measured individually in a private room with a qualified nurse.

### 2.4. Study Tool

Data were collected using a structured questionnaire based on previously published studies examining obesity and lifestyle behaviors among university students. The questionnaire consisted of three main sections, including sociodemographic information, lifestyle-related factors, and perceptions related to obesity and healthy behaviors.

To ensure the validity and relevance of the questionnaire, validated questions were used and reviewed to align with the objectives of the current study. In addition, the research team communicated with and obtained permission from the authors of the original studies. The questionnaire was carefully reviewed to ensure clarity, accuracy, and relevance before being distributed to participants. Responses were automatically recorded and stored securely within the Microsoft Forms platform.

#### Sociodemographic and Anthropometric Data

The first section of the questionnaire collected both sociodemographic and anthropometric information from participants. Sociodemographic data included variables such as age, gender, and academic year of study, which were used to describe the characteristics of the study population and to explore potential associations with Body Mass Index (BMI).

Anthropometric measurements, including height and weight, were obtained to calculate BMI. To ensure accuracy, the research team received assistance from a qualified nurse from the student clinic of the College of Pharmacy, who measured participants' height

and weight using standardized equipment. Height was recorded in meters and weight in kilograms.

BMI was calculated using the standard formula:

$$\text{BMI} = \text{weight (kg)} / \text{height (m}^2\text{)}$$

Based on the calculated BMI values, participants were classified into underweight, normal weight, overweight, or obese according to internationally recognized BMI classification criteria; World Health Organization (WHO) BMI classification criteria: underweight ( $<18.5 \text{ kg/m}^2$ ), normal weight ( $18.5\text{--}24.9 \text{ kg/m}^2$ ), overweight ( $25.0\text{--}29.9 \text{ kg/m}^2$ ), and obese ( $\geq 30.0 \text{ kg/m}^2$ ).

#### Factors Affecting Obesity

This section consisted of 17 items (Questions 7–23) assessing participants' lifestyle behaviors using a frequency-based scale. The questions covered multiple domains, including dietary habits (7 items: breakfast intake, fruit and vegetable consumption, fast food intake, sugary beverages, snacking, meal skipping, and late-night eating), physical activity and sedentary behavior (5 items: moderate activity, vigorous exercise, duration of exercise, prolonged sitting, and screen time), and sleep and stress-related behaviors (5 items: sleep duration, sleep quality, academic stress, stress-related eating, and emotional eating). These items were designed to capture the frequency and patterns of daily behaviors that may influence body weight.

#### Perceptions

This section included 6 items (Questions 24–29) assessing participants' perceptions and attitudes toward obesity and weight management using an agreement-based Likert scale. The questions evaluated participants' perceptions of obesity as a health issue, their understanding of the role of lifestyle factors in obesity, their interest in weight management programs, and their views regarding the use and effectiveness of weight-loss supplements. This section aimed to assess participants' beliefs and attitudes that may influence their lifestyle choices and weight-related behaviors.

#### Response Measurement Scale

The questionnaire utilized two different types of Likert scales, depending on the nature of the questions.

For lifestyle Factors, a five-point frequency-based Likert scale was used:

1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always.

For Perceptions, a five-point agreement-based Likert scale was used:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

Thus, the questionnaire incorporated two distinct Likert scale formats, as different types of variables were being measured. Behavioral questions were assessed using a frequency scale, while perception-based questions were measured using an agreement scale to better capture participants' opinions.

#### 2.5. Reliability Test

To ensure the internal consistency of the questionnaire, a reliability analysis was conducted using Cronbach's alpha test. Prior to the main data collection, a pilot test was performed on a randomly selected sample of approximately 30 students. The responses collected were analyzed using the Statistical Package for the Social Sciences (SPSS) software, version 31.

The Cronbach's alpha value obtained was 0.887, indicating a high level of internal consistency among the questionnaire items. This value suggests that the instrument used in this study was reliable for assessing the variables of interest.

### 2.6. Statistical Analysis

All collected data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) software. Prior to analysis, the dataset was reviewed for completeness and accuracy.

Descriptive statistics were used to summarize the characteristics of the study population. Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as mean  $\pm$  standard deviation. BMI values were calculated and categorized according to standard BMI classification criteria.

