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RESEARCH ARTICLE

PREVALENCE AND DETERMINANTS OF OBESITY AMONG MEDICAL STUDENTS AT AL MAAREFA UNIVERSITY, SAUDI ARABIA, 2022

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ABSTRACT

Background: As the future of our healthcare system is in the hands of the current medical students, we aimed in this study to deduce the prevalence and determinants of obesity among Al-Maarefa medical students. This is of importance due to society's perspective on medical students, as they are the future doctors. So, we would like to encourage the university to start an educational program. Objective:Our study aims to identify the prevalence and determinants of obesity among medical students at Al-Maarefa University, Saudi Arabia **Methodology:** A cross-sectional study was conducted among medical students at Al- Maarefa University, Riyadh Saudi Arabia. After obtaining permission from the college authority, self- administered, pre-coded, pre-tested questionnaires were distributed to 450 medical students. **Results:** The study included 402 medical students who completed the study questionnaire. in which 37.79% were in clinical years and 62.21% were in preclinical years; and the mean age was 22 years. Exactly 51% of participants were female and 49% were male. **Conclusions:** We found that 10.20% of participants were underweight,21.39% were overweight, and 13.2% were obese. The prevalence of obesity among students in clinical years was higher. Male students had higher prevalence of obesity compared to female students. Risk factors for obesity were age and a family history of the condition. Our study revealed high prevalence of obesity and overweight among medical students at Al-Maarefa university. This shed light on the need for educational programs to encourage a healthy lifestyle, healthy diet, and physical activities to avoid obesity and its related complications.

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INTRODUCTION

Obesity is a complex, multifactorial, and preventable disease with several known etiology (World Health Organization, 2003) World's obesity rates increasing and estimated to affect 20 % of the population by 2030 (Kelly, 2008). One of the leading countries in obesity rates is Saudi Arabia (Al-Nuaim, 1996). Obesity is especially challenging at the college level as it is a transition phase from overweight status to obesity because of dietary patterns and alternating physical (Assir, 2016) Psychological stress, such as that associated with college life in medical schools, is another important factor in obesity (Ali, 2020) University can play a tremendous role in encouraging positive behavior in students. There is a need to incorporate health education programs for college students because unhealthy lifestyles are prevalent among students (Saghafi-Asl, 2020). There are limited articles that estimated the prevalence of obesity among medical students in Saudi Arabia. Our goal is to identify the prevalence and determinants of obesity among medical students at Al-Maarefa University, Saudi Arabia. As this may help support in the promotion of health among the future doctors.

Obesity is increasing in the Kingdom of Saudi Arabia at an alarming rate, with an overall obesity rate of 33.7% (Al-Othaimeen, 2007). Among medical students at Shaqra University, a study showed that 25.4% of participants were overweight and 19.3% were obese. (8) In a study conducted on medical students in Dar al Uloom University, Riyadh it was found that 23.7% of participants were overweight and 11% were obese (Makkawy, 2021) A study conducted on the health colleges of King Saud University, Riyadh it was found that 13.7% of students were obese (Saeed, 2017) Among medical students in the Northern Border University, Arar it was found that 21.7% of participants were overweight and 8.4% were obese (Mehmood, 2016) In a study conduct-ed in the King Khalid University, Abha college of Medicine, found that 21% of participating students were overweight and 8% were obese (Al Bshabshe, 2018) A study amongst medical students in King Abdulaziz University, Rabigh found that 29.8% of participants were overweight, 10.7% were obese and 7.9% were severely obese (Baig, 1969) The increasing trend in the prevalence of obesity and overweight, are also the sources of various diseases (Alqarni, 2016) Obesity was signifi-cantly associated with 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 diseases (OR =

1.31), and thyroid disorders (OR = 1.8[15]). 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 profes-sionals, and they are considered as the most knowledgeable and health-conscious popula-tion. Thus, our study was planned to identify the prevalence and determinants of obesity among medical students at Al-Maarefa university, Saudi Arabia.

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 purpose of this study after consultation of literature and epidemiol-ogist 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 Center for Disease Control and Prevention (CDC) BMI category status, which specifies the BMI below 18.5 kg/m2 as underweight, from 18.5 to 24.9 kg/m2 as normo-weight, from 25 to 29.9 kg/m2 as overweight, and 30 kg/m2 and above as obese (National Center for Health Statistics, 2020).

Data collection methods: Interviewer administered. Ethical consideration: ethical approval has been obtained with number IRB6-06042022-26, and aconsent was obtained from participants before data collection emphasizing confidentiality and the suitable participant to withdraw from the study at any time.

