

Tingkah Laku Pembelian Mahasiswa Institusi Pengajian Tinggi dalam Jualan Secara Langsung di Aplikasi Tiktok

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EMOTIONAL EATING, EMOTIONAL FOOD CHOICE, AND ITS ASSOCIATED FACTORS AMONG PUBLIC UNIVERSITY STUDENTS IN MALAYSIA

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Abstract

Emotional eating is characterized by changes in food intake patterns in response to negative emotional states and is associated with high prevalence rates of obesity and mental health disorders among university students. Despite its potential impact, there is limited research on emotional eating and food choices among Malaysian university students. This study aimed to assess differences in sociodemographic variables and emotional eating behaviours among students from Malaysian public universities. A cross-sectional study was conducted using an online self-administered questionnaire (n=400). The questionnaire comprised three sections: (1) sociodemographic profile, (2) emotional eating behaviours, and (3) emotional food choice. Data were analysed using SPSS version 27, with descriptive statistics computed to summarize the data. Results indicated that 57.75% of students reported lower emotional eating tendencies. Most students reported decreased food consumption during negative emotional states and a preference for savoury and sweet foods in both positive and negative emotions. Significant differences in emotional eating behaviours were found between household income ($p=0.003$) and education level ($p=0.049$). In conclusion, this study highlights the association between sociodemographic factors and emotional eating among Malaysian university students. Future research should focus on developing targeted intervention programs to improve students' ability to regulate emotions and food intake.

Keywords: Emotional eating, Emotional food choice, Associated factors, University students, Malaysia

Abstrak

Pemakanan emosi merujuk kepada perubahan corak pengambilan makanan sebagai tindak balas terhadap keadaan emosi negatif dan dikaitkan dengan kadar prevalens obesiti dan gangguan kesihatan mental yang tinggi dalam kalangan pelajar universiti. Di sebalik potensi kesannya, terdapat penyelidikan terhad mengenai pemakanan emosi dan pilihan makanan dalam kalangan pelajar universiti Malaysia. Kajian ini

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bertujuan untuk menilai perbezaan dalam pemboleh ubah sosiademografi dan tingkah laku pemakanan emosi dalam kalangan pelajar universiti awam Malaysia. Kajian keratan rentas telah dijalankan menggunakan soal selidik yang ditadbir sendiri dalam talian (n=400). Soal selidik ini mengandungi tiga bahagian: (1) profil sosiademografi, (2) tingkah laku pemakanan emosi, dan (3) pilihan makanan emosi. Data dianalisis menggunakan SPSS versi 27, dengan statistik deskriptif dikira untuk meringkaskan data. Keputusan menunjukkan bahawa 57.75% pelajar melaporkan pengurangan pengambilan makanan secara emosi. Kebanyakan pelajar melaporkan penurunan pengambilan makanan semasa mengalami emosi negatif dan menunjukkan keutamaan terhadap makanan masin dan manis dalam kedua-dua emosi positif dan negatif. Perbezaan yang signifikan dalam tingkah laku pemakanan emosi didapati antara pendapatan isi rumah ($p=0.003$) dan tahap pendidikan ($p=0.049$). Kesimpulannya, kajian ini menonjolkan hubungan antara faktor sosiademografi dan pemakanan emosi dalam kalangan pelajar universiti di Malaysia. Penyelidikan masa depan perlu memfokuskan kepada pembangunan program intervensi yang disasarkan untuk meningkatkan keupayaan pelajar dalam mengawal emosi dan pengambilan makanan.

Kata kunci: *Pemakanan emosi, Pilihan makanan emosi, Faktor berkaitan, Pelajar university, Malaysia*

Introduction

Emotional eating (EE) is defined as overeating or undereating in response to negative emotional states such as anger, stress, or anxiety (Al-Musharaf, 2020; Reichenberger et al., 2020). Negative emotions or stresses in the body are known to create a condition comparable to postprandial satiety, resulting in a loss of appetite or reduced nutrient intake (Al-Musharaf, 2020; Van Strien, 2018). However, in certain circumstances, an opposite effect of increased eating is observed. As a result, eating becomes a technique to distract or escape from unpleasant emotional states (Al-Musharaf, 2020). Emotional eating has been linked to increased adiposity and a higher body mass index (BMI) regardless of the sort of effect that people respond to (Shriver et al., 2020). Since unhealthy behaviours developed during childhood might persist throughout adulthood, young adults are an important demographic to address for obesity prevention programs (Shriver et al., 2020).

Food selection is complicated and impacted by a number of factors. Psychological influences such as mood, stress, and guilt are among them (Wongprawmas et al., 2021). According to Bartkiene (2019), the European Food Information Council (EFIC) stated that food-induced emotions are very important because our food choices are influenced by our mood. The mood is a complex human mental state that varies depending on a variety of central and peripheral biological factors, as well as other external factors such as food. The relationship between mood, emotional state,

and eating habits is complex, and it is thought that people may control their emotions and moods by changing their food choices and quantity (Bartkiene et al., 2019). As a result, the influence of emotions in deciding food choices is extremely important. As a result, emotional food choice can be characterized as the selection or preference of food kinds such as salty, sweet, bitter, and savoury based on emotions (Alalwan et al., 2019).

