ORIGINAL ARTICLE

Prevalence of Obesity and Its Associated Psychological Factors and Mindful Eating Among Medical Students: A Cross Sectional Study in UPM

Hui Zhu Thew[1], Fadzilah Mohamad[1], Afifah Husna Mohd Shahrim[2] , Muhammad Hafiy Akmal Abdul Rahim[2], Puravin Raj Aravandy[2], Chen Loong Alyx Chew[2], Qiao Rou Amelia Yap[2], Yan Bin Fong[2]

[1] Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia.
[2] Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia

ABSTRACT

Introduction: There is a tremendous prevalence of obesity worldwide, among both adults and children. Obesity may be caused by various factors, including genetic factors, psychosocial stresses, and environmental factors. Some local studies showed that the prevalence of obesity is high among undergraduate medical students, which might impact the quality of life of the medical students. The objective of this study is to determine the prevalence of obesity among UPM medical students and its associated factors, including sociodemographic factors, levels of mindful eating, and psychological factors. **Method:** A cross sectional study was performed on 483 medical students between 20 and 26 years old who were selected via universal sampling method. Through a google form, medical students were sent a self-administered online questionnaire that included sections on sociodemography, psychological distress, MEQ scores, and self-reported weight and height. **Results:** The majority of the respondents were female undergraduate medical students (66.9%). Out of 483 respondents, 166 were obese (34.4%). Multivariate logistic regression analysis shows that gender (p <0.001, β: 1.018), age (p:0.014, β:0.156), ethnicity (Chinese: p<0.001, β-1.020) and total MEQ scores (p <0.001, β:1.669) were statisticly significant associated with obesity. **Conclusion:** In summary, this study explores obesity prevalence and its associated factors among UPM medical students, including sociodemographics, mindful eating, and psychological aspects. The factors of this study which were significant associated with obesity were gender, age, ethnicity and total MEQ scores. By recognizing the myriad variables intertwined with obesity development, we can now design more targeted interventions for obesity prevention. This broader perspective compels a shift from one-size-fits-all approaches to tailored solutions that address the unique needs and susceptibilities of individuals.
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Corresponding Author:
Thew Hui Zhu, MMed (Fam Med)
Email: jothew@upm.edu.my
Tel: +6010-2367862

INTRODUCTION

The prevalence of obesity worldwide was predicted to be 50% of the population. From the obese population, 26% are aged 18 and above (1,2). Global Nutrition Report 2021 states about 2.2 billion people globally are either overweight or obese (40.4% men, 40.8% women), with an increasing trend since 2010 to 2021(3). According to the National Health and Morbidity Health Survey (NHMS), obesity among persons aged 18 and above grew from 19.7% to 30.4% in Malaysia from 2015 to 2019 (4). However, despite the abundance of obesity prevalence in the global population, much less research has been done to assess obesity among the medical student population. Medical students who are exposed to academic distress and sedentary lifestyle have many risk factors for developing obesity but are much less researched. Thus, this article serves to address this research gap and aims to identify the unique and novel factors that are associated with obesity among this specific population.

Obesity is linked to conscious eating. Mindfulness-based therapies decreased binge eating, emotional eating, external eating behaviours, and self-control, according to a recent research(5). Mindfulness also encouraged better living, which aided in weight reduction (6).

Moreover, stress was shown to be strongly connected to obesity and overweight among university students (7). Not only that, but depression contributed to the development of obesity via weight gain (8,9). Obesity was shown to be associated with anxiety, post-traumatic

stress disorder, and major depressive disorder in New Zealand research (10).

