

Knowledge, Attitude and Practice of Breakfast Consumption among Health Sciences and Non-Health Sciences Students of International Islamic University Malaysia (IIUM)

Siti Zalifah Zahri¹, Nuraniza Azahari,^{1,2*}

¹Department of Nutrition Sciences, Kulliyah of Allied Health Sciences, International Islamic University Malaysia, Pahang, Malaysia

²Food Security and Public Health Nutrition Research Group (FOSTER), Kulliyah of Allied Health Sciences, International Islamic University Malaysia, Pahang, Malaysia

ABSTRACT

Background: Regular breakfast consumption is recommended as part of a healthy lifestyle, as it helps individuals meet their nutritional needs and benefits their mental health, emotional well-being, and positive social interactions. However, the prevalence of breakfast consumption remains low among university students. Therefore, this study aims to assess knowledge, attitude, and practice (KAP) levels regarding breakfast consumption among health sciences and non-health sciences students at the International Islamic University Malaysia (IIUM). **Methods:** A convenience sampling method was used to recruit 382 on-campus undergraduate participants, with 191 health sciences students from the Kuantan campus and 191 non-health sciences students from the Kuantan, Gombak, and Pagoh campuses. An online questionnaire was distributed, comprising four sections: sociodemographic information, knowledge, attitude, and practice related to breakfast consumption. **Results:** The results showed that while 66% of IIUM students had a high level of knowledge about breakfast consumption, 92% had only moderate attitudes toward it, and 84% displayed moderate breakfast practice. Health sciences students exhibited significantly higher knowledge levels compared to non-health sciences students. No significant differences were found between knowledge and practice. Notably, significant associations were identified between knowledge and attitude, and between attitude and practice concerning breakfast consumption. **Conclusion:** These findings indicate a need for universities to implement educational programs and interventions to promote regular breakfast consumption and healthier eating patterns among students.

Keywords:

breakfast consumption; knowledge; attitude; practice; health sciences

INTRODUCTION

Breakfast is the first meal consumed upon waking from an overnight fast and it is widely recognised as a basis of daily nutrition. This mealtime pattern is closely related to maintaining good and healthy eating habits, improving nutritional value, and supporting cognitive growth (Christensen et al., 2019; Ishida et al., 2020; Yao et al., 2019). In the broader context of establishing a healthy lifestyle, regular breakfast consumption is not merely a dietary suggestion but a strategic response to the rising worldwide challenge of obesity. This widespread health problem which affects not only Malaysia but the entire world, needs thoughtful and educated dietary choices. Many studies have highlighted the importance of breakfast concerning cognitive function and academic performance among students. For instance, Hoyland et al. (2009) reported that students who skipped breakfast faced difficulties in memory tests and demonstrated poorer performance in attention tasks in the morning.

Despite its importance, the number of university students with poor nutritional quality of breakfast is concerning due to poor eating habits. A recent study revealed that approximately 31.8% of Malaysian university students skip breakfast regularly (Jayaveloo et al., 2021). Factors such as time constraints, lack of nutritional knowledge, socioeconomic conditions, and academic pressures have been identified as major contributors to this trend (Lazzeri et al., 2016; Okada et al., 2019; Badrasawi et al., 2021). The growing concern over unhealthy breakfast habits underscores the need for a greater understanding of knowledge, attitude, and practice (KAP) towards breakfast consumption among university students.

Numerous studies have examined the impact of breakfast consumption on academic performance, the factors leading to breakfast skipping, and the relationship between breakfast consumption, snacking behaviour, and BMI. However, limited studies have examined the KAP of breakfast consumption across different academic backgrounds. Assessing these parameters is needed as it would help to identify whether health sciences students, who are generally more exposed to nutrition education, may demonstrate different breakfast habits compared to non-health sciences students.

* Corresponding author.

E-mail address: nuraniza@iium.edu.my

This study aims to fill this gap by assessing the KAP of breakfast consumption among health sciences and non-health sciences students at IIUM. By exploring the potential differences between these two groups, the results will deepen our knowledge of how various academic backgrounds influence breakfast consumption. It can also provide university authorities with insightful information about how to provide nutritional education to promote healthier breakfast consumption patterns to meet the student's individual needs. Therefore, this study was conducted to assess the KAP of breakfast consumption among health sciences and non-health sciences students of IIUM that could positively impact not only the students' academic performance but also their overall health.

