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EXPLORING ATTITUDES TOWARD OBESITY AMONG UNIVERSITY STUDENTS: GENDER AND BODY MASS INDEX CORRELATIONS

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Abstract: The escalating prevalence of obesity among young adults is a concerning trend, given the potential for societal stigmatization. This study sought to examine whether gender differences exist in attitudes toward obese individuals and to measure the relationship between these attitudes and body mass index (BMI) among university students. Utilizing the Attitudes Toward Obese Persons (ATOP) scales, data were gathered from undergraduate students at UiTM Sarawak Branch, Samarahan Campus, during the period from April 2022 to June 2022 through an online platform. Both male and female students exhibited statistically significant, moderate scores in their attitudes toward obese individuals ($p < .05$). A detailed split correlation analysis revealed a noteworthy association between BMI and attitudes toward obesity, particularly among those classified as underweight. Interestingly, individuals in the underweight category demonstrated a significant positive relationship between their BMI and acceptance of obese persons ($p < .05$). In conclusion, female students exhibited a higher level of acceptance toward their obese peers compared to their male counterparts. Furthermore, as BMI increased, individuals in the underweight category demonstrated increased acceptance of those who were obese. The findings underscore the importance of fostering positive attitudes regardless of body weight among university students. This study advocates for the promotion of inclusive attitudes and emphasizes the significance of discouraging negative beliefs and stigmatization of

obese people. Encouraging a positive and accepting environment, irrespective of body weight, is crucial. Addressing these issues can serve as a foundational step in combating the escalating rates of overweight and obesity among university students.

Keywords: Attitude Towards Obese Person, Gender, Overweight, Obese, University Students

INTRODUCTION

Obesity is a serious public health issue, and it is becoming more prevalent. Over 650 million individuals worldwide were obese in 2016 (WHO, 2017), an almost threefold increase in the incidence of obesity since 1975. Overall, 13% of the adult population worldwide was expected to be obese in 2016. With regard to Asian nations, Malaysia has the highest rate of obesity. According to Malaysian data, 50% of adults are overweight or obese. When comparing results from the National Health and Morbidity Survey (NHMS) from 2011 (29.4%, 15.1%) and 2015 (30.0%, 17.7%), the NHMS showed rising trends in adult overweight and obesity. Additionally, the NHMS 2019 reported an increase in individuals who are overweight or obese, reaching 30.4% and 19.7%, respectively (IPH, 2019).

The term "obesity" refers to the imbalance between bodily mass and height. Body weight-to-height ratios for the Asian population range from 23.0 to 27.4 kg/m^2 for overweight and over 27.5 kg/m^2 for obesity (Zainuddin *et al.*, 2011). Higher scores indicate that being extremely fat is a more significant health concern. A person who is overweight or obese is claimed to have an excessive amount of body fat deposited, which causes health problems and raises their risk of morbidity and mortality (Dai *et al.*, 2020).

According to a recent study conducted during the COVID-19 pandemic, approximately 40% of university students in Malaysia are overweight or obese (Pitil & Ghazali, 2022). This trend is supported by a similar study conducted among the same population in a different region of Malaysia, where the frequency of overweight and obesity has increased among university students (Tan *et al.*, 2021). As a result, there is a concern that negative attitudes toward obese people within this population may also be on the rise.

Individuals who are overweight or obese encounter bias or unjust discrimination in their daily lives. The cultural emphasis on thinness and the widespread notion that one's weight can be changed and controlled are the root

causes of obesity prejudice (Mills *et al.*, 2017). There are several difficulties in treating obesity, such as stigma. Bullying, discrimination, and weight-based taunting can all lead to internalizing or externalizing emotional issues. Teasing or weight-related taunting increases the risk of depression or suicidal thoughts in young obese people (Pereira-Miranda *et al.*, 2017).

