GLOBAL BUSINESS MANAGEMENT REVIEW
http://e-journal.uum.edu.my/index.php/gbmr

How to cite this article:
Chai, E. Y. & Cheah, Y. K. (2024). Factors influencing fast food consumption among public university students: A case study at Universiti Utara Malaysia. *Global Business Management Review, 16*(2), 1-22. https://doi.org/10.32890/gbmr2024.16.2.1

FACTORS INFLUENCING FAST FOOD CONSUMPTION AMONG PUBLIC UNIVERSITY STUDENTS: A CASE STUDY AT UNIVERSITI UTARA MALAYSIA

Ee Yuin Chai[1]

Yong Kang Cheah[1,2]

[1]*School of Economics, Finance and Banking, Universiti Utara Malaysia*
[2]*Corresponding author: yong@uum.edu.my*

Received: 08/05/2024 Revised: 27/07/2024 Accepted: 28/08/2024 Published: 30/12/2024

ABSTRACT

The prevalence of fast food consumption among students is on the rise. Although there is a growing study investigating consumption of fast food among adolescents and adults in Malaysia, little attention has been paid to university students. This is perhaps the first study to examine factors influencing fast food consumption within a sample of students in Universiti Utara Malaysia (UUM). Primary data from a survey were used. An ordered logistic regression analysis was utilised to estimate the odds of consuming fast food. The explanatory variables consisted of demographic factors, peer influence, knowledge about fast food, lifestyle and mental health. Findings of the present study showed that most of the students in UUM consumed 1 to 2 times of fast food per week. Males tended to consume more fast food than females. Fast food consumption was lower among Chinese students than Malays, Indians and those of other ethnicities. Students who have excellent academic performance were less likely to consume fast food than those with poor academic performance. High personal income was associated with increased odds of consuming fast food. Students who were influenced by their peers were more likely to consume fast food compared to those who were not. Living a healthy lifestyle was associated with reduced odds of fast food consumption. These findings are important in the sense that they can assist UUM and government in developing more effective measures aimed at lowering students' fast food intake. Intervention measures directed toward reducing fast food consumption among UUM students who are males, are Malays, have poor academic performance, have high income and adopt unhealthy lifestyles may yield promising outcomes.

Keywords: fast food consumption, Malaysia, university students

1.0 INTRODUCTION

As a result of rapid urbanisation, the lifestyle of Malaysian people has undergone a significant transformation, leading to a large increase in the prevalence of non-communicable diseases (NCDs). Data show that 6.1 million Malaysians suffer from hypertension and 3.6 million live with diabetes (The Star, 2020). As pointed out by the Ministry of Health Malaysia, unhealthy lifestyles, most notably, poor eating habits and sedentary lifestyles are responsible for the majority of NCD-related fatalities (Bernama, 2023). The trend of consuming fast food developed in the Western countries has been expanded around the world. Many developing countries, including Malaysia, are shifting away from traditional diets in favour of Western dietary culture (Devereux, 2006). To a large extent, fast food has replaced nutrient-dense healthy diets (Ashakiran & Deepthi, 2012). This phenomenon is detrimental to public health and contributes to the fast growth of NCDs.

Fast food contains high amounts of harmful ingredients, such as refined carbohydrates, sugar, trans fats and preservatives. These substances improve food's taste, texture and longevity but possess adverse impacts on human health. Fast food can even lead to excess weight gain and raise the risk of developing various NCDs, such as diabetes, cancers and heart diseases. According to Odegaard et al. (2012), consuming fast food once a week raises the probability of dying from coronary heart disease by at least 20%. Another study found that consuming only one plate of fast food every week was associated with a 27% increase in the risk of breast cancer (Mahabir, 2012). Even though fast food provides large amounts of energy, it lacks vital nutrients, such as vitamins, minerals, and fiber (Ashakiran & Deepthi, 2012).

In today's hectic lifestyles, fast food has become one of the popular dietary choices among Malaysian consumers, especially university students who are often on a tight schedule and do not possess time for meal preparation (Knutson, 2000; Sivakumar, 2022). Bipasha & Goon (2014) found 84% of Malaysian university students to consume fast food frequently. Living on campus limits students' ability to cook, thereby increasing students' reliance on fast food (The Barbecue Lab, 2023).

The National Health and Morbidity Survey (NHMS) 2022 showed worsening health status and lifestyle behaviours in the Malaysian adolescent population (Institute for Public Health, 2022). Being overweight, physical inactivity, prolonged sitting, poor nutritional intake, excessive consumption of carbonated soft drinks and high fast food intake, for instance, are all on the rise among adolescents of all age groups. According to the NHMS 2022, about one-third of teenagers were classified as overweight or obese, one in every three consumed soft drinks on a daily basis and one in every ten ate fast food at least three times per week (Institute for Public Health, 2022). Regular consumption of fast food may increase the risk of various NCDs among university students, which may have detrimental impacts on students' health, quality of life and academic performance (Jia et al., 2022; WHO, 2023).

In light of the alarming facts and figures about fast food, the objective of the present study is to examine factor affecting fast food consumption with a focus on university students in Malaysia, which is the population that is prone to bad eating habits. In an effort to promote healthy dietary lifestyles in students, it is of great importance to gain a deep understanding of the decisions of students to consume fast food. The present study aims to provide important insights into the relationships between fast food consumption and demographic, peer influence, knowledge about food, lifestyle, and mental health factors.

2.0 THEORETICAL BASIS

Two economic theories were used in the present study to explain fast food consumption behaviours. One of which is consumer theory which emphasises budget constraints and utility maximisation. The theory focuses on how consumers decide what goods and services they will purchase in accordance with their preferences and budget constraints. The budget constraint specifies that when an individual's income rises, the budget constraint shifts outward, indicating that additional quantities of goods and services will be purchased. When the budget constraint is tangent to an indifference curve, it reflects the combination of commodities that maximises utility, subject to an individual's budget. The theory of utility maximisation states that consumers intend to derive the highest degree of satisfaction from their financial capability.

Consumer theory is used in the present study as it aids in the explanation of the correlation between income and fast food consumption among students. Budget constraints play a major role in the meal choices made by students. As income increases, students are able to consume more food in order to increase their utility. Students seek to maximise their utility within their budget constraints. They make choices based on the marginal utility derived from consuming fast food compared to other options like home-cooked or healthy meals. If the marginal utility derived from consuming fast food is higher than that of healthy food, students are likely to choose fast food over healthy food. This decision is made based on both taste preferences and budget constraints.

Another theoretical underpinning for the present study is the Grossman model (Grossman, 1972). It is a health inventory model developed by Michael Grossman, which provides a framework pertaining to how consumer choices affect health outcomes. The main objective of the Grossman model is to explain the effects of age, education and income on the production of health through health capital demand. According to the model, personal activities affect a person's health; thus, they alter the length of life. The health of older people is expected to depreciate faster than that of younger people because of aging. While one's ideal health stock declines with age, it possesses no effect on income and other factors. Furthermore, increasing income enhances the benefits earned from the days of being healthy. The reason is that the expenses on preserving health are incredibly expensive, thus limiting an individual's capacity to invest in health. As a result, higher income recipients reap greater rewards from being healthy than lower income ones. In addition, better educated individuals may invest more efficiently than their less educated counterparts, resulting in a better rate of return from health investment. Grossman claims that well-educated individuals tend to improve their health through adopting of healthy lifestyles and use of medical care.