One of the greatest challenges in university life is the rise in overweight and obesity rates among students in the United States between 18 and 29 years old (Haidar et al., 2018). According to the 2019 National Health and Morbidity Survey (NHMS), 30.4% of Malaysian adults were overweight, while 19.7% were obese. Obesity rates are also rising each year, as they stood at 14.0% in 2006, 15.1% in 2011, and 17.7% in 2015, while overweight rates rose from 29.1% in 2006, 29.4% in 2011, and 30.3% in 2015. Malaysia has researched the matter, but there are currently few studies related to emotions. Furthermore, among college students in the United States, there has been a great increase in mental health disorders in recent decades (Lipson et al., 2019). According to the Malaysia National Health and Morbidity Survey (NHMS) 2019, 2.3% of adults have depression. The prevalence of mental health problems among adults has risen from 11.2% in 2006 to 29.2% in 2015. Therefore, Malaysia has researched the matter, but there are currently few studies related to food intake. Most studies have only shown that the prevalence of mental health disorders is related to peers and conduct problems. Thus, due to all the noted problems, this study must be carried out among students in Malaysia. This study should be conducted to determine emotional eating and emotional food choice among public university students in Malaysia. Therefore, the goal of this study is to compare any significant differences between sociodemographic characteristics and emotional eating among public university students in Malaysia.

Materials and Methods

A cross-sectional study was conducted between August and September 2022 through convenience sampling among 400 Malaysian university students via an online survey involving four regions; the East (Universiti Malaysia Terengganu and Universiti Sultan Zainal Abidin), South (Universiti Tun Hussein Onn Malaysia and Universiti Teknologi Malaysia), North (Universiti Sains Malaysia and Universiti Malaysia Perlis), and Borneo (Universiti Malaysia Sabah and Universiti Malaysia Sarawak). All these locations were selected due to their convenient accessibility. Convenience sampling is also faster, less expensive, and easier than alternative procedures (Stratton, 2021). The minimum sample size for this study was calculated using the Yamane formula at a 95% confidence level and 5% of absolute error. Population size, N , was obtained from the total number of students in each of the selected universities in Malaysia. Hence, the sample size to fulfil this study was at least 400 respondents.

The questionnaire consisted of three sections, which were section 1 (Sociodemographic Characteristics), section 2 (Emotional Eating Questionnaire), and section 3 (Emotional Food Choice Questionnaire). Section 1 consisted of eight questions, while Section 2 consisted of 15 questions. Emotional eating is mostly examined through questionnaires such as the Emotional Eating Scale (EES), the Salzburg Emotional Eating Scale (SEES), and the Emotional Overeating Questionnaire (EOQ). The Emotional Eating Questionnaire (EEQ) is one of the most widely used psychological measures for assessing emotional eating (Skolmowska et al., 2022). Individuals' emotional eating behaviour was assessed using the EEQ. Four types of emotional eaters were identified: non-emotional eaters, less emotional eaters, emotional eaters, and very emotional eaters. The category was established by adding together the emotional eating questionnaire's score. In this study, emotional eating scores were determined using the Emotional Appetite Scale, with "Never" receiving a score of 0, "Rarely" receiving a score of 1, "Occasionally" receiving a score of 2, "Frequently" receiving a score of 3, and "Very frequently" receiving a score of 4. Scores range from 0 to 15, defined as non-emotional eaters; 16 to 30, defined as less emotional eaters; 31 to 45, defined as emotional eaters; and 46 to 60, defined as very emotional eaters. Additionally, Section 3 comprised multiple-choice questions that consisted of two subsections. Subsection 1 was to determine the quantity of food consumed during various emotions, whether much less, much more, or the same. Subsection 2 was to determine the most common types of food choices during various emotions, whether salty, savoury, sour, spicy, or sweet.

Statistical Package for Social Sciences (SPSS) version 27 was used to analyse the data with a significance level $p < 0.05$. A normality test was conducted before data analysis. The Kolmogorov-Smirnov Test was used for not normally distributed data, while the Shapiro-Wilk Test was used for normally distributed data. The Descriptive Test was used to determine the sociodemographic characteristics, emotional eating questionnaire, and emotional food choice questionnaire. The Mann-Whitney U Test was a nonparametric test used to determine whether two groups of an independent variable on a continuous or ordinal dependent variable were statistically significant. The Kruskal-Wallis H Test was used to examine whether there were statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable.

Results and Discussion

Sociodemographic characteristics of respondents

Table 1 shows the sociodemographic characteristics of 400 respondents. Based on this study, females comprised 257 respondents (64.25%), compared to males with 143 respondents (35.75%). When compared to other races, Malays had the highest percentage with 276 respondents (69.00%). Approximately 54.75% of the

respondents reported a monthly household income of less than RM4,850. The majority of the respondents were 22 years old (38.75%), with a median (IQR) of 23.00 (1). Most of the respondents were from Universiti Malaysia Terengganu (26.25%), currently pursuing a degree (89.50%), undergoing their third year of study (48.0%), and were single (98.5%).