University students refer to individuals who are at the beginning of their adulthood phase. It is the transition where they become independent and move away from home (Stok *et al.*, 2018). As appearance and social acceptance are important among youth (Di Gesto *et al.*, 2022), being stigmatized might cause many psychological effects. Some of those include depression, anxiety, substance use, and suicidality (Pearl & Puhl, 2018). Studies show that negative attitudes, prejudice, and discrimination against obese people have become increasingly common among the general population, which includes young adults.

Hence, obesity is a complicated medical disease that is impacted by a number of factors. The majority of them are biological and outside the scope of personal control (Erikson *et al.*, 2003). Weight bias refers to widespread unfavorable weight-related attitudes or beliefs that manifest as stereotypes, prejudice, and even outright discrimination against children and adults who are overweight or obese (Rathbone, 2021). Obesity raises the risk of a variety of associated diseases, including type 2 diabetes, hypertension, cardiovascular disease, and even cancer (Hruby *et al.*, 2016). Obesity may also have a negative impact on a person's well-being and quality of life. Studies have revealed that depression, stress, and anxiety are more common among those who are overweight or obese than among those who are of normal weight (Eik-Nes *et al.*, 2022). This is something to explore and understand so they can be treated fairly, regardless of the stigma towards this population.

There are too many negative perceptions towards obese people. Many people believe that people who are obese lack self-control, do not "eat sensibly", and do not have the desire to get healthy. These beliefs are fundamentally associated with stereotypes, and they are likely to promote stigmatizing views against obese persons (Puhl & Heuer, 2009; Johnson *et al.*, 2012; Apovian, 2016). With the rising prevalence of obesity worldwide, weight stigma persists (Puhl *et al.*, 2020). While preventative and intervention initiatives frequently emphasize individual behavior (eat less, exercise more, healthy diet) (Kocher

et al., 2022), such messages may contribute to the public's perception of controllability. The effects of such a wide public health message on obesity stigma have not been studied. However, requests for action on a specialized public health strategy to address obesity stigma have increased. This is particularly significant given the accumulating evidence that stigmatizing people with obesity does not drive them to lose weight but rather reduces their motivation and weight loss success (Tomiyama *et al.*, 2018; Lee *et al.*, 2021).

These attitudes start in childhood rather than in adolescence or maturity. Children who are overweight frequently experience rejection from friends because of their weight (Hill, 2017). Overweight people are subjected to taunts and rejection more frequently than their thin peers. Low self-esteem and body dissatisfaction might result from this treatment (Weinberger *et al.*, 2016). The harmful effects of obesity stigmatization experiences on physical and psychological health can last into adulthood and include increasing weight and bad weight-management habits motivated by the desire to be thin. The stigma associated with weight has a severe impact on both physical and emotional health. Numerous unhealthy eating habits, such as binge eating, dieting, and eating disorders, develop as a result of weight stigma (Wellman *et al.*, 2018). A person is more likely to experience more depression, body dissatisfaction, and worse self-esteem when they are stigmatized because of their weight. In addition, individuals who are overweight or obese are less inclined to exercise when they experience weight-based prejudice (Salter *et al.*, 2018). Weight stigma affects everyone, regardless of gender, making them vulnerable to these effects. It is important to examine how university students feel about fat people in order to understand how to reduce the negative effects of these stereotypes and avoid negative body image and low self-esteem.

Emerging adulthood is characterised by a huge emphasis on identity exploration. Erik Erikson formulated the theory of psychosocial development, according to which identity development is essential for the shift from adolescence to adulthood (Vogel-Scibilia *et al.*, 2009). For long-term success, young adults must build their identities with confidence and determination. In order to build their identities, this group explores a variety of life choices while progressively outlining their adult lives (Wood *et al.*, 2018). During young adulthood, areas such as love, career, and worldviews are the primary focus of identity development. In addition, other psychological traits, such as self-efficacy, emerge throughout this period and are crucial for establishing good behavioral habits (Nelson *et al.*, 2008). Because of the unique characteristics

of this developmental era, it is a vital age group to study. Therefore, this study aims to measure the attitude towards obese persons among university students and its relationship with gender and BMI.