Inferential statistical tests were used to examine the relationship between BMI categories and the studied variables. The Chi-square test was used to assess associations between categorical variables. A *p*-value of less than 0.05 was considered statistically significant.

## 3. Results

### 3.1. Reliability Test

The reliability analysis of the questionnaire used in this study included 30 cases, with no missing or excluded data, indicating complete responses from participants. The internal consistency was high, with a Cronbach's alpha value of 0.887 across 23 items. This suggests that the questionnaire demonstrated good reliability and was suitable for assessing the variables of interest among pharmacy students (Table 1).

**Table 1.** Cronbach's Alpha result.

| Case Processing Summary |          |            |       |
|-------------------------|----------|------------|-------|
| Cases                   |          | N          | %     |
|                         | Valid    | 30         | 100.0 |
|                         | Excluded | 0          | 0.0   |
|                         | Total    | 30         | 100.0 |
| Reliability Statistics  |          |            |       |
| Cronbach's Alpha        |          | N of Items |       |
| 0.887 *                 |          | 23         |       |

\* Cronbach Alpha > 0.85 indicating the high internal consistency between items.

### 3.2. Sociodemographic and Anthropometric Characteristics

A total of 139 pharmacy students participated in the study. The majority were aged between 21–23 years (48.2%), followed by 18–20 years (37.4%). Females constituted most of the sample (88.5%), while males represented 11.5%. Regarding academic level, participants were distributed across all years, with the highest proportion in Year 4 (29.5%).

In terms of BMI classification, nearly half of the participants had normal weight (46.8%), while 30.9% were overweight and 11.5% were obese. Additionally, 10.8% were underweight. A positive family history of obesity was reported by 68.3% of students (Table 2).

**Table 2.** Sociodemographic and anthropometric characteristics of pharmacy students.

| Variable       | Category           | *n  | %     |
|----------------|--------------------|-----|-------|
| Age            | 18–20 years        | 52  | 37.4% |
|                | 21–23 years        | 67  | 48.2% |
|                | 24–27 years        | 16  | 11.5% |
|                | 28 years and above | 4   | 2.9%  |
| Gender         | Male               | 16  | 11.5% |
|                | Female             | 123 | 88.5% |
| Year of study  | Year 1             | 35  | 25.2% |
|                | Year 2             | 28  | 20.1% |
|                | Year 3             | 35  | 25.2% |
|                | Year 4             | 41  | 29.5% |
| Family history | Yes                | 95  | 68.3% |
|                | No                 | 44  | 31.7% |
| BMI Category * | Underweight        | 15  | 10.8% |
|                | Normal weight      | 65  | 46.8% |
|                | Overweight         | 43  | 30.9% |
|                | Obese              | 16  | 11.5% |

\*n: No. of Participants. \* Internationally recognized BMI classification criteria: underweight ( $<18.5 \text{ kg/m}^2$ ), normal weight ( $18.5\text{--}24.9 \text{ kg/m}^2$ ), overweight ( $25.0\text{--}29.9 \text{ kg/m}^2$ ), and obese ( $\geq 30.0 \text{ kg/m}^2$ ).

### 3.3. Dietary Habits

The dietary habits of pharmacy students suggested a moderate level, with a descriptive mean response of 3.16, indicating moderately healthy dietary practices. Breakfast consumption demonstrated a moderate frequency (mean =  $3.27 \pm 1.24$ ), suggesting that students consumed breakfast inconsistently. Daily fruit and vegetable intake was also moderate (mean =  $3.11 \pm 1.16$ ), indicating that the recommended daily intake was not consistently achieved.

Fast food consumption showed a moderate level (mean =  $3.30 \pm 0.93$ ), suggesting occasional to frequent consumption among participants. Similarly, snacking between meals demonstrated a moderate level (mean =  $3.20 \pm 1.09$ ), reflecting a common dietary behavior. Consumption of sugar-sweetened beverages was moderate (mean =  $2.86 \pm 1.18$ ). Skipping main meals during periods of stress (mean =  $3.22 \pm 1.31$ ) and late-night eating (mean =  $3.19 \pm 1.17$ ) were also interpreted as moderate, indicating that these unhealthy eating behaviors occurred occasionally among the students (Table 3).

