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THE RELATIONSHIP BETWEEN MINDFUL EATING AND BODY MASS INDEX AMONG UNIVERSITY STUDENTS

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ABSTRACT

Mindfulness can promote healthier lifestyles and dietary habits, which may support weight loss. This study aimed to evaluate the relationship between mindful eating and body mass index among university students. A total of 437 participants' height and weight were obtained, and the Mindful Eating Questionnaire (MEQ) was administered via a self-reported online form. Findings showed that 25.9% of the participants were overweight, and 15.6% were obese. A significant positive relationship was discovered between the total mean MEQ and BMI among university students ($r = .105$, $n = 437$, $p = < .05$). Moreover, split correlation showed that the relationship was significant among males ($r = .209$, $p = < .01$) but not among females ($p > .05$). The total mean MEQ score was significantly greater among males, including for the factors of disinhibition and awareness ($p < .05$), while females exhibited significantly higher emotional responses than males ($p < .05$). These findings showed that eating awareness increased with BMI and was more prevalent in men. Overall, a better awareness of eating behavior should be encouraged among university students, particularly those who are overweight..

Keywords: *Body Mass Index, Gender, Mindful Eating, Overweight, Obese.*

1.0 INTRODUCTION

Mindful eating is conceptualised as being aware of the present moment while eating, paying close attention to the senses, including both physical and emotional sensations. It also encompasses the presence and awareness of one's unique food experiences. Albers (2009) identified three basic steps that are central to mindful eating. The first step involves noticing all the senses, taste, smell, and texture of the food being consumed. The second step is recognising repetitive habits, such as eating while multitasking or eating on autopilot without conscious awareness. The third step is being aware of the triggers that initiate and stop eating.

Body mass index (BMI) is a measure commonly used as an indicator of body fatness and as a screening tool for obesity and related health risks in this research. BMI scores classify individuals as underweight, normal weight, overweight, or obese. Previous research has found mindfulness to be negatively correlated with BMI, suggesting that individuals who are more mindful in daily life tend to maintain a healthier weight (Moor, Scott, & McIntosh, 2013). According to Asian categorisation (Zainudin et al., 2011), individuals with a BMI of 23 kg/m² or above are considered at risk of having a higher body fat percentage.

According to the World Health Organization (WHO) (2020), university students represent the youthful age group within a community and are particularly prone to unhealthy eating habits that may affect their wellbeing and increase the risk of obesity. These habits often include frequent consumption of fast food, low intake of vegetables and fruit, physical inactivity, and prolonged sedentary behaviours such as spending long hours in front of a computer. Consequently, students may skip meals, consume limited varieties of food, and rely on unhealthy snacks. The hectic lifestyle of university students can also lead to disordered eating behaviours, such as binge eating disorder, which is one of the most prevalent eating disorders among adults (Saguy et al., 2014), and anorexia nervosa, which is characterised by attempts to lose weight to the point of starvation (Surgenor et al., 2013). These behaviours are consequences of mindless eating and may ultimately result in unhealthy body weight.

Increasing awareness and understanding of mindful eating is essential to encourage healthier eating habits and better weight management. Therefore, the objective of this study is to investigate the relationship between mindful eating and BMI among university students.

2.0 LITERATURE REVIEW

Mindful eating has increasingly been examined in relation to body mass index (BMI), physical activity, and dietary behaviours, with growing interest in its application among university student populations. Several studies have contributed to understanding the psychometric assessment of mindful eating as well as its behavioural and health-related correlates.

Moor, Scott, and McIntosh (2013) demonstrated that mindful eating was negatively associated with BMI, suggesting that students with lower BMI tended to engage in more mindful eating behaviours. Interestingly, their results also indicated a negative association between mindful eating and physical activity, leading the authors to speculate that students who engage in frequent exercise may either have busier lifestyles or may use exercise as a compensatory mechanism for emotional eating. This complex relationship highlights the need to disentangle how physical activity and eating regulation interact within the student population.

Similarly, Roman and Urban (2019), in their validation of the Hungarian version of the Mindful Eating Questionnaire (MEQ), identified significant associations between self-regulation in eating, trait mindfulness, and reduced uncontrolled or emotional eating. Their findings reinforced the notion that self-regulatory aspects of mindful eating may act as a protective factor against overeating. However, their results also suggested that awareness is a key subscale of mindful eating was paradoxically associated with both lower BMI and higher levels of emotional eating. This duality mirrors earlier findings by Ward and Mann (2000), who argued that restrictive eating can increase susceptibility to binge eating under certain conditions. Collectively, these studies underscore that mindful eating is not a unitary construct but rather a

multidimensional behaviour with both adaptive and potentially maladaptive expressions depending on contextual factors.

