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Prevalence and determinants of obesity among medical students at Al Maarefa University, Saudi Arabia, 2022

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ABSTRACT

Background: Our healthcare system's future is in the hands of current medical students, the purpose of this study was to determine the prevalence and risk factors for obesity among Al-Maarefa medical students. This is significant because of society's perception of medical students, because they will be doctors in the future. As a result, we'd like to encourage the university to launch an educational program. *Objective:* Identifying the prevalence and causes of obesity among Saudi medical students at Al-Maarefa University. *Methodology:* A cross-sectional study of med students at Al- Maarefa University in Riyadh, Saudi Arabia, was done. After obtaining permission from the college administration, 450 medical students were given self-administered, pre-coded, pre-tested questionnaires. *Results:* The study included 402 med students who answered to the survey. The mean age was 22 years, with 37.79% in clinical years and 62.21% in preclinical years. 51% of participants were female, while 49% were male. *Conclusions:* 10.20% of participants were underweight, 21.39% were overweight and 13.2% were obese, according to our findings. Obesity was more prevalent among students in clinical years. Male undergraduates were more likely over female students to be obese. Obesity risk factors included age and a family history of the condition. This study discovered a high prevalence of overweight and obese individuals among medical students. This highlighted the importance of educational programs.

Keywords: Obesity, medical students, Saudi Arabia, Prevalence

1. INTRODUCTION

Obesity is complex and preventable disease with several known etiology (WHO, 2003), world's obesity rates increasing and estimated to affect 20% of the population by 2030 (Kelly et al., 2008). One of the leading countries in obesity rates is Saudi Arabia (Al-Nuaim et al., 1996). College-level obesity is particularly difficult since there is a transition from being overweight to obese

due to eating patterns and varying physical activity (Khan et al., 2016; El-Mawgod et al., 2023). Another significant contributing factor to obesity is psychological stress notably that experienced throughout college or more specifically, medical school (Ali et al., 2020; Alamer et al., 2022). The university has a significant influence on how students behave and can promote positive behavior. Unhealthy lifestyles are prevalent among college students, thus emphasizing the requirement for health education programs for saudi students (Saghafi-Asl et al., 2020). There are few papers that estimate how common obesity is among Saudi medical students. At Al-Maarefa University in Saudi Arabia, we seek to understand the incidence and contributing factors of obesity among medical students. As a result, future doctors will be encouraged to promote physical fitness.

Obesity is increasing in the Kingdom of Saudi Arabia at an alarming rate, with an overall obesity rate of 33.7% (Al-Othaimeen et al., 2007). A study of Shaqra University's medical students revealed that 19.3% of them were obese and 25.4% were overweight (Aqeel et al., 2020). In a survey of medical students at Dar Al Uloom University in Riyadh, it was discovered that overweight students made up 23.7% of the participants and obese students made up 11% of the participants (Makkawy et al., 2021). A study conducted on the health colleges of King Saud University, Riyadh it was found that 13.7% of students were obese (Saeed et al., 2017). It was shown that 8.4% of medical students at Northern Border University, Arar, were obese and that 21.7% of participants were overweight (Mehmood et al., 2016). In a study conducted in the King Khalid University, Abha college of Medicine, found that 21% of participating students were overweight and 8% were obese (Al-Bshabshe et al., 2018). A study among King Abdulaziz University medical students, Rabigh found that 29.8% of participants were overweight, 10.7% were obese and 7.9% were severely obese (Baig et al., 2015). This rising trend in the incidence of obesity and excess weight, are also the sources of various diseases (Alqarni, 2016). Type 2 diabetes (Odd ratio (OR) = 1.52), hypercholesterolemia (OR) = 1.69, hypertension (OR) = 1.61, lung diseases (OR) = 1.69, rheumatoid arthritis (OR) = 1.57, sleep apnea (OR) = 1.82, colon illnesses (OR) = 1.31 and thyroid disorders (OR) = 1.8 were all substantially linked with obesity (Althumiri et al., 2021). Our study aims to shed light on a major problem in the community, due to the high prevalence of obesity among the Saudi population. Our research would help contribute to more preventive measures. There are a limited number of studies conducted on medical students regarding their obesity. Today's medical students are the future healthcare professionals and they are considered as the most knowledgeable and health-conscious population. Thus, our study was planned to identify the prevalence and determinants of obesity amongst medical students at Al-Maarefa University, Saudi Arabia.

2. METHODS

Study design

An institutional-based cross-sectional study in 7-month duration (from April 2022 to October 2022) in Almaafra College, located in Riyadh city, the capital of Saudi Arabia.

Study population

Medical student males and females were included, excluded non-medical, pregnancy, previous surgical and non-surgical treatment of obesity The sample size is 450, with sampling technique systemic random sampling.

