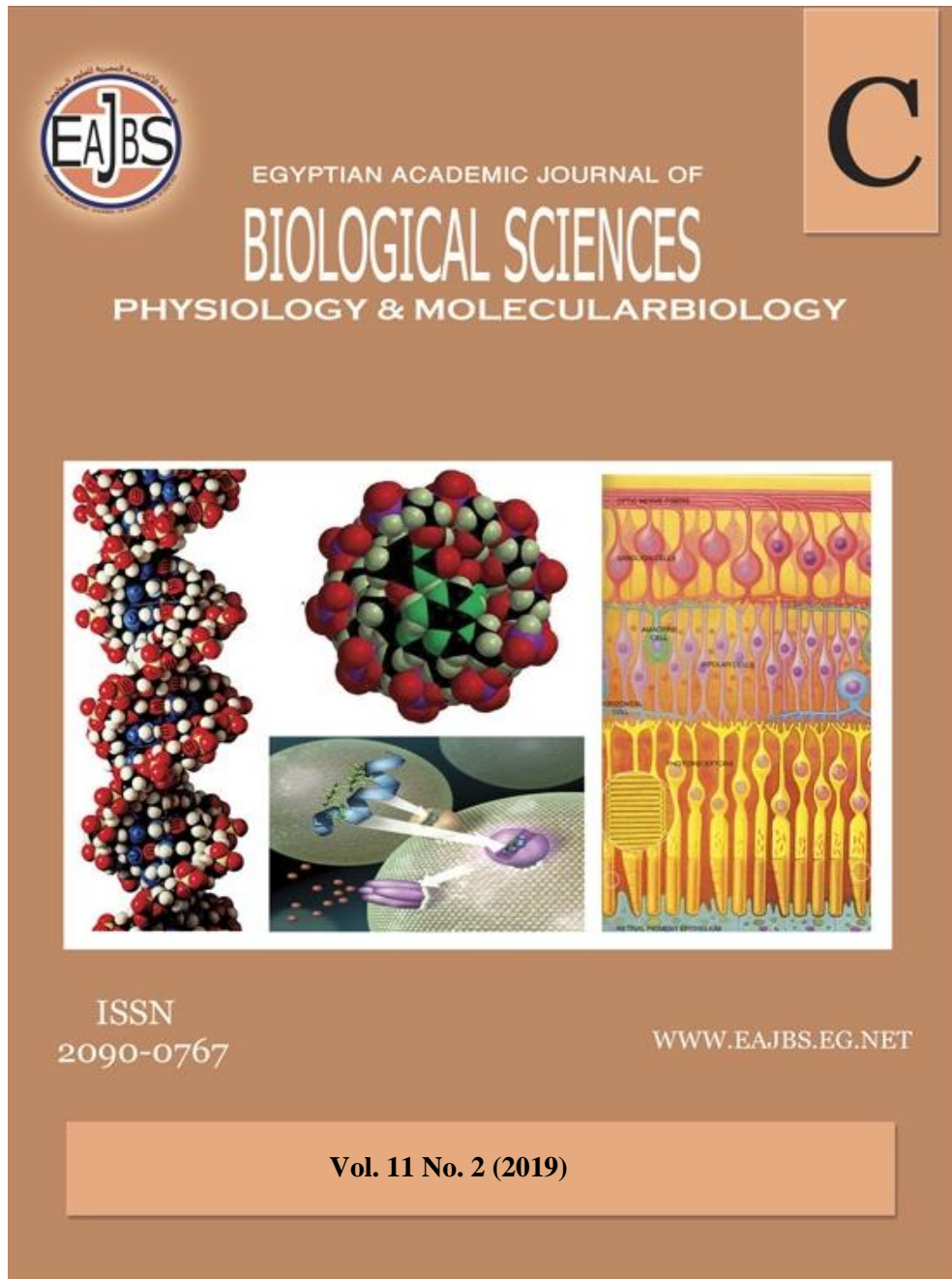


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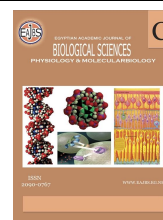
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The Prevalence of Obesity and the Relationship of Food Intake in the Body Weight of Medical Students of Hail University – Northern Saudi Arabia