In the present study, we expect that as students age, they may become more conscious about their health and the long-term consequences of their dietary choices. To preserve or strengthen their health capital, older students are more likely to avoid fast food when compared with younger students. In addition, higher income students are anticipated to have a greater capability to choose healthier and more expensive food, whereas lower income students may find fast food more affordable. Furthermore, we hypothesise that better educated students are more aware of fast food-related risks compared to those of less educated. Hence, they are more inclined to choose healthy meals over fast food. As pointed out in previous empirical studies, better educated individuals tended to have better knowledge about nutrition than the less-educated ones (Cheah & Yip, 2017; Cheah et al., 2023).

3.0 INSIGHTS FROM THE LITERATURE

The factors that affected fast food consumption found in past studies were noteworth. Findings from several studies showed a significant relationship between age and fast food consumption (Oladimeji et al., 2017; Bondoc et al., 2019; Dowarah et al., 2020). Consumers tended to consume less fast food as they grew older (Arslan et al., 2023). Similarly, a systematic review study found that being younger

was positively associated with the frequency of fast food consumption among college students (Saha et al., 2022). There was also evidence suggesting that one out of six individuals aged 16 to 20 years ate fast food at least twice a day, compared to one out of eight individuals aged 21 to 34 years (BBC News, 2016). Therefore, the present study hypothesises that younger students consume more fast food compared to older students.

Previous studies found a significant relationship between gender and fast food consumption but the relationship was inconclusive (Jayasinghe et al., 2014; Cheong et al., 2021; Arslan et al., 2023). In particular, females were more likely to consume fast food than males (Cheong et al., 2021). Another study likewise showed that female adolescents were more likely to visit fast food restaurants when compared with male adolescents (Abdullah et al., 2016). However, others found male students to be more likely to consume fast food than female students (Rajini et al., 2021; Didarloo et al., 2022). Similarly, Li et al. (2020), drawing from the data collected in low- and middle-income countries, found that males had higher odds of consuming fast food than females. Hence, the present study expects that gender is associated with fast food consumption but without specifying whether the association is negative or positive.

There appeared to be a correlation between fast food intake and ethnicity, with Malay students consuming more fast food than Chinese and Indian students (Cheong et al., 2021). Similarly, Abdullah et al. (2015) found that fast food consumers were more likely to be Malays. This may be due to cultural differences in dietary lifestyles (Zhou et al., 2015). As such, the present study hypothesises that Malay students consume more fast food than non-Malays.

In terms of income, Didarloo et al. (2022) found a significant association between family income and fast food consumption. Specifically, increased family income encouraged students to consume more fast food. Similar findings were evidenced by Mumena et al. (2022), who found the frequency of fast food consumption to increase with income. In the study by Saha et al. (2022), high-socioeconomic class was also correlated with an increased frequency of fast food consumption. However, the study by Mir et al., (2022) observed that monthly household income was not associated with fast food consumption. In the present study, we anticipate that family income has a positive correlation with fast food consumption.

According to findings from previous studies, education levels affected fast food consumption (Oladimeji et al., 2017; Radzak et al., 2022). A high level of education was associated with low consumption of fast food (Muti'ah et al., 2020). This was simply because education promoted healthy dietary lifestyles (Raghupathi & Raghupathi, 2020). However, there was also a study found no educational differences in fast food consumption (Mir et al., 2022). While past findings are inconclusive, a negative relationship between education level and fast food consumption is hypothesised in the present study.

Past findings showed that academic performance was significantly correlated with fast food consumption (Reuter et al., 2020). Students with higher academic performance were less likely to engage in unhealthy behaviors, including eating fast food compared to their peers with poorer academic performance (Al-Haifi et al., 2023). In order to develop effective learning, students who pay considerable attention to their academic performance may choose to consume less fast food (Naveed et al. 2020). Therefore, the present study predicts a negative relationship between academic performance and fast food consumption.

Mwafi et al. (2021), Didarloo et al. (2022) and Arslan et al. (2023) observed a significant association between personal income and fast food consumption, with income being positively associated with fast food consumption. Studies showed that university students tended to spend a large proportion of their pocket money on fast food and that higher-income students may have more disposable income to spend

(Darling et al., 2006; Bipasha & Goon, 2014). With these findings, the present study hypothesises personal income to have a positive relationship with fast food consumption.

Several studies found a positive correlation between parental education levels and fast food consumption (Arslan et al., 2023; Didarloo et al., 2022). Parents possessed strong influences on their kids' eating habits (Vereecken et al., 2004). Education affected health-related behaviours through increasing the accessibility of health-related information (Laitinen et al., 1995). Students whose parents had low or moderate levels of education were less likely to eat fruits and vegetables (FV) than those with well-educated parents (Fernández-Alvira et al., 2013). There was evidence that the intake of FV was elevated as the education level increased whereas the intake of fast food increased as the educational level decreased (Fernández-Alvira et al., 2013). Based on these findings, parental education level is expected to be negatively associated with fast food consumption.

Fast food intake was significantly associated with body mass index (Al-Otaibi & Basuny, 2015; Seo et al., 2011; Li et al., 2020; Sharma et al., 2023), and people with higher BMI tended to consume more fast food than those with lower BMI (Schroder et al., 2007; Westerterp-Plantenga et al., 1996). This was simply due to the strong correlation between unhealthy lifestyles and fast food intake. Therefore, the present study expects that a positive relationship between BMI and fast food consumption exists.

Similar to parenting factors, peers play an important role in determining dietary lifestyles (Stager et al., 2023). For instance, the studies by Seo et al. (2011) and Al-sheyab et al. (2018) consistently showed that peer influence was significantly linked to fast food consumption. According to Chakraborty (2023), university students often followed the cultural norms of their peer groups. Some students stated that the only reason they ate fast food was to fit in with their friends, which was why peer friendships were cited as a driving factor of fast food consumption (Askari Majabadi et al., 2016). University students tended to spend time with friends in unsupervised settings and consequently increased their consumption of fast food (Lam et al., 2014). The present study, therefore, anticipates that peer influence increases fast food consumption.

Previous studies found that the effect of fast food knowledge on the frequency of fast food intake was significant (Onurlubaş & Yilmaz, 2013; Arslan et al., 2023). Greater knowledge about diets was associated with better eating habits among university students because individuals with good nutritional information were more conscious about their food consumption (Kolodinsky et al., 2007). Based on these findings, the present study expects students with comprehensive knowledge about fast food to consume less fast food compared to those with poor knowledge.

There was an association between fast food consumption and lifestyles (Scully, 2020; Mwafi et al., 2021; Elbarazi & Tikamdas, 2023). Unhealthy lifestyle practices, such as short sleep duration, drinking and smoking were associated with an increased likelihood of fast food consumption (Chiolero et al., 2006; Kruger et al., 2014; Tarantino et al., 2022). Furthermore, using data from 28 countries, Romano et al. (2023) found that use of cannabis was positively associated with the likelihood of consuming fast food. Individuals who adopted a healthy lifestyle were more concerned about nutrition and quality of food than those living an unhealthy lifestyle as they had better health awareness (Commetric, 2019). In light of these findings, the present study hypothesises that a healthy lifestyle reduces fast food consumption.

Fast food consumption among students was associated with poor mental health condition, including stress, depression and suicide (Park et al., 2016; Almogbel et al., 2019; Xu et al., 2020; Jacob et al., 2020; Moradi et al., 2022; Elbarazi, & Tikamdas, 2023). According to Oliver et al. (2000), increased mental tension was closely related to increased consumption of unhealthy meals. Emotional eaters were likely to control their stress by eating junk foods (O'Connor et al., 2008). Stressful conditions tended

to cause one to indulge in unhealthy eating lifestyles (Grajek, 2022). In view of these findings, the present study anticipates that mental health conditions are associated with increased fast food intake.