In truth, obesity raises the risk of numerous noncommunicable illnesses, which have a negative impact on the quality of life and functional capabilities of its sufferers (1,11). The World Health Organization (WHO) also reported that overweight and obesity were responsible for more fatalities in the general population than underweights (1). Apart from health concerns, obesity has significantly raised the yearly medical expenses of obese persons when compared to those with normal weights. A variety of factors influence obesity. Obesity can affect anyone at any age and gender. Men and women differ greatly in their prevalence of overweight and obesity within and between nations. Women were more likely to be obese than men. In the United States, women are more likely to be obese than men, due to the growing problem of childhood obesity (12) Obesity distribution might be affected by menopause biologically, causing severe health consequences. The prevalence of obesity was 14.2 % among males and 21.1 % among females in Selangor, Malaysia. Due to the current increase in life expectancy, obesity among older age groups is also increasing (13). The highest prevalence of obesity was found in Malaysia among males (30.8%) and those aged 45-49 years (39.6%); females aged 35-39 years had the highest prevalence. Bumiputera Sabah had the highest prevalence of overweight (35.3%), while Indian ethnicity had the highest percentage of obesity (29.3%) (4). Our study aims to determine the prevalence of obesity among UPM medical students at the Faculty of Medicine and Health Sciences (FMHS, UPM) and its associated factors, including sociodemographic factors, mindfulness eating levels, and psychological factors.

MATERIALS AND METHODS

Study Design

This was a cross-sectional study conducted in the Faculty of Medicine and Health Sciences (FMHS), UPM in Serdang. However, the study was conducted using a self-administered online questionnaire due to the Covid-19 pandemic. Universal sampling technique was used in this study. All active medical students from Universiti Putra Malaysia studying for the session 2021/2022 were the inclusion criteria for this study. Meanwhile, the exclusion criteria were medical students with underlying medical conditions. Data collection period was implemented from 13th March 2022 to 15th April 2022.

Ethical Consideration

Ethical approval for this study was obtained from the Ethics Committee for Research involving Human Subjects of University Putra Malaysia (JKEUPM) in which the reference number was (JKEUPM-2022-167). Each respondent's personal information was confidential, and study participation was voluntary. The study population was informed about the objectives and processes of the study where the data gathered would be anonymized, including for publication.

By using the formula for two proportions by Wang et al. (14). The Sample Size Calculation for Comparing Proportions based on the local study (15) where prevalence of population experiencing obesity consist of , 21% male and 10.7% female. The estimated sample size was 430. To account for potential non-response, a conservative estimate of a 10% non-response rate was considered. Therefore, the final sample size was adjusted to 473 respondents. This adjustment ensured that even if there were some non-responses, the study would still have an adequate number of participants to achieve meaningful results and maintain the desired confidence level.

Study Instruments

Sociodemographic data such as age, gender, ethnicity, educational level, and household income were investigated in this study. As for anthropometry measurements, weight, height and body mass index (BMI) were assessed. BMI was computed by dividing weight (kg) with height squared (m). The measurements were obtained by self-reported informations through online questionnaire. The Malaysian Clinical Practice Guidelines of Obesity (2004) was used for obesity classification as followed: Underweight (<18.5 kg/m), Normal (18.5 - 22.9 kg/m), Overweight (23.0 - 27.4 kg/ m), Obese I (27.5 - 34.9 kg/m), Obese II (35.0 - 39.9 kg/m) and Obese III (≥ 40 kg/m) (34). This guideline was chosen to suit the health needs and characteristics of the population within Malaysia. Adhering to local guidelines ensures that the findings are more relevant and actionable for healthcare professionals and policymakers.

According to Framson et. al, mindful eating was termed as "the non-judgemental awareness of physical and emotional sensations while eating or in a food-related environment"(16). It involves focusing on food purposefully without judgement in every moment. The approach to mindful eating involves selecting food consciously, becoming aware of physical and psychological starvation, recognizing cues of satiety, and eating healthily as a result. A number of systematic reviews have examined whether mindful eating and mindful interventions can reduce obesity and obesity-related behaviours. Mindful Eating Questionnaire (MEQ) which consisted of 28 items and 5 subscales: 1) Disinhibition; 2) Awareness; 3) External Cues; 4) Emotional Response; and 5) Distraction were used to assess mindful eating. Each item was scored from 1 to 4. Higher scores indicated more mindful eating. Each subscale score was calculated as the mean of items. "Not-applicable" responses were excluded from calculation. The summary score was the mean of the 5 subscales. Psychometric properties of the MEQ were

good. There was good internal consistency reliability for each subscale, which ranged from 0.64 to 0.83. Overall, the five subscale scores reliability of the MEQ was also good with 0.64 (17).

