

KNOWLEDGE, ATTITUDE AND PRACTICE ON FUNCTIONAL FOOD CONSUMPTION AMONG HEALTH SCIENCE AND NON-HEALTH SCIENCE STUDENTS

HANAPI MAT JUSOH, PhD (CORRESPONDING AUTHOR)

DEPARTMENT OF NUTRITION SCIENCES, KULLIYAH OF ALLIED HEALTH SCIENCES,
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA, JALAN SULTAN AHMAD SHAH
BANDAR INDERA MAHKOTA 25200 KUANTAN, PAHANG, MALAYSIA

hanapi@iium.edu.my

NOOR AZIEMAH NOOR AZMAN

DEPARTMENT OF NUTRITION SCIENCES, KULLIYAH OF ALLIED HEALTH SCIENCES,
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA, JALAN SULTAN AHMAD SHAH
BANDAR INDERA MAHKOTA 25200 KUANTAN, PAHANG, MALAYSIA

nooraziemah@gmail.com

ABSTRACT

Introduction: It is widely recognized that functional foods can address specific health needs of consumers, potentially contributing to enhancing overall public health. While numerous studies have explored consumer perception and acceptance of functional food products, research examining knowledge, attitude, and practice (KAP) remains limited, especially among university students. Hence, this study aimed to assess KAP regarding functional foods consumption among both health science and non-health science students. **Methods:** A total of 118 students participated in this study, including 77 from the health science group and 41 from the non-health science group. Respondents were provided with a self-administered questionnaire that covered demographic profiles, knowledge, attitude, and practice related to functional foods consumption. **Results:** The study showed that students at IIUM Kuantan exhibited poor knowledge, moderate attitude, and poor practice regarding functional foods consumption. Notably, health science respondents demonstrated significantly higher levels of knowledge and attitude compared to their non-health science counterparts. Interestingly, both groups showed a similar frequency of functional foods consumption per week. **Conclusion:** Overall, students at IIUM Kuantan had poor levels of knowledge, moderate attitude, and practice about functional foods intake, although health science groups had higher knowledge and attitude than non-health science groups. Additional efforts are needed to increase knowledge and awareness regarding the consumption of functional foods.

KEYWORDS: Functional foods, knowledge, attitude, practice, university students

INTRODUCTION

Functional foods, a category of nutritionally enhanced food products, have gained prominence for their potential to offer health benefits beyond basic nutrition. While there is no universal definition of functional foods, the International Life Sciences Institute describes them as “*foods that by virtue of physiologically active food components provide health benefits beyond basic nutrition*” (Bagchi, 2008). Functional foods include a diverse range of products, whether naturally occurring or processed, including fortified or enriched foods. These foods have the ability to modulate metabolic processes in the human body, subsequently improving health conditions and reducing the risk of chronic diseases (Bleich et al. 2015; Büyükkaragöz et al. 2014; El Sohaimy, 2012).

In recent times, people began to rely on functional foods to improve their health (Shariff et al. 2017). The inclusion of these foods, however, depends not only on their availability and affordability but also on the knowledge, attitudes, and practices of the consumers. Many consumers include functional foods in their diet unaware that the food belongs to this food category. For instance, a cross-sectional

study in Thessaloniki, Greece, indicated that over 70% of the consumers include functional foods in their daily diet without realizing them as such (Christidis et al. 2011). Another study reported that a high percentage of US consumers were unaware that consuming functional foods could have positive effects on their health (Urala et al. 2011). In addition, Wahba et al. (2006) stated that many of the respondents believe that certain food components contribute to better health, yet their understanding of functional foods remains limited. Nevertheless, those with a strong understanding of the health benefits offered by functional foods are more likely to include them in their regular diets (Wansink et al. 2005).

Factors such as age, gender, and education levels can have a significant influence on knowledge, attitude, and practice related to functional foods consumption. Rezai et al. (2012) found that individuals under the age of 25 years old demonstrated higher awareness on functional foods than older counterparts. Meanwhile, females tend to have greater acceptance of functional foods than male (Sääksjärvi et al. 2009; Dogan et al. 2011) as they seem to be more conscious on their health (Bogue et al. 2006). According to Dogan et al., 2011, higher education levels are linked to increased knowledge and awareness of functional foods. Consequently, university students, particularly those in health-related disciplines are presumed to possess a better understanding of functional foods compared to their non-health discipline counterparts. This study, therefore, seeks to evaluate the Knowledge, Attitude, and Practice (KAP) regarding functional food consumption among university students, with a specific focus on health and non-health disciplines.

METHODS

Subjects

This cross-sectional study utilized convenience sampling involving a total of 118 students, with 77 students from health science disciplines and 41 students from non-health science disciplines at International Islamic University Malaysia (IIUM) Kuantan. Inclusion criteria encompassed local undergraduate students, while exclusion criteria were foundation, postgraduate and foreign students. The proportion of health-science to non-health science students in the sample was determined based on the actual population of IIUM Kuantan, with 65% representing health science students and 35% non-health science students. Respondents in health science disciplines came from *Kulliyah* of Allied Health Sciences, *Kulliyah* of Medicine, *Kulliyah* of Dentistry, *Kulliyah* of Pharmacy and *Kulliyah* of Nursing. Respondents in non-health science discipline were selected from various departments within *Kulliyah* of Science including Marine, Biotechnology, Applied Plant, Applied Physics, Applied Chemistry and Computational and Theoretical Sciences. Furthermore, respondents in this study were limited to students in their second year and third year of study to ensure equivalent knowledge level among respondents. The gender distribution in this study was also based on the actual population at IIUM Kuantan, with approximately 75% female students and 25% male students.

