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Weight Management Behaviors among Students in a Public University

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ABSTRACT

Background: Obesity is the most common health concern among the public worldwide. Weight gain among students occurred during their college years, when physical activity and dietary patterns were observed to change. The Health Belief Model (HBM) depicts the role of anticipating and justifying the causes of a person's transformation or maintenance of specific health behaviors. **Objective:** This study determines the prevalence of obesity and the differences in weight management behaviours with gender among university students. **Methods:** A cross-sectional study was conducted at Universiti Teknologi MARA (UiTM) Puncak Alam Campus, Selangor, involving 377 respondents (122 males and 255 females) aged 18-26 years from February to April 2021. Health Belief Model (HBM) questionnaire on Weight Management Behaviors was used as a research tool in this study. **Results:** The findings showed that the majority of the respondents have a normal Body Mass Index (BMI) (n=214, 56.8%), followed by overweight (n=66, 17.5%), underweight (n=63, 16.7%) and obese (n=34, 9.0%). Independent *t*-test showed that female students significantly have more perceived susceptibility and cues to action than males ($p<0.05$). While, male students significantly have a high score in weight management behaviour for perceived benefits, perceived self-efficacy in dieting, and behavioural intention of weight management compared to female ($p<0.05$). **Conclusion:** Health interventions such as nutrition education regarding healthy food preparation and exercise schedule, including duration and types of activity, should increase female students' motivation and confidence in managing weight. Besides, an awareness campaign regarding the risk of obesity focusing on the male students must be created to generate awareness and prevention of obesity.

Keywords: Behavior(s); Health Belief Model; University Student(s); Weight Management

INTRODUCTION

Obesity is a significant public health issue on the rise around the world (Ariaratnam *et al.*, 2020). Nearly 1.9 billion overweight adults aged 18 and up were estimated to be obese in 2016 World Health Organization (WHO), 2019. Sogari *et al*. (2018) stated that physical inactivity and unhealthy dietary habits are two of the most common behaviours that can have a negative impact on young adults' weight and health status. Significantly, one-third of university students were overweight or obese (Rabanales-Sotos *et al.*, 2020). Previous study results showed that the overall prevalence of overweight and obesity among Malaysian university students is 21.2% and 16.3%, respectively (Wan Mohamed Radzi *et al.*, 2019). Furthermore, the specific prevalence of overweight and obesity among bachelor's students was 23% and 17.6%, respectively, 21.9% and 14.3% among master's students, and 17.8% and 18.4% among PhD students (Wan Mohamed Radzi *et al.*, 2019). The number of obese or overweight students is increasing due to the transition from high school to college, especially for first-year college students who must adjust to a new academic, social, and personal

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environment, which can be extremely stressful (Denovan & Macaskill, 2017). Obesity increases the risk of noncommunicable diseases (NCDs) such as type 2 diabetes, cardiovascular disease, and malignancies of the breast, large intestine, pancreas, and kidney. However, modest weight loss of 5%–10% or more can significantly improve health-related outcomes (Fruh, 2017). A study substantiated the findings of previous studies by providing objective quantification of the advantages of weight loss for relevant outcomes in a primary care setting (Haase *et al*., 2021). The greatest benefits were seen in lowering the risk of CVD, which included type 2 diabetes, hypertension, dyslipidaemia, chronic kidney disease (CKD), and sleep apnea (Haase *et al.*, 2021).

The students faced new challenges when entering university, including different schedules, lifestyles, and cultures. Experiencing stress at high levels may cause students to practise inappropriate coping behaviours, regularly change their body composition, and become less physically active. Hence, weight control was a significant health challenge for this community. Nevertheless, the Health Belief Model (HBM) comprises perceived severity, susceptibility, benefits, barriers, cues to action, and self-efficacy with the goal of better understanding why people do not follow through on preventive health measures (Johari, 2019). Saghafi-Asl *et al*. (2020) used the HBM to predict behavioural intentions for weight management. It showed a relationship between weight management behaviour and students' body mass index (BMI) among Iranian female students. The findings showed that overweight students scored lower in perceived severity, self-efficacy in dieting, and exercise subscales while scoring higher in perceived barrier subscales. Meanwhile, underweight and standard weight students recorded higher scores on perceived severity, which motivated them to control their weight.