Beyond mindfulness-specific measures, broader investigations into students' dietary habits provide context to eating-related behaviours. Tok, Ahmad, and Quee (2018) reported that overweight and obese students at Universiti Brunei Darussalam were more likely to skip breakfast, consume multiple meals daily, and maintain poor dietary practices despite adequate nutrition knowledge. Stress, academic workload, and convenience were identified as key drivers of unhealthy eating behaviours, with fast food consumption emerging as a common practice. These findings resonate with the mindfulness literature, as they suggest that external and situational pressures often override internal regulation strategies, reinforcing the importance of mindful eating interventions as potential countermeasures.

In terms of measurement development, Hulbert-Williams et al. (2013) introduced the Mindful Eating Scale (MES) as an alternative to the MEQ, offering greater conceptual overlap with established mindfulness measures. Unlike the MEQ, the MES demonstrated stronger construct validity across multiple psychological domains, suggesting it may provide a more comprehensive framework for assessing mindful eating. The identification of correlated subscales, particularly awareness and acting with awareness, further points to the need for nuanced measurement tools capable of capturing the complexities of eating-related mindfulness.

Taken together, the literature suggests that mindful eating is consistently associated with lower BMI, yet its relationship with physical activity and emotional eating remains less clear. Evidence also points to contextual factors, such as stress and lifestyle constraints, that undermine healthy eating despite adequate nutrition knowledge. Furthermore, while psychometric tools like the MEQ have contributed to advancing this field, newer instruments such as the MES may offer greater validity and theoretical grounding for future research. Overall, mindful eating interventions hold promise for university populations, but their effectiveness will depend on addressing both behavioural regulation and the environmental pressures that shape students' eating practices.

3.0 METHODOLOGY

This study adopted a descriptive cross-sectional survey design to investigate the relationship between mindful eating and body mass index (BMI) among university students. Data were collected from October to December 2021 using the Google Forms platform, as face-to-face administration was restricted during the COVID-19 pandemic.

The target population comprised students from a public university in Malaysia. A stratified sampling technique was used to ensure adequate representation. Based on Krejcie and Morgan's (1970) sample size determination formula, a minimum of 364 respondents was required. To account for potential non-responses, an additional 20% was included, resulting in a final target sample size of 437 students.

The survey instrument consisted of two sections. The first section captured demographic variables (age, gender, ethnicity, course of study, and campus) and self-reported height and weight, which were used to calculate BMI. Respondents were instructed to provide their most accurate and recent measurements. The second section utilised the Mindful Eating Questionnaire (MEQ; Framson et al., 2009) to assess mindful eating behaviours. The MEQ, which has demonstrated acceptable reliability (Cronbach's $\alpha = 0.64–0.83$), consists of 28 items across five subscales: Disinhibition (8 items, eating despite satiety), Awareness (7 items, attentiveness to sensory aspects of food), External Cues (6 items, eating in response to environmental triggers), Emotional Response (4 items, eating in response to stress or negative emotions), and Distraction (3 items, eating while engaged in other activities). Responses were rated on a Likert scale, with reverse scoring applied to all Awareness and External Cues items, as well as three Disinhibition items (items 1, 2, and 7).

Data Analysis

The data were entered and analysed using the Statistical Package for the Social Sciences (SPSS) version 26.0. The results were then discussed and interpreted based on the research objectives and hypotheses of the study.

4.0 RESULT AND DISCUSSION

This study involved participants aged 18–20 years (42.3%) up to 24–26 years (2.1%). More than half of the respondents were female students (n = 280, 64.1%), while male students accounted for 157 respondents (35.9%). In terms of ethnic background, the largest group was Malay Sarawak (n = 152, 34.8%), whereas the smallest was Peninsular Malaysia (n = 61, 14%). Regarding campus distribution, the majority of respondents (n = 342, 78.3%) were from Campus A, while 95 respondents (21.7%) were from Campus B.

With respect to body mass index (BMI) categories, 65 respondents (14.9%) were overweight, 120 respondents (27.5%) were obese, and 79 respondents (18.1%) were underweight. In contrast, 173 respondents (39.6%) fell within the normal weight range out of the total 437 participants across both campuses.