**Table 3.** Dietary habits of pharmacy students based on Likert-scale responses.

| Question                                 | Never n (%) | Rarely n (%) | Sometimes n (%) | Often n (%) | Always n (%) | Mean $\pm$ SD   |
|------------------------------------------|-------------|--------------|-----------------|-------------|--------------|-----------------|
| Eating Breakfast                         | 13 (9.4)    | 24 (17.3)    | 43 (30.9)       | 30 (21.6)   | 29 (20.9)    | $3.27 \pm 1.24$ |
| One serving of Fruits & Vegetables daily | 11 (7.9)    | 33 (23.7)    | 45 (32.4)       | 30 (21.6)   | 20 (14.4)    | $3.11 \pm 1.16$ |
| Fast Food Consumption                    | 4 (2.9)     | 21 (15.1)    | 55 (39.6)       | 47 (33.8)   | 12 (8.6)     | $3.30 \pm 0.93$ |
| Consumption of Sugary Beverages          | 20 (14.4)   | 36 (25.9)    | 36 (25.9)       | 37 (26.6)   | 10 (7.2)     | $2.86 \pm 1.18$ |
| Snacking Between Meals                   | 9 (6.5)     | 27 (19.4)    | 46 (33.1)       | 41 (29.5)   | 16 (11.5)    | $3.20 \pm 1.09$ |

**Table 3.** *Cont.*

| Question                    | Never n (%) | Rarely n (%) | Sometimes n (%) | Often n (%) | Always n (%) | Mean $\pm$ SD   |
|-----------------------------|-------------|--------------|-----------------|-------------|--------------|-----------------|
| Meal Skipping During Stress | 21 (15.1)   | 16 (11.5)    | 41 (29.5)       | 34 (24.5)   | 27 (19.4)    | 3.22 $\pm$ 1.31 |
| Late-Night Food Consumption | 15 (10.8)   | 21 (15.1)    | 42 (30.2)       | 44 (31.7)   | 17 (12.2)    | 3.19 $\pm$ 1.17 |
| Total Average Mean *        |             |              |                 |             |              | 3.164           |

SD: Standard Deviation. \* Responses with a score equal to or less than 2.6 were classified as low habit, and responses with a score between 2.7 and 3.4 were classified as moderate habit. While responses of more than 3.4 were recognized as a high habit.

### 3.4. Physical Activity and Sedentary Behavior

Physical activity and sedentary behaviors reported an overall moderate level, with a total average mean score of 3.17. Moderate physical activity (mean =  $2.86 \pm 1.14$ ), vigorous exercise (mean =  $2.55 \pm 1.21$ ), and engaging in at least 30 min of daily exercise (mean =  $2.86 \pm 1.29$ ) all showed moderate levels, indicating that regular physical activity was not consistently practiced by the participants.

Conversely, sedentary behaviors were high. Long sitting hours demonstrated a high level (mean =  $3.82 \pm 0.89$ ), while spending several hours daily using screens also showed a high level (mean =  $3.77 \pm 0.94$ ). These findings suggest that sedentary behavior was common despite the overall moderate level of physical activity (Table 4).

**Table 4.** Physical activity and sedentary behaviors among pharmacy students.

| Question                          | Never n (%) | Rarely n (%) | Sometimes n (%) | Often n (%) | Always n (%) | Mean $\pm$ SD   |
|-----------------------------------|-------------|--------------|-----------------|-------------|--------------|-----------------|
| Moderate Physical Activity        | 20 (14.4)   | 31 (22.3)    | 46 (33.1)       | 32 (23.0)   | 10 (7.2)     | 2.86 $\pm$ 1.14 |
| Vigorous Exercises                | 35 (25.2)   | 33 (23.7)    | 39 (28.1)       | 24 (17.3)   | 8 (5.8)      | 2.55 $\pm$ 1.21 |
| Exercise $\geq$ 30 min daily      | 25 (18.0)   | 33 (23.7)    | 35 (25.2)       | 28 (20.1)   | 18 (12.9)    | 2.86 $\pm$ 1.29 |
| Long Sitting Hours *              | 1 (0.7)     | 7 (5.0)      | 42 (30.2)       | 55 (39.6)   | 34 (24.5)    | 3.82 $\pm$ 0.89 |
| Screen Time Several Hours Daily * | 3 (2.2)     | 7 (5.0)      | 42 (30.2)       | 54 (38.8)   | 33 (23.7)    | 3.77 $\pm$ 0.94 |
| Total Average Mean                |             |              |                 |             |              | 3.172           |