Self-Administered Questionnaire

This study utilized self-administered questionnaire. Before distributing questionnaires, a pilot study was conducted with 28 respondents, and their feedback was used to revise the questionnaire. The questionnaires were structured into four sections: demographic data, knowledge, attitude, and practice related to functional foods intake. The knowledge section consisted of 15 statements, where respondents needed to indicate whether they were "true" or "false". The attitude section comprised 10 statements and respondents were asked to express their opinion by selecting from options such as "strongly disagree", "disagree", "neutral", "agree" or "strongly agree". In the practice section, the participants were presented with 10 selected functional foods, and they needed to indicate the frequency of their consumption per week.

Scoring System

A scoring system was applied to the knowledge and attitude sections before incorporating them into SPSS. In the knowledge section, a score of one was given for a correct answer and zero for incorrect or when respondents chose 'not sure'. In the attitude section, a score of one was given for "strongly disagree", two for "disagree", three for "neutral", four for "agree" and five for "strongly agree".

Statistical Analysis

SPSS version 12.01 was used to analyse all the information. The statistical significance level was set at $p < 0.05$. When describing the level of knowledge, attitude and practice, percentages were used. For the comparison between groups, independent T-test was used.

RESULTS

Knowledge, attitude, and practice regarding functional foods

Table 1 shows knowledge, attitude, and practice levels among health science and non-health science respondents. The majority of the IIUM Kuantan respondents (76.3%) had a low level of knowledge regarding functional foods. Likewise, both health science and non-health science disciplines respondents demonstrated low levels of knowledge. Meanwhile, most respondents (69.5%) exhibited a moderate level of attitude toward functional foods. Similarly, both health science and non-health science disciplines respondents showed moderate levels of attitude. The majority of the respondents demonstrated a low level of practice, as reflected by the poor frequency of functional foods intake per week. Likewise, both health science and non-health science disciplines respondents showed a low level of practice, but this difference was not statistically significant.

Table 2 shows knowledge, attitude, and practice scores between health science and non-health science groups. Health science respondents achieved an average knowledge score of 7.2, significantly higher than their non-health science counterparts, with an average score of 5.6 ($p = 0.001$). Similarly, health science respondents demonstrated a significantly higher attitude score compared to non-health science groups, with average scores of 3.7 and 3.4, respectively ($p = 0.006$). On the contrary, non-health science respondents exhibited slightly higher practice scores for the frequency of functional foods consumption per week than health science group, but this difference was not statistically significant.

DISCUSSION

Most respondents, whether considered collectively or when analysed by groups, exhibited a low level of knowledge level about functional foods. This outcome aligns with the finding reported by Afina and Retnaningsih (2018) where over half of undergraduate students managed to correctly answer only six out of 15 questions. Notably, our results also demonstrated that health science respondents had a higher score of knowledge compared to non-health science counterparts. This is consistent with a study by Morawska et al. (2016), who reported that Dietetics students possessed higher levels of knowledge on functional foods compared to Pharmacy students. Despite both groups falling under the health science category, Dietetic students may benefit from a more specialized exposure to functional foods in line with their academic background.

Approximately two-thirds of the respondents had a moderate attitude regarding the consumption of functional foods. This result corresponds to the finding reported by Afina and Retnaningsih (2018) where 80.0% of undergraduate students exhibited a moderate level of attitude. Our finding, however, differed slightly from a study among young Malaysian consumers conducted by Rezai et al. (2012), which reported a positive attitude regarding the consumption of functional foods for the purpose of achieving good health. This moderate attitude observed despite a low level of knowledge could be attributed to the increasing awareness among IIUM Kuantan students regarding the importance of maintaining good health.

As for dietary practice, this study found that most respondents, regardless of academic disciplines, had a low frequency of functional foods intake. The reason for this limited consumption of functional foods among students may be due to low level of knowledge about these foods. This is in line with a study by Bilgiç and Yüksel (2012), in which about 114 university students argued that their lack of knowledge was the reason for not consuming the functional foods.

Table 1: Distribution of the knowledge, attitude, and practice levels.

	Level	Overall	Health Science	Non-Health Science
		%	%	%
Knowledge	High (≥ 80)	3.4	5.2	0
	Moderate (60-79)	20.3	28.6	4.9
	Low (≤ 59)	76.3	66.2	95.1
Attitude	High (4)	22.9	31.2	7.3
	Moderate (3-3.9)	69.5	63.6	80.5
	Low (< 3)	7.6	5.2	12.2
Practice	High (> 29)	5.9	2.6	12.2
	Moderate (15-28)	27.1	29.9	22.0
	Low (0-14)	66.9	67.5	65.9

Table 2: Knowledge, attitude and practice scores between health science and non-health science.

