

ORIGINAL ARTICLE

The Impact of Gender, Body Mass Index and Levels of Physical Activity on Attitudes Toward Obese Persons

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ABSTRACT

Introduction: The increasing prevalence of excess body weight among young adults is worrying as they may receive negative attitudes from society. Purpose: To examine whether attitudes toward obese persons differ among gender, body mass index (BMI) and levels of physical activity (PA) among healthcare students. **Methods:** This cross-sectional study recruited 185 participants (78 men, 107 women, mean age=23.45±4.02 years, BMI=25.84±5.59 kg/m²). BMI and levels of PA were measured using a body composition monitor and the International Physical Activity Questionnaire-Short Form (IPAQ-SF), respectively. A self-administered questionnaire assessed attitudes toward obese persons using “The Attitudes Toward Obese Persons (ATOP)”. **Results:** Analysis showed that females scored a higher ATOP score (65.56±13.11) than males (64.37±10.50) ($p>0.05$). In terms of BMI, the obese individuals had the highest ATOP score (65.84±14.10), followed by those with a healthy weight (64.96±12.03) and the overweight (64.42±9.96) ($p>0.05$). There were also no significant differences in ATOP score among individuals with different levels of PA ($p>0.05$), but those with low PA had the highest ATOP score (65.29±13.80) followed by high PA (65.25±11.34) and moderate PA (64.76±12.21). **Conclusion:** Differences in gender, BMI and levels of PA might have less impact on the attitudes toward obese persons. Negative attitudes toward obesity may not be acceptable in the community. On the other hand, showing a positive or neutral attitude may discourage people with obesity to adopt a healthy lifestyle or seek intervention for weight management.

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destructive, these findings may indicate the importance of teaching a positive attitude toward obesity. It may be productive and supportive to individuals with obesity to encourage and motivate them to fight against obesity.

INTRODUCTION

The latest report from the World Health Organization revealed that Malaysia has the highest rate of obesity and overweight among Asian countries, with 64% of males and 65% of the female population being either obese or overweight (1). Obese people are usually labelled lazy, lack motivation, have poor self-discipline, lack of skill, and carelessness (2). This kind of labelling or stigmatization may lead to weight discrimination, especially in job-seeking, educational settings, and seeking health care (2,3). Other than that, individuals in interpersonal interactions also found weight bias that may hurt romantic interactions, sexual interactions, and friendships (2). While negative attitudes are harmful and

Participation in regular physical activity is an established factor for combating obesity. In Malaysia, as reported by the National Health and Morbidity Survey 2019 (NHMS 2019), there is an increasing trend in the participation in regular exercise with only 25% who were physically inactive in 2019 compared to 35.7% in 2011 (4). However, the increasing trend in the participation in physical activity was not reflected in the population with overweight or obesity. The NHMS 2019 reported that about 50% of the Malaysian population were overweight or obese compared to 45% in 2011 (4). This inconsistency needs further study to explore whether weight stigma or being overweight or obese is perceived positively among the populations. A previous study has suggested that weight stigma may have a complex

connection to mental health (5). Besides, the increasing body of knowledge on weight bias in various settings shows that weight bias is probably present in the college setting, especially among healthcare students who are diverse in terms of gender, body mass index and level of participation in physical activity. It is important to explore this issue among the healthcare students as they are supposed to be the professions responsible for providing healthcare education, especially on preventing diseases associated with being overweight or obese.

Given the increasing trend of obesity in Malaysia, this study aimed to examine the levels of attitudes toward obese persons among healthcare students with different gender, body mass index (BMI) classifications, and physical activity levels (PA). Findings from this study may provide evidence for a better approach to preparing healthcare students to enhance the effectiveness of delivery of health services to the general population.

MATERIALS AND METHODS

Participants

This cross-sectional study was conducted from January to July 2019. Participants were recruited among college-aged individuals from a public-funded university. The inclusion criteria for participation were (i) aged 18 to 30 years old, (ii) both males and females, (iii) BMI ranged from healthy to obese (18.5 to ≥ 30 kg/m²) and (iv) able to read and understand English. Participants excluded from the study were (i) smokers, (ii) had been diagnosed with chronic conditions involving the cardiovascular and neuromuscular systems, and (iii) classified as underweight. This study was held at the Exercise Testing Lab of the university. An a priori power analysis was conducted using Gpower 3.1 software to test the difference between three independent groups means using medium effect size ($d=0.25$) and alpha of 0.05 (6). Results showed that a total sample of between 159 and 191 after considering about 20% dropouts was required to achieve a power of 0.80.

Before the data collection, the advertisement for inviting participants into the study was placed in the social media dedicated to the students of the university and via flyers distribution. The meeting with the potential participants was held at the Exercise Testing Lab of the Physiotherapy Department. The study information sheets were given during the meeting, and formal informed consent for participation was obtained. Confidentiality was strictly enforced throughout the study. Research ethics involving human subjects was obtained from the University's Research Ethics Review Committee (600-IRMI (5/1/6)).