Table 1: Sociodemographic characteristics of respondents

Sociodemographic Characteristics	Number of respondents n (%)	Median (IQR)
Gender		
Female	257 (64.25)	-
Male	143 (35.75)	
Race		
Malay	276 (69.0)	-
Chinese	59 (14.75)	
Indian	42 (10.50)	
Others	23 (5.75)	
Household Income^a		
Less than RM4,850	219 (54.75)	
RM4,851-RM10,970	134 (33.50)	
More than RM10,971	47 (11.75)	
Age		
19	7 (1.75)	-
20	4 (1.00)	
21	31 (7.75)	
22	155 (38.75)	
23	146 (36.50)	
24	50 (12.50)	
25	4 (1.00)	
26	3 (0.75)	
University		
Universiti Malaysia Terengganu (UMT)	105 (26.25)	23.00 (1)
Universiti Malaysia Perlis (UniMAP)	81 (20.25)	
Universiti Teknologi Malaysia (UTM)	53 (13.25)	
Universiti Tun Hussein Onn Malaysia (UTHM)	50 (12.50)	
Universiti Sultan Zainal Abidin (UniSZA)	39 (9.75)	
Universiti Malaysia Sabah (UMS)	25 (6.25)	
Universiti Malaysia Sarawak (UniMAS)	24 (6.00)	
Universiti Sains Malaysia (USM)	23 (5.75)	
Education Level		
Currently doing a Degree	358 (89.50)	-
Currently doing a Diploma	31 (7.75)	
Currently doing a Master	11 (2.75)	

Table 1 (continued)

Sociodemographic Characteristics	Number of respondents n (%)	Median (IQR)
Current year of study		
1	17 (4.25)	-
2	60 (15.00)	
3	192 (48.00)	
4	131 (32.75)	
Marital Status		
Unmarried	394 (98.50)	-
Married	6 (1.50)	

^a Monthly household income is based on Income Classification in Malaysia (2022)

Emotional Eating Questionnaire

Table 2 illustrates the emotional eating questionnaire among respondents. Most of the respondents occasionally have the desire to eat when they feel disturbed (29.25%) and do not feel guilty when eating foods like candy or snacks (56.50%). Besides, most of the respondents rarely had the desire to eat when they were feeling down, disappointed, angry, felt something unpleasant was about to happen, when something contrary to their desire happened, and sad, with 34.25%, 39.50%, 40.50%, 32.75%, 34.25%, and 50.00%, respectively. However, most of the respondents frequently had the desire to eat when they were lonely (43.75%), bored (49.25%), happy (40.75%), eating more of their favourite food with less or no control when alone (38.00%), and when there was nothing to do (42.75%). Approximately, most of the respondents also never had the desire to eat when they were anxious or worried (36.00%) and scared (48.50%).

In this study, most respondents frequently had the desire to eat when they were lonely, bored, happy, with no control over their favourite food when alone, or when there was nothing to do. Similar patterns were observed by Ganasegeran et al. (2012), who found that 132 Malaysian university students frequently ate when bored or happy. Similarly, Richardson et al. (2017) reported that eating disorders among University of Southampton students were associated with loneliness. The current study found that the majority of the respondents rarely had the desire to eat when stressed or feeling down, disappointed, angry, or when they felt something unpleasant was about to happen, something contrary to their desire happened, and they were sad. However, the findings of the current study did not support the previous research that stated most of the respondents never had the desire to eat when feeling disappointed (Alzahrani et al., 2020). Besides, students at the University of Rhode Island reported that they never had a desire to eat when stressed or feeling down, angry (Bennett et al., 2013). According to El Ansari et al. (2012), living alone was one of the factors contributing to students' unhealthy eating habits, while living with family

appeared to be a helpful environment to protect against unhealthy eating habits. To summarize, the frequency of eating among respondents varied according to emotional state, whether positive or negative.

Table 2: Emotional Eating Questionnaire of respondents (n=400)

Emotional Eating Questionnaire		Number of respondents n (%)
Do you have the desire to eat when you feel disturbed?	Never Rarely Occasionally Frequently Very frequently	68 (17.00) 108 (27.00) 117 (29.25) 72 (18.00) 35 (8.75)
Do you have the desire to eat when you have nothing to do?	Never Rarely Occasionally Frequently Very frequently	12 (3.00) 30 (7.50) 104 (26.00) 171 (42.75) 83 (20.75)
Do you have the desire to eat when you are stressed or feeling down?	Never Rarely Occasionally Frequently Very frequently	63 (15.75) 137 (34.25) 113 (28.25) 52 (13.00) 35 (8.75)
Do you have the desire to eat when you feel lonely?	Never Rarely Occasionally Frequently Very frequently	23 (5.75) 57 (14.25) 103 (25.75) 175 (43.75) 42 (10.50)
Do you have the desire to eat when someone disappoints you?	Never Rarely Occasionally Frequently Very frequently	75 (18.75) 158 (39.50) 101 (25.25) 38 (9.50) 28 (7.00)
Do you have the desire to eat when you are angry?	Never Rarely Occasionally Frequently Very frequently	73 (18.25) 162 (40.50) 101 (25.25) 39 (9.75) 25 (6.25)