METHODOLOGY

This study employed a cross-sectional design, with the survey conducted online between April and June 2022. Participants were selected from university students at a single institution in Sarawak (Universiti Teknologi MARA (UiTM), Sarawak).

Participants

The inclusion and exclusion criteria for the participants were formulated as follows: inclusion criteria, the participant should be (a) full-time undergraduate students, (b) aged no less than 18 years old, and (c) accessible online – due to the online survey, willing and able to complete the questionnaire. The exclusion criteria include (a) part-time students or postgraduate students and (b) having no access to the internet. Participants were not reimbursed for their participation. The sample size required was 364, according to Krejcie and Morgan's (1970) calculation for a total population of 7,772 (source: UiTM Sarawak, 2022). To reduce the non-response rate, the researchers increased the sample size by 20%. As a result, 437 participants were targeted for the study.

The stratified random sampling was employed to select the participants. This sampling technique ensures that each subgroup of a given population is adequately represented within the whole sample population of a research study (Taherdoost, 2016). The sample size of each stratum is proportionate to the population size of the stratum. In the early phase of the study, the stratification was made by the two campuses of UiTM Sarawak branch.

For instance:
Total students in Campus 1 = 4706,
The strata sample size is calculated as (4706/7772) x 437 = 265.
Total students in Campus 2 = 3066,
The strata sample size is calculated as (3066/7772) x 437 = 172.

Now that the strata sample size is known, the researchers performed a simple random sampling in each stratum in selecting the participants. The return rate

was 84.7%, which equals 370 respondents. The final sample size was sufficient to represent the population, $N = 370$.

All participants received clear information about the study, which was provided in the introduction of the online survey. They gave their informed consent in the first section of the questionnaire before proceeding to the first item.

Measures

The demographic data, including body weight and height, were collected in the second section of the survey. The body weight and height were gathered using self-reported measurements. Several studies suggested that self-reported height and weight were reliable for weight classification purposes (Olfert et al., 2018). The previous study supports the method of this present study, which was fully online.

To assess the attitudes toward obese persons, the Attitudes Toward Obese Persons Scale (ATOP) (Allison et al., 1991) was employed. This instrument contains 20 items rated on a six-point Likert-type scale ($-3 =$ strongly disagree to $+3 =$ strongly agree). After reverse coding, the 13 negatively worded items, summing the 20-item scores, and adding 60 to the summated score, a higher score indicates more positive attitudes toward people with obesity. There were 13 negatively worded items, starting from item 2 through item 6, item 10 through item 12, item 14 through item 16, item 19, and item 20. The overall scores ranged from 0 to 120, with higher scores indicating more positive attitudes towards obese persons. A score between 61 and 120 indicates a positive attitude, whilst a score between 0 and 60 indicates a negative attitude towards persons living with obesity. The internal consistency was evaluated and showed an acceptable value (Cronbach's $\alpha = 0.8$).

Statistical analysis

The Statistical Package for Social Science version 26 was utilized for data analysis of this study. Means, standard deviations, frequencies, and percentages were used to convey descriptive data. A normal distribution of scores was discovered after utilizing skewness (ranges between -1 and +1) and kurtosis (ranges between -2 and +2) (George & Mallery, 2019) to test for normality. The Independent Sample t-test was utilized to examine whether there were any gender differences in the ATOP score that were statistically significant, and the Pearson correlation was used to determine whether there

were any correlations between the ATOP score and BMI. The strength of the relationship increased as the *r*-value approached 1 (Mukaka *et al.*, 2012). Statistical significance was established as a *p*-value of 0.05.