Psychological distress were assessed using the Depression Anxiety Stress Scales 21 (DASS21) questionnaire, involving 7 items per subscale. 4-point severity/frequency scales were used to rate the extent experienced by respondents under each state over the past week. Scores for Depression, Anxiety and Stress from the questionnaire were calculated by summing the scores respectively and multiplying by 2. Severity was grouped based on the DASS-21 scoring. Severity was grouped based on the DASS-21 scoring. According to the DASS-21, severe depression is a score of 11 to 13, severe anxiety is a score of 8 to 9, and severe stress is a score of 13 to 16. DASS-21 scores were derived from highly reliable and valid DASS-42 scores. With an overall excellent Cronbach's alpha of 0.96, DASS-21 is one of the most widely used questionnaires. In terms of reliability, the DASS-21 has excellent Cronbach's alpha values of 0.81, 0.89, and 0.78 for each subscale (12). Respondents with positive findings for anxiety, stress and depression were to be informed to see doctors in UPM's University Health Center for assessment and management.

Statistical Analysis

For data analysation, Statistical Product and Service Solutions (SPSS) version 27.0 was utilised. All continuous independent variables (age, mindful eating domains and total MEQ) were tested for normality testing using histograms. Results showed normal distribution. Hence, the results were reported in mean and standard deviation. As for categorical data, percentage and frequency were used.

For analytical analysis, the Chi-square test or Fisher's exact test was used for categorical data to investigate the association between dependent variable (obesity) and independent variables (sociodemographic factors, mindful eating and psychological factors).

Simple logistic regression was used to determine the association and predictors of each factor with obesity. Variables with P<0.25 in Simple Logistic Regression (SLR) were tested in Multivariate Logistic Regression (MLR). Forward, backward and stepwise variables selection methods were be used to come out with best fit model. The final model was created with forward selection method. Factors with P<0.05 were considered statistically significant models to determine the determinants of factors associated with obesity.

RESULTS

The questionnaires were distributed as online google forms. 489 participants responded in total and 483 of them were eligible and gave consent to participate in this study. Thus, the response rate for our study was 98.77%.

Sociodemographic characteristics

Table I showed the distribution of the sociodemographic characteristics of respondents. Among the 483 respondents, 323 were female respondents (66.9%), and 160 were male respondents (33.1%). The mean score for the age of the respondents was 22.02 ± 1.631. Most of the respondents were Malays, with a total of 274 respondents (56.7%); meanwhile, other ethnic respondents were recorded the least with 5 respondents (1.0%). Year 1 respondents had the highest response proportion with 116 respondents (24.0%) whereas Year 5, being the minority, had 85 respondents (17.6%). Among the 483 respondents, 195 respondents belonged to the M40 group (40.4%), being the highest response percentage. Nearly half of the respondents had a normal BMI (219, 45.3%), while about one-third of the respondents are obese (166, 34.4%).

Association between sociodemographic characteristics and DASS-21 score categories with obese among respondents

Table II showed association between sociodemographic characteristics and obese among respondents. Chi-square test results showed significant association

Table I: Sociodemographic characteristics and BMI among respondents.

Characteristics	Mean ± SD / Median (IQR)	N	%
Gender			
Male		160	33
Female		323	67
Age	22.02±1.631		
Ethnicity			
Malay		274	57
Chinese		101	21
Indian		103	21
Others		5	1
Educational level			
Year 1		116	24
Year 2		86	18
Year 3		90	19
Year 4		106	22
Year 5		85	18
Household Income			
B40		174	36
M40		195	40
T20		114	24
BMI (kg/ m^2)			
Non-Obese			
Underweight		98	20
Normal		219	45
Overweight / Obesity			
Overweight		106	22
Obese I		44	9
Obese II		12	3
Obese III		4	1

Table II: Associations between sociodemographic characteristic, depression, anxiety, stress and overweight / obesity among respondents