Score	Health Science		Non-Health Science		<i>p-value</i>
	Mean	SD	Mean	SD	
Knowledge	7.3	(2.6)	5.7	(2.1)	0.001
Attitude	3.7	(0.6)	3.4	(0.5)	0.006
Practice	11.7	(7.9)	13.4	(9.9)	0.325

CONCLUSION

Overall, students at IIUM Kuantan had poor levels of knowledge, moderate attitude, and practice about functional foods intake, although health science respondents had higher knowledge and attitude than non-health science respondents. Additional efforts are needed to increase knowledge and awareness regarding the consumption of functional foods. When students understand the role of functional foods in maintaining their health and reducing the risk of chronic diseases, they are more likely to consume them more frequently.

ACKNOWLEDGMENTS

Firstly, the highest gratitude belongs to Allah for giving me the guidance and strength to complete this study. I would like to extend my heartfelt appreciation to Noor Aziemah Noor Azman for her invaluable contributions to the success of this project. My sincere thanks also go to Dr Nor Azwani Mohd Shukri and Dr Suriati Sidek for their expertise and assistance.

REFERENCES

- Afina, S., and Retnaningsih. (2018). The Influence of Students' Knowledge and Attitude towards Functional Foods consumption behaviour. *Journal of Consumer Sciences*, 03(01), 1-14.
- Bagchi D (ed). (2008). *Neutraceutical and Functional Food Regulations*. Elsevier: New York.
- Bilgiç, S., and Yüksel, A. (2012). University Students' Perception and Attitudes towards Functional Foods in Istanbul. *International Conference on Industrial and Engineering Operations Management*, 1127-1137.
- Bleich, S. N., Jones-Smith, J., Wolfson, J. A., Zhu, X., and Story, M. (2015). The complex relationship between diet and health. *Health Affairs*, 34(11), 1813-1820. <https://doi.org/10.1377/hlthaff.2015.0606>
- Bogue, J., Seymour, C., and Sorenson, D. (2006). Market-Oriented New Product Development of Meal Replacement and Meal Complement Beverages. *Journal of Food Products Marketing*, 12(3), 1-18. https://doi.org/10.1300/J038v12n03_01
- Büyükkaragöz, A., Bas, M., Sağlam, D., and Cengiz, Ş. E. (2014). Consumers' awareness, acceptance and attitudes towards functional foods in Turkey. *International Journal of Consumer Studies*, 38(6), 628-635. <https://doi.org/10.1111/ijcs.12134>
- Christidis, N., Tsoulfa, G., Varagunam, M., and Babatzimopoulou, M. (2011). A cross sectional study of consumer awareness of functional foods in Thessaloniki, Greece. *Nutrition & Food Science*, 41(3), 165-174. <https://doi.org/10.1108/00346651111132439>
- Dogan, I. S., Yildiz, O., Eydurhan, E., and Kose, S. (2011). A study on determination of functional food consumption habits and awareness of consumers in Turkey. *Bulgarian Journal of Agricultural Science*, 17(2), 246-257
- El Sohaimy, S. (2012). Functional foods and nutraceuticals-modern approach to food science. *World Applied Sciences Journal*, 20(5), 691-708. <https://doi.org/10.5829/idosi.wasj.2012.20.05.66119>
- Morawska, A., Górna, I., Bolesławska, I., and Przysławski, J. (2016). The Nutritional Awareness of Functional Food Among University Students in Poland. *National Institute of Public Health*, 67(2), 163-167.

Rezai, G., Teng, P. K., Mohamed, Z., and Shamsudin, M. N. (2012). Functional Food Knowledge and Perceptions among Young Consumers in Malaysia. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, 6(3), 7-12.

Sääksjärvi, M., Holmlund, M., and Tanskanen, N. (2009). Consumer knowledge of functional foods. *International Review of Retail, Distribution and Consumer Research* (19). <https://doi.org/10.1080/09593960903109469>

Shariff, F. M., Khairunisa, D., Sapawi, A., and Wee, H. (2017). Malaysian Local Functional Food Attributes and Customer Satisfaction. *Journal of Tourism*, 8(December 2016), 45-54.

Urala, N., Schutz, H., and Spinks, J. (2011). Consumer perceptions of “functional food” in the United States. *Journal of Food Products Marketing*, 17(4), 407-419. <https://doi.org/10.1080/10454446.2011.583181>

Wahba, S., Arrafa, A., Saleh, N., Mekkawy, A., and Ahmed, R. T. (2006). Knowledge, attitudes toward functional foods among adults working in the national research center. *Journal of Applied Sciences Research*, 2(1), 39-43. Retrieved from <http://pdfsr.com/pdf/knowledge-attitudes-toward-functional-foods-among-adults-working-in-the-national-research-center>

Wansink, B., Westgren, R. E., and Cheney, M. M. (2005). Hierarchy of nutritional knowledge that relates to the consumption of a functional food. *Nutrition*, 21(2), 264- 268. <https://doi.org/https://doi.org/10.1016/j.nut.2004.06.022>