4.0 METHODOLOGY

4.1 Data

Primary data collection was conducted in the present study. Structured questionnaires with closed-ended questions were used to collect information and data from the respondents. The questionnaires were written in English and consisted of three sections, namely Section A, B, and C. Section A included questions on the students' age, gender, ethnicity, family income, current year of study, academic performance, parental education levels, parent's marital status, personal monthly income, as well as body height and weight. The questions in Section B were pertaining to students' fast food consumption frequency, whereas the questions in Section C asked about the effects of the students' peer influence, knowledge about fast food, lifestyles and mental health on their fast food consumption. All the questions in Section C used a five-point Likert scale with responses of 'strongly disagree', 'disagree', 'neutral', 'agree' and 'strongly agree'.

Questionnaires were distributed for self-administration through face-to-face, Google Form and social media platforms, such as Facebook, Instagram, WhatsApp, and Telegram. Social desirability bias was minimised as self-administrated questionnaires were used. The inclusion criteria were pre-university, undergraduate, Master and PhD students at Universiti Utara Malaysia (UUM). Owing to budget and time constraints, the data collection was based on convenience sampling and focused on one university only. While convenience sampling did not guarantee a representative sample, it was easy, fast and inexpensive. A total of 412 respondents were surveyed from the entire population of UUM. Although the sample size was not very large, it was adequate for research and generating important findings. The survey period was between 15 October 2023 and 22 February 2024. All the respondents were asked to provide written consent before answering the questionnaires.

4.2 Dependent Variables

The dependent variable of the present study, fast food consumption, was a categorical variable with ordinal outcomes. To form this variable, the respondents were asked to anwer the following question: "How many times did you consume fast food in the past 7 days?". Their responses were categorised into four categories: 'never', '1-2 times', '3-4 times' and '≥5 times'.

4.3 Independent Variables

The selected independent variables consisted of age, gender, ethnicity, family income, academic performance, personal income, parental education levels, parental marital status and body mass index (BMI). The age of respondents was categorised into five groups: 20 years old and below, 21 years old, 22 years old, 23 years old, and 24 years old and above. In terms of ethnicity, four ethnic groups were formed: Chinese, Indian, Malay and other ethnicities. The family income of students was categorised into B40 (below Ringgit Malaysia [RM] 4,851 per month), M40 (between RM 4,851 and RM 10,960 per month), and T20 (above RM 10,960 per month).

The academic performance was assessed based on self-rated information provided by the respondents. It was categorised as excellent, good and fair. Students' monthly personal income was divided into five categories: RM 100 and below, RM 101–RM 200, RM 201–RM 300, RM 301–RM 400, and RM 401 and above. The father's and mother's educational levels of the students were segmented into three categories: primary education, secondary education and tertiary education. Students' parental marital

status was classified as married and divorced/widowed. Students' BMI consisted of two categories: obese/overweight (≥30.0) and non-obese/-overweight (≤29.9).

In addition, peer influence, knowledge about fast food, lifestyle and mental health were used as the independent variables. All these variables were measured using five items with Likert scales; thus, they were formatted as continuous variables. Each of the items had five possible responses: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree) and 5 (strongly agree). These values were summed and used in the analyses. The maximum value of these variables was 25, while the minimum value was 5. The details of the items are presented in Table 2.

4.4 Statistical Analysis

A total of 412 respondents were used in the analyses. Before estimating the regression, descriptive statistics of all the variables were calculated and presented. For categorical variables, frequencies and percentages were shown, while means and standard deviations were illustrated for continuous variables. Since the dependent variable was an ordinal variable, an ordered logit regression was utilised to assess factors associated with different levels of fast food consumption. The result interpretation was based on odds ratios (ORs) as they provided insights into how each independent variable influenced the odds of consuming larger amounts of fast food. Additionally, variance inflation factors (VIFs) were used to detect potential multicollinearities. The significance level of $p < 0.05$ was selected. Statistical analyses were performed using Stata statistical software (StataCorp, 2018).

5.0 RESULT

The majority of the respondents indicated they had consumed fast food 1–2 times in the past 7 days (52.43 percent), followed by 3–4 times (29.37 percent), 5 times and more (11.89 percent) and never (6.31 percent). About 16.99 percent, 12.14 percent, 16.26 percent, 43.20 percent and 11.41 percent of the respondents aged 20 years and below, 21 years, 22 years, 23 years and 24 years and above, respectively. The majority of the respondents were females (71.12 percent). The Chinese ethnicity had the highest proportion (47.33 percent), followed by Malays (40.78 percent), Indians (8.98 percent), and other ethnicities (2.91%). Most of the respondents were in the B40 category (75.97 percent), while only 19.42 percent in the M40 category and 4.61 percent in the T20 category (Table 1).

Table 1

Summary of demographic profile (n = 412)

Characteristics	Frequency	Percent
Dependent variable		
Fast food consumption		
Never	26	6.31
1-2 times	216	52.43
3-4 times	121	29.37
≥5 times	49	11.89
Independent variables		
Age (years)		
≤20	70	16.99
21	50	12.14

22	67	16.26
23	178	43.20
≥24	47	11.41
Gender		
Female	293	71.12
Male	119	28.88
Ethnicity		
Chinese	195	47.33
Malay	168	40.78
Indian	37	8.98
Others	12	2.91
Monthly family income		
B40 (≤RM4,851)	313	75.97
M40 (RM4,851–RM10,960)	80	19.42
T20 (≥ RM10,960)	19	4.61
Education level		
Pre-university	3	0.73
Year 1	48	11.65
Year 2	77	18.69
Year 3	82	19.90
Year 4	199	48.30
Master/ PhD	3	0.73
Academic performance		
Excellent	50	12.14
Good	246	59.71
Fair	116	28.16
Monthly personal income		
≤RM100	47	11.41
RM101–RM200	45	10.92
RM201–RM300	66	16.02
RM301–RM400	116	28.16
≥RM401	138	33.50
Father's educational level		
Primary	89	21.60
Secondary	234	56.80
Tertiary	89	21.60
Mother's educational level		
Primary	63	15.29
Secondary	263	63.83
Tertiary	86	20.87
Parents' marital status		
Married	375	91.02
Divorced/widowed	37	8.98
BMI		
Obese/overweight	22	5.34
Non-obese/non-overweight	390	94.66

Approximately 0.73 percent, 11.65 percent, 18.69 percent, 19.9 percent and 48.3 percent of the respondents were in pre-university, Year 1, Year 2, Year 3, Year 4, and Master or PhD degree, correspondingly. About 12.14 percent of the respondents self-rated their academic performance as excellent, 59.71 percent with good academic performance, and 28.16 percent with fair academic performance. The monthly personal income of the respondents was broken down into 11.41 percent RM100 and below, 10.92 percent RM101 to RM200, 16.02 percent RM201 to RM300, 28.16 percent RM301 to RM400, and 33.5 percent RM401 and above. A large proportion of the respondents' fathers' education level was secondary education (56.8 percent), followed by primary and tertiary education (21.60 percent). More than half of the respondents' mothers had secondary education (63.83 percent), and only a small proportion had primary education (15.29 percent). Nearly all the respondents' parents were married (91.2 percent). Most of the respondents were non-obese or non-overweight (94.66 percent).

On average, respondents rated each item in the peer influence component with 3–4 points, amounting to a total score of 17.20. The item with the highest point was 'I will try a specific fast food that my friends recommend.' The overall score for knowledge of fast food was high (22.09) as the respondents gave each item around 4–5 points. The average value of the lifestyle component was 19.07 points, with 'I keep away from cigarettes and other tobacco products' having the highest score (4.71) while 'I sleep at least 8 hours per day' having the lowest score (2.86). The component of mental health had a total score of 20.89 with the respondents rating 3–4 points for each item (Table 2).