Sociodemographic characteristics	Non overweight / Non obese		Overweight / Obese		X^2 (df)	p-value
	n	%	n	%		
Gender						
Male	82	51	78	49	21.938	<0.001*
Female	235	72	88	27		
Ethnicity						
Malay	170	62	104	38		
Chinese	81	80	20	20		
Indian	65	63	38	37	16.193	<0.001*
Others	1	20	4	80		
Educational level						
Year 1	85	73	31	27		
Year 2	52	60	34	40		
Year 3	62	69	28	31	5.910	0.207
Year 4	64	60	42	40		
Year 5	54	64	31	37		
Household Income						
B40	112	64	62	36		
M40	131	67	64	33	0.356	0.841
T20	74	65	40	35		
Depression						
Normal	163	67	79	33	2.329 (4)	0.675
Mild	32	68	15	32		
Moderate	63	64	35	36		
Severe	18	55	15	46		
Extremely Severe	41	65	22	35		
Anxiety						
Normal	105	61	67	39	3.142 (4)	0.534
Mild	22	71	9	29		
Moderate	80	69	36	31		
Severe	34	71	14	29		
Extremely Severe	76	66	40	35		
Stress						
Normal	186	66	98	35	1.910 (4)	0.752
Mild	43	68	20	32		
Moderate	33	64	19	37		
Severe	38	70	16	30		
Extremely Severe	17	57	13	43		

** significant p 0.05*

among gender (X2=21.938 ; P=<0.001) and ethnicity (X2=16.193 ; P = <0.001) with obesity.

Table III showed the association between DASS score and obesity among respondents which were analysed by using Chi-square test. The results showed that there is no statistically significant association between DASS score for depression, anxiety and stress with obesity.

Factors associated with obesity

Simple logistic regression of obese with mindful eating and DASS-21 scores

Table IV shows the association between mindful eating and obesity using simple logistics regression. Disinhibition (P < 0.001), emotional response (P = 0.002), external cues (P = 0.006) and total MEQ (level of mindful eating) scores (P < 0.001) were significantly associated with obesity. There is no statistically significant association between DASS score and obesity.

Predictors of obesity among UPM's undergraduate medical students

Table V shows the factors associated with obesity among undergraduate medical students using multivariate analysis. Multiple logistic regression showed that gender, age, ethnicity and total MEQ scores were statistically significant with obesity (P < 0.05). Total MEQ had the highest impact on proportion of obesity compared to gender, age and ethnicity (1.669 versus 1.018, 0.156 and - 1.020) respectively. Male respondents were 2.766 times more likely to be obese compared to females (OR=2.766, 95% CI:1.821,4.202, P = <0.01). Older age were 1.168 times more likely to be obese (OR=1.168, 95% CI:1.032,1.323, P = 0.014). Chinese were 0.361 less likely to be obese compared to Malay (OR=0.361, 95% CI:0.202,0.643, P < 0.001).

Table III: Simple logistic regression of sociodemographic characteristics and obesity among respondents

Variables		OR	Unadjusted B	SE	Wald	95%CI		p-value
						Lower	Upper	
Gender	Female	Ref						
	Male	2.540	0.932	0.202	21.387	1.711	3.771	<0.001*
Age		1.110	0.104	0.059	3.141	0.989	1.245	0.076
Race / Ethnicity	Malay	Ref						
	Chinese	0.404	- 0.907	0.279	10.575	0.234	0.697	0.001*
	Indian	0.956	-0.045	0.239	0.036	0.598	1.527	0.849
	Others	6.538	1.878	1.125	2.786	0.721	59.297	0.095
Educational Level	Preclinical	Ref						
	Clinical	1.183	0.168	0.195	0.738	0.807	1.734	0.390
Household Income	B40	Ref						
	M40	0.883	-0.125	0.220	0.323	0.574	1.358	0.570
	T20	0.976	-0.024	0.252	0.009	0.596	1.601	0.925

Note: OR = Odd ratio; CI = Confidence interval, SE = Standard error, Ref = Reference, (*) significant p 0.05

Table IV: Simple Logistic Regression of Mindful Eating, Depression, Anxiety, Stress and Overweight / Obesity among Respondents