RESULTS

Table 1 outlines the participants' characteristics. The majority were aged from 18 to 23 years old (95.1%). Males and females were almost equally distributed. The BMI ranged from 16.41 to 40.09 kg/m^2, with the majority at a normal weight (50.5%) and some underweight (7.8%). The overweight and obese respondents made up 16.8% and 24.9%, respectively.

A high percentage of the participants had a positive attitude based on the ATOP score (97.3%). The Independent Sample t-test analysis showed that the ATOP score was significantly different between male and female participants; t (2) = -2.637, p = .009 (p < .05), Male = 75.34 ± 0.41, Females = 77.80 ± 0.47 (Table 2).

In the Pearson correlation analysis, a significant correlation was found between the ATOP score and BMI in the Underweight category (r = .477, p < .05). This finding suggests that as the ATOP score increases, there tends to be a corresponding increase in BMI among individuals categorized as underweight. However, the correlations in the other BMI categories were not significant (p > .05). Specifically, in the normal weight and overweight categories, the correlation coefficients were very small (r = -0.025 and 0.010, respectively). This close-to-zero correlation indicates that there is almost no relationship between being of normal weight or overweight and ATOP scores, as shown in Table 3.

Table 1: Participants' characteristics (N = 370)

Variables	**Categories**	***n* (%)**
Age group (years)	18-20	138 (37.3%)
	21-23	214 (57.8%)
	24-26	18 (4.9%)
Sex	Male	169 (45.7%)
	Female	201 (54.3%)
BMI categories	Underweigt	29 (7.8%)
	Normal weight	187 (50.5%)
M (± SD) = 23.52 (± 4.58) kg/m²	Overweight	62 (16.8%)
	Obese	92 (24.9%)
Min = 16.41, Max = 40.09		

Note. BMI classification: Underweight < 18.5 kg/m^2, Normal 18.5 - 22.9 kg/m^2, Overweight 23.0 – 27.4 kg/m^2, Obesity > 27.5 kg/m^2 (WHO Expert Consultation, 2004)

Table 2: The ATOP score by categories and sex (N = 370)

ATOP score	**Categories**	***N* (%), M (± SD)**		
	Negative (0 – 60)	10 (2.7%)		
	Positive (61 – 120)	360 (97.3%)		
	Overall score	76.68 (± 9.02)		
	Gender		***t***	***p***
	Male	75.34 (± 0.41)	-2.637	.009*
	Female	77.80 (± 0.47)		

*Significant difference at .05 (p < .05)

Table 3: Correlations between ATOP score and BMI by BMI categories

Variable	**BMI categories**	***r*- value**
ATOP score	Underweight	.477*
	Normal weight	-.025
	Overweight	.010
	Obese	-.109

*Correlation is significant at .05 (p < .05)

DISCUSSION

A significant 41.7% of individuals were overweight (16.8%) or obese (24.9%), while the rest fell within normal (50.5%) or underweight (7.9%) categories. This overweight and obesity proportion slightly exceeded that of Malaysian university students during the initial phase of the COVID-19 pandemic's restrictive movement control order (22.19% and 16.88%, respectively) (Pitil & Ghazali, 2022). Lifestyle changes stemming from the extended practice of forced remote learning (FRL) since March 2020 due to the pandemic may explain these findings. Reports indicate notable weight gain among university students during pandemic lockdowns (Tan *et al.*, 2021), a trend observed in the study sample. Additionally, a study involving students from another Malaysian university revealed a correlation between BMI and eating habits, emphasizing the pre-existing influence of lifestyle on weight, even before the pandemic (Md Yasin *et al.*, 2018).