Table 2

Summary of Peer, Knowledge, Lifestyle and Mental Health Factors Influencing Student Fast Food Consumption (n = 412)

Characteristics	Mean	Standard Deviation
Peer influence		
My close friends consume fast food frequently.	3.54	0.926
My friends often choose fast food when dining together.	3.18	1.046
My friends influence my food choice.	3.34	1.116
I will try a specific fast food that my friends recommend.	3.83	0.829
Sometimes I eat fast food to cater to my friends.	3.31	1.025
Total	17.20	3.331
Knowledge about fast food		
I think fast food is not good for health.	4.29	0.793
I know fast food is often nutritionally poor and high in calories.	4.42	0.699
I know fast food can cause heart disease, diabetes, high blood pressure, and obesity.	4.50	0.667
I know that fast food contains additives and preservatives.	4.44	0.679
I know that excessive consumption of fast food can lead to nutrient deficiencies.	4.44	0.696
Total	22.09	3.043
Lifestyle		

In the past 7 days, I have engaged in physical activities or exercise.	3.33	1.218
I avoid alcohol and drugs.	4.55	0.846
I stay away from cigarettes and other tobacco products.	4.71	0.646
I think my dietary habit is healthy.	3.62	0.953
I sleep at least 8 hours per day.	2.86	1.233
Total	19.07	2.941
Mental Health		
I think my mental health is healthy.	3.83	0.828
I do not suffer from depressive symptoms.	3.81	0.855
I do not suffer from stress.	3.03	1.116
I do not suffer from anxiety.	3.32	1.029
I do not suffer from poor sleep quality.	3.44	1.051
I do not get frustrated easily and feel down.	3.46	0.984
Total	20.89	4.643

The respondents with the age of 21 years had lower odds of consuming fast food compared to those aged 20 years and below (OR: 0.433). Males were 2.321 times as likely to consume fast food as females. For Malays, Indians and other ethnicities, the ORs of consuming fast food were 3.132, 2.285, and 5.005, respectively, given Chinese as the reference group. For respondents who self-rated their academic performance as good and fair, their odds of consuming fast food were 2.171 and 2.630 times higher, respectively, than those who self-rated their academic performance as excellent. The ORs of consuming fast food among the respondents with personal incomes of RM301–RM400, and RM401 and above were 3.844 and 4.145, respectively, when compared with those having personal incomes of RM100 and below. Every one unit increase in peer influence was associated with 1.162 times increases in the odds of fast food consumption. In contrast, an additional unit of lifestyle was associated with 0.812 time decrease in the odds of fast food consumption (Table 3). Of note, all the independent variables had VIFs of less than 10, meaning that multicollinearity problem did not exist (Table 4).

Table 3

Results of the Ordered Logistic Regression Analysis of Students' Fast Food Consumption

Variables	Estimated Coefficient	Standard Error	Odds Ratio	95% CI	p-value
Age (years)					
≤20	Ref.	-	1.000	-	-
21	-0.837	0.395	0.433	0.200, 0.939	0.034
22	-0.501	0.367	0.606	0.295, 1.245	0.172
23	-0.255	0.311	0.775	0.421, 1.426	0.413
≥24	-0.358	0.406	0.699	0.316, 1.549	0.378
Gender					
Female	Ref.	-	1.000	-	-
Male	0.842	0.241	2.321	1.449, 3.719	<0.001
Ethnicity					
Chinese	Ref.	-	1.000	-	-

Malay	1.142	0.253	3.132	1.909, 5.138	<0.001
Indian	0.826	0.376	2.285	1.094, 4.770	0.028
Others	1.610	0.586	5.005	1.586, 5.797	0.006
Monthly family income					
B40 (≤RM4,851)	Ref.	-	1.000	-	-
M40 (RM4,851–RM10,960)	0.028	0.237	1.029	0.588, 1.800	0.921
T20 (≥ RM10,960)	0.017	0.382	1.018	0.360, 2.878	0.974
Academic performance					
Excellent	Ref.	-	1.000	-	-
Good	0.775	0.888	2.171	1.107, 4.258	0.024
Fair	0.967	1.224	2.630	1.235, 5.600	0.012
Monthly personal income					
≤RM100	Ref.	-	1.000	-	-
RM101–RM200	0.124	0.460	1.131	0.460, 2.786	0.788
RM201–RM300	0.579	0.422	1.785	0.781, 4.078	0.169
RM301- RM400	1.347	0.383	3.844	1.814, 8.147	<0.001
≥RM401	1.422	0.379	4.145	1.972, 8.714	<0.001
Father's educational level					
Primary	Ref.	-	1.000	-	-
Secondary	-0.290	0.304	0.749	0.412, 1.359	0.341
Tertiary	-0.433	0.431	0.649	0.279, 1.511	0.361
Mother's educational level					
Primary	Ref.	-	1.000	-	-
Secondary	-0.532	0.335	0.587	0.304, 1.133	0.113
Tertiary	-0.664	0.478	0.515	0.202, 1.315	0.165
Parents' marital status					
Married	Ref.	-	1.000	-	-
Divorced/widowed	-0.524	0.392	0.592	0.275, 1.276	0.181
BMI					
Obese/overweight	Ref.	-	1.000	-	-
Non-obese/non-overweight	0.396	0.497	1.485	0.561, 3.932	0.426
Peer influence	0.150	0.033	1.162	1.089, 1.241	<0.001
Knowledge about fast food	0.018	0.037	1.018	0.946, 1.095	0.633
Lifestyle	-0.207	0.042	0.812	0.749, 0.882	<0.001
Mental health	-0.019	0.025	0.982	0.934, 1.032	0.462

Table 4

VIF test for all the independent variables

Variables	VIF	1/VIF
Age		
≤20	Ref.	-
21	1.64	0.61
22	1.84	0.54
23	2.35	0.43

≥24	1.74	0.58
Gender		
Female	Ref.	-
Male	1.18	0.85
Ethnicity		
Chinese	Ref.	-
Malay	1.42	0.70
Indian	1.21	0.83
Others	1.14	0.88
Monthly family income		
B40 (≤RM4,851)	Ref.	-
M40 (RM4,851–RM10,960)	1.20	0.83
T20 (≥RM10,960)	1.29	0.77
Academic performance		
Excellent	Ref.	-
Good	2.55	0.39
Fair	2.71	0.37
Monthly personal Income		
≤RM100	Ref.	-
RM101–RM200	1.86	0.54
RM201–RM300	2.18	0.46
RM301–RM400	2.71	0.37
≥RM401	2.83	0.35
Father's educational level		
Primary	Ref.	-
Secondary	2.23	0.45
Tertiary	2.93	0.34
Mother's educational level		
Primary	Ref.	-
Secondary	2.58	0.39
Tertiary	3.54	0.28
Parents' marital status		
Married	Ref.	-
Divorced/widowed	1.05	0.95
BMI		
Obese/overweight	Ref.	-
Non-obese/overweight	1.11	0.90
Peer influence	1.10	0.91
Knowledge about fast food	1.25	0.80
Lifestyle	1.37	0.73
Mental health	1.28	0.78

6.0 DISCUSSION

Considering the harmful effects of fast food, the present study using rigorous methodological approaches throws light on the factors associated with fast food consumption within a sample of public university students in Malaysia. The finding showed that the relationship between age and fast food consumption was weak as most of the age categories had no significant impact on fast food consumption. This is consistent with the findings from previous studies that showed no significant association between age and fast food consumption (Joseph et al., 2015; Oladimeji et al., 2017; Mir et al., 2022; Mumena et al., 2022). University students of different ages may have diverse preferences for fast food; thus, age alone may not be adequate for capturing the factors that contribute to fast food intake (Kipke et al., 2007; Briawan et al., 2023).