MATERIALS AND METHODS

Study Population

This study focused on undergraduate students from both health sciences and non-health sciences courses from Kuantan, Gombak and Pagoh campuses. The Kuantan campus had the most health sciences students, majoring in allied health sciences, dentistry, medicine, nursing, and pharmacy, while a smaller group of non-health sciences students at the Kuantan campus majored in science. In contrast, the Gombak and Pagoh campuses had the most non-health sciences students. Students from the Gombak campus study non-health sciences courses such as architecture, economics, education, engineering, information and communication technology, and human science. Meanwhile, the Pagoh campus students only study language management courses.

Sampling Method

This study employed a convenience sampling method for its practicality across three campuses, allowing access to willing participants and accommodating the diversity of students. The inclusion criteria focused on on-campus undergraduate students who were healthy.

Sample Size Calculation

The sample size was determined based on Krenjcie & Morgan's table (1970). The total student population across the three campuses of IIUM was 24,582, with 19,382 students in Gombak, 3,566 students in Kuantan, and 1,634 students in Pagoh. For the calculation, the population size was rounded up to 30,000. The sample size recommended was 379 participants. However, data collection yielded a final sample size of 382 participants.

Questionnaires and Data Collection

A validated KAP survey by Jayaveloo et al. (2021) was used to conduct this study. This questionnaire consisted of four sections, including sociodemographic information, breakfast consumption patterns, KAP, and barriers related to breakfast consumption. However, to fit the objectives of this study, only two sections of this questionnaire were utilized: the sociodemographic part and the KAP part. For the KAP part, there were thirteen knowledge questions, ten attitude questions, and eleven practice questions in this questionnaire. The researchers had already validated the KAP sections in this questionnaire, with the values for the Cronbach alphas for the KAP being 0.722, 0.705, and 0.784, respectively. These alpha values were considered acceptable, indicating the reliability of the questionnaires.

Sociodemographic Questionnaire

The first part of this section comprises questions asking about personal details. It includes gender (female or male), age, Kulliyah, year of study (1, 2, 3, 4 and 5), marital status (single or married), daily budgets on food (in RM), monthly allowance (in RM), and scholarship (self-sponsored, JPA, MARA, PTPTN, and others).

KAP of Breakfast Consumption

The KAP part comprised three sections. The knowledge section contains thirteen questions using multiple-choice (True, Not Sure and False). The scoring for this question was assigned with zero for incorrect, one for uncertain and two for correct answers. The attitude section consists of ten questions rated on a five-point Likert scale (Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree). Scoring assigned four marks for the most ideal attitude, three for ideal attitude, two marks for the uncertain attitude, one for less ideal attitudes and zero for the least ideal attitudes. Lastly, the practice section included eleven questions also rated on a five-point Likert scale with scoring mirroring the attitude section. The total scores for each category in this questionnaire were computed and classified according to Perumal et al. (2013), where scores less than 40% are considered low, 40% to 80% are moderate, and more than 80% are high.

Data Analysis

The data collected were analyzed using the Statistical Packages for Social Sciences (SPSS) version 29.0 computer program (IBM Corporation, New York, USA). Descriptive analysis was conducted to measure the KAP scores of breakfast consumption among IIUM students. To compare the KAP scores of breakfast consumption between health

sciences and non-health sciences students, the Mann-Whitney U test was employed, as the data were not normally distributed. Additionally, Spearman's correlation was utilized to assess the relationships between the KAP domains of breakfast consumption, providing insights into how these domains interact with one another.