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ABSTRACT

Background: Obesity is becoming major problems in developed as well as developing countries. Obesity is the major cause of a large number of debilitating and life-threatening diseases such as cardiovascular, metabolic and other non-communicable diseases. The Objectives of this study is to estimate the prevalence of obesity among medical students and the role of food intake among medical students. **Methods:** A descriptive cross-sectional design was used. 150 Saudi medical students studying at Colleges of Medicine, Dentistry, Pharmacy, Nursing, and applied medical science in Hail university were invited. **Results:** The mean age of the study population was 33.5 ± 18.7 years with 33.6 ± 19.2 for males and 32.3 ± 16.9 for females. Males to female's ratio was 1.00:1.01. The overall prevalence of obesity was 64.7%. **Conclusions:** The study showed that the prevalence of obesity among the medical students of Hail University is high, which is comparable to the other studies. This indicates the need to encourage a healthy lifestyle, healthy food habits, and a physically active daily routine, among medical students.

INTRODUCTION

Overweight and obesity, which is now considered as a disease, have become pandemic [Padmasree *et al.*, 2012]. Various low- and middle-income countries are now facing a "double burden" of disease. Worldwide more people are obese than underweight – this occurs in every region except parts of sub-Saharan Africa and Asia (WHO 2016). Obesity is perhaps the most prevalent form of malnutrition Park 2015. It has also been said it decreases the productivity of a country by reducing the life expectancy of individuals (Haslam and James 2005). It is expected that the prevalence of overweight and obesity will rise and by 2025, there will be approximately more than 2.3 billion overweight and more than 700 million obese individuals worldwide (Byington *et al.*, 2008). A variety of factors, including diet, physical activities, genetic predisposition, behavioral and physiological factors, are implicated as contributing factors to obesity (Parveen *et al.*, 2013, Wilborn *et al.*, 2006). Health personnel are important promoters and role models for maintaining a

healthy lifestyle for the general population; however, studies on medical students and health personnel in many countries suggest that obesity is a problem among these population groups (Kumar and Ramiah 2005; Ohe *et al.*, 1992, Bertsimas *et al.*, 2003; Nesar *et al.*, 1986; Abbate *et al.*, 2006; Rampal *et al.*, 2006). The college students are greatly exposed to unhealthy eating habits and lifestyle leading to body weight gain. According to the World Health Organization, obesity is generally more prevalent among women than men. However, research on college students revealed more percent of obesity in males than in females. In the Kingdom of Saudi Arabia, more than 30% of female health college students were either obese or overweight. In contrast, very few researches were found in our literature search regarding obesity prevalence in Saudi male college students (Al-Rethaiaa *et al.*, 2010; Baig *et al.*, 2019; Parveen *et al.*, 2016). Commonly held stereotypes characterize obese people as, lacking in self-control, less intelligent, unhappy, lazy, and poorly motivated. These stereotypes can be found among health professionals, including physicians and medical students (Wigton and McGaghie 2013; Meo *et al.*, 2015). Since this obesity becomes an alarming sign it is necessary to prevent this by young adults based approaches like changes in lifestyle and health education, the purpose of this study is to estimate the prevalence of obesity and overweight among the medical students of our Institution and assess the factors influencing the development of obesity and overweight.

MATERIALS AND METHODS

The present cross-sectional study was conducted in the College of Medicine, Hail University, Hail, Saudi Arabia during the period of December 2018 to January 2019. On a computer-

generated students list, and considering the exclusion and inclusion criteria, initially, we selected 200 medical students. Students were fully informed about the research objectives, methodology, and their formal written consent was obtained.

A well-written English language questionnaire was distributed among medical, dental, pharmacy, nursing, and Applied medical science students, at Hail University, Hail, KSA. Information about age, weight, height, body mass index, gender, social habits, health state, stigma, the overall academic grades and year of study were obtained to determine the prevalence and the association of obesity with performance and academic grades of medical students. After getting the academic grades and anthropometric data of the medical students, apparently healthy, volunteer, Saudi medical students studying at Colleges of Medicine, Dentistry, Pharmacy, Nursing, and applied medical science in Hail university, were invited. The students who are having a health-related condition like chronic anemia, visual problems, diabetes mellitus, rheumatic fever or rheumatoid arthritis, leading to limited physical activity were not included in the study. The students who suffered from any serious diseases during the last two years were also excluded from the study because debilitating diseases including diabetes mellitus impair memory and cognitive functions. The potential confounding factors were carefully considered due to their known or plausible associations with outcomes and impact. The ethical approval was obtained from the Institutional Review Board, College of Medicine, Hail University, Hail, Saudi Arabia.