Table 1: Participants' Demographics

Items	Classifications	Number of Respondents (N)	Percentage (%)
Age	18 – 20 years old	185	42.3
	21 – 23 years old	243	55.6
	24 – 26 years old	9	2.1
Gender	Male	157	35.9
	Female	280	64.1
Ethnics	Malay Sarawak	152	34.8
	Bumiputera Sarawak	150	34.3
	Bumiputera Sabah	74	16.9
	Peninsular Malaysia	61	14.0
Campus	A	342	78.3
	B	95	21.7
BMI	Underweight	79	18.1
	Normal Weight	173	39.6
	Overweight	120	27.5
	Obese	65	14.9

Figure 1 shows the course of the participants (N = 437). The highest participants from the course Bachelor of Sports Science (Hons.) (SR243) were 137 respondents (31.4%), while the lowest participants from the courses Bachelor of Business Administration (International Business) (Hons.) (BA246), Diploma in Art and Design (Fine Art) (AD118), Diploma in Electrical Engineering (EE111), and Diploma in Office Management & Technology (BA118) were 1 respondent (0.2%).

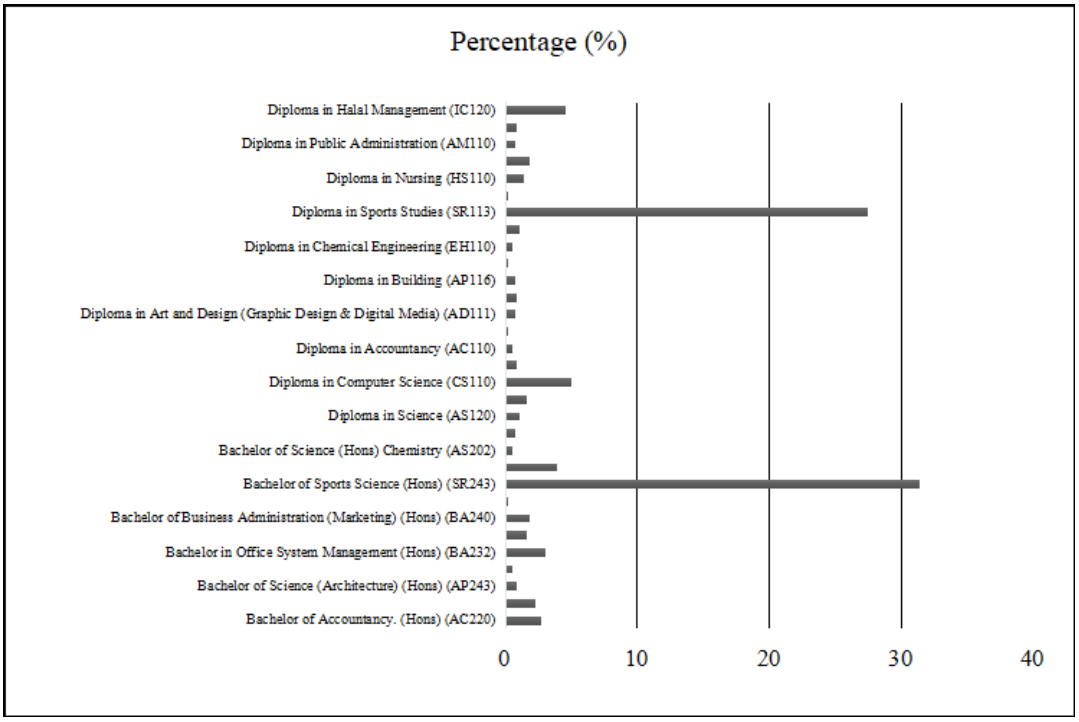

Figure 1: The course of participants

A normality test was conducted to test the statistical assumptions of the study's data by using the Skewness and Kurtosis values. The BMI Skewness was 1.652 and the kurtosis was 4.513. While the mindful eating of Skewness was -.493 and Kurtosis was .174. The result of Skewness and kurtosis should range between -1.96 to 1.96 for normality (George & Mallery, 2010). The Kurtosis value for BMI exceeds the range. However, the Skewness met normality, so it is considered in the normal distribution of scores. Therefore, all data were in normal distribution and eligible for the parametric test. The result of the normality test is shown in Table 2.

Table 2: Normality Data MEQ

Variables	**Skewness**	**Kurtosis**
BMI	1.652*	4.513
Mindful eating	-.493*	.174*

*Note. Normality is accepted at -1.96 to 1.96

Table 3 shows the reliability test for MEQ with 28 items for the study. The result of Cronbach's Alpha α = α was .58 which shows moderate reliability.