As anticipated, there was a significant relationship between gender and fast food consumption. More specifically, male students consumed more fast food than female students and this finding corresponds with the results from past studies (Li et al., 2020; Rajini et al., 2021; Didarloo et al., 2022). This is perhaps because most females are likely to monitor their bodyweight (Driskell et al., 2006), whereas males rely on energy-dense food to meet their daily energy requirements (Jayasinghe & De Silva, 2014). Moreover, compared to males, females tend to have higher preference for healthy diets and are more likely to indulge in healthy dietary lifestyles (Beardsworth et al., 2002; Malinauskas et al., 2006; Bellows et al., 2010; Skoyen et al., 2018).

Consistent with our expectation, ethnicity was a determining factor of fast food consumption. Malays, Indians and students of other ethnic groups were found to be more likely to consume fast food than Chinese students. This is in agreement with findings from previous studies (Abdullah et al., 2015; Cheong et al., 2021). Traditional Chinese childcare approaches may be the explanation (Zhou et al., 2015). For health reasons, most Chinese parents have a high tendency to limit unhealthy meals and encourage balanced food intake among their children.

Family income had no significant relationship with fast food consumption. This finding is consistent with that of a previous study (Mir et al., 2022). University students often gain some degrees of financial independence, which may include financial aid that allows them to make independent food choices, regardless of their family income (Bruening et al., 2017). As a result, income has no significant effect on the decisions of students to consume fast food (Mir et al., 2022). With the availability of longitudinal data, examining the causality between income and fast food intake can be a direction for future research.

In the present study, a significant relationship existed between academic performance and fast food consumption. Students with higher academic performance were less likely to engage in fast food eating than those with poorer academic performance. Past studies, using different datasets, shared similar results (Al-Haifi et al., 2023; Reuter et al., 2020). According to the Grossman's argument, education is able to improve health through consumption of healthy food (Grossman, 1972). Therefore, students with a strong educational background may be more aware of the negative health consequences of fast food and consequently avoid excessive fast food consumption.

Finding from the present study showed that personal income was positively associated with fast food consumption. This outcome supports the evidence of prior studies, which indicated that higher income led to a greater amount of fast food consumption (Arslan et al., 2023). Consumer theory can be applied

to explain this phenomenon. As students' income increases, their budget constraints increase as well; thus, they are able to purchase more convenience snacks, such as fast food. However, this finding may seem to contradict Grossman's argument that increasing income enhances the benefits gained from healthy days (Grossman, 1972).

There was no significant relationship between parental education levels and fast food consumption among UUM students. This finding is in contrast to the previous studies' findings, which showed parental education levels to be significant in determining students' fast food consumption behaviours (Didarloo et al., 2022; Arslan et al., 2023). The fact of the matter is that while well-educated parents may recognise the importance of healthy eating, they do not think that it is important to limit their kids' fast food intake (Mott Poll Report, 2017).

The result showed that no significant relationship existed between parental marital status and fast food consumption. This finding lends support to the findings from the study by Mumena et al. (2022). Also, there was no significant relationship between BMI and fast food consumption, which is in line with previous studies' results (Jayasinghe & De Silva, 2014; Joseph et al., 2015; Shaban & Alkazemi, 2019; Scully et al., 2020; Cheong et al., 2021; Mwafi et al., 2021).

As expected, peers appeared to be one of the influential factors in the students' fast food consumption and this finding is consistent with the evidence of previous studies (Seo et al., 2011; Al-sheyab et al., 2018). As pointed out by Chakraborty (2023), university students often devoted themselves to the cultural norms of their peer groups. It is obvious that students are involved in many social activities with their peers (Lam et al., 2014); thus, they have a high tendency to spend on soft drinks and fast food (Jensen et al., 2012; Li et al., 2017).

Although knowledge about fast food was an insignificant variable, lifestyle played an important role in influencing students' fast food consumption. This finding is consistent with those of previous study (Bondoc et al., 2019; Jacob et al., 2020; Scully et al., 2020; Mwafi et al., 2021; Arslan et al., 2023; Stager et al., 2023; Elbarazi et al., 2023). Students with healthy lifestyles were less likely to consume fast food than those with unhealthy lifestyles. Since students with healthy lifestyles have better health awareness compared to their peers with unhealthly lifestyles, they are more concerned with the quality of the food that they consume (Commetric, 2019). As pointed out by Grossman (1972), health conscious individuals tended to invest in their health capital by making decisions that could improve their overall well-being.

The present study has several limitations. Firstly, due to recall bias, respondents may report wrong information about their fast food consumption. Secondly, cross-sectional data do not allow for causalities. Thirdly, the number of surveyed respondents is not large due to time and budget constraints. The data may not be representative as well due to non-probabilistic sampling. Fourthly, only undergraduate and postgraduate students from one university were surveyed; thus, findings from the present study may not be generalisable to the entire university student population in Malaysia. Despite these limitations, the present study has numerous strengths. The present study contributes to the existing literature by providing new findings related to factors influencing fast food consumption among university students in Malaysia. In addition, the population of interest of the present study is university students, who are heavily exposed to unhealthy eating patterns. Thereby, the present study's findings

are beneficial to developing a better nutritional policy that enhances the nutritional condition of university students.

7.0 CONCLUSION

The present study found that gender, ethnicity, academic performance, peer influence and lifestyles were associated with fast food consumption, suggesting that UUM should develop programmes aimed at reducing fast food consumption among students of different demographic and environmental backgrounds. These programmes could serve as interventions to promote healthier eating habits and encourage students to avoid fast food consumption. They should be carried out in each semester in order to create a sustained impact and provide students with continuous opportunities to make healthier food choices. Additionally, students who have excellent academic performance and healthy lifestyles are urged to share their knowledge and healthy consumption behaviours with their friends, thereby leading to a reduction in the prevalence of fast food consumption among students in UUM.

UUM could also introduce a scheme to subsidise healthy food in the campus. Subsidising nutritious food can contribute to promoting healthy eating habits among students and may be cost-effective in the long run. UUM can also provide low-income students with discount coupons or vouchers for healthy food. Furthermore, the government can collaborate with UUM on offering incentives for students who indulge in healthy dietary lifestyles. These actions are in response to the economic challenges faced by students with limited financial resources, making healthier options more accessible and affordable. Additionally, health awareness campaigns should be held frequently in UUM. In the campaigns, health professionls, such as physicians, public health lecturers and registered nurses from various ethnic backgrounds can be invited to give multilingual health-related talks. The main purpose is to improve students' knowledge about the adverse effects of unhealthy lifestyles on health and academic performance. Moreover, UUM is suggested to take concerted action to reduce the availability of fast food in the campus, so that the students' tendencies to purchase fast food can be lowered.

8.0 CONFLICT OF INTEREST

The authors have no competing interests to declare.

9.0 ACKNOWLEDGEMENT

The authors are grateful to the respondents who took time to participate in the survey.