\* Responses with a score equal to or less than 2.6 were classified as low activity and behavior, and responses with a score between 2.7 and 3.4 were classified as moderate activity and behavior. Responses of more than 3.4 were recognized as high activity and behavior.

### 3.5. Sleep and Stress-Related Behaviors

Sleep and stress-related behaviors demonstrated an overall moderate level, with a total average mean score of 3.34. Obtaining the recommended 6–8 h of sleep per night showed a moderate level (mean =  $3.26 \pm 1.12$ ), while restful and adequate sleep was also moderate (mean =  $3.32 \pm 1.02$ ), indicating that satisfactory sleep quality was not consistently achieved.

Academic stress demonstrated a high level (mean =  $3.75 \pm 1.12$ ), suggesting that stress related to academic demands was commonly experienced by the participants. Eating more during periods of stress showed a moderate level (mean =  $3.03 \pm 1.19$ ), indicating that stress-related eating behaviors occurred occasionally (Table 5).

**Table 5.** Sleep and stress-related behaviors among pharmacy students.

| Question                 | Never n (%) | Rarely n (%) | Sometimes n (%) | Often n (%) | Always n (%) | Mean $\pm$ SD   |
|--------------------------|-------------|--------------|-----------------|-------------|--------------|-----------------|
| Enough sleep (6–8 h)     | 10 (7.2)    | 24 (17.3)    | 44 (31.7)       | 42 (30.2)   | 19 (13.7)    | 3.26 $\pm$ 1.12 |
| Restful & adequate sleep | 5 (3.6)     | 28 (20.1)    | 38 (27.3)       | 54 (38.8)   | 14 (10.1)    | 3.32 $\pm$ 1.02 |

**Table 5.** *Cont.*

| Question                                  | Never n (%) | Rarely n (%) | Sometimes n (%) | Often n (%) | Always n (%) | Mean $\pm$ SD   |
|-------------------------------------------|-------------|--------------|-----------------|-------------|--------------|-----------------|
| Stress associated with academic demands * | 6 (4.3)     | 11 (7.9)     | 39 (28.1)       | 39 (28.1)   | 44 (31.7)    | 3.75 $\pm$ 1.12 |
| Eating more when stressed                 | 18 (12.9)   | 27 (19.4)    | 42 (30.2)       | 37 (26.6)   | 15 (10.8)    | 3.03 $\pm$ 1.19 |
| Craving & emotional eating during stress  | 11 (7.9)    | 21 (15.1)    | 49 (35.3)       | 37 (26.6)   | 21 (15.1)    | 3.26 $\pm$ 1.13 |
| Total Average Mean                        |             |              |                 |             |              | 3.34            |

\* Responses with a score equal to or less than 2.6 were classified as low behavior, and responses with a score between 2.7 and 3.4 were classified as moderate behavior. Responses of more than 3.4 were recognized as high behavior.

### 3.6. Perceptions Toward Obesity

Participants showed a positive perception toward obesity, with a total average mean score of 3.63, indicating generally positive perceptions regarding obesity and its prevention.

The belief that obesity can be prevented through appropriate lifestyle modifications demonstrated a very high level of agreement (mean = 4.21  $\pm$  0.93). Likewise, perceiving obesity as a serious health issue showed a very high level (mean = 4.32  $\pm$  0.93). The belief that lifestyle factors play a major role in the development of obesity demonstrated a high level of agreement (mean = 4.12  $\pm$  0.97). Perceptions regarding the effectiveness of weight management programs were also high (mean = 3.50  $\pm$  1.23), indicating generally favorable attitudes toward these interventions. In contrast, the use of weight-loss supplements or herbal products demonstrated a low level (mean = 2.55  $\pm$  1.41), suggesting that these products were not commonly used. Beliefs regarding the effectiveness of weight-loss supplements or herbal products were moderate (mean = 3.06  $\pm$  1.09), indicating uncertainty about their effectiveness for weight management (Table 6).