Table 2 (continued)

Emotional Eating Questionnaire		Number of respondents n (%)
Do you have the desire to eat when you feel something unpleasant is about to happen?	Never Rarely Occasionally Frequently Very frequently	130 (32.50) 131 (32.75) 94 (23.50) 27 (6.75) 18 (4.50)
Do you have the desire to eat when you feel anxious or worried?	Never Rarely Occasionally Frequently Very frequently	144 (36.00) 136 (34.00) 81 (20.25) 24 (6.00) 15 (3.75)
Do you have the desire to eat when something contrary to your desire happens?	Never Rarely Occasionally Frequently Very frequently	130 (32.50) 137 (34.25) 90 (22.50) 28 (7.00) 15 (3.75)
Do you have the desire to eat when you are scared?	Never Rarely Occasionally Frequently Very frequently	194 (48.50) 98 (24.50) 78 (19.50) 20 (5.00) 10 (2.50)
Do you have the desire to eat when you are bored?	Never Rarely Occasionally Frequently Very frequently	7 (1.75) 30 (7.50) 83 (20.75) 197 (49.25) 83 (20.75)
Do you have the desire to eat when you feel happy?	Never Rarely Occasionally Frequently Very frequently	5 (1.25) 26 (6.50) 124 (31.00) 163 (40.75) 82 (20.50)
Do you have the desire to eat when you feel sad?	Never Rarely Occasionally Frequently Very frequently	41 (10.30) 200 (50.00) 109 (27.30) 28 (7.00) 22 (5.50)
Don't you feel guilty when eating foods like candy or snacks?	Never Rarely Occasionally Frequently Very frequently	35 (8.75) 63 (15.75) 226 (56.50) 50 (12.50) 26 (6.50)

Table 2 (continued)

Emotional Eating Questionnaire		Number of respondents n (%)
Do you eat more of your favourite food with less/no control when alone?	Never	18 (4.50)
	Rarely	47(11.75)
	Occasionally	143 (35.75)
	Frequently	152 (38.00)
	Very frequently	40 (10.00)

Comparison of the significant difference between sociodemographic characteristics and emotional eating

Table 3 presents the comparison of significant differences between sociodemographic characteristics and emotional eating among respondents. According to the data, most of the respondents were less emotional eaters (57.75%), followed by emotional eaters (27.75%), non-emotional eaters (10.25%), and very emotional eaters (4.25%).

There were two tests used to compare the significant differences between sociodemographic characteristics and emotional eating among students, which were the Mann-Whitney U Test and the Kruskal-Wallis H Test. The Mann-Whitney U Test was used to compare gender and marital status, while the Kruskal-Wallis H Test was used to compare race, household income, age, university, education level, and current year of study. The results revealed that there was no significant difference between gender, race, age, university, current year of study, marital status, and emotional eating among students, as the p-value was greater than 0.05. However, there was a significant difference between the level of household income and the level of education regarding emotional eating among students, as the p-value was 0.003 and 0.049, respectively, which were less than 0.05. Household income of less than RM4,850 had the highest emotional eating score (Median = 28.00, IQR = 13) compared to income RM4,851 to RM10,970 (Median = 24.0, IQR = 9) and income with more than RM10,971 (Median = 24.0, IQR = 14). Lower household income students tend to eat more emotionally, which was associated with higher financial distress compared to higher household income students (Spinosa et al., 2019). According to Richardson et al. (2015), the stress of lower-income students has been associated with poor eating behaviours and diet quality. Table 3 shows that students pursuing a diploma had a higher emotional eating score (Mean = 29.32, SD = 11.962) due to the transition from high school to university and experienced "culture shock." This situation brought them anxiety about the learning process, loneliness, homesickness, and an increase in workload (McMillan, 2013). Thus, eating emotionally was the way to cope with those emotions.

Table 3: Comparison of significant differences between sociodemographic characteristics and emotional eating among respondents (n=400)

Sociodemographic Characteristics	Emotional ^a Eating Score Mean ± SD / Median (IQR)	Category of Emotional Eating ^b				Mann-Whitney U ^c / Kruskal-Wallis H ^d	Z-score	P-value
		1	2	3	4			
Gender								
Females	26.00 (52)	22	150	74	11	17137.00 ^c	1.118	0.263
Males	25.00 (12)	19	81	37	6			
Race								
Malay	26.00 (14)	26	150	88	12	7.083 ^d	-	0.069
Chinese	25.41 ± 9.054	5	41	11	2			
Indian	25.79 ± 10.412	7	24	8	3			
Others	23.39 ± 6.686	3	16	4	0			
Household Income								
Less than RM4,850	28.00 (13)	22	110	74	13	11.407 ^c	-	0.003 [*]
RM4,851-RM10,970	24.00 (9)	15	91	26	2			
More than RM10,971	24.00 (14)	4	30	11	2			
Age								
19	33.43 ± 8.772	0	3	4	0	10.740 ^d	-	0.150
20	24.75 ± 4.500	0	3	1	0			
21	28.77 ± 11.538	3	16	9	3			
22	26.00 (14)	14	88	47	6			
23	25.85 ± 9.283	19	88	33	6			
24	28.02 ± 8.789	3	29	16	2			
25	24.00 ± 10.231	1	2	1	0			
26	16.67 ± 8.021	1	2	0	0			