The number of patients seeking weight management guidance is projected to rise as the global incidence of overweight and obesity rises (Attlee *et al.*, 2017). Recent findings revealed that students with varying weight statuses had different perceptions of obesity and weight loss behaviour (Saghafi-Asl *et al.*, 2020). Abraham, Noriega, & Shin (2018) stated that weight management beliefs differed between males and females of first-year university students using the Health Belief Model, showing differences in health beliefs between genders. Additionally, a study performed among private college students in Kelantan discovered that body weight perception is a crucial factor that influences the practise of weight reduction (Badrin, Daud, & Ismail., 2018). However, the least published studies regarding this situation are in our local setting. Therefore, this study was conducted to determine the prevalence of obesity and weight management behaviours among university students, especially in terms of gender differences.

METHODOLOGY

Study Design, Location, and Target Population

The research design used was a quantitative and cross-sectional study. The study was conducted at Universiti Teknologi MARA, Puncak Alam Campus, Selangor. This campus is in Kuala Selangor District. Full-time university students from the Faculty of Health Sciences, the Faculty of Business and Management, the Faculty of Education, the Faculty of Accountancy, the Faculty of Art and Design, the Faculty of Planning and Surveying, the Faculty of Hotel and Tourism Management, and the Faculty of Pharmacy were the study's target population. We employed convenience sampling approaches and unrestricted self-selected surveys. This method is open to UiTM students, as anyone can self-select to participate as this is an online, self-administered questionnaire.

Sample Size Calculation, Inclusion and Exclusion Criteria

Raosoft Software (2004) determined the sample size calculation with a margin of 5% and a Confidence Level of 95%. The estimated sample size was 377 (n=377). All participants had to be 18 years old or older, full-time undergraduate students, and fluent in English. Respondents consuming weight loss supplements were excluded from the study.

Ethical Consideration

Ethical approval was obtained from the UiTM Research Ethics Committee, Selangor, Puncak Alam Campus REC/01/2021 (UG/MR/39) (22nd January 2021) before the commencement of the study. The participants were provided with adequate information and could give consent after making a reasoned decision. Besides, the participant's information was kept anonymous, and the sources could not be identified.

Data was collected over a three-month period, from February to April 2021. A convenience sampling technique was used, and the respondents, university students who met all eligibility criteria, were invited to participate in this study through this online self-administered questionnaire.

Instruments and Pilot Study

The instruments were divided into two sections. Section A is socio-demographic information with 11 items, and Section B is weight management behaviours with 89 items. The weight management behaviour instrument was adopted from Saghafi-Asl *et al.*, (2020). There are 13 questions on perceived severity with three subscales (emotional/mental health, physical health/fitness, and social/professional); 7 questions on perceived susceptibility with two subscales (lifestyle and environmental); 14 questions on perceived barriers with three subscales (practical concerns, emotional/mental health, and awareness); and 13 questions on perceived benefits with three subscales (emotional/mental health, physical health/fitness, and awareness). The authors use a 5-point Likert scale to rate the responders' statements, ranging from 1 (strongly disagree) to 5 (strongly agree). The maximum score for each question is 5, and the minimum score is 1. The calculated mean score determined the score of each subscale. Each subscale's scores are based on the number of questions. Based on the research conducted by Saghafi-Asl *et al.*, (2020), the overall reliability of the questionnaire was high (0.92) based on the calculation of the internal consistency of Cronbach's alpha.

A pilot study was done with a sample of 38 full-time undergraduate students before the actual research and found that the Cronbach's Alpha for the instruments were acceptable at 0.93.

Data Analysis

The collected data were analysed with IBM SPSS Statistics Version 26. Descriptive and inferential statistics, such as independent t-tests, were used for the analysis. A p-value of less than 0.05 was considered significant to reject the null hypothesis.

RESULTS

The prevalence of obesity and the socio-demographic information of the respondents

As recorded in Table 1, this study involved 377 students aged between 18 and 26 years old. All the respondents completed the questionnaire (100%). The prevalence of obesity was 9.0% (n=34). Majority of them were having normal BMI (23.15 ± 5.18) kg/m2 (n=214, 56.8%), followed by overweight (n=66, 17.5%) and underweight (n=63, 16.7%).

The respondents' average age was 22 (2.01) years. Most of the respondents were female (n=255, 67.6%), year 2 (n=113, 30.0%), and from non-obese families (n=244, 64.7%). Most students reported were that they to not have controlled their diet for weight reduction (n=279, 74.0%), exercise (n=267, 62.9%), and sought medical treatment (n=308, 81.7%) to control their weight. Many students responded that they attempted to control their weight for health and better appearance (331, 87.8%), while some students did so for health (n=32, 8.5%) and least for better appearance (n=14, 3.7%).