RESULTS

The mean age of the study population was 33.5 ± 18.7 years with 33.6 ± 19.2 for males and 32.3 ± 16.9

for females. Males to female’s ratio was 1.00:1.01. The overall prevalence of obesity was 64.7%. Moreover, the prevalence of males was 58.3% and the prevalence of females was 69%. When categorizing obesity, 31.1%, 17.2%, and 13% were categorized as

overweight, obese, and morbid obesity & 39.3%, 18.6%, and 19.4%, respectively. Moreover, increased weight categories were strongly linked to females and this was found to be statistically significant (< 0.0001), as indicated in Figure 1.

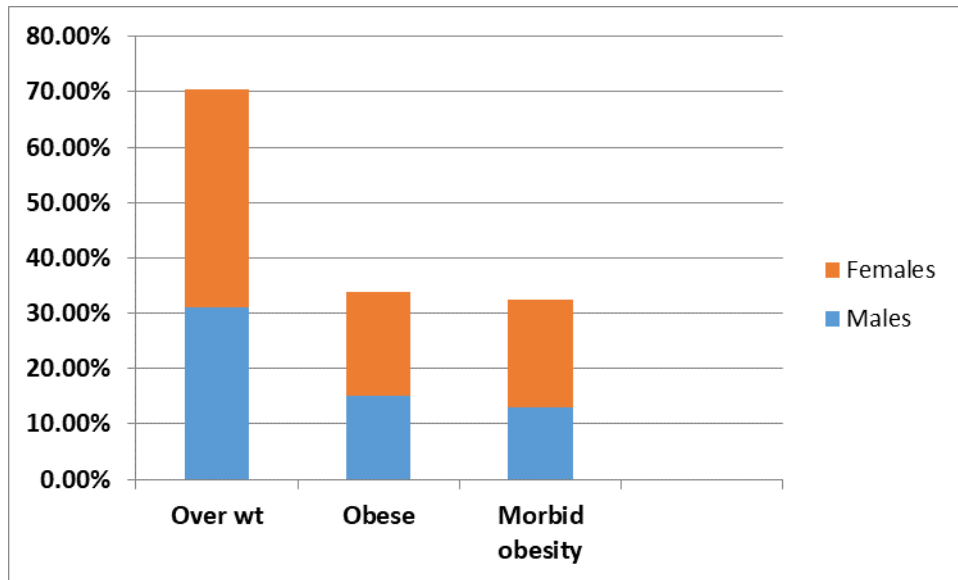


Fig. 1: Description of BMI categories by gender.

A total of 150 students participated in the study. 44 were between the ages of 18-22, 56 were between 23-27 and 50 were between 28-33. The 6.12% were found to be normal weight,

63.27% were overweight, 22.45% were obese and 8.16% were morbidly obese. Out of all, 46% admitted that they exercise and 54% admitted that they do not exercise. (Table 1).

Table 1 Age groups in relation to BMI, exercise and food content.

Age group	Body Mass Index	Exercise	Food	Total Number
18 – 22	NW -6.12%	Yes-34.69%	Carbohydrate-79.59%	44
	OW -63.27%	No- 45.31%	Protein- 20.41%	
	OB -22.45%	No- 65.31%		
	MOB-8.16%	No- 75.31%		
23 – 27	NW-10%	Yes-47.50%	Carbohydrate-72.5%	56
	OW-42.5%	No- 62.50%	Protein-27.5%	
	OB-27.5%			
	MOB-20%			
28 – 33	NW-0%	Yes-90.91%	Carbohydrate-72.73%	50
	OW-36.36%	No-9.09%	Protein27.27%	
	OB-54.55%	No-49.23%		
	MOB-9.09%	No-56.06%		
				150
UW: OW: Overweight, NW: Normal Weight, OB: Obese. Mobese: Morbid obesity				

Fat was not shown as the major content of the diet of any of the participants. Out of all, 43% indicated carbohydrate as their major diet content and 19% chose protein. Most

of the students across all age groups picked carbohydrate-rich food content in their diet and the remaining indicated protein as their major food content (Table 2).

Table 2 BMI (Body mass index) in relation to food content.