**Table 6.** Perceptions toward obesity among pharmacy students.

| Statement                                                                                                             | Strongly Disagree n (%) | Disagree n (%) | Neutral n (%) | Agree n (%) | Strongly Agree n (%) | Mean $\pm$ SD    |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------|----------------|---------------|-------------|----------------------|------------------|
| I believe that obesity can be prevented through appropriate lifestyle modifications.                                  | 4 (2.9)                 | 1 (0.7)        | 21 (15.1)     | 49 (35.3)   | 64 (46.0)            | 4.21 $\pm$ 0.928 |
| I believe that lifestyle factors play a major role in the development of obesity.                                     | 4 (2.9)                 | 2 (1.4)        | 28 (20.1)     | 45 (32.4)   | 60 (43.2)            | 4.12 $\pm$ 0.971 |
| I perceive obesity as a serious health issue that can negatively affect overall health and well-being.                | 3 (2.2)                 | 3 (2.2)        | 17 (12.2)     | 40 (28.8)   | 76 (54.7)            | 4.32 $\pm$ 0.925 |
| I believe that weight management programs are effective in helping individuals achieve and maintain a healthy weight. | 13 (9.4)                | 11 (7.9)       | 45 (32.4)     | 33 (23.7)   | 37 (26.6)            | 3.50 $\pm$ 1.230 |
| I believe that weight-loss supplements or herbal products can be useful in supporting weight management.              | 50 (36.0)               | 18 (12.9)      | 30 (21.6)     | 27 (19.4)   | 14 (10.1)            | 2.55 $\pm$ 1.405 |
| I perceive weight-loss supplements or herbal products as effective for weight management.                             | 15 (10.8)               | 20 (14.4)      | 58 (41.7)     | 33 (23.7)   | 13 (9.4)             | 3.06 $\pm$ 1.092 |
| Total Average Mean *                                                                                                  |                         |                |               |             |                      | 3.626            |

\* Responses with a score equal to or less than 2.6 were classified as low Perceptions, and responses with a score between 2.7 and 3.4 were classified as moderate Perceptions. Responses of more than 3.4 were recognized as high Perceptions.

### 3.7. Association Between BMI and Variable Responses

Statistical analysis revealed a significant association between BMI and stress-related eating behaviors ( $p = 0.034$ ) as well as family history of obesity ( $p = 0.002$ ). Specifically,

25.0% of obese students reported always engaging in stress eating, compared to only 4.6% of normal-weight students.

No significant associations were observed in Table 7 between BMI and fast food intake ( $p = 0.552$ ), moderate physical activity ( $p = 0.181$ ), academic stress ( $p = 0.534$ ), age ( $p = 0.935$ ), year of study ( $p = 0.245$ ) or sedentary behaviors including long sitting hours ( $p = 0.463$ ) and screen time several hours daily ( $p = 0.426$ ).