Table 3: MEQ Reliability Statistics

Cronbach's Alpha	**N of Items**
.58	28

Table 4 shows the mean and standard deviation of each descriptive statistic for the variables measured. The variables with the highest mean and standard deviation were emotional response (2.43, ±0.73) and distraction (2.44, ±0.68).

Table 4: Descriptive Statistic of Mindful Eating and The Subscales

Variables	Mean	±Std Deviation
Mindful Eating Total Score	2.28	±0.25
Disinhibition	2.35	±0.48
Awareness	2.09	±0.57
External Cues	2.26	±0.56
Emotional Response	2.43	±0.73
Distraction	2.44	±0.68

Table 5 shows the mean and standard deviation of each descriptive statistic for variables measured by gender. The highest male variables were emotional response (2.30, ±0.73) and distraction (2.46, ±0.68). While female was emotional response (2.51, ±0.72) and distraction (2.42, ±0.68) variables.

Table 5: Descriptive Statistic of Mindful Eating and The Subscales by Gender

Gender	Variables	Mean	±Std Deviation
Male	Mindful Eating Score	2.33	±0.24
	▪ Disinhibition	2.47	±0.44
	▪ Awareness	2.17	±0.56
	▪ External Cues	2.30	±0.53
	▪ Emotional Response	2.30	±0.73
	▪ Distraction	2.46	±0.68
Female	Mindful Eating Score	2.26	±0.26
	▪ Disinhibition	2.27	±0.48
	▪ Awareness	2.04	±0.57
	▪ External Cues	2.23	±0.58
	▪ Emotional Response	2.51	±0.72
	▪ Distraction	2.42	±0.68

The relationship between mindful eating and BMI among university students was examined using Pearson's correlation analysis. Results indicated a significant positive correlation between the two variables, $r = .105$, $n = 437$, $p < .05$. Given this outcome, the null hypothesis (H1) was rejected, confirming a significant association between mindful eating and BMI among the participants.

Table 6: Pearson Correlation for BMI and Mindful Eating Score

		BMI	Mindful Eating
BMI	Pearson Correlation	1	.105*
	Sig. (2-tailed)		.028
	N	437	437
Mindful Eating	Pearson Correlation	.105*	1
	Sig. (2-tailed)	.028	
	N	437	437

*. Correlation is significant at the 0.05 level (2-tailed)

The relationship between mindful eating and BMI among male university students was examined using Pearson's correlation analysis. A significant positive correlation was found between the two variables, $r = .209$, $n = 157$, $p < .05$. Accordingly, the null hypothesis (H2) was rejected, indicating a significant association between mindful eating and BMI among male students.

Table 7: Pearson Correlation for BMI and Mindful Eating Score Among Males

Gender			BMI	Mindful Eating
Male	BMI	Pearson Correlation	1	.209*
		Sig. (2-tailed)		.035
		N	157	157
	Mindful Eating	Pearson Correlation	.209*	1
		Sig. (2-tailed)	.037	
		N	157	157

*. Correlation is significant at the 0.05 level (2-tailed)

The relationship between mindful eating and BMI among female university students was examined using Pearson's correlation analysis. No significant correlation was observed between the two variables, $r = .068$, $n = 280$, $p > .05$. Therefore, the null hypothesis (H3) was not rejected, indicating no significant association between mindful eating and BMI among female students.

Table 8: Pearson Correlation for BMI and Mindful Eating Score Among Females

Gender			BMI	Mindful Eating
Female	BMI	Pearson Correlation	1	.068
		Sig. (2-tailed)		.257
		N	280	280
	Mindful Eating	Pearson Correlation	.068	1
		Sig. (2-tailed)	.257	
		N	280	280

*. Correlation is significant at the 0.05 level (2-tailed)

The study revealed that there were 27.5% overweight students and 14.9% obese students. This number is higher than a study conducted in 2020, where the prevalence was slightly lower (overweight: 22.2% and obese: 16.9%) (Pitil & Ghazali, 2022). The females in the present study have a lower percentage of overweight (23.6%) and obese (15.4%) than males (overweight: 34.4% and obese: 14%). Prolonged Forced Distance Learning (FDL) due to the pandemic contributed to the weight gain among these students. Stress was high, and various foods were feasible in the learning environment, which was at home, thus promoting excess calories.