RESULTS

Sociodemographic Characteristics

Table 1 outlines the sociodemographic characteristics of the respondents, comprising 108 (28.3%) males and 274 (71.7%) females. Among them, 252 (65.9%) were from the Kuantan campus, with the largest group being 129 (33.8%) from the Kulliyah of Allied Health Sciences, followed by smaller numbers from other Kulliyah: Nursing (13, 3.4%), Pharmacy (14, 3.7%), Medicine (26, 6.8%), Dentistry (11, 2.9%), and Science (59, 15.4%). Additionally, 32 (8.4%) respondents were from the Kulliyah of Sustainable Tourism and Contemporary Languages at the Pagoh campus. From the Gombak campus, 10 (2.6%) were from the Ahmad Ibrahim Kulliyah of Law, while others came from various Kulliyah, including Architecture and Environmental Design (15, 3.9%), Information and Communication Technology (15, 3.9%), Islamic Revealed Knowledge (27, 7.1%), Engineering (13, 3.4%), Economics and Management Sciences (14, 3.7%), and Education (4, 1.0%).

In terms of academic year, the majority were in Year 3, accounting for 132 (34.6%) respondents, while Year 5 had the fewest, with only 4 (1.0%). Regarding funding, most participants were self-funded (34.8%), followed by Majlis Amanah Rakyat (MARA) (23.6%), the National Higher Education Fund Corporation (PTPTN) (22.3%), and the Public Service Department Malaysia (JPA) (11%). Additionally, the largest group of respondents (51.8%) reported daily food expenditures between RM 10 and RM 15, followed by those spending over RM 15 (31.4%) and those spending RM 5 to RM 10 (16.8%).

Table 1: Sociodemographic characteristics of the subjects

Variables	Frequency (n)	Percentage (%)
Gender		
Male	108	28.3
Female	274	71.7
Campus		
Kuantan	252	65.9
Gombak	32	8.4
Pagoh	98	25.7

Kulliyah	Frequency (n)	Percentage (%)
Kulliyah of Allied Health Sciences	129	33.8
Kulliyah of Nursing	13	3.4
Kulliyah of Pharmacy	14	3.7
Kulliyah of Medicine	26	6.8
Kulliyah of Dentistry	11	2.9
Kulliyah of Science	59	15.4
Kulliyah of Sustainable Tourism and Contemporary Languages	32	8.4
Ahmad Ibrahim Kulliyah of Law	10	2.6
Kulliyah of Architecture and Environmental Design	15	3.9
Kulliyah of Information and Communication Technology	15	3.9
Abdul Hamid Abu Sulayman Kulliyah of Islamic Revealed Knowledge and Human Sciences	27	7.1
Kulliyah of Engineering	13	3.4
Kulliyah of Economics and Management Sciences	14	3.7
Kulliyah of Education	4	1.0
Year of study		
Year 1	128	33.5
Year 2	72	18.8
Year 3	132	34.6
Year 4	46	12.0
Year 5	4	1.0
Funding for study		
PTPTN	85	22.3
JPA	42	11.0
Self-funding	133	34.8
MARA	90	23.6
Others	32	8.4
Daily Budget on food (RM)		
RM 5 – RM 10	64	16.8
RM 10 – RM 15	198	51.8
More than RM 15	120	31.4

Knowledge of Breakfast Consumption

Knowledge among IIUM students

Table 2 reveals that only a small proportion of IIUM students (0.5%) demonstrated low knowledge score

regarding breakfast consumption, followed by 128 (33.5%) respondents scoring at a moderate level, while the majority of IIUM students (66%) scored at a high level. The mean knowledge score regarding breakfast consumption is 82.11 ± 12.49 .

Table 2: Knowledge level of breakfast consumption among IIUM students.

Knowledge	Frequency	Percentage (%)	Mean \pm SD
Low	2	0.5	
Moderate	128	33.5	$82.11 \pm$
High	252	66	12.49

Knowledge among health sciences and non-health sciences students

Table 3 shows that the mean knowledge score for health sciences respondents is 85.46 (SD = 11.39) and for non-

Table 3: Knowledge level of breakfast consumption among health sciences and non-health sciences students

Variable	Health Sciences (n = 191)		Non-Health Sciences (n = 191)		Mean Difference (95% CI)	p-value
	Mean	SD	Mean	SD		
Knowledge	85.46	11.39	78.76	12.67	6.71 (4.28, 9.13)	< 0.001

Table 4: Attitude level of breakfast consumption among IIUM students.