Data collection instrument

Self-administered, pre-coded, pre-tested, collected from different literature questionnaire devolved mainly for the goal of this study after consultation of literature and epidemiologist contains data about (demographic data, anthropometric parameters physical activity, family history, sleeping hours and dietary factors) BMI will be calculated. This questionnaire was subjected to probe to test for validity and reliability. We used the BMI category status recommended by the Centers for Disease Control and Prevention (CDC), which classifies individuals with a BMI of 18.5 kg/m2 or less as underweight, 18.5 to 24.9 kg/m2 as normo-weight, 25 to 29.9 kg/m2 as overweight and 30 kg/m2 or more as obese (NCHS, 2020).

Data collection methods

Interviewer administered.

Ethical consideration

Ethical approval has been obtained with number IRB6-06042022-26 and consent was obtained from participants before data collection emphasizing confidentiality and the suitable participant to withdraw from the study at any time.

3. RESULTS

The study included 450 medical students in total. 48 incomplete response sheets were eliminated from the study, leaving only 402 participants. 402 medical students made up the final sample, of whom 152 (37.29%) were in their clinical years and 62.21% were still in their pre-clinical years. The results of the descriptive statistics of the individual student data are displayed (Table 1). It revealed that of the participants, 51% (205) were women and 49% (197) were men. The study's sample of students ranged in age from the youngest, who were 18 years old, to the oldest and who were 29 years old. The mean age was 21.8 + 2.7 years. Additionally, it was discovered that the students' mean + SD height was 167.28 + 9.55 cm and their mean + SD body weight was 68.07 + 18.3 kg. The pupils' weight and height were used to calculate their BMI, which was centered at 24.14 + 5.04 points. The percentage of obese medical students (clinical and preclinical years) based on data analysis and the WHO's BMI classification was 13.2%.

Table 1 Descriptive socio-demographic analysis

Variables		Frequency	Percentage
Age	18-20	113	19.17%
	21-23	174	41.60%
	24-26	95	32.23%
	+26	20	7%
Gender	Male	205	51%
	Female	197	49 %
Marital status	Single	372	92.54%
	Married	23	5.72%
	Divorced	6	1.42%
	Widowed	1	0.25%
BMI	Underweight	41	10.20%
	Normal	217	53.98%
	Overweight	86	21.39%
	Obese	53	13.2%
Clinical status	Per-clinical	250	62.21%
	Clinical	152	37.79%

Figure 1 shows that the percentage of normal BMI students is the highest (53.98%), the percentage of the obese students in the university is (13.2%) and the percentage of the overweight student is (21.39%).