Table 3 (continued)

Sociodemographic Characteristics	Emotional ^a Eating Score	Category of Emotional Eating ^b			Mann-Whitney U ^c / Kruskal-Wallis H ^d	Z-score	P-value
University							
Universiti Malaysia Terengganu (UMT)	26.00 (12)	11	61	26	10.460 ^d	-	0.164
Universiti Malaysia Perlis (UniMAP)	25.00 (16)	13	41	22			
Universiti Teknologi Malaysia (UTM)	29.62 ± 10.695	5	21	25			
Universiti Tun Hussein Onn Malaysia (UTHM)	24.00 (12)	2	33	12			
Universiti Sultan Zainal Abidin (UniSZA)	27.44 ± 7.170	1	25	13			
Universiti Malaysia Sabah (UMS)			19	4			
Universiti Malaysia Sarawak (UniMAS)	24.60 ± 6.252	2	16	4			
Universiti Sains Malaysia (USM)	23.21 ± 7.241	4	15	5			
	24.74 ± 8.719	3					
Education Level							
Currently doing diploma	29.32 ± 11.962	5	1	12	6.045 ^d	-	0.049 [*]
Currently doing degree	26.00 (13)	34	211	98			
Currently doing master	20.91 ± 7.035	2	8	1			
Current year of study							
1	28.53 ± 12.268	2	9	4	2.061 ^d	-	0.560
2	25.00 (15)	4	36	18			
3	25.00 (12)	22	116	49			
4	26.00 (14)	13	70	40			
Marital Status							
Unmarried	26.00 (13)	39	229	110	1159.000 ^c	0.082	0.935
Married	28.00 ± 16.456	2	2	1			

* Significantly different at $p < 0.05$ ^a Emotional Eating Score : Minimum = 8, Maximum = 60^b Category of Emotional Eating

1: Non-Emotional Eater

2: Less Emotional Eater

3: Emotional Eater

4: Very Emotional Eater

^d Kruskal-Wallis H Test is used

Emotional Food Choice Questionnaire

Table 4 illustrates the results of the Emotional Food Choice Questionnaire among respondents. Most of the respondents consumed much less food when they were angry (49.75%), anxious (70.50%), frustrated (66.75%), stressed (64.00%), and frightened (78.25%). However, most of the respondents consumed much more food when bored, happy, and enthusiastic, with 54.75%, 53.25%, and 49.00% respectively. Approximately, most of the respondents consumed the same quantity of food when they were confident (50.25%), tired (61.25%), relaxed (56.25%), and lonely (47.50%).

Stress is a global problem due to its negative impact on human health. Previous studies reported that stressful or negative emotions can cause a state similar to postprandial satiety, leading to loss of appetite or reduced nutrient intake (Al-Musharaf, 2020; Van Strien, 2018). Consistent with the present results, a prior study found that stress and emotions substantially influence eating habits. During acute stress, activation of the sympathetic nervous system and noradrenaline production shifts blood flow away from the digestive tract, resulting in reduced food intake (Reichenberger et al., 2018). Intense or highly aroused emotions are thought to suppress appetite by activating the autonomic nervous system, causing physiological changes such as slowed gastric emptying, redirected blood flow to muscles, and the release of appetite-suppressing hormones like catecholamines (Evers et al., 2018). In contrast, moderate arousal or fairly strong emotions are believed to increase food intake due to weakened cognitive control (Evers et al., 2018). Bored individuals are also more likely to eat more, with both normal-weight and overweight adults reporting increased eating when lonely or bored (Haddad et al., 2020). Overall, various forms of emotion-induced changes can result in either increased or decreased eating.

Table 4: Emotional Food Choice Questionnaire of respondents (n=400)

Emotional Food Choice Questionnaire		Number of respondents n (%)
As compared to usual, do you eat when you are bored	Much less Much more The same	46 (11.50) 219 (54.75) 135 (33.75)
As compared to usual, do you eat when you are confident	Much less Much more The same	53 (13.25) 146 (36.50) 201 (50.25)
As compared to usual, do you eat when you are angry	Much less Much more The same	199 (49.75) 25 (6.25) 176 (44.00)
As compared to usual, do you eat when you are anxious	Much less Much more The same	282 (70.50) 10 (2.50) 108 (27.00)

Table 4 (continued)

Emotional Food Choice Questionnaire		Number of respondents n (%)
As compared to usual, do you eat when you are happy	Much less Much more The same	33 (8.25) 213 (53.25) 154 (38.50)
As compared to usual, do you eat when you are frustrated	Much less Much more The same	267 (66.75) 23 (5.75) 110 (27.50)
As compared to usual, do you eat when you are tired	Much less Much more The same	139 (34.75) 16 (4.00) 245 (61.25)
As compared to usual, do you eat when you are stressed	Much less Much more The same	256 (64.00) 24 (6.00) 120 (30.00)
As compared to usual, do you eat when you are frightened	Much less Much more The same	313 (78.25) 7 (1.75) 80 (20.00)
As compared to usual, do you eat when you are relaxed	Much less Much more The same	27 (6.75) 148 (37.00) 225 (56.25)
As compared to usual, do you eat when you are lonely	Much less Much more The same	61 (15.25) 149 (37.25) 190 (47.50)
As compared to usual, do you eat when you are enthusiastic	Much less Much more The same	34 (8.50) 196 (49.00) 170 (42.50)