Table 1: Socio-Demographic Information (N=377)

	Frequency (n)	Percentage (%)
Age (Mean±SD)	22.44±2.011	
Gender		
Male	122	32.4
Female	255	67.6
Year of Study		
Year 1	86	22.8
Year 2	113	30.0
Year 3	77	20.4
Year 4	101	26.8

Weight (kg) (Mean±SD)	60.37±15.59	
Height (cm) (Mean±SD)	161.15±8.10	
Body mass index (BMI) (Mean±SD)	23.15±5.18	
Male	23.89±5.08	
Female	22.79±5.20	
Body Mass Index (BMI) by group		
Underweight (<18.5 kg/m^2)	63	16.7
Normal (18.5-24.9 kg/m^2)	214	56.8
Overweight (25- 30.0 kg/m^2)	66	17.5
Obese (>30 kg/m^2)	34	9.0
Obese Family Members		
Yes	133	35.3
No	244	64.7
Experienced of Diet for Weight Reduction		
Yes	98	26.0
No	279	74.0
Experienced of Exercise		
Yes	140	37.1
No	237	62.9
Experienced of Medical Treatment		
Yes	69	18.3
No	308	81.7
Reason of Weight Management		
Health	32	8.5
Better appearance	14	3.7
Health and better appearance	331	87.8

Comparison of Weight Management Behaviours between Male and Female Students

Table 2 shows the weight management behaviours among students at a public university. The total score for weight management behaviours among university students was perceived severity (50.51±9.21), perceived susceptibility (25.09±5.39), perceived barriers (42.97± 10.75), perceived benefits (54.96 ± 9.79), cue to action (44.45±10.81), perceived self-efficacy in dieting (62.76 ± 13.36), perceived self-efficacy in exercise (26.79±5.04) and behavioural intention in weight management (17.90±4.00).

An independent *t*-test was used to determine the differences between weight management behaviours and gender. Significant results were found for perceived susceptibility, benefits, cues to action, self-efficacy in dieting, and behavioural intention of weight management between males and females ($p<0.05$).

The mean score of perceived susceptibility to obesity risk for female students was higher (25.23±5.70) than for male students (24.80 ± 4.68). It showed a significant difference t (375) = -0.728, $p = 0.007$. Besides, for the perceived cue to action, there were significant differences between male and female, t (375) = -2.193, $p = 0.040$. Females recorded higher mean scores (45.29 ± 10.39) than male students (42.70 ± 11.50).

The results found there were significant differences between two groups in perceived benefits [t (375) = 0.283, $p = 0.041$], perceived self-efficacy in dieting [t (375) = 1.194, $p=0.012$] and behavioral intentions of weight management [t (375) = 2.712, $p = 0.030$]. The results showed that the total mean scores of perceived benefits (55.16 ± 7.96), perceived self-efficacy in dieting (63.94 11.41), and behavioural intentions of weight management (18.70±3.27) were higher in male students compared to female students. The scores for perceived benefits, perceived self-efficacy in dieting and behavioural intentions of weight management among females were 54.86 ± 10.56, 62.19 ± 14.18 and 17.51 ± 4.26, respectively.

Meanwhile, no significant differences in perceived severity were found between weight management behaviours and gender [$t(375) = -1.061$, $p = 0.289$], perceived barriers [$t(375) = 0.436$, $p = 0.663$] and perceived self-efficacy in exercise [$t(375) = 0.608$, $p = 0.544$].

Table 2: Comparison of Weight Management Behaviour between Male and Female (N=377)