Procedures

Data such as age (year) and gender (male/female) were recorded for each participant. Bodyweight (kg), body

mass index (kg/m²), fat percentage (%), and muscle mass percentage (%) were assessed using a body composition monitor. A standard non-elastic cloth tape measure was used to measure the waist circumference that was recorded to the nearest cm. A stadiometer was used to measure the participants' height that were documented to the nearest cm.

The Attitudes Toward Obese Persons (ATOP) scale was used to measure attitudes toward individuals with obesity (7). The scale is a 20-item Likert rating scale; the participants were required to indicate the extent to which they disagree or agree with a statement of; -3 = I strongly disagree; +3 = I strongly agree. The participants' scores may range from 0 to 120. Higher scores reflect more positive attitudes toward individuals with obesity. The ATOP scale has been proven to have high internal consistency, with Cronbach's alpha ranging from .80 to .84 (8).

The levels of PA were measured using "The International Physical Activity Questionnaire-Short Form (IPAQ-SF)" that can estimate the total PA in MET-min/week and time spent sitting as part of their daily lives (9). Categorical scoring for a low level of PA is less than 600 MET-min/week, moderate level of PA at least 600 MET-min/week, and high level of PA achieve at least 3000 MET-min/week. It consists of 7 items of open-ended questions surrounding individuals' last 7-day recall of PA.

Data analysis

The SPSS statistical software (version 21.0) was used for data analysis. The descriptive statistics reported the means (M) and standard deviation (SD) of all the variables of interest. The normality of dependent variables was determined using the Shapiro Wilk test. An independent t-test was used to determine the significant difference in ATOP among gender. Besides, ANOVA was used to determine the significant difference in ATOP among different BMI classifications and levels of PA. Besides, a one-way analysis of covariance (ANCOVA, controlling for gender) compares the ATOP score among BMI classification and levels of PA. A p value of less than 0.05 was set as the level of statistical significance.

RESULT

The characteristics of the 185 participants who were recruited for this study are presented in Table I. The results showed that male participants were significantly taller (height), had lower BMI, lower fat %, higher muscle mass %, bigger waist circumference, and a higher level of PA (All $p<0.05$). The age, body weight and ATOP scores did not show any statistical differences between genders (ALL $p>0.05$). The mean and SD for male and female participants fell in the middle range or close to the score suggested earlier as more negative. The ANOVA and ANCOVA (controlling for gender)

result revealed no significant differences found in ATOP scores among BMI classification and levels of PA (ALL $p > 0.05$) (Table II).

Table I. Characteristics of participants (N=185)

Variables	All	Male (n=78) mean±SD	Female (n=107) mean±SD	Sig diff p value
Age (year)	23.45 ±4.018	23.64 ±4.29	23.32±3.82	0.590
Weight (kg)	68.04 ±16.00	70.07± 13.17	66.56±17.70	0.142
Height (m)	162.12 ±7.16	168.21 ±5.39	157.68±5.84	0.001**
BMI (kg/ m ²)	25.84 ±5.59	24.72 ±4.21	26.65±6.32	0.020*
Fat (%)	27.94 ±9.09	20.34 ±7.17	33.48±5.73	0.001**
Muscle mass (%)	28.42 ±5.17	33.61 ±3.15	24.63±2.19	0.001**
Waist circum- ference (cm)	81.47 ±14.88	84.69± 11.35	79.13±16.66	0.012*
ATOP	65.06 ±12.06	64.37± 10.503	65.56±13.11	0.510
Level of PA (MET- min/ week)	2884.30 ±2556.66	3377.41± 2876.91	2524.84 ±2241.596	0.025*

ATOP=Attitudes toward obese person; PA=Physical activity, %=percentage. ** $p < 0.01$; * $p < 0.05$.

Table II. ATOP scores among individuals with different BMI classifications and levels of PA (N=185)

Variables	n	ATOP Mean (SD)	p value
BMI			
Normal	69	64.96 (±12.03)	0.817 ^a
Overweight	59	64.42 (±9.96)	
Obese	57	65.84 (±14.10)	0.855 ^b
Level of PA			
Low	31	65.29 (±13.80)	0.962 ^a
Moderate	75	64.76 (±12.21)	
High	79	65.25 (±11.34)	0.949 ^b

PA=Physical activity.

* $p < 0.05$

^a= p Values for analysis of variance (ANOVA)

^b= p Values for analysis of covariance (ANCOVA) with gender as a covariate

DISCUSSION

This current study has attempted to examine the differences in ATOP scores among gender, BMI classification, and levels of PA. To briefly summarize the findings, ATOP among genders, BMI classification, and levels of PA were not significantly different (All $p > 0.05$). A further look at the mean scores, none of the groups scored below 59.7, indicating anti-obesity attitudes (7). However, males, being overweight, and those with a moderate level of PA showed a tendency toward lower ATOP scores. However, the mean score for ATOP among all the participants fell in the middle range or very close to being negative. This may indicate a tendency towards a negative attitude towards obese persons, indicating the need to improve attitudes (10). The non-significant findings between male and female participants could also be due to the difference in the sample size in terms of genders. Besides, participants for this current study were young and currently studying at a university that may have explained their better awareness is not to be prejudiced towards individuals with obesity.