Type of food choice during various emotions

Table 5 shows the type of food choice during various emotions among respondents. The current study found that most of the respondents chose sweet food when they were anxious and frightened, with 47.25% and 52.00% respectively. However, the most obvious findings to emerge from the analysis was that majority of the respondents choose savoury food when they were bored (38.50%), confident (60.75%), angry (41.25%), happy (63.25%), frustrated (37.75%), stressed (48.25%), relaxed (47.75%), lonely (38.75%), and enthusiastic (66.25%).

In this study, there were many factors affecting consumer food choices. The European Food Information Council (EUFIC) states that food-induced emotions are crucial since mood can influence food choices (Bartkiene et al., 2019). Mood is a complex mental state that changes based on biological components and factors like diet. Certain foods can improve mood by regulating neurotransmitter production and

reducing stress (Kate et al., 2017). Human eating behaviour is complex and influenced by emotions and moods, and it is believed people can control their mood and emotions by altering food preferences and intake (Cabout et al., 2017). Academic stress, according to prior research, increases the consumption of unhealthy foods, notably snacks and sweet foods, while decreasing the consumption of healthy foods, such as fruits and vegetables (Caso et al., 2020; Barcn-Güzeldere & Devrim-Lanpir, 2021). Besides, individuals with negative emotional eating also tend to consume high-calorie foods (Sze et al., 2021). It was believed that sweet and high-calorie foods can be a coping mechanism when experiencing stress, especially among female students, as stated by Alfreeh et al. (2020). Another study found that emotionally unstable people engage in counter-regulatory emotional eating, specifically high-energy dense, sweet and savoury foods, to deal with their unpleasant feelings (Keller & Siegrist, 2015; Zerón-Rugério et al., 2022). Stress is also partially regulated by the hypothalamic-pituitary-adrenal (HPA) axis and can be alleviated by sugary foods, along with hormone release (Ulrich-Lai et al., 2011). In summary, happy individuals tend to eat healthy foods, while sad individuals tend to prefer unhealthy foods (Groesz et al., 2012; Gardner et al., 2014; Frayn et al., 2016).

Table 5: Type of food choice during various emotions among respondents (n=400)

Type of Food Choice During Various Emotions	Number of respondents n (%)	
What type of food do you most prefer when bored?	Salty Savoury Sour Spicy Sweet	37 (9.25) 154 (38.50) 31 (7.75) 79 (19.75) 99 (24.75)
What type of food do you most prefer when confident?	Salty Savoury Sour Spicy Sweet	19 (4.75) 243 (60.75) 9 (2.25) 31 (7.75) 98 (24.50)
What type of food do you most prefer when angry?	Salty Savoury Sour Spicy Sweet	24 (6.00) 165 (41.25) 34 (8.50) 33 (8.25) 144 (36.00)
What type of food do you most prefer when anxious?	Salty Savoury Sour Spicy Sweet	27 (6.75) 131 (32.75) 44 (11.00) 9 (2.25) 189 (47.25)

Table 5 (continued)

Type of Food Choice During Various Emotions	Number of respondents n (%)	
What type of food do you most prefer when happy?	Salty Savoury Sour Spicy Sweet	28 (7.00) 253 (63.25) 8 (2.00) 16 (4.00) 95 (23.75)
What type of food do you most prefer when frustrated?	Salty Savoury Sour Spicy Sweet	39 (9.75) 151 (37.75) 40 (10.00) 20 (5.00) 150 (37.50)
What type of food do you most prefer when tired?	Salty Savoury Sour Spicy Sweet	47 (11.75) 225 (56.25) 21 (5.25) 4 (1.00) 103 (25.75)
What type of food do you most prefer when stressed?	Salty Savoury Sour Spicy Sweet	38 (9.50) 193 (48.25) 28 (7.00) 16 (4.00) 125 (31.25)
What type of food do you most prefer when frightened?	Salty Savoury Sour Spicy Sweet	40 (10.00) 101 (25.25) 48 (12.00) 3 (0.75) 208 (52.00)
What type of food do you most prefer when relaxed?	Salty Savoury Sour Spicy Sweet	32 (8.00) 191 (47.75) 16 (4.00) 85 (21.25) 76 (19.00)
What type of food do you most prefer when lonely?	Salty Savoury Sour Spicy Sweet	35 (8.75) 155 (38.75) 34 (8.50) 90 (22.50) 86 (21.50)
What type of food do you most prefer when enthusiastic?	Salty Savoury Sour Spicy Sweet	25 (6.25) 265 (66.25) 16 (4.00) 29 (7.25) 65 (16.25)

Conclusion

This research aimed to explore the interplay between emotional eating, food choice, and sociodemographic variables among public university students in Malaysia. The majority of the students were less emotional eaters. The research has also shown that most of the students consumed less food when having negative emotions, and the most common types of food choice during various emotions (positive and negative) were savoury food, followed by sweet food. Respondents also could control their emotions and moods by altering both their food preferences and intake. Most of the respondents choose sweet and savoury food to alleviate signs of stress. There was no significant difference between sociodemographic characteristics and emotional eating among public university students in Malaysia, except for differences in household income level and education level. The information presented in this study can be used to provide specific, targeted strategies to students experiencing frequent emotional eating episodes.