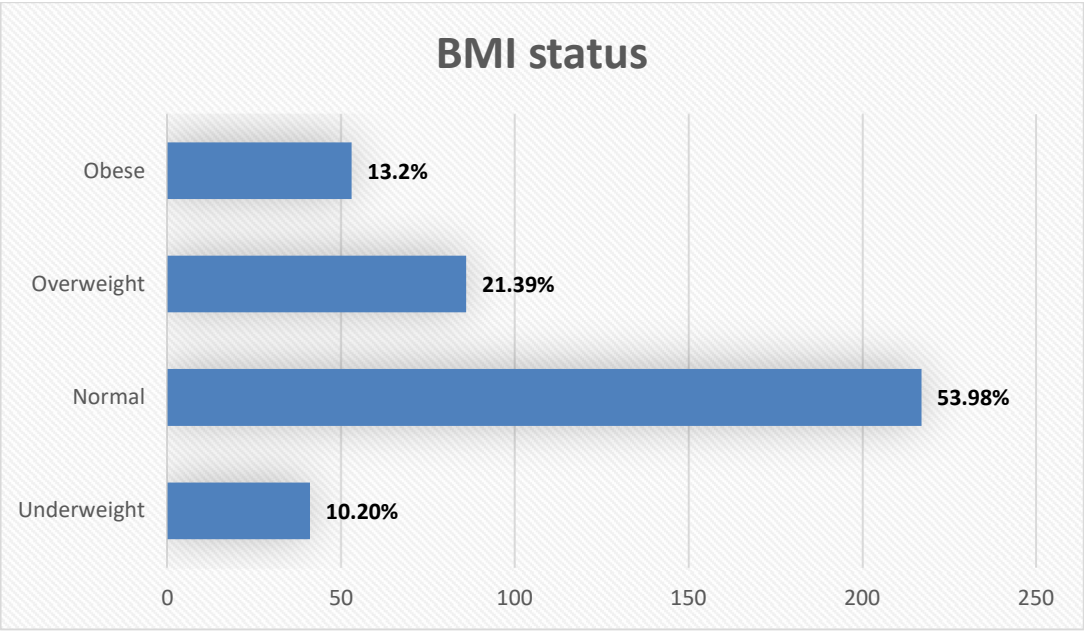

Figure 1 Percentage of BMI states among students

In Table 2 the data was analyzed statistically significant associations of obesity with the student's measured personal information. In Table 2, findings of the analysis suggested that the gender of student had a significant correlation with obesity. In comparison to their female counterparts, male students had a higher likelihood to be obese. Students who were obese and those who were not had significantly different mean ages. The average age of the obese students was noticeably higher than that of the non-obese students. Interestingly, there was statistically significant association between the students' Clinical status with obesity, P =0.002, compared to students in the pre-clinical years, students in the clinical years were shown to have a higher propensity to be obese. Additionally, there is no statistically significant link between obesity and marital status P = 0.88.

Table 2 Analysis of socio-demographic data association with obesity

Obesity		Yes	No	P value
Gender	Male	23.3% (n=46)	76.6% (n=151)	0.037
	Female	3.4% (n=7)	96.5% (n=198)	
Marital status	Single	13.4% (n=50)	86.6% (n=322)	0.88
	Married	8.7% (n=2)	91.3% (n=21)	
	Divorced	16.67% (n=1)	83.3% (n=5)	
	Widowed	0% (n=0)	100% (n=1)	
Age	Age (Years), mean (SD)	23.19+3.8	21.69+2.3	0.001
Clinical status	Pre-clinical	10% (n=25)	90% (n=225)	0.002
	Clinical	18.42% (n=28)	81.58% (n=124)	

n=402

Table 3 demonstrated the examination of the student's data to seek for statistically significant correlations with the risk factor of lifestyle and dietary practices. The results showed that there was no statistically significant relationship between students' lifestyle choices and chance of obesity.

Table 3 Analysis of lifestyle and dietary behaviors association with obesity

Obesity		Yes	No	P value
Hours of sleep	4 hours or less	4.88% (n=2)	95.12% (n=39)	0.51
	5 hours	11.76% (n=8)	88.24% (n=60)	
	6 hours	14.39% (n=19)	85.61% (n=113)	
	7 hours	15.71% (n=11)	84.29% (n=59)	
	8 hours or more	14.29% (n=13)	85.71% (N=78)	
Exercise	No exercise	12.69% (n=17)	87.31% (n=117)	0.47
	Less than 60 Mins a week	16.43% (n=23)	83.57% (n=117)	
	60 to 150 Mins a week	11.27% (n=8)	88.73% (n=63)	
	More than 150 Mins a week	8.77% (n=5)	91.23% (n=52)	
Fast food	Do not eat	6.45% (n=4)	93.55% (n=58)	0.25
	Once or twice a week	13.45% (n=23)	86.55% (n=148)	
	2-5 times a week	13.64% (n=15)	86.36% (n=95)	
	More than 4-5 a week	18.64% (n=11)	81.36% (n=48)	
Soft drinks	Never	8.42% (n=8)	91.58% (n=87)	0.39
	Daily	17.59% (n=19)	82.41% (n=89)	
	Numerous time a day	14% (n=7)	86% (n=43)	
	Weekly	13.64% (n=15)	86.36% (n=95)	
	Monthly	10.26% (n=4)	89.74% (n=35)	
Smoke tobacco	Yes	17.82% (n=18)	82.18% (n=83)	0.26
	No	11.9% (n=32)	88.1% (n=237)	
	Ex-smoker	9.38% (n=3)	90.63% (n=29)	

n=402

Table 4 examined the student's medical history and the data analysis of their weight for any statistically significant risk factor correlations. Expectedly, the results of the analysis showed that students were significantly likely to be obese if their families had a history of obesity p = 0.006. However, no statistically significance was found to link between obesity and chronic illness p = 0.36. Additionally, no statistically significance was found linking between taking of a steroid or antidepressant and being overweight. p =0.067 or the duration of the treatment p = 0.42