Variables	OR	Unadjusted B	SE	Wald	95%CI		p-value
					Lower	Upper	
Awareness	0.870	-0.139	0.177	0.620	0.615	1.230	0.431
Distraction	1.068	0.066	0.058	1.307	0.954	1.197	0.253
Disinhibition	3.682	1.303	0.207	39.676	2.454	5.523	<0.001*
Emotional Response	1.591	0.464	0.150	9.517	1.184	2.136	0.002*
External Cues	0.594	-0.521	0.188	7.637	0.411	0.859	0.006*
Total MEQ	5.034	1.616	0.442	13.368	2.117	11.971	<0.001*
Depression							
Normal	Ref						
Mild	0.967	-0.033	0.342	0.010	0.495	1.889	0.922
Moderate	1.146	0.137	0.251	0.295	0.700	1.876	0.587
Severe	1.719	0.542	0.376	2.083	0.824	3.589	0.149
Extremely Severe	1.107	0.102	0.298	0.117	0.618	1.984	0.732
Anxiety							
Normal	Ref						
Mild	0.641	-0.445	0.425	1.092	0.278	1.476	0.296
Moderate	0.705	-0.349	0.254	1.884	0.428	1.161	0.170
Severe	0.645	-0.438	0.354	1.531	0.322	1.291	0.216
Extremely Severe	0.825	-0.193	0.250	0.592	0.505	1.347	0.441
Stress							
Normal	Ref						
Mild	0.883	-0.125	0.298	0.175	0.492	1.583	0.676
Moderate	1.093	0.089	0.314	0.080	0.591	2.022	0.777
Severe	0.799	-0.224	0.323	0.482	0.424	1.505	0.048
Extremely Severe	1.451	0.373	0.389	0.917	0.677	3.111	0.338

Note: OR = Odd ratio; CI = Confidence interval, SE = Standard error, Ref = Reference, (*) significant p 0.05

DISCUSSION

This study discovered that sociodemographic characteristics such as gender, age, and race/ethnicity were statistically significant in obesity among medical students. There were also significant relationships between mindful eating and obesity where disinhibition, emotional reaction, external cues, and total MEQ are the statistically significant domains. Otherwise, there was no significant relationship between family income, awareness and distraction, depression, anxiety, stress and obesity.

In this study, the prevalence of medical students found to be overweight or obese was about 34.4%, with the majority being in the overweight category (21.9%). This is a worrisome figure compared with previous descriptive studies done by Manojan et al., 2019 (18) and Anupama M. et al., 2017 (19) which shows a prevalence of 18% and 25.71% respectively. This proves the prevalence of overweight and obesity among UPM medical students is relatively high as compared to other populations of medical students. Hence, identification of factors associated with overweight and obesity among medical students and subsequent notification for action at UPM is crucial for the implementation of a better strategy to overcome this issue. However, it should be noted that this study measures height and weight using the

Table V: Multiple Logistic Regression of Factors Associated with Overweight / Obesity among Respondents

Variables	OR	Unadjusted B	SE	Wald	95%CI		p-value
					Lower	Upper	
Gender							
Female	Ref						
Male	2.766	1.018	0.469	12.676	1.821	4.202	<0.001*
Age	1.168	0.156	0.064	6.008	1.032	1.323	0.014*
Ethnicity							
Malay	Ref						
Chinese	0.361	-1.020	0.295	11.961	0.202	0.643	<0.001*
Indian	0.969	-0.031	0.250	0.016	0.594	1.582	0.900
Others	7.852	2.061	1.188	3.010	0.765	80.544	0.083
Total MEQ	5.308	1.669	0.469	12.676	2.118	13.305	<0.001*

Note: OR = Odd ratio; CI = Confidence interval, SE = Standard error, Ref = Reference, (*) significant p 0.05

students' self reported questionnaires. This might cause the data to have a recall bias. Some might record the measurements that were taken a few years ago. This can depreciate the accuracy and reliability of the data.