Attitude	Frequency	Percentage (%)	Mean \pm SD
Low	15	3.9	
Moderate	352	92.1	$58.11 \pm$
High	15	3.9	11.47

Attitude among health sciences and non-health sciences students

Table 5 shows that the mean attitude score for health sciences respondents is 59.4 (SD = 11.31) and for non-health sciences respondents is 57.62 (SD = 11.60). The mean difference of 1.80 has a 95% CI ranging from -0.56 to 4.10, which includes zero, indicating no significant difference (p = 0.066). Thus, there is no significant difference in attitude between health sciences and non-health sciences students at IIUM.

Practice of Breakfast Consumption

Practice among IIUM students

Table 6 presents those 352 (92.1%) respondents shows a moderate level of practice regarding breakfast consumption, scoring between 40% and 80%. Notably, 55 respondents (14.4%) had a low level of practice, which

health sciences respondents is 78.76 (SD = 12.67). The mean difference of 6.70 has a 95% CI ranging from 4.28 to 9.13, which excludes zero, indicating a significant difference (p < 0.001). Thus, the study rejects the null hypothesis, confirming a significant difference in knowledge levels between health sciences and non-health sciences students at IIUM.

Attitude of Breakfast Consumption

Attitude among IIUM students

Table 4 reveals that most respondents, 352 (92.1%), exhibited a moderate attitude toward breakfast consumption. Meanwhile, 15 respondents (3.9%) displayed either a low or high attitude level. The average attitude score was 58.51 ± 11.47 , placing it within the moderate range. Thus, IIUM students generally hold a moderate attitude toward breakfast consumption.

exceeded the number with a high level (6, 1.6%). The mean practice score was 50.94 ± 11.51 , indicating a moderate level overall. Thus, IIUM students generally exhibit moderate breakfast consumption practices.

Practice among health sciences and non-health sciences students

Table 7 shows that the mean of practice level for health sciences respondents is 50.48 (SD = 10.56) and for the non-health sciences respondents is 51.39 (SD = 12.41). The mean difference between these two groups is -0.90 and the 95% CI is from -3.33 until 1.41, which includes zero, indicating no significant difference (p = 0.707). Therefore, there is no significant difference in practice level between health sciences and non-health sciences students at IIUM.

The Relationship Between Knowledge, Attitude, and Practice regarding Breakfast Consumption

Table 8 demonstrates the relationship between knowledge, attitude, and practice regarding breakfast consumption among health sciences and non-health sciences students of IIUM by using Spearman's correlation test. The results show two significant positive correlation between knowledge and attitude (r = 0.348, p < 0.001) and between attitude and practice (r = 0.358, p < 0.001). However, no significant correlation was observed between

knowledge and practice ($r = 0.067$, $p = 0.195$), as the p -value close to zero. value exceeded 0.05 and the correlation coefficient, r , was

Table 5: Attitude level of breakfast consumption among health sciences and non-health sciences students

Variable	Health Sciences (n = 191)		Non-Health Sciences (n = 191)		Mean Difference (95% CI)	p-value
	Mean	SD	Mean	SD		
Attitude	59.40	11.31	57.62	11.60	1.80 (-0.56, 4.10)	0.066

Table 6: Practice level of breakfast consumption among IIUM students.

Attitude	Frequency	Percentage (%)	Mean ± SD
Low	55	14.4	
Moderate	321	84.0	50.94 ± 11.51
High	6	1.6	

Table 7: Practice level of breakfast consumption among health sciences and non-health sciences students

Variable	Health Sciences (n = 191)		Non-Health Sciences (n = 191)		Mean Difference (95% CI)	p-value
	Mean	SD	Mean	SD		
Practice	50.48	10.56	51.9	12.41	-0.90 (-3.22, 1.41)	0.707

Table 8: Correlation of KAP domain regarding the breakfast consumption.