Table 4 Analysis of medical history association with obesity

Obesity		Yes	No	P value
Family history of obesity	Yes	18.09% (n=34)	81.91% (154)	0.006
	No	8.88% (n=19)	91.12% (n=195)	
Illnesses	DM	0% (n=0)	100% (n=14)	0.36
	High BP	0% (n=0)	100% (n=10)	
	High cholesterol	14.29% (n=1)	85.71% (n=6)	
	Cardiac	0% (n=0)	100% (n=1)	
	Metabolic diseases	0% (n=0)	100% (n=8)	
	None	14.36% (n=52)	85.64% (n=310)	
Treated with steroid or anti-depressant	Yes	6.15% (n=4)	93.85% (n=61)	0.067
	No	14.54% (n=49)	85.46% (n=288)	
If yes for how long	Less than 6 months	7.69% (n=2)	92.31% (n=24)	0.42
	6 months – 1 year	4.76% (n=1)	95.24% (n=20)	
	1 -2 years	10% (n=1)	90% (n=9)	
	More than 2 years	0% (n=0)	100% (n=8)	

n=402

4. DISCUSSION

Obesity among societies and communities is becoming ever more prevalent, the issue has grown to epidemic proportions (WHO, 2003). The goal of our research is to realize the prevalence and determinants among Al Maarefa medical college students. As the future of our healthcare resides in their hands it is crucial to understand and determine the effects that obesity could have on them and to what degree are they affected.

The current study revealed that out of 402 participants, 86(21.39%) were overweight and 53(13.2%) were obese. This prevalence was significantly lower than that found in a study carried out in the northern border university (Mehmood et al., 2016). However, it is in concurrence with the reported study in KSU (Saeed et al., 2017) and slightly higher than that of the reported finding in Dar Al-Uloom study (Makkawy et al., 2021). One surprising finding was revealing the significant disparity between obese female and male students. In which it was established that male 23.3% were found to be obese however only 3.4% of the females were obese and this goes in line with a previous study done by Shehata et al., (2021) King Khalid University their research revealed that 64.6% of male students and 32.2% of female participants were obese or overweight (P=.001). Increased age was discovered to be associated with obesity in the current study, while non-obese students were found to be substantially younger than obese students. Similarly, this finding was also true among medical students in Dar Al-Uloom University (Makkawy et al., 2021). Also, this agrees with other studies which have similar findings suggesting older age is one of risk factors of obesity. Even though there are some differences among genders regarding this finding, it was a significant risk factor found in among men over the age of 35 (Memish et al., 2014). Family history of obesity was also found to be significant risk factor with p value = 0.006 this goes in line with most studies that were done in Saudi Arabia (Mehmood et al., 2016). We also looked for the effect of lifestyle and dietary behaviors on students BMI. Surprisingly, according to the findings, no statistically significant difference link between students' lifestyle choices and their likelihood to be obese. This may be due to the younger age of participants. No association was found between smoking and increased risk of obesity. This goes in line with Dare et al., (2015) their study showed that smokers were less likely to be obese than individuals who had never smoke. As for the effect of student's obesity on their general health there was not any statistical correlation between obesity and chronic illness p value= 0.36. However, for high cholesterol 5 participants out of 7 were overweight and 1 was obese. This again may be due to the younger age of these medical students (Age between 18-29). This goes against what was reported by Makkawy et al., (2021) and Saeed et al., (2017) we believe that it could be possible that being obese for a longer

duration may lead to serious complications, especially in older age (after 40 years). As for the use of anti-depressant or steroids among the participants, no significant association with obesity was in the present study.

Interestingly, the current study found a statistically significant relation between the students' Clinical status with obesity, P =0.002, students in the clinical years were had a greater inclination to be obese compared to students in the pre-clinical years. Which was not in consensus with the result from Dar Al-Uloom university, which found no statistically significant association between the academic level with obesity P = 0.933 (Makkawy et al., 2021). This could be due to a myriad of factors affecting clinical students, including increased stress, poor lifestyle habits, increased workload and age as previously reflected upon. This result contradicted our hypothesis in which it was assumed that as students would progress through their medical years, with their increased knowledge and experience in healthcare would have a positive effect on their weight and lifestyle. This study's self-reported weight and height is one of its drawbacks. In some demographic groups, self-reporting could result in underestimating weight and overestimating height (Maukonen et al., 2018).

5. CONCLUSION AND RECOMMENDATIONS

Our study found that Almaarefa University's medical students had a higher-than-average rate of obesity and overweight. Higher academic level students, older students, students with a positive family history of obesity and male students were more likely to be obese. Consequently, we recommend starting an education program about obesity and its related complications. Such a program will educate college students about a healthy lifestyle, healthy diet, physical activity and how to tackle obesity.

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Ethical consideration

Ethical approval from the Institutional review board (IRB) of Almaarefa University College of Medicine (Ethical approval code: IRB08-03102022-87) was met before data collection began and the purpose of the study was clearly explained to the participants. They are assured that data from this study will be used for scientific purposes only, that ethical concerns and legal issues was considered and that participation is completely voluntary.

Authors' contribution

All authors had substantial contribution to the paper YMA, YYA, SS and ABH designed the study and prepared the proposal. YMA and ABH analyzed and interpreted data. BSA, MMA and QMA wrote results and discussion. JOY checked and revised every step of this paper. All authors have collected data and critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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