In regards to factors associated with obesity among medical students in Malaysia, it is discovered that the findings of association between gender and prevalence of obesity contradict previous studies, which found that females were more likely than men to be obese (12,20). Yet, this study found that male respondents had a larger prevalence of obesity (48.8%) than female respondents (27.2%). One possible explanation of the discrepancy in the results with other studies might be due to the limitation of self declaration of obesity and overweight. Female students are less likely to declare themselves as overweight or obese. This is coherent with a study done in Korea (21) among the adolescent obese population that investigated the relationship between gender and their stress perception. It was found that females have more stress than males in obese population. This general trend is also reflected in our study that despite having less prevalence of obesity among female as compared to male, the prevalence of obese female having extremely severe and severe stress is higher than male (20% vs 11% respectively).

Also, age was significantly associated with obesity. Few factors may be attributed to the findings, in which a previous study done by Gazzaz et al., 2018 (22) shows an increased perceived stress among clinical students as compared to pre-clinical students. Another research conducted by Alhashemi et al., 2022 (23) shows a significant finding between perceived stress, stress eating and prevalence of obesity. This correlates with our findings in which clinical students (Year 4) who have the highest obesity prevalence have significant DASS scores in the stress domain, and preclinical students (Year 2) which may be subjected to higher psychosocial stressors such as Professional Examination 1, which attributed to 2nd highest obesity prevalence in the population of medical students in this study.

The relationship between ethnicity and obesity was statistically significant, however the proportion of obesity differed among races. According to these statistics, other ethnicities had the greatest proportion of obesity (80.0%), followed by Malay respondents (38.0%), Indian respondents (36.9%), and Chinese respondents (19.8%). There were various causes for these ethnic obesity percentage discrepancies. For starters, other ethnic groups had a relatively small number of respondents (5), which diminished confidence, raised uncertainty, and increased the margin of error of this study, resulting in lower accuracy of the conclusions. As a result, this data would be insufficient to statistically show and justify the obese proportion among them. Second, Malay respondents had the second highest proportion of obesity (38.0%). Findings from a study done in 2013 shows Malaysian Malays have the poorest glycemic and cardiometabolic management (24). Indian respondents were also observed to have a high rate of obesity (36.9%) in which several lifestyle characteristics supported this conclusion. Asian Indians, for example, were observed to be physically less active which contributes to higher BMI average value than other races (25). Apart from that, Asian Indians were genetically linked to a greater risk of acquiring dyslipidemia (26). Finally, Chinese respondents had the lowest obesity rate (19.8%). Factors that may contribute to obesity rates in Chinese medical students may be due to unhealthy eating habits such as eating faster than peers, as evidenced by high scores in the distractibility domain in our study. This finding is further proven by a study conducted by Zhang T. et al., 2016 (27) which states factors which impact obesity prevalence in Chinese students are mainly unhealthy eating habits, mainly eating faster than peers and presence of distractions during mealtimes.

The sociodemographic status with obesity study, on the other hand, revealed that the majority of respondents (24.0%) were in year 1. Year 4 had the largest proportion of obese students (39.6%), followed by Year 2 (39.5%). Yet, there was no statistically significant link between educational level and obesity. Current evidence supports the non-significant relationship between educational

degree and male obesity (28), in which both preclinical and clinical students are more aware of the causes and consequences of obesity, which increased their awareness of making good living choices involving food and exercise.

Family income had no statistically significant relationship with obesity (P > 0.05). Research found that, after controlling for other characteristics, income was inversely associated with BMI in the low-income (B40) demographic category; in other words, persons with more incomes had a lower BMI. This can be further explained by the choices of food regardless of family income. For wealthier individuals, they practice healthy eating by purchasing organic foods, thus they become less likely to be obese. On the other hand, individuals who have limited household income may have lesser choice of food, leading to low nutritious but higher calories food, resulting in obesity. This is supported by study which showed that in contrast to the built environment in rural areas, families of higher income levels can access to healthy food options, various weight loss programmes, walkable entertainment venues, shopping malls, and healthcare facilities; as a result, they may be less obese than the rest of the community (29).