**Table 7.** Association between BMI categories and the variable responses.

|                            | Response Category  | Underweight<br>n (%) | Normal<br>n (%) | Overweight<br>n (%) | Obese<br>n (%) | <i>p</i> -Value |
|----------------------------|--------------------|----------------------|-----------------|---------------------|----------------|-----------------|
| Year of Study              | Year 1             | 2 (13.3%)            | 19 (29.2%)      | 12 (27.9%)          | 2 (12.5%)      | 0.245           |
|                            | Year 2             | 5 (33.3%)            | 17 (26.2%)      | 4 (9.3%)            | 2 (12.5%)      |                 |
|                            | Year 3             | 3 (20.0%)            | 15 (23.1%)      | 12 (27.9%)          | 5 (31.3%)      |                 |
|                            | Year 4             | 5 (33.3%)            | 14 (21.5%)      | 15 (34.9%)          | 7 (43.8%)      |                 |
| Family History             | Yes                | 12 (80.0%)           | 51 (78.5%)      | 27 (62.8%)          | 5 (31.3%)      | 0.002 **        |
|                            | No                 | 3 (20.0%)            | 14 (21.5%)      | 16 (37.2%)          | 11 (68.8%)     |                 |
| Academic stress            | Never              | 1 (6.7%)             | 1 (1.5%)        | 3 (7%)              | 1 (6.3%)       | 0.534           |
|                            | Rarely             | 1 (6.7%)             | 6 (9.2%)        | 3 (7%)              | 1 (6.3%)       |                 |
|                            | Sometimes          | 2 (13.3%)            | 24 (36.9%)      | 8 (18.6%)           | 5 (31.3%)      |                 |
|                            | Often              | 3 (20.0%)            | 17 (26.2%)      | 15 (34.9%)          | 4 (25.0%)      |                 |
|                            | Always             | 8 (53.3%)            | 17 (26.2%)      | 14 (32.6%)          | 5 (31.3%)      |                 |
| Age                        | 18–20 years        | 5 (33.3%)            | 26 (40.0%)      | 17 (39.5%)          | 4 (25.0%)      | 0.935           |
|                            | 21–23 years        | 9 (60.0%)            | 30 (46.2%)      | 20 (46.5%)          | 8 (50.0%)      |                 |
|                            | 24–27 years        | 1 (6.7%)             | 7 (10.8%)       | 5 (11.6%)           | 3 (18.8%)      |                 |
|                            | 28 years and above | 0 (0.0%)             | 2 (3.1%)        | 1 (2.3%)            | 1 (6.3%)       |                 |
| Fast food intake           | Never              | 1 (6.7%)             | 1 (1.5%)        | 2 (4.7%)            | 0 (0.0%)       | 0.552           |
|                            | Rarely             | 2 (13.3%)            | 12 (18.5%)      | 7 (16.3%)           | 0 (0.0%)       |                 |
|                            | Sometimes          | 7 (46.7%)            | 24 (36.9%)      | 15 (34.9%)          | 9 (56.3%)      |                 |
|                            | Often              | 5 (33.3%)            | 20 (30.8%)      | 17 (39.5%)          | 5 (31.3%)      |                 |
|                            | Always             | 0 (0.0%)             | 8 (12.3%)       | 2 (4.7%)            | 2 (12.5%)      |                 |
| Moderate Physical activity | Never              | 2 (13.3%)            | 9 (13.8%)       | 7 (16.3%)           | 2 (12.5%)      | 0.181           |
|                            | Rarely             | 6 (40.0%)            | 11 (16.9%)      | 10 (23.3%)          | 4 (25.0%)      |                 |
|                            | Sometimes          | 4 (26.7%)            | 24 (36.9%)      | 11 (25.6%)          | 7 (43.8%)      |                 |
|                            | Often              | 2 (13.3%)            | 20 (30.8%)      | 8 (18.6%)           | 2 (12.5%)      |                 |
|                            | Always             | 1 (6.7%)             | 1 (1.5%)        | 7 (16.3%)           | 1 (6.3%)       |                 |
| Long Sitting Hours         | Never              | 0 (0.0%)             | 0 (0.0%)        | 1 (2.3%)            | 0 (0.0%)       | 0.463           |
|                            | Rarely             | 0 (0.0%)             | 3 (4.6%)        | 4 (9.3%)            | 0 (0.0%)       |                 |
|                            | Sometimes          | 4 (26.7%)            | 24 (36.9%)      | 7 (16.3%)           | 7 (43.8%)      |                 |
|                            | Often              | 6 (40.0%)            | 24 (36.9%)      | 20 (46.5%)          | 5 (31.3%)      |                 |
|                            | Always             | 5 (33.3%)            | 14 (21.5%)      | 11 (25.6%)          | 4 (25.0%)      |                 |

Table 7. Cont.