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References

- Al-Musharaf, S. (2020). Prevalence and predictors of emotional eating among healthy young Saudi women during the COVID-19 pandemic. *Nutrients*, 12(10), 2923. <https://doi.org/10.3390/nu12102923>
- Alalwan, T. A., Hilal, S. J., Mahdi, A. M., Ahmed, M. A., & Mandeel, Q. A. (2019). Emotional eating behavior among University of Bahrain Students: A cross-sectional study. *Arab Journal of Basic and Applied Sciences*, 26(1), 424–432. <https://doi.org/10.1080/25765299.2019.1655836>
- Alfreeh, L., Abulmeaty, M. M., Abudawood, M., Aljaser, F., Shivappa, N., Hebert, J. R., Almuammar, M., Al-Sheikh, Y., & Aljuraiban, G. S. (2020). Association between the inflammatory potential of diet and stress among female college students. *Nutrients*, 12(8), 2389. <https://doi.org/10.3390/nu12082389>
- Alzahrani, S. H., Saeedi, A. A., Baamer, M. K., Shalabi, A. F., & Alzahrani, A. M. (2020). Eating habits among medical students at King Abdulaziz University, Jeddah, Saudi Arabia. *International Journal of General Medicine*, Volume 13, 77–88. <https://doi.org/10.2147/IJGM.S246296>

- Barcin-Güzeldere, H. K., & Devrim-Lanpir, A. (2021). The association between body mass index, emotional eating, and perceived stress during the COVID-19 partial quarantine in healthy adults. *Public Health Nutrition*, 25(1), 43–50. <https://doi.org/10.1017/S1368980021002974>
- Bartkiene, E., Steibliene, V., Adomaitiene, V., Juodeikiene, G., Cernauskas, D., Lele, V., Klupsaite, D., Zadeike, D., Jarutiene, L., & Guiné, R. P. (2019). Factors affecting consumer food preferences: Food taste and depression-based evoked emotional expressions with the use of face reading technology. *BioMed Research International*, 2019, 1–10. <https://doi.org/10.1155/2019/2097415>
- Bennett, J., Greene, G., & Schwartz-Barcott, D. (2013). Perceptions of emotional eating behavior. A qualitative study of college students. *Appetite*, 60, 187–192. <https://doi.org/10.1016/j.appet.2012.09.023>
- Cabout, M., Brouwer, I. A., & Visser, M. (2017). The moodfood project: Prevention of Depression through nutritional strategies. *Nutrition Bulletin*, 42(1), 94–103. <https://doi.org/10.1111/nbu.12254>
- Caso, D., Miriam, C., Rosa, F., & Mark, C. (2020). Unhealthy eating and academic stress: The moderating effect of eating style and BMI. *Health Psychology Open*, 7(2), 205510292097527. <https://doi.org/10.1177/2055102920975274>
- El Ansari, W., Stock, C., & Mikolajczyk, R. T. (2012). Relationships between food consumption and living arrangements among university students in four European countries - a cross-sectional study. *Nutrition Journal*, 11(1). <https://doi.org/10.1186/1475-2891-11-28>
- Evers, C., Dingemans, A., Junghans, A. F., & Boevé, A. (2018). Feeling bad or feeling good, does emotion affect your consumption of food? A meta-analysis of the experimental evidence. *Neuroscience & Biobehavioral Reviews*, 92, 195–208. <https://doi.org/10.1016/j.neubiorev.2018.05.028>
- Frayn, M., Sears, C. R., & von Ranson, K. M. (2016). A sad mood increases attention to unhealthy food images in women with food addiction. *Appetite*, 100, 55–63. <https://doi.org/10.1016/j.appet.2016.02.008>
- Gardner, M. P., Wansink, B., Kim, J., & Park, S. B. (2014). Better moods for better eating? How mood influences food choice. *Journal of Consumer Psychology*, 24(3), 320–335. <https://doi.org/10.1016/j.jcps.2014.01.002>
- Groesz, L. M., McCoy, S., Carl, J., Saslow, L., Stewart, J., Adler, N., Laraia, B., & Epel, E. (2012). What is eating you? Stress and the drive to eat. *Appetite*, 58(2),

717–721. <https://doi.org/10.1016/j.appet.2011.11.028>

Haddad, C., Zakhour, M., Bou kheir, M., Haddad, R., Al Hachach, M., Sacre, H., & Salameh, P. (2020). Association between eating behavior and quarantine/confinement stressors during the coronavirus disease 2019 outbreak. *Journal of Eating Disorders*, 8(1). <https://doi.org/10.1186/s40337-020-00317-0>