RESULTS

A total of 450 medical students participated in the study. However, 402 participants completed the study and excluded 48 incomplete response sheets. The final sample was 402 medical students and out of this 37.79% (152) were in the clinical years and 62.21% were in pre-clinical years. These findings from the descriptive statistics of students' Personal information are shown in the (Table 1)

Table 1. Personal information

Variables		Frequncey	Precantage
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 %
Maritalstatus	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%
Clinicalstatus	Per-clinical	250	62.21%
	Clinical	152	37.79%

It showed that 51% (205) of the participants were female and 49% (197) were male. The mean age was 21.8 +2.7 years, and the youngest students included in the study were aged 18 and the eldest were 29 years old. it was also found that the mean + SD body weight for the students was 68.07 + 18.3 kg, and the mean + SD height was 167.28 + 9.55 cm. The computed BMI from the weight and height of the students was centered at 24.14 + 5.04 points. The data analysis, according to the WHO classification of BMI, the percentage of obese medical students (clinical and preclinical years) was 13.2%. In table (2) the data was analyzed student's obesity for statistically significant associations with the student's measured Personal information. In Table 2, findings of the analysis suggeste that the gender of student was significantly correlated with obesity. Male students were more likely to be obese compared to there female counterpart. The mean age of the students differed significantly between obese and non-obese students. Those obese students were significantly older on average than the non-obese students. Interestingly, there was statistically significant association between the students' Clinical status with obesity, P =0.002, students in the clinical years were found to be more inclined to be obese compared to students in the pre-clinical years.

Also, no statistically significant association between the Marital status with obesity P = 0.88. Table 3 showed the data analysis of the student's obesity for statistically significant associations with the lifestyle and dietary behaviors as a risk factor. Results show that there was no statistically significant association between students' lifestyle and the likelihood of being obese. Table 4 showed the data analysis of the student's obesity for statistically significant associations with their medical history as a risk factor. Expectedly, the analysis findings suggested that students with a positive family history of obesity were significantly more inclined to be obese p = 0.006. However, no statistically significant association was found between having chronic illness and obesity p = 0.36. Also, no statistically significant association was found between usage of steroid or anti-depressant and obesity p =0.067 or the duration of the treatment p = 0.42.

DISCUSSION

Obesity among societies and communities is becoming ever more prevalent, the issue has grown to epidemic proportions, with over 4 million people dying each year as a result of being overweight or obese in 2017 according to the global burden of disease (World Health Organization, 2003) The goal of our research is to realize the prevalence and determinants among AlMaarefa 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. (11) However, it is in concurrence with the reported study in KSU, (10) and slightly higher than that of the reported finding in Dar Al-Uloom study (Makkawy, 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 S, King Khalid University, 2020 (Shehata Farag Shehata, 2012) their study showed that 64.6% of male students had overweight / obesity compared to 32.2% of females (P=.001). It was found that increased age has an association with obesity in the present study, those obese students were significantly older on average than the non-obese students. Similarly, this finding was also true among medical students in Dar Al-Uloom University. (9) Also, this agrees with other studies which have similar findings suggesting older age is a risk factor for obesity. Even though there are some differences among genders in regard to this finding, it was a significant risk factor found in among men over the age of 35 (16) . Family history of obesity was a significant risk factor with p value = 0.006 this goes in line with most studies that were done in Saudi Arabia (Mehmood, 2016).

Table 2. Analysis Personal information association with obesity

n=402

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	-Preclinical	10% (n=25)	90% (n=225)	0.002
	-clinical	18.42% (n=28)	81.58% (n=124)	

Table 3. The lifestyle and dietary behaviors

n=402

Obesity		**Yes**	**No**	
Hours of sleep	- 4 hours or less	4.88% (n=2)	95.12% (n=39)	**P value** 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)	**P value** 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)	**P value** 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)	**P value** 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)	**P value** 0.26
	-No	11.9% (n=32)	88.1% (n=237)	
	- Ex-smoker	9.38% (n=3)	90.63% (n=29)	

Table 4. Medical history

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)	
	-Metabolicdiseases	0% (n=0)	100% (n=8)	
	- None	14.36% (n=52)	85.64% (n=310)	
Treatedwith 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 year	0% (n=0)	100% (n=8)	

We also looked for the effect of lifestyle and dietary behaviors on students BMI. surprisingly, results showed that there was no statistically significant association between students' lifestyle and the likelihood of being obese. This may be due to the younger age of participants. Smoking was also not associated with an increased risk of obesity. This goes in line with Shadrach D 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 (10) (9) 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, it was not found to have a statistically significant association with obesity in the present study Interestingly, the current study found a statistically significant association between the students' Clinical status with obesity, P =0.002, students in the clinical years were found more inclined to be obese compared to students in the pre-clinical years.

Which was not in consensus with the result from al Dar Al-Uloom university, which found no statistically significant association between the academic level with obesity P = 0.933. (9) 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 .One of the limitations in this study is that weight and height were self-reported. Self-reporting may lead to overestimating height and underestimating weight in some demographical groups (Maukonen, 2018).

Conclusion and recommendations

Our study revealed a high prevalence of obesity and overweight among medical students at Almaarefa university. Obesity was more prevalent among higher academic level students, older aged students, students who had a positive family history of obesity and male students. 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 and YYA and SS and ABH designed the study and prepared the proposal. YMA and ABH analyzed and interpreted data. BSA and 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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Data and materials availability: All data associated with this study are present in the paper

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