|                                    | Response Category | Underweight<br>n (%) | Normal<br>n (%) | Overweight<br>n (%) | Obese<br>n (%) | p-Value  |
|------------------------------------|-------------------|----------------------|-----------------|---------------------|----------------|----------|
| Screen Time Several Hours<br>Daily | Never             | 0 (0.0%)             | 0 (0.0%)        | 3 (7.0%)            | 0 (0.0%)       | 0.426    |
|                                    | Rarely            | 2 (13.3%)            | 4 (6.2%)        | 1 (2.3%)            | 0 (0.0%)       |          |
|                                    | Sometimes         | 4 (26.7%)            | 22 (33.8%)      | 10 (23.3%)          | 6 (37.5%)      |          |
|                                    | Often             | 5 (33.3%)            | 24 (36.9%)      | 19 (44.2%)          | 6 (37.5%)      |          |
|                                    | Always            | 4 (26.7%)            | 15 (23.1%)      | 10 (23.3%)          | 4 (25.0%)      |          |
| Tendency to stress eating          | Never             | 3 (20.0%)            | 11 (16.9%)      | 3 (7.0%)            | 1 (6.3%)       | 0.034 ** |
|                                    | Rarely            | 7 (46.7%)            | 11 (16.9%)      | 7 (16.3%)           | 2 (12.5%)      |          |
|                                    | Sometimes         | 3 (20.0%)            | 22 (33.8%)      | 11 (25.6%)          | 6 (37.5%)      |          |
|                                    | Often             | 2 (13.3%)            | 18 (27.7%)      | 14 (32.6%)          | 3 (18.8%)      |          |
|                                    | Always            | 0 (0.0%)             | 3 (4.6%)        | 8 (18.6%)           | 4 (25.0%)      |          |

\*\*: statistical significance. The percentages were calculated by column.

## 4. Discussion

### 4.1. Sociodemographic and Anthropometric Characteristics

The findings revealed that 42.4% of students were either overweight (30.9%) or obese (11.5%), indicating a considerable burden of excess weight among pharmacy students. This prevalence is consistent with studies conducted in the Gulf region, where rising obesity rates have been documented among young populations [11]. Similar findings were reported among university students internationally, in which overweight and obesity are linked to lifestyle and sociodemographic factors [16,19]. Similarly, research among Omani university students reported comparable levels of overweight and obesity, highlighting the growing public health concern in this demographic [14]. The high proportion of students with a positive family history (68.3%) may further contribute to this trend, as familial, behavioral, and environmental factors are known to play a role in obesity risk [26,27].

### 4.2. Dietary Habits

Dietary behaviors in this study showed several suboptimal patterns. A large proportion of students reported irregular breakfast consumption, with 26.7% rarely or never consuming breakfast. Similarly, 36% only reported consuming fruits and vegetables at least often, indicating suboptimal intake. Fast food consumption was notably high, with 42.4% of students reporting consumption (often/always), while 33.8% consumed sugary beverages regularly. Snacking between meals was also common (41%), and almost 44% reported skipping main meals during stress, with the same percentage engaging in late-night eating.

These findings align with previous studies among health sciences students, which reported poor dietary habits, including frequent fast food consumption and irregular meal patterns [28]. Similar patterns have also been observed among university and medical students, where academic demands and independent living were associated with unhealthy eating behaviors and reduced adherence to healthy lifestyle practices [29,30]. The high prevalence of fast food intake is particularly concerning, as it has been directly associated with increased obesity risk among university students [6]. Additionally, late-night eating behaviors have been linked to weight gain [5]. These results suggest that, despite being in a health-related field, pharmacy students may adopt unhealthy dietary behaviours like their peers.

#### 4.3. Physical Activity and Sedentary Behavior

Physical activity levels among participants were generally low. Almost 30% reported engaging in moderate physical activity at least often. Vigorous exercise was even less frequent, with 23.1% reporting participation (often/always). Additionally, 41.7% never or rarely achieved  $\geq 30$  min of exercise, indicating suboptimal adherence to recommended physical activity guidelines. In contrast, sedentary behaviors were highly prevalent, with 64.1% reporting prolonged sitting and 62.5% experiencing extended screen time (often/always). These findings are consistent with studies indicating that university students often lead sedentary lifestyles due to academic demands [10]. Systematic review evidence also shows that university students spend considerable time being sedentary, particularly during screen-based and study-related activities [31–33]. A study in Oman also highlighted low physical activity levels as a significant contributor to obesity among adults [13]. Sedentary behavior has been strongly linked to weight gain and metabolic disorders, reinforcing its role as a major risk factor [1,34].