In terms of gender comparison, the current finding did not find a significant differences in ATOP scores. However, the finding indicated that male participants showed more negative attitudes towards obese persons, which is consistent with a previous literature (11, 12). In contrast, another study showed that overweight males perceived a better attitude about their weight than women who had excessive body weight (10). While other studies found that weight bias among young adults was not influenced by gender (11, 13).

Regarding comparisons among different BMI classification on ATOP scores, the finding that no significant differences is comparable to a study conducted at Turkey University that BMI did not affect attitudes towards obese people (14). Another similar finding at the north-eastern university in the United States reported that attitudes toward obese persons might not be influenced by how they perceived their body weight (10). In addition, another study conducted in population samples of undergraduate nurses found no significant correlation between ATOP score and BMI (15). A study involving nurses (16) and occupational therapists (17) using the ATOP scale did not identify any significant difference between BMI and attitudes. This could be because young adults who have a healthy weight believe that obesity is beyond the person's control (18). However, one study suggested a significant prejudice against individuals with obesity with a more definite view that obesity can be controlled (19). In this study, it is believed that many factors may influence attitudes toward obese persons, such as level of education and knowledge about obesity, economic

background, cultural background and social norm that were not measured in this current study. The non-significant difference may be that the sample population of the current study did not involve enough participants in each category of BMI, especially in the obese range, which is similar to a previous study (20).

With regards to levels of PA, participants who had a moderate level of PA had the lowest ATOP score, while those who reported a low level of PA had slightly higher ATOP scores than those who were highly active. According to a previous study, an individual who pays attention to their habits and behaviour in every field to live an active and healthy life thinks that obesity is usually caused by their shady practices such as nutritional habits, PA, and stress management (15). Because of their irresponsibility and weakness of will, obese people are blamed for their overweight. This could explain why individuals with moderate to high levels of PA have a more negative attitude towards obese individuals. On the other hand, negative obesity attitudes may be associated with a lack of motivation for losing weight and may not result in weight loss (21). Health care providers should be careful when dealing with obese clients as an attempt to perceive negative obesity attitudes as acceptable may misrepresent the actual and ideal body perceptions, promote poor eating behaviour, physical inactivity, and thus encourage further weight gain (22). A few studies have found that weight stigma can decrease exercise behaviour, which may become a barrier to PA (23, 24).

Based on the findings of this current study, it is difficult to conclude whether having positive or negative attitudes toward an obese person is suitable for the current development of policy in obesity prevention. Since obesity has been recognized as one of the significant factors for various chronic diseases, strategies for obesity prevention should be in place. However, if obesity is not the choice of ones' life thus, one should not be the victim of discrimination in many situations.

Since, in this study, most participants were young college-aged individuals; therefore, they should be educated on the importance of participation in regular PA and exercise and a healthy diet. More importantly, young adults also need to be educated on the negative effect of obesity stigmatization and the chances of having obesity. At the same time, healthcare providers must educate the community on the issues related to weight bias. The education should also give knowledge about genetic inheritance of obesity and being obese is not entirely due to unhealthy lifestyles such as poor diet practices and lack of exercise (10). There is also a need to train communication techniques among health care providers to increase their confidence and skills promoting weight management with their clients (25). Media portrayals and news articles can also influence attitudes towards individuals with obesity; therefore, the contents of the news should not be encouraging

stigmatization and weight bias.

This study has several limitations. Firstly, regarding the self-reported ATOP questionnaires, similar to a previous suggestion (26), participants may have a different interpretation of the meaning of each question and thus respond differently, and some questions seemed to focus more on knowledge about obesity rather than on attitudes. Secondly, the participants may have been subjected to under-reporting or over-reporting the actual PA behaviour due to recall bias. Thirdly, this study recruited participants from only one particular university, and the sample was primarily comprised of Malay ethnic, findings might not be generalizable to other individuals with different racial or ethnic backgrounds.

CONCLUSION

In conclusion, this study revealed insignificant differences in ATOP score among participants with different BMI classifications, between gender, and among participants with varying levels of PA. The results found that the ATOP scoring is in the middle range, which needs interventions to prevent or reduce weight-biased attitudes in young adults, especially healthcare students. It is crucial to alleviate the negative attitude and obesity stigma among healthcare students in training to help them provide the best care and plan strategies to encourage behaviour change in obese persons without any stigma and bias environment in the future. We believe that the attitude towards obesity could be one of the barriers for an obese person to come and seek intervention for weight management. The refinement in interventions to avoid any unintended consequences due to stigmas should be done to maximize the effectiveness of weight interventions for behavioural change in people with excess body weight.

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