In our research, we also discovered a link between mindful eating and obesity. Disinhibition, emotional reaction, external cues, and total MEQ are the statistically significant domains. Overall MEQ represents one's total degree of mindful eating. The higher the score, the more conscious eating there is. Disinhibition (p<0.001), emotional reaction (p=0.002), external cues (p=0.006), and overall MEQ (p<0.001) had significant p-values.

Firstly, domain disinhibition is statistically significant with obesity. Disinhibition is the propensity to binge eat in response to diverse triggers. For example, because of the vast number of daily overeating opportunities it provides in the typical western food setting, chronic disinhibition may be the most significant predictor of weight increase and obesity (30). According to the previous studies, domain emotional reaction is substantial with obesity. Obesity is significantly linked to negative emotions. Anger, worry, sadness, and despair had an impact on eating behaviours (31).When there were negative emotions, individuals will be prone to increase in appetite and had a desire for higher-calorie foods. Thus, they tend to consume an increased amount of food than usual. Following that, for the domain, exterior cues, sensory cues (e.g., palatability), and normative cues (e.g., serving sizes) allude to indicators of correct intake (32). Obesity is strongly linked to environmental signals. According to a research done by Richard E. Nisbett, an overweight person would consume until the signals are no longer there (33). Finally, in this research, overall MEQ is statistically significant. In contrast to prior research, this study reveals that persons who practise mindful eating are more likely to be obese. Thoughtful eating may not always imply good eating. It was because mindful eating helps individuals become more aware of their eating habits and the triggers that lead to overeating or unhealthy food choices. Furthermore, mindful eating encouraged individuals to differentiate between physical hunger and emotional triggers, leading to a decrease in emotional or stress-related eating, resulting in obesity among the respondents.

Awareness (p=0.431) and distraction (p=0.253) are two dimensions that are not statistically significant in this research. According to the p-value (p>0.05), these domains were not related with obesity in this research. Domain distraction had no relationship with obesity and is connected to the prior research. This result was unaffected by the patients' baseline condition or gender. Those who first met the distracted state ate far less than the other groups (34).

This research discovered that there is no significant relationship between DASS scores for depression, anxiety, and stress and obesity, which contradicts previous studies that established a statistically significant relationship between depression, anxiety, and stress and obesity (8,35,36). This can be explained by the way psychological issues were assessed. Self-report questionnaires like the DASS may have limitations in capturing the nuanced and complex nature of these psychological factors. Other assessment methods, such as clinical interviews or physiological measures, could provide a different perspective. Besides, some medical students were underweight because they might be having psychological issues such as eating disorders. Nonetheless, medical students who were constantly having stress in studies may have a tight schedule that forces them to stick to a strict diet and have little time to snack (37). They might end up losing weight as a result of depression. Additionally, previous study has shown that medical students exhibit anti-obesity biases (37–40). Negative preconceptions about obese people may cause respondents to be nervous and self-conscious about their weight in order to avoid discrimination. Anti-obese attitudes among medical students may put respondents under pressure to lose weight, which may be stressful.

However, several limitations are noted in this study . Firstly, the accuracy of our results might be impacted by memory bias and social desirability bias in self-reported data on eating behaviours and psychiatric disorders. Additionally, the study's specific emphasis on UPM medical students may have limited the data's applicability to other groups. Although the study found a link between mindful eating and obesity, other potential confounding factors like physical activity levels, and genetic predisposition were not thoroughly examined in this analysis. A more thorough approach taking into account these elements could provide a more complex explanation of the links that have been discovered.

CONCLUSION

In conclusion, this study found a significant relationship between sociodemographic factors, mindful eating, and obesity among UPM undergraduate medical students. In fact, most of the responders, who were medical students at UPM, were not obese. This shows that the way medical students are taught at UPM may be promoting a culture of health awareness and good eating habits. These results have large implications on how doctors learn and practise medicine. This would give future doctors and nurses the information to help their patients in improving quality of life. Even though this study did not find a significant relationship between psychological issues and obesity, it did show how important it is to learn more about how psychological health, eating habits, and obesity affect each other. Future study in this area could help to study more about the causes that lead to obesity in order to provide more effective treatment options.

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