Variable	Total (n=377) (Mean ± SD)	Male (n=122) (Mean ± SD)	Female (n=255) (Mean ± SD)	*t*-stats	*df*	*p*-value
Perceived Severity						
Physical health/fitness	19.67 ± 3.74	19.4 ± 3.44	19.74 ± 3.88			
Emotional/mental health	16.30 ± 3.07	15.77 ± 2.83	16.56 ± 3.16			
Social/professional	14.54 ± 3.55	14.48 ± 3.19	14.57 ± 3.72			
Total	**50.51 ± 9.21**	**49.79 ± 8.34**	**50.86 ± 9.60**	**-1.061**	**375**	**0.289**
Perceived Susceptibility						
Lifestyle	18.98 ± 3.98	18.76 ± 3.54	19.09 ± 4.17			
Environmental	6.11 ± 2.34	6.03 ± 2.12	6.14 ± 2.43			
Total	**25.09 ± 5.39**	**24.80 ± 4.68**	**25.23± 5.70**	**-0.728**	**375**	**0.007***
Perceived Barriers						
Awareness	16.37 ± 5.00	16.76 ± 4.98	16.18 ± 5.01			
Emotional/mental health	12.86 ± 3.56	13.34 ± 3.77	13.94 ± 3.90			
Practical concerns	13.74 ± 3.86	12.52 ± 3.29	13.02 ± 3.68			
Total	**42.97 ± 10.75**	**42.62 ± 10.44**	**43.14 ± 10.92**	**-0.436**	**375**	**0.663**
Perceived Benefits						
Physical health/fitness	29.87 ± 5.34	29.81 ± 4.27	29.90 ± 5.78			
Emotional/mental health	16.90 ± 3.16	16.94 ± 2.56	17.0 ± 3.42			
Social/professional	8.18 ± 1.84	8.41 ± 1.45	8.07 ± 2.00			
Total	**54.96 ± 9.79**	**55.16 ± 7.96**	**54.86 ± 10.56**	**0.283**	**375**	**0.041***
Cue to Action						
Internal cues	22.5 ± 5.58	21.62 ± 6.02	22.92 ± 5.32			
External cues	21.95 ± 5.67	21.07 ± 5.87	22.37 ± 5.35			
Total	**44.45 ± 10.81**	**42.70 ± 11.50**	**45.29 ± 10.39**	**-2.193**	**375**	**0.040***
Perceived Self-Efficacy in Dieting						
Habits and preference	46.00 ± 9.73	46.58 ± 8.29	45.70 ± 10.35			
Emotional/mental health	16.77 ± 4.74	17.36 ± 4.03	16.49 ± 5.03			
Total	**62.76 ± 13.36**	**63.94 ± 11.41**	**62.19 ± 14.18**	**1.194**	**375**	**0.012***
Perceived Self-Efficacy in Exercise						
Total	**26.79 ± 5.04**	**27.02 ± 4.73**	**26.68 ± 5.19**	**0.608**	**375**	**0.544**
The Behavioural Intention of Weight Management						
Diet therapy	10.30 ± 2.54	10.82 ± 2.10	10.05 ± 2.70			
Exercise therapy	7.59 ± 1.75	7.88 ± 1.41	7.46 ± 1.88			
Total	**17.90 ± 4.00**	**18.70 ± 3.27**	**17.51 ± 4.26**	**2.712**	**375**	**0.030***

*Note: *significant at $p<0.05$*

DISCUSSION

The Prevalence of Obesity and the Socio-Demographic Information of Respondents

In this study, the prevalence of obesity and overweight among university students was 9% and 17.5%, respectively. The results might be related to the number of obese people in their family, where 35% of the family members were obese. Similarly, Wan Mohamed Radzi *et al.*, (2019) estimated the overall prevalence of overweight and obesity among Malaysian university students to be 21.2% and 16.3%, respectively. As a result, the findings of this study showed that obesity among university students should be considered by responsible authorities to prevent future obesity-related problems.

About 377 university students aged between 18 and 26 years old were recruited for this study. This age group is targeted in this study as rapid growth and physical appearance changes occur at this time. The average age of respondents in this study was 22 years. The study showed similar data to a previous study in which the mean age was 22 years and ranged from 18 to 43 years (Saghafi-Asl *et al.*, 2020). In the present study, females scored higher than males. However, comparable to a survey by Syed *et al.,* (2020), the number of male students involved was higher (53%) than females (47%).

Furthermore, the current findings report that exercise and diet are the most common methods for managing weight. This result is consistent with other studies that examined weight-loss behaviour among university students (Saghafi-Asl *et al.*, 2020). In contrast, a study found young adults are less likely to participate in behavioural weight control trials, and recruitment into healthy weight trials may be difficult to gain their attention as the health consequences of overweight and obesity are perceived as unimportant by young adults (Whiteley *et al.*, 2020). However, the present result was not in line with other studies. Many students choose to maintain a better appearance as the main reason for controlling body weight (Saghafi-Asl *et al.*, 2020). The reason for weight management may encourage the individual to maintain their fitness and ideal weight. Previous research revealed that body weight and shape concerns could play a role in linking obesity and psychosocial impairment. These findings suggest that in the clinical care of obesity, weight perception should be targeted to enhance physical and psychosocial outcomes (Badrin, Daud & Ismail, 2018; Quaidoo, Ohemeng & Amankwah-Poku, 2018; Jamani *et al.*, 2018).