The females exhibited a more positive attitude towards their obese peers than the males. While previous studies have indicated that females often experience

more challenges with their own body shape (Smith, 2019) and greater weight self-stigma (Suhaimi *et al.*, 2023), the current study uncovered notably positive findings. This could be because females are more understanding and accepting of their peers, even though they are living with excess body weight. The frequent pressure from society to be thin among females could likely drive a better attitude toward those living with obesity. Even though the overall mean score for ATOP in both sexes revealed a positive attitude towards obese persons, the significant lesser among males is worth discovering. The plausible explanation for this finding is that males have less empathy than females. Males are regarded as being less emotional and more logical, while females are portrayed as being more empathetic and sympathetic (Christov-Moore *et al.*, 2016). Less empathy for others' condition influences the attitude towards their obese peers has been found in the earliest study (Hoffman, 1977). One theory that could explain this empathy is the empathy-altruism hypothesis (Batson *et al.*, 1997). It centers on the emotional level, which maintains that embracing the perspective of a member of a stigmatized group will enhance an individual's ability to empathize, including feelings of empathy and compassion for that person. These emotions will incite an altruistic drive and spread across the entire stigmatized group, thus, improving an individual's opinion of and attitude toward the group.

The observed moderate correlation between underweight participants' BMI and their ATOP scores underscore the significance of exploring attitudes towards obesity within this subgroup. This correlation suggests that as BMI increases among underweight individuals, there tends to be a more positive attitude towards obese individuals. This finding aligns with previous research indicating that being underweight is often associated with body weight issues and weight stigma (Lian *et al.*, 2018). One possible explanation for this correlation could be that underweight individuals, who may have experienced societal pressure or stigma related to their own weight, demonstrate increased empathy and reduced judgment towards others facing similar challenges. In contrast, individuals classified as normal weight, overweight, or obese did not exhibit significant associations between their BMI and attitudes towards obese individuals. This suggests that factors other than weight status may influence attitudes towards obesity among individuals in these categories.

Moreover, the observed correlation among underweight participants may reflect a broader societal trend towards increased acceptance of overweight

and obese individuals, particularly among young adults aged 18 to 25. This age group often experiences shifts in social norms and attitudes, which could contribute to evolving perceptions of body weight and acceptance.

Overall, these findings highlight the complexity of attitudes towards obese person and underscore the importance of considering individual experiences and societal influences when examining attitudes towards obesity. Further research is needed to explore the mechanisms underlying these associations and to develop interventions aimed at promoting understanding and acceptance of diverse body sizes.

CONCLUSION

The study revealed that the majority of participants demonstrated a positive attitude towards obese individuals, with females exhibiting a more positive attitude than males. Moreover, an increased BMI among underweight participants correlated with a more positive attitude toward obesity. These positive attitudes suggest that university students are inclined towards a healthy attitude and can manage body weight issues positively, even with the rising trend of weight gain. This positive attitude makes interventions more welcome. It could be the first step in addressing body weight issues in this age group. Collaborative efforts between counselors, psychologists, and fitness trainers could prove effective through health programs, awareness initiatives, support groups, and exercise programs. This comprehensive approach, addressing both physical and mental aspects, is crucial for the overweight or obese population. Furthermore, encouraging body positivity through healthy eating and active lifestyle is essential. In a world where obesity is epidemic and weight stigma is prevalent among this age group, promoting these practices can have a positive impact.

Informed Consent Statement

The participants provided informed consent by agreeing to be respondents in the online form's first section of the questionnaire.

Conflict of Interest

None declared.

Ethics Statement

This study was approved by the UiTM Sarawak Branch Ethics Review Committee (SWKBERC/U13/2022). The procedures were carried out following the ICH Good Clinical Practice Guidelines, Malaysia Good Clinical Practice Guidelines, and the Declaration of Helsinki.

Author Contributions

Patricia Pawa Pitil carried out the introduction and data analysis. Izzham Josli@Perlis and Mohd Nazmie Aliamat collected the data and interpreted the results. Izzham Josli@Perlis also wrote the data methodology section. All authors wrote the discussion and conclusion sections. All authors read and approved the final manuscript.

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Data Availability Statement

All data generated or analysed during this study are included in their entirety in this published article itself. Ethics approval, participant permissions, and all other relevant approvals were granted for this data sharing.

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