10.0 REFERENCE

Abdullah, N. F., Teo, P. S., & Foo, L. H. (2016). Ethnic differences in the food intake patterns and its associated factors of adolescents in Kelantan, Malaysia. *Nutrients, 8*(9), 551. https://doi.org/10.3390/nu8090551

Abdullah, N. N., Mokhtar, M. M., Abu Bakar, M. H., & Al-Kubaisy, W. (2015). Trend on fast food consumption in relation to obesity among Selangor urban community. *Procedia - Social and Behavioral Sciences, 202*, 505-513. https://doi.org/10.1016/j.sbspro.2015.08.189

Al-Haifi, A. R., Al-Awadhi, B. A., Bumaryoum, N.Y., Alajmi, F. A., Ashkanani, R. H., & Al-Hazzaa, H. M. (2023). The association between academic performance indicators and lifestyle behaviors among Kuwaiti college students. *Journal of Health, Population and Nutrition, 42*, 27. https://doi.org/10.1186/s41043-023-00370-w

Al-Otaibi, H., & Basuny, A. (2015). Fast food consumption associated with obesity/overweight risk among university female student in Saudi Arabia. *Pakistan Journal of Nutrition, 14*(8), 511-516. http://dx.doi.org/10.3923/pjn.2015.511.516

Al-Sheyab, N. A., Gharaibeh, T., & Kheirallah, K. (2018). Relationship between peer pressure and risk of eating disorders among adolescents in Jordan. *Journal of Obesity*, 7309878. https://doi.org/10.1155/2018/7309878

Almogbel, E., Aladhadh, A. M., Almotyri, B. H., Alhumaid, A. F., & Rasheed, N. (2019). Stress associated alterations in dietary behaviours of under graduate students of Qassim University, Saudi Arabia. *Open Access Macedonian Journal of Medical Sciences, 7*(13), 2182-2188. https://doi.org/10.3889/oamjms.2019.571

Arslan, N., Ceylan, J. A., & Hatipoğlu, A. (2023). The relationship of fast food consumption with sociodemographic factors, body mass index and dietary habits among university students. *Nutrition & Food Science*, *53*(1), 112-123. https://doi.org/10.1108/NFS-01-2022-0003

Ashakiran, S., & Deepthi, R. (2012). Fast foods and their impact on health. *Journal of Krishna Institute of Medical Science University, 1*(2), 7-15. http://www.jkimsu.com/jkimsu-vol1no2/jkimsu-vol1no2-RA-1-7-15.pdf

Askari Majabadi, H., Solhi, M., Montazeri, A., Shojaeizadeh, D., Nejat, S., Khalajabadi Farahani, F., & Djazayeri, A. (2016). Factors influencing fast-food consumption among adolescents in Tehran: a qualitative study. *Iranian Red Crescent Medical Journal, 18*(3), e23890. https://doi.org/10.5812/ircmj.23890

BBC News. (2016). One in six young people eat fast food 'twice a day'. *BBC News.* Retrived from https://www.bbc.com/news/health-37511554

Beardsworth, A., Bryman, A., Keil, T., Goode, J., Haslam, C., & Lancashire, E. (2002). Women, men and food: the significance of gender for nutritional attitudes and choices. *British Food Journal, 104*(7), 470-491. https://doi.org/10.1108/00070700210418767

Bellows, A. C., Alcaraz, V. G., & Hallman, W. K. (2010). Gender and food, a study of attitudes in the USA towards organic, local, U.S. grown, and GM-free foods. *Appetite, 55*(3), 540-550. https://doi.org/10.1016/j.appet.2010.09.002

Bernama. (2023). 73 peratus kematian di Malaysia disebabkan NCD. *Bernama.* Retrived from https://www.astroawani.com/berita-malaysia/73-peratus-kematian-di-malaysia-disebabkan-ncd-436452

Bipasha, M. S., & Goon, S. (2014). Fast food preferences and food habits among students of private universities in Bangladesh. *Southeast Asia Journal of Public Health, 3*(1), 61-64. https://doi.org/10.3329/seajph.v3i1.17713

Bondoc, A. F., Florendo, H. F., Taguiwalo, E. J., & Eustaquio, J. (2019). Life in the fast food lane: understanding the factors affecting fast food consumption among students in the Philippines. *The Philippine Statistician, 68*(1), 75-101. https://www.psai.ph/docs/publications/tps/tps_2019_68_1_5.pdf

Bruening, M., Argo, K., Payne-Sturges, D., & Laska, M. N. (2017). The struggle is real: a systematic review of food insecurity on postsecondary education campuses. *Journal of the Academy of Nutrition and Dietetics, 117*(11), 1767-1791. https://doi.org/10.1016/j.jand.2017.05.022

Briawan, D., Khomsan, A., Alfiah, E., Nasution, Z., & Putri, P. A. (2023). Preference for and consumption of traditional and fast foods among adolescents in Indonesia. *Food Research, 7*(4), 211-226. https://doi.org/10.26656/fr.2017.7(4).156

Chakraborty, A. (2023). Social conformity among peer groups in educational institutions. *International Journal of Multidisciplinary Innovative Research, 3*(3), 17-29. https://ijmir.org/doc/Vol-3-No-3-2023/3_IJMIR_Vol%203%20No%203_July%202023.pdf

Cheah, Y. K., Lim, K. K., Ismail, H., Salleh, R., Kee, C. C., & Lim, K. H. (2023). Knowledge of calories and its influencing factors: evidence from a fast-growing developing country. *British Food Journal*, *125*(4), 1300–1316. https://doi.org/10.1108/BFJ-01-2022-0002

Cheah, Y. K., & Yip, C. Y. (2017). Factors determining the use of nutrition labels: the case of Malaysia. *Journal of Foodservice Business Research*, *20*(5), 557-567. http://dx.doi.org/10.1080/15378020.2016.1222745

Cheong, S. M., Lim, K. H., Chan, Y. Y., Kee, C. C., Lim, K. K., The, C. H., Baharudin, A., & Nur Shahida, A. A. (2021). Is fast-food consumption a problem among adolescents in Malaysia? An analysis of the National School-Based Nutrition Survey, 2012. *Journal of Health, Population and Nutrition, 40*, 31. https://doi.org/10.1186/s41043-021-00254-x

Chiolero, A., Wietlisbach, V., Ruffieux, C., Paccaud, F., & Cornuz, J. (2006). Clustering of risk behaviors with cigarette consumption: a population-based survey. *Preventive Medicine, 42*(5), 348-353. https://doi.org/10.1016/j.ypmed.2006.01.011

Commetric. (2019). Fast Food in the Media: The Rise of the Health-Conscious Consumer. *Commetric*. Retrived from https://commetric.com/2019/01/04/fast-food-in-the-media-the-rise-of-the-health-conscious-consumer/.

Darling, H., Reeder, A. I., Mc Gee, R., & Williams, S. (2006). Brief report: Disposable income, and spending on fast food, alcohol, cigarettes, and gambling by New Zealand secondary school students. *Elsevier, 29*(5), 837-843. https://doi.org/10.1016/j.adolescence.2006.06.003

Devereux, G. (2006). The increase in the prevalence of asthma and allergy: food for thought. *Nature Reviews Immunology, 6*, 869-874. https://doi.org/10.1038/nri1958.

Didarloo, A., Khalili, S., Aghapour, A. A., Moghaddam-Tabrizi, F., & Mousavi, S. M. (2022). Determining intention, fast food consumption and their related factors among university students by using a behavior change theory. *BMC Public Health, 22*, 314. https://doi.org/10.1186/s12889-022-12696-x.

Dowarah, L. J., Bhowmick, D. R., & Chakraborty, S. (2020). Fast Food Consumption Behaviour among College Students- A Case Study in Tinsukia. *Current Research in Nutrition and Food Science, 8*(2), 371-379. http://dx.doi.org/10.12944/CRNFSJ.8.2.02.