Haidar, S. A., de Vries, N. K., Karavetian, M., & El-Rassi, R. (2018). Stress, anxiety, and weight gain among university and college students: A systematic review. *Journal of the Academy of Nutrition and Dietetics*, 118(2), 261–274. <https://doi.org/10.1016/j.jand.2017.10.015>

Kate, P. E., Deshmukh, G. P., Datir, R. P., & Rao, J. (2017). Good mood foods. *Journal of Nutritional Health & Food Engineering*, 7(4). <https://doi.org/10.15406/jnhfe.2017.07.00246>

Keller, C., & Siegrist, M. (2015). Does personality influence eating styles and food choices? Direct and indirect effects. *Appetite*, 84, 128–138. <https://doi.org/10.1016/j.appet.2014.10.003>

Lipson, S. K., Lattie, E. G., & Eisenberg, D. (2019). Increased rates of mental health service utilization by U.S. college students: 10-year population-level trends (2007–2017). *Psychiatric Services*, 70(1), 60–63. <https://doi.org/10.1176/appi.ps.201800332>

McMillan, W. (2013). Transition to university: The role played by emotion. *European Journal of Dental Education*, 17(3), 169–176. <https://doi.org/10.1111/eje.12026>

Reichenberger, J., Kuppens, P., Liedlgruber, M., Wilhelm, F. H., Tiefengrabner, M., Ginzinger, S., & Blechert, J. (2018). No haste, more taste: An EMA study of the effects of stress, negative and positive emotions on eating behavior. *Biological Psychology*, 131, 54–62. <https://doi.org/10.1016/j.biopsycho.2016.09.002>

Reichenberger, J., Schnepfer, R., Arend, A., & Blechert, J. (2020). Emotional eating in healthy individuals and patients with an eating disorder: Evidence from psychometric, experimental, and naturalistic studies. *Proceedings of the Nutrition Society*, 79(3), 290-299. <https://doi.org/10.1017/S0029665120007004>

Richardson, A. S., Arsenault, J. E., Cates, S. C., & Muth, M. K. (2015). Perceived stress, unhealthy eating behaviors, and severe obesity in low-income women. *Nutrition Journal*, 14(1). <https://doi.org/10.1186/s12937-015-0110-4>

Richardson, T., Elliott, P., & Roberts, R. (2017). Relationship between loneliness and mental health in students. *Journal of Public Mental Health*, 16(2), 48–54.

<https://doi.org/10.1108/JPMH-03-2016-0013>

- Shriver, L. H., Dollar, J. M., Calkins, S. D., Keane, S. P., Shanahan, L., & Wideman, L. (2020). Emotional eating in adolescence: Effects of emotion regulation, weight status, and negative body image. *Nutrients*, 13(1), 79. <https://doi.org/10.3390/nu13010079>
- Skolmowska, D., Głabska, D., & Guzek, D. (2022). Body mass and emotional eating: Emotional eater questionnaire (EEQ) in the Polish adolescents' COVID-19 experience (place-19) study. *Nutrients*, 14(4), 828. <https://doi.org/10.3390/nu14040828>
- Spinosa, J., Christiansen, P., Dickson, J. M., Lorenzetti, V., & Hardman, C. A. (2019). From socioeconomic disadvantage to obesity: The mediating role of psychological distress and emotional eating. *Obesity*, 27(4), 559–564. <https://doi.org/10.1002/oby.22402>
- Stratton, S. J. (2021). Population research: Convenience sampling strategies. *Prehospital and Disaster Medicine*, 36(4), 373–374. <https://doi.org/10.1017/S1049023X21000649>
- Sze, K. Y., Lee, E. K., Chan, R. H., & Kim, J. H. (2021). Prevalence of negative emotional eating and its associated psychosocial factors among urban Chinese undergraduates in Hong Kong: A cross-sectional study. *BMC Public Health*, 21(1). <https://doi.org/10.1186/s12889-021-10531-3>
- Ulrich-Lai, Y. M., Ostrander, M. M., & Herman, J. P. (2011). HPA axis dampening by limited sucrose intake: Reward frequency vs. Caloric consumption. *Physiology & Behavior*, 103(1), 104–110. <https://doi.org/10.1016/j.physbeh.2010.12.011>
- Van Strien, T. (2018). Causes of emotional eating and matched treatment of obesity. *Current Diabetes Reports*, 18(6). <https://doi.org/10.1007/s11892-018-1000-x>
- Wongprawmas, R., Mora, C., Pellegrini, N., Guiné, R. P., Carini, E., Sogari, G., & Vittadini, E. (2021). Food choice determinants and perceptions of a healthy diet among Italian consumers. *Foods*, 10(2), 318. <https://doi.org/10.3390/foods10020318>
- Zerón-Rugério, M. F., Hernáez, Á., Cambras, T., & Izquierdo-Pulido, M. (2022). Emotional eating and cognitive restraint mediate the association between sleep quality and BMI in young adults. *Appetite*, 170, 105899. <https://doi.org/10.1016/j.appet.2021.105899>

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