University life often has a poor dietary intake, which causes substantial public health concerns. For example, university students tend to adopt more mindless eating behaviours due to stress, and lack of time acts as a barrier for students to practise a healthy eating habit. Moreover, the hectic lives of students may encourage them to develop unhealthy eating habits, such as eating quickly and eating while doing work or watching movies. These habits can be referred to as mindless or unconscious eating and strongly lead to weight gain and obesity.

Overall, the level of mindful eating was moderate. The distraction and emotional response revealed the highest among these students. As noted, the FDL was implemented during this data collection, which could have contributed to their being distracted while eating, and they used eating to accommodate their emotions. Mindfulness alleviates stress and increases students' awareness of hunger and satiety cues (Tsenkova, Boylan, & Ryff, 2013). Hence, with the transition to university creating a number of changes within an individual's life, it can be a stressful period, having the potential to negatively impact health-related behaviours (Quick & Byrd-Bredbenner, 2013). Stressed individuals within the general population often consume more food (Mouchacca, Abbott, & Ball, 2013; Tomiyama et al., 2012; Torres & Nowson, 2007). Nevertheless, a limitation of the present study is related to the reliability of the Mindful Eating Questionnaire (MEQ). The Cronbach's alpha obtained in this sample was 0.58, which is below the commonly accepted threshold of 0.70 for internal consistency. This suggests that the scale may not have fully captured the construct of mindful eating among the current population. Therefore, the findings should

be interpreted with caution, and future research is recommended to refine the instrument or use alternative validated measures with stronger psychometric properties.

Relationship Between Mindful Eating and BMI Among University Students

The findings indicate a significant relationship between mindful eating and BMI among students from two campuses of a public university in Sarawak. Results showed that mindful eating scores increased as BMI increased. This outcome contrasts with previous studies, which reported a negative correlation, suggesting that individuals with lower BMI tend to be more mindful eaters (Framson et al., 2009). In their study, there was a strong association between BMI groups and MEQ scores ($p < 0.001$), and BMI and MEQ, including all sub-factors, showed negative correlations ($p < 0.001$). Similarly, other studies reported negative correlations between MEQ scores and body weight, as well as negative associations with emotional eating and disinhibition factors ($p < 0.05$) (Beshara, Hutchinson, & Wilson, 2013). In addition, participants with higher BMI values were found to have lower MEQ scores and reduced emotional eating scores (Moor et al., 2013; Mason et al., 2016).

Relationship Between Mindful Eating and BMI by Gender

A split analysis revealed gender differences in the relationship between mindful eating and BMI. Among male students, there was a significant positive correlation between mindful eating and BMI, $r = .209$, $n = 157$, $p < .05$. However, no significant relationship was observed among female students, $r = .068$, $n = 280$, $p > .05$. This suggests that higher BMI among males was associated with higher mindful eating scores, while females' mindful eating scores were not related to their body weight.

The prevalence of overweight and obesity was higher among males (34.4% overweight, 14% obese) compared to females (23.6% overweight, 15.4% obese). One possible explanation is that higher BMI among males may be attributed to greater muscle mass. Despite having higher BMI, males appeared to be more mindful eaters, possibly due to their higher physical activity levels and muscle development, which require increased energy intake. Previous studies have consistently shown that males tend to be more physically active than females (Bauman et al., 2009), and men typically possess approximately 60% greater total muscle mass compared to women (Abe, Kearns, & Fukunaga, 2003). Muscle growth and maintenance also demand substantial energy consumption (Lassek & Gaulin, 2009). Another possible explanation is that, during the pandemic period, male students may have been more conscious of their eating habits despite reduced physical activity. In contrast, female students' mindful eating was not related to BMI, suggesting that they may possess stronger health responsibility and nutritional awareness than their male counterparts (Wei et al., 2012).

5.0 CONCLUSION

This study contributes to the growing body of evidence on the relationship between mindful eating and BMI in young adults. Overall, the level of mindful eating among university students was moderate, with the highest scores reported in the domains of distraction and emotional response. Mindful eating tended to increase with BMI, but this association was evident only among male students. The findings also highlight the relatively high prevalence of overweight and obesity, particularly among males. These outcomes suggest the need for tailored interventions that consider gender differences in both mindful eating practices and weight management strategies.

AUTHORS' CONTRIBUTION

All authors contributed to the conception and design of the study. Material preparation, data collection, and analysis were performed by the first author. Both authors reviewed and approved the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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