Driskell, J. A., Meckna, B. R., & Scales, N. E. (2006). Differences exist in the eating habits of university men and women at fast-food restaurants. *Nutrition Research, 26*(10), 524-530. https://doi.org/10.1016/j.nutres.2006.09.003

Elbarazi, A. S., & Tikamdas, R. (2023). Association between university student junk food consumption and mental health. *Nutrition and Health.* https://doi.org/10.1177/02601060231151480

Fernández-Alvira, J. M., Mouratidou, T., Bammann, K., Hebestreit, A., Barba, G., Sieri, S., Reisch, L., Eiben, G., Hadjigeorgiou, C., Kovacs, E., Huybrechts, I., & Moreno, L. A. (2013). Parental education and frequency of food consumption in European children: the IDEFICS study. *Public Health Nutrition, 6*(3), 487-498. http://dx.doi.org/10.1017/S136898001200290X

Grajek, M., Krupa-Kotara, K., Białek-Dratwa, A., Staśkiewicz, W., Rozmiarek, M., Misterska, E., & Sas-Nowosielski, K. (2022). Prevalence of emotional eating in groups of students with varied diets and physical activity in Poland. *Nutrients. 14*(16), 3289. https://doi.org/10.3390/nu14163289

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy, 80*(2), 223-255. https://www.jstor.org/stable/1830580

Institute for Public Health. (2022). *Technical Report National Health and Morbidity Survey (NHMS) 2022: Adolescent Health Survey, Malaysia*. Shah Alam: Institute for Public Health.

Jacob, L., Stubbs, B., Firth, J., Lee, S., Haro, J. M., & Koyanagi, A. (2020). Fast food consumption and suicide attempts among adolescents aged 12–15 years from 32 countries. *Journal of Affective Disorders, 266*, 63-70. https://doi.org/10.1016/j.jad.2020.01.130

Jayasinghe, J. M., & De Silva, L. P. U. (2014). Fast food consumption and health status of students of a university in Sri Lanka. *Journal of Food and Agriculture, 7*(1-2), 38-50. http://dx.doi.org/10.4038/jfa.v7i1-2.5192

Jensen, J. D., Bere, E., De Bourdeaudhuij, I., Jan, N., Maes, L., Manios, Y., Martens, M. K., Molnar, D., Moreno, L. A., Singh, A. S., Velde, S., & Brug, J. (2012). Micro-level economic factors and incentives in Children's energy balance related behaviours - findings from the ENERGY European cross-section questionnaire survey. *International Journal of Behavioral Nutrition and Physical Activity, 9*, 136. https://doi.org/10.1186/1479-5868-9-136

Jia, S. S., Wardak, S., Raeside, R., & Partridge, S. R. (2022). The impacts of junk food on health. *Frontiers for Young Minds*, *10*, 694523. https://kids.frontiersin.org/articles/10.3389/frym.2022.694523

Joseph, N., Nelliyanil, M., Rai, S., Raghavendra Babu, Y.P., Kotian, S. M., Ghosh, T., & Singh, M. (2015). Fast food consumption pattern and its association with overweight among high school boys in Mangalore city of Southern India. *Journal of Clinical & Diagnostic Research, 9*(5), LC13-LC17. https://doi.org/10.7860/jcdr/2015/13103.5969

Kipke, M. D., Iverson, E., Moore, D., Booker, C., Ruelas, V., Peters, A. L., & Kaufman, F. (2007). Food and Park Environments: Neighborhood-level Risks for Childhood Obesity in East Los Angeles. *Journal of Adolescent Health, 40*(4), 325-333. https://doi.org/10.1016/j.jadohealth.2006.10.021

Knutson, B. J. (2000). College students and fast food –: how students perceive restaurant brands. *Cornell Hotel and Restaurant Administration Quarterly, 41*(3), 68-74. https://doi.org/10.1177/001088040004100318

Kolodinsky, J., Harvey-Berino, J. R., Berlin, L., Johnson, R. K., & Reynolds, T. W. (2007). Knowledge of current dietary guidelines and food choice by college students: better eaters have higher knowledge of dietary guidance. *Journal of the American Dietetic Association, 107*(8), 1409-1413. https://doi.org/10.1016/j.jada.2007.05.016

Kruger, A., Reither, E., Peppard, P., Krueger, P., & Hale, L. (2014). Do sleep-deprived adolescents make less-healthy food choices? *British Journal of Nutrition, 111*(10), 1898-1904. https://doi.org/10.1017/S0007114514000130

Laitinen, S., Räsänen, L., Viikari, J., & Åkerblom, H. K. (1995). Diet of finnish children in relation to the family's socio-economic status. *Scandinavian Journal of Social Medicine, 23*(2), 88-94. http://www.jstor.org/stable/45140923

Lam, C. B., Mc Hale, S. M., & Crouter, A. C. (2014). Time with peers from middle childhood to late adolescence: developmental course and adjustment correlates. *Child Development, 85*(4), 1677-1693. https://doi.org/10.1111/cdev.12235

Li, L., Sun, N., Zhang, L., Xu, G., Liu, J., Hu, J., Zhang, Z., Lou, J., Deng, H., Shen, Z., & Han, L. (2020). Fast food consumption among young adolescents aged 12-15 years in 54 low- and middle-income countries. *Global Health Action*, *13*, 1795438. https://doi.org/10.1080/16549716.2020.1795438

Li, M., Xue, H., Jia, P., Zhao, Y., Wang, Z., Xu, F., & Wang, Y. (2017). Pocket money, eating behaviors, and weight status among chinese children: the childhood obesity study in China mega-cities. *Preventive Medicine, 100*, 208-215. https://doi.org/10.1016/j.ypmed.2017.04.031

Mahabir, S. (2012). Association between diet during preadolescence and adolescence and risk for breast cancer during adulthood. *Journal of Adolescence Health, 52*(5), 30-35. https://doi.org/10.1016/j.jadohealth.2012.08.008

Malinauskas, B. M., Raedeke, T. D., Aeby, V. G., Smith, J. L., & Dallas, M. B. (2006). Dieting practices, weight perceptions, and body composition: A comparison of normal weight, overweight, and obese college females. *Nutrition Journal, 5*, 11. https://doi.org/10.1186/1475-2891-5-11

Mir, O. M., Khan, O. F., & Sheikh, B. A. (2022). Consumption Pattern of Fast Food among university students in Kashmir. *Current Research in Interdisciplinary Studies, 1*(1), 22-36. https://www.jpub.org/journal-admin/uploads/articles/cris114.pdf

Moradi, M., Mozaffari, H., Askari, M., & Azadbakht, L. (2022). Association between overweight/obesity with depression, anxiety, low self-esteem, and body dissatisfaction in

children and adolescents: A systematic review and meta-analysis of observational studies. *Critical Reviews in Food Science and Nutrition, 62*(2), 555-570. https://doi.org/10.1080/10408398.2020.1823813

Mott Poll Report. (2017). Healthy eating for children: parents not following the recipe. *National Poll on Children's Health*. Retrieved from https://mottpoll.org/sites/default/files/documents/022017_healthyeating.pdf

Mumena, W. A., Ateek, A. A., Alamri, R. K., Alobaid, S. A., Alshallali, S. H., Afifi, S. Y., Aljohani, G. A., & Kutbi, H. A. (2022). Fast-food consumption, dietary quality, and dietary intake of adolescents in Saudi Arabia. *International Journal of Environmental Research and Public Health, 19*, 22. https://doi.org/10.3390/ijerph192215083

Muti'ah Azman, S. A., Ibrahim, M. A., & Azahari, N. (2020). Knowledge, attitude and practice on fast food consumption among normal and overweight/obese International Islamic University Malaysia Kuantan students. *International Journal of Allied Health Sciences, 4*(3), 1189-1202. https://doi.org/10.31436/ijahs.v4i3.479

Mwafi, N. R., Al-Rawashdeh, I. M., Al-Kubaisy, W. A., Ezzat, W. R., Al-Qazaqi, R. A., & Salameh, M. H. (2021). Prevalence and factors related to obesity and fast food consumption among Mutah University students, Jordan. *Journal of the Pakistan Medical Association, 71*(6), 1608-1612. http://dx.doi.org/10.47391/JPMA.274