BMI	Carbohydrate	Protein	Total
Overweight	65 (43.33%)	19 (12.67%)	84
Obese	34 (26.67%)	16 (10.67%)	50
Morbid obesity	9 (0.06%)	7 (04.67%)	16
Total	108	42	150

For those who were overweight, 19 (12.67%) indicated a protein diet, compared to roughly 16 (10.67%) in the other obese ranges. The main food content for those who are obese, overweight, and morbid obesity was

carbohydrate at more than 75%. Interestingly for those who were underweight and normal weight more than 72% indicated that they do not exercise (Figure 2).

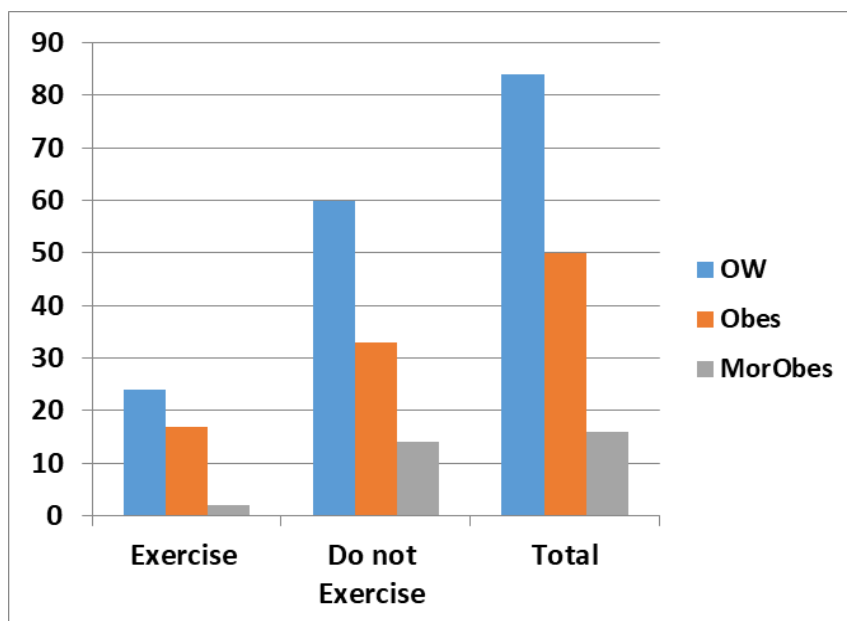


Fig. 2: BMI (Body mass index) in relation to exercise

DISCUSSION

This research determines the prevalence of obesity and the dietary factors associated with it among medical students of the University of Hail, Northern Saudi Arabia. The provided information can be used as a baseline for future intervention program, which designed to prevent overweight and obesity among medical

students. In a study in Kingdom of Saudi Arabia, the prevalence rate of obesity by body mass index was found to be more than 30% with more girls falling in the grade I (26.1 %) than the grade II (4.5 %) category (Rasheed *et al.*, 1994). In another research done in the Kingdom of Saudi Arabia, 34.5 % of the students were overweight, and 10.3 % were obese (Allam *et al.*,

2012). In a study done on first-year students in Turkey out of 2259 subjects included in the analyses, 322(14.3%) were overweight or obese (Gunes *et al.*, 2012). The research results showed that about 72% of the medical students are on a diet that contains carbohydrate as the main component while only 28% are consuming protein as the major component in their diet. This research therefore also confirm that a diet that contains a relatively high amount of carbohydrates is necessary for the maintenance of body weight. Other researchers conducted among medical students showed that the high consumption of carbohydrates could lead to an increase in body weight if this is not balanced with a high level of energy use (Van Dam and Seidell JC 2007; Rasheed *et al.*, 1994; Allam *et al.*, 2012; Gunes *et al.*, 2012). The study samples were comparatively small, and more samples would have been greater representative of the exercise and diet habits of students as well as their respective BMI. In this research, we concluded that the type of diet and exercise play an important role in the prevalence of different weight groups among medical college students. Most students eat a diet rich in carbohydrates and they do not exercise have high weight prevalence while most normal weight students are on the protein diet.

Conclusion & Recommendations:

The emphasis of our research was narrowed to food content and exercise and perhaps limited the study. A broader focus on integrating other factors that could affect weight and general wellbeing would help improve the study. We also recommend that the University authority should promote proper dietary habit and encourage exercise among medical students, as this will improve their general performance.

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