Comparison of Weight Management Behaviours between Male and Female Students

The findings demonstrate that female students significantly have more perceived susceptibility and cues to action than males. However, male students reported significantly high scores for perceived benefits, perceived self-efficacy in dieting, and behavioural intention toward weight management.

Female students recorded higher scores than male students for both lifestyle and environmental subscales under "perceived susceptibility". Previous reports affirmed that the male group viewed their susceptibility to being physically inactive as limited access to healthier foods and gym supplies, time constraints, large work overload, and a lack of support from family and friends (Abraham *et al.*, 2018). Also, seeing loved ones' struggles with chronic diseases increased many students' susceptibility. Besides, females perceived their susceptibility as influencing weight gain, ultimately affecting their aesthetic beauty (Voges *et al.*, 2019). Women also perceived a lack of time to exercise or practise healthy eating habits, poor time management, stress from different environments, and a failure to prioritise weight management as barriers. Thus, it indicates that male and female students have different understandings of the risk factor of being overweight. Jayaveloo, Mat Daud, & Abd Rahman (2021) stated that they are looking for self-reliance to adapt to an independent life, which includes finding a dietary lifestyle that suits them. Hence, they tend to practise unhealthy eating habits (Bede *et al.*, 2020; Tok, Ahmad & Soo Quee, 2020).

Furthermore, cues to action in weight management show significant differences between genders. The total score for cues to action in female students was higher than that in male students. Hence, it demonstrates that female students have realised that internal cues like personal goals and external cues like receiving information about the health risks of being overweight would probably trigger them to achieve a healthy weight. Internal and external cues were also significantly different for both genders. External cues motivate people to practise a healthy lifestyle. Sogari *et al.,* (2018) also indicate that social relationships, especially with friends at college and family members, are a strong determinant in supporting and maintaining a healthy diet.

Perceived benefits have shown significant differences between male and female students. Male students received higher total scores than female students. Males received higher scores in the social/professional subscale. These results emphasise that providing a comfortable environment encourages male students to practise a healthy lifestyle, which describes the significance of the social environment. The advantages of social support from the current study are consistent with previous studies. The perceived benefits of being physically active and eating well for men were improved quality of life and friendships (Sogari *et al.*, 2018).

Perceived self-efficacy in dieting was statistically significant for both genders. Male students reported having higher scores than female students. The results showed that male students have a high level of confidence in controlling their diet intake in terms of habits, preferences, and emotional and mental health. Despite higher scores in self-efficacy in dieting among male students in the current study, Heiman & Olenik-Shemesh (2019) found women have a poorer body image than men, are particularly worried about their weight and diet, and exercise less. Despite the differences, Richardson, Madzima, and Nepocatych (2019) concluded that males and females were equally likely to use food manipulation and engage in unhealthy habits for weight management.

Then, the behavioural intention of weight management was also reported to be statistically different between male

and female students. Male students reported higher scores in diet therapy and exercise therapy. These results show that male students have good intentions, like controlling their diet and being actively involved in physical exercise, motivating themselves to manage their weight healthily. Alkazemi (2018) emphasised that both males and females with poor weight perception experience unhealthy weight control practices. Weight management motivation and positive understanding can be increased by providing specific organisations related to health programs.Sogari *et al.*, (2018) indicated that developing programmes and methods for behavioural change can enhance knowledge about diet and health among college students, which helps them change to a healthy lifestyle and reduce diet-related diseases in particular.

There were several limitations found in this study. As the data was collected via an online survey, the risk of sampling and response bias in this study may influence the outcome. Besides, the study was done during the COVID-19 pandemic, and the Malaysian government issued a Movement Control Order (MCO). Thus, it may affect the respondents' daily activities, such as performing outdoor physical programmes and regular exercise.

CONCLUSION

In conclusion, the results showed that 9% of respondents were obese. It can be suggested that this group be introduced to health interventions such as food education and physical exercise programmes by the university administrator. Besides, weight loss programmes should be provided to the obese group, so they have the opportunity to achieve their ideal weight. Subsequently, there are differences in weight management behaviours between male and female students. Hence, an awareness campaign regarding the risk of obesity must be presented to the male students. Further more research is needed to incorporate the HBM into experimental studies and demonstrate health management behaviour and the positive outcome of weight control.

Conflict of Interest

The authors declare that they have no conflict of interests.

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