Naveed, S., Lakka, T., & Haapala, E. A. (2020). An overview on the associations between health behaviors and brain health in children and adolescents with special reference to diet quality. *International Journal of Environment Research and Public Health, 17*, 3. https://doi.org/10.3390%2Fijerph17030953

O'Connor, D. B., Jones, F., Conner, M., McMillan, B., & Ferguson, E. (2008). Effects of daily hassles and eating style on eating behavior. *Health Psychology, 27*(1), 20-31. https://doi.org/10.1037/0278-6133.27.1.S20

Odegaard, A. O., Koh, W. P., Yuan, J. M., Gross, M. D., & Pereira, M. A. (2012). Western-style fast food intake and cardiometabolic risk in an Eastern country. *Circulation, 126*(2), 182-188. https://doi.org/10.1161/CIRCULATIONAHA.111.084004

Oladimeji, Y. U., Eze, A. C., Abdulrahman, S., & Sani, A. A. (2017). Determinants of fast-food consumption and preferences among undergraduate students of Ahmadu Bello University, Zaria, Nigeria. *FUDMA Journal of Sciences (FJS), 1*(1), 176-184. https://fjs.fudutsinma.edu.ng/index.php/fjs/article/view/1243/923

Oliver, G., Wardle, J., & Gibson, E. L. (2000). Stress and food choice: a laboratory study. *Psychosomatic Medicine, 62*(6), 853-865. https://doi.org/10.1097/00006842-200011000-00016

Onurlubaş, E., & Yilmaz, N. (2013). Fast food consumption habits of university students. *Journal of Food, Agriculture and Environment, 11*(3-4), 12-14. https://doi.org/10.1234/4.2013.4593

Park, S., Lee, Y., & Lee, J. H. (2016). Association between energy drink intake, sleep, stress, and suicidality in Korean adolescents: energy drink use in isolation or in combination with junk food consumption. *Nutrition Journal, 15*, 87. https://doi.org/10.1186/s12937-016-0204-7

Radzak, H. A., Aniza Salim, S. N., Mohamad Zaini, M. H., Md Yusoff, E. H., Mohd Rizal, M. I. Y., Zafira Azhar, A. R., Hamizah Hamidi, N. L., Jannah Suhaimi, N. R., Zafira Azhar, A. R., & Che Hashim, H. F. (2022). Fast food consumption among adults in Malaysia during Covid-19 lockdown. *The International Journal of Medicine and Sciences, 7*(1), 35-46. https://tijms.unishams.edu.my/images/pdf_file/vol7/Hazirah%202022%20v2.pdf

Raghupathi, V., & Raghupathi, W. (2020). The influence of education on health: an empirical assessment of OECD countries for the period 1995–2015. *Archives of Public Health, 78*, 20. https://doi.org/10.1186/s13690-020-00402-5

Rajini, S., Kannan, K., & Selvi, T. (2021). Factors influencing the consumption of fast food among young adults. *Journal of Pharmaceutical Research International, 33*(44A), 430-440. https://doi.org/10.9734/jpri/2021/v33i44A32635

Reuter, P. R., Forster, B. L., & Brister, S. R. (2020). The influence of eating habits on the academic performance of university students. *Journal of American College Health*, *69*(8), 921-927. https://doi.org/10.1080/07448481.2020.1715986

Romano, E., Ma, R., Vancampfort, D., Smith, L., Firth, J., Solmi, M., Veronese, N., Stubbs, B., & Koyanagi, A. (2023). The association of cannabis use with fast-food consumption, overweight, and obesity among adolescents aged 12-15 years from 28 countries. *Journal of Substance Use*, *28*(6), 952-961. https://doi.org/10.1080/14659891.2022.2114388

Saha, S., Al Mamun, M. A., & Kabir, M. R. (2022). Factors affecting fast food consumption among college students in South Asia: a systematic review. *Journal of American College of Nutrition*, *41*(6), 626-636. https://doi.org/10.1080/07315724.2021.1940354

Schroder, H., Fito, M., & Covas, M. I. (2007). Association of fast food consumption with energy intake, diet quality, body mass index and the risk of obesity in a representative Mediterranean population. *British Journal of Nutrition, 98*, 1274-1280. https://doi.org/10.1017/S0007114507781436

Scully, M., Morley, B., Niven, P., Crawford, D., Pratt, I., & Wakefield, M. (2020). Factors associated with frequent consumption of fast food among Australian secondary school students. *Public Health Nutrition, 23*(8), 1340-1349. https://doi.org/10.1017/S1368980019004208

Seo, H. S., Lee, S. K., & Nam, S. Y. (2011). Factors influencing fast food consumption behaviors of middle-school students in Seoul: an application of theory of planned behaviors. *Nutrition Research and Practice, 5*(2), 169-178. https://doi.org/10.4162/nrp.2011.5.2.169

Shaban, L., & Alkazemi, D. (2019). Trends in fast-food consumption among Kuwaiti youth. *International Journal of Preventive Medicine, 10*, 44. https://doi.org/10.4103%2Fijpvm.IJPVM_480_18

Sharma, S., Patnaik, L., Pattnaik, S., & Mohapatra, G. (2023). Study on consumption of fast food and its association with BMI among medical students in a tertiary care center of eastern India. *International Journal of Nutrition, Pharmacology, Neurological Diseases, 13*(3), 140-144. https://doi.org/10.4103/ijnpnd.ijnpnd_2_23

Sivakumar, V. (2022). Weaning students off fast food. *New Straits Times*. Retrived from https://www.nst.com.my/opinion/letters/2022/11/850717/weaning-students-fast-food

Skoyen, J. A., Rentscher, K. E., & Butler, E. A. (2018). Relationship quality and couples' unhealthy behaviors predict body mass index in women. *Journal of Social and Personal Relationships, 35*(2), 224-245. https://doi.org/10.1177/0265407516680909

Stager, L. M., Watson, C., Long, D., & Fobian, A. D. (2023). Parenting factors predicting longitudinal fast-food consumption from adolescence. *American Journal of Lifestyle Medicine*. https://doi.org/10.1177/15598276231208032

Tarantino, G., Cataldi, M., & Citro, V. (2022). Could alcohol abuse and dependence on junk foods inducing obesity and/or illicit drug use represent danger to liver in young people with altered psychological/relational spheres or emotional problems? *International Journal of Molecular Sciences, 23*, 18. https://doi.org/10.3390%2Fijms231810406

The Barbecue Lab. (2023). Fast Food Statistics. Retrieved from https://thebarbecuelab.com/fast-food/

The Star. (2020). Danger of pre-existing conditions. *The Star.* Retrieved from https://www.thestar.com.my/news/nation/2020/04/30/danger-of-pre-existing-conditions

Vereecken, C. A., Keukelier, E., & Maes, L. (2004). Influence of mother's educational level on food parenting practices and food habits of young children. *Appetite 43*(1), 93-103. https://doi.org/10.1016/j.appet.2004.04.002

World Health Organization. (WHO). (2023). Noncommunicable diseases. Retrieved from https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

Xu, H., Wu, X., Wan, Y., Zhang, S., Yang, R., Wang, W., Zeng, H., Geng, M., Dou, L., Zhang, G., Xu, H., & Tao, F. (2020). Interaction effects of co-consumption of fast food and sugar-sweetened beverages on psychological symptoms: Evidence from a nationwide survey among Chinese adolescents. *Journal of Affective Disorders, 276*, 104-111. https://doi.org/10.1016/j.jad.2020.07.030

Zhou, N., Cheah, C. S. L., Van Hook, J., Thompson, D. A., & Jones, S. S. (2015). A cultural understanding of Chinese immigrant mothers' feeding practices. A qualitative study. *Appetite, 87*, 160-167. https://doi.org/10.1016/j.appet.2014.12.215