Item	Correlation, r	p-value
Knowledge – Attitude	0.348	< 0.001
Knowledge – Practice	0.067	0.195
Attitude - Practice	0.358	< 0.001

DISCUSSION

Knowledge of Breakfast Consumption

The findings of this study are aligned with recent research by Jayaveloo et al. (2021) in Malaysia and Gupta et al. (2022) in India, which found that most university students have high levels of knowledge regarding breakfast consumption. The study found health sciences students are more likely to possess a greater understanding of healthy lifestyle habits compared to non-health sciences students, likely due to their academic backgrounds. Health sciences students receive more education on these topics and have greater access to information and resources for developing such knowledge.

For example, Stage et al. (2021) reported that teachers with professional training in healthy eating had significantly higher knowledge for promoting health behaviors. Similarly, Matsumoto et al. (2019) found that Japanese adults with higher nutrition knowledge consumed breakfast more frequently.

Attitude of Breakfast Consumption

The study's results are consistent with previous research by Jayaveloo et al. (2021), which found a similar pattern of moderate attitude level towards breakfast consumption among Malaysian students. This suggests that factors such as culture, time constraints, lifestyle, and economic challenges (Abu Bakar et al., 2019 & Okada et al., 2019) may hinder students from adopting a more positive attitude toward breakfast. The lack of disparity between student groups might reflect a common belief among students that breakfast is not significantly related to overall well-being. This finding proposes that even with better knowledge, students may not see the practical importance of breakfast, potentially due to personal habits and established behaviours of skipping breakfast from an early age.

Practice of Breakfast Consumption

The findings indicate that university students generally have moderate level of breakfast habits, suggesting that academic knowledge may not impact these habits. In contrast, Xiao (2023) found that the dietetics students had better breakfast habits than the non-dietetics students. However, that study only focused on dietetics students, while our study also included a wider range of students in health sciences courses such as medical, nursing, pharmacy, and dentistry.

Health sciences students frequently struggle to have breakfast due to busy schedules and early hospital duties, which limit their time. Limited cafeteria hours, as noted by Ackuaku-Dogbe and Abaidoo (2014), further hinder access to breakfast. To improve this situation, cafeterias could consider opening earlier and providing quick breakfast options. Additionally, educating students on the importance of breakfast and offering time management tips could help them incorporate it into their daily routines.

Relationship between Knowledge, Attitude and Practice Regarding Breakfast Consumption

The results of this study were comparable to the recent study by Jayaveloo et al. (2021) and a thesis by Xiao (2023). Both studies reported significant association between knowledge and attitude, as well as attitude and practice. These consistent results across different studies indicate that students' knowledge and attitude influence their breakfast consumption. A student with a high level of knowledge is likely to have a positive attitude towards breakfast. The correlations found in this study suggests that students may be influenced by several factors such as time constraints faced among students with early morning classes. Besides, the availability of healthy breakfast choices on campus is crucial as limited options can discourage students from eating their regular breakfast, even though they recognize its benefits.

To bridge the gap between attitude and practice of breakfast consumption, universities can educate students by organizing educational campaigns about the benefits of breakfast, providing affordable and healthy breakfast choices on campus, and encouraging morning routines that incorporate breakfast. These initiatives would encourage students to promote healthy eating habits and enhance their overall health.

CONCLUSION

In summary, IIUM students exhibit a high level of understanding but moderate level of attitude and practice of breakfast consumption. This highlights that they still struggle to adopt a positive attitude and good practice of breakfast consumption. The study found a significant difference in knowledge levels between health sciences and non-health sciences students, with health sciences students showing greater knowledge, but no significant differences in attitudes or practices. Additionally, significant associations were observed between knowledge and attitude, as well as between attitude and practice, though no correlation was found between knowledge and practice.

This study has several limitations including the absence of analysis on breakfast patterns and barriers to consumption. Future research should focus on these areas as well as the quantity and quality of dietary intake, BMI and CGPA. This will provide a more thorough understanding of breakfast habits and their effects on student health and academic performance.

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ETHICAL APPROVAL

Ethical approval was obtained from the International Islamic University Malaysia Research Ethical Committee (IREC). Participants were provided with digital consent before completing the questionnaire and could withdraw from the survey at any time after signing the agreement if they chose not to participate.

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