#### 4.4. Sleep and Stress-Related Behaviors

Sleep patterns and stress-related behaviors were also notable. Although around 44% of students reported obtaining 6–8 h of sleep at least often, only a smaller proportion experienced consistently restful sleep. Academic stress was highly prevalent, with more than 59% reporting stress. This stress appeared to influence eating behaviors, with 37% reporting increased eating during stress. These findings are supported by previous research demonstrating a strong association between psychological stress and obesity-related behaviors [1]. Stress-induced eating, particularly emotional eating, has been identified as a key contributor to weight gain among university students [35]. Recent evidence also indicates that emotional eating among university students is associated with perceived stress, BMI, unhealthy dietary behaviors, and reduced mental well-being [28,36–38]. Poor sleep quality further exacerbates this relationship by lifestyle strategies [1].

#### 4.5. Perceptions Toward Obesity

Despite the prevalence of unhealthy behaviors, students demonstrated generally positive perceptions regarding obesity. A substantial proportion agreed or strongly agreed that obesity is preventable (81.3%) and caused by lifestyle factors (75.6%). Furthermore, 83.5% recognized obesity as a serious health issue. However, interest in weight management programs was moderate, suggesting a gap between perception and practice.

Additionally, doubts regarding the effectiveness of dietary supplements emphasize the importance of strengthening education on evidence-based weight management approaches [7].

#### 4.6. Association Between BMI and Lifestyle Factors

The analysis of associations revealed that stress-related eating was significantly associated with BMI ( $p = 0.034$ ), as 25.0% of obese students reported “always” engaging in stress eating compared to 4.6% of normal-weight students. Additionally, family history showed a strong association with BMI ( $p = 0.002$ ), as 68.8% of obese students had a positive family history. In contrast, no significant associations were observed between BMI and fast food intake, physical activity, or sedentary behaviors. This may suggest that obesity is multifactorial and influenced by a combination of behavioral, psychological, and environmental factors. Similar findings have been reported in studies among college students, where stress and familial predisposition were stronger predictors of obesity than individual lifestyle behaviors alone [39]. Other studies have also reported that BMI may not always show a direct association with individual dietary behaviors, supporting the view that obesity

should be interpreted as a complex condition rather than the result of one isolated lifestyle factor [16].

#### 4.7. Implications

Given the substantial proportion of students affected by overweight and obesity, universities should prioritize comprehensive health-promotion initiatives. Such interventions may include nutrition education programs, opportunities for physical activity, stress-management workshops, and campus-based wellness strategies designed to support healthy lifestyle behaviors among students.

#### 4.8. Strengths and Limitations

A major strength of this study is its comprehensive assessment of multiple lifestyle domains, including dietary habits, physical activity, sleep patterns, stress-related behaviors, and obesity perceptions among pharmacy students. Furthermore, the questionnaire demonstrated high internal consistency, supporting the reliability of the collected data.

However, this study was conducted at a single institution and included a predominantly female sample, which may limit the generalizability of the findings to other university populations in Oman. Future multicenter studies incorporating objective anthropometric and behavioral measurements are recommended to further explore the determinants of obesity among university students. In addition, to the limited statistical power for subgroup comparisons, particularly given the small numbers in the underweight and obese groups. Furthermore, BMI is a useful screening measure but does not distinguish between fat mass and lean mass.

### 5. Conclusions

This study found a high prevalence of overweight and obesity among pharmacy students, alongside widespread unhealthy dietary habits, sedentary behavior, low physical activity, and stress-related eating. BMI was significantly associated with stress eating and family history of obesity. These findings highlight the need for targeted university-based interventions focusing on nutrition education, physical activity promotion, and stress management to reduce obesity risk and improve students' health outcomes.

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## Abbreviations

The following abbreviations are used in this manuscript:

|      |                                             |
|------|---------------------------------------------|
| BMI  | Body Mass Index                             |
| SD   | Standard Deviation                          |
| n    | Number of Participants                      |
| SPSS | Statistical Package for the Social Sciences |

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