



**JOURNAL OF TOURISM,
HOSPITALITY AND
ENVIRONMENT MANAGEMENT
(JTHER)**

www.gaexcellence.com/jthem



UNIVERSITY STUDENTS' AWARENESS TOWARDS FOOD HYGIENE PRACTICES USING THE KAP (KNOWLEDGE, ATTITUDE, AND PRACTICE) MODEL: A CASE STUDY IN UITM TERENGGANU

Noor Aziean Abd Karim¹, Nur Auni Syazwina Saharipudin², Mohamad Arif Abdul Kadir^{3*},
Siti Aisyah Tumin⁴

¹Faculty of Hotel and Tourism Management, Universiti Teknologi MARA, Malaysia

 2025160721@student.uitm.edu.my

 <https://orcid.org/0009-0005-6549-3808>

²Faculty of Hotel and Tourism Management, Universiti Teknologi MARA, Malaysia

 2025148649@student.uitm.edu.my

 <https://orcid.org/0009-0000-1383-0415>

³Faculty of Hotel and Tourism Management, Universiti Teknologi MARA, Malaysia

 arifkadir@uitm.edu.my

 <https://orcid.org/0009-0002-8644-0893>

⁴Faculty of Hotel and Tourism Management, Universiti Teknologi MARA, Malaysia

 aisyahatumin@uitm.edu.my

 <https://orcid.org/0000-0001-7692-4224>

*Corresponding Author

Article Info:

Article history:

Received date: 16.07.2026

Revised date: 30.07.2026

Accepted date: 16.08.2026

Published date: 21.09.2026

To cite this document:

Karim, N. A. A., Saharipudin, N. A. S., Kadir, M. A. A., & Tumin, S. A. (2026). University Students' Awareness Towards Food Hygiene Practices Using the Kap (Knowledge, Attitude, And Practice) Model: A Case Study in UiTM Terengganu. *Journal of Tourism Hospitality and*

Abstract:

This conceptual paper describes and explains the relationships between the awareness of food hygiene among university students by applying the Knowledge, Attitude, and Practice (KAP) model. This paper uses findings from existing studies rather than collecting primary data to explore how food hygiene knowledge and attitudes may affect food-handling behaviours in higher education settings. A conceptual framework is proposed to discuss structural relationships, offering a novel theoretical synthesis that clarifies how cognitive and affective factors translate into protective health practices. Ultimately, this framework provides a foundation for future empirical research, while giving insights for universities, health educators, and policymakers to design targeted food hygiene interventions and lower foodborne illness risks among young adults, especially university students.

DOI:10.35631/JTHER.1145037

Keyword:

Food Hygiene Awareness, Food Hygiene Practices, Knowledge, Attitude and Practice (KAP) Model, Uitm Terengganu, University Students



© The authors (2026). This is an Open Access article distributed under the terms of the Creative Commons Attribution (CC BY NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact jthem@gaexcellence.com.

Introduction***Research Background***

Food hygiene continues to be an important public health issue because unsafe food handling, preparation, and storage can increase the risk of foodborne diseases. Despite being part of a well-educated population, university students are still reported to engage in food hygiene practices that may compromise food safety. This issue has frequently been examined using the Knowledge, Attitude, and Practices (KAP) model, which proposes that an individual's knowledge and attitudes influence their behaviour. Within the context of food hygiene, the model assumes that individuals who possess adequate knowledge and positive attitudes are more likely to practise safe food handling. However, findings from previous studies suggest that this relationship is often more complex, particularly among university students, where good knowledge and favourable attitudes do not always result in appropriate hygiene practices (Islam et al., 2022).

Other studies have shown that students' food hygiene knowledge, attitudes, and practices do not produce the same result. For example, a study among university students in the Kilimanjaro region of Tanzania found that most students had good food safety knowledge (82.6%) and positive attitudes (78.4%). However, only 31.9% shows good food hygiene practices (Masiku et al., 2024). This finding lead to having good knowledge and positive attitudes does not always guarantee good food handling behaviour.

A same situation was reported among university students in Bangladesh. Islam et al. (2022) found that students have low scores in food handling knowledge (41.8%) and food safety practices (34.9%). These results shows that limited knowledge may contribute to poor hygiene

practices. This due to knowledge plays an important role in shaping behaviour. Furthermore, the findings also show that knowledge may not be enough to encourage behavioural change.

The application of the KAP model has also been observed in institutional food service environments. Firdani (2022) demonstrated that KAP assessments are useful in identifying differences between food safety knowledge, attitudes, and actual practices among university food handlers. In Malaysia, food hygiene issue has increased due to the growth of home-based food businesses and small-scale food operations especially in Terengganu. Ishak et al. (2023) emphasised that improving food hygiene knowledge and attitudes is important in encouraging safer food handling practices among both food handlers and consumers.

Therefore, this conceptual paper proposes a framework for understanding food hygiene behaviour among university students. The proposed framework examines the relationship between food hygiene knowledge and attitudes as independent variables, and food hygiene practices as the dependent variable among Universiti Teknologi MARA (UiTM) Terengganu students. The framework applies the KAP model that suggests students' knowledge and attitudes may influence their actual hygiene practices. The proposed framework may provide useful guideline for future research and support universities in developing more effective food hygiene education and preventive strategies.

Research Problem

Food hygiene is a public health concern among university students who are increasingly responsible for their own meal preparation and daily food choices. As students becoming more independent, maintaining proper food hygiene practices is important to reduce the risk of foodborne illnesses. The KAP model has been widely used to explain food safety behaviour, based on the assumption that adequate knowledge and positive attitudes contribute to safer food handling practices. However, previous studies suggest that the relationship between these factors is more complex than traditionally assumed.

Recent studies have shown that students may have a certain level of food safety knowledge but still fail to apply it appropriately and consistently. In Bangladesh, Ali et al. (2023) mentioned that university students shows moderate food safety awareness, yet less in knowledge and unsafe food handling behaviours were still observed. Similarly, Afrin et al. (2024) found that although students at Jahangirnagar University had positive perceptions and awareness regarding food hygiene, their actual practices remained inconsistent. These findings indicate that knowledge and attitudes alone may not always lead to safe food handling behaviours, highlighting the need to further examine the factors influencing the practice component of the KAP model.

There are limited studies have explored how the KAP model applies to Malaysian university students, particularly within Universiti Teknologi MARA (UiTM) Terengganu. Differences in cultural practices, campus food environments, and student lifestyles may influence how knowledge and attitudes are translated into daily food hygiene practices. Therefore, this study aims to examine the relationship between food hygiene knowledge and attitudes and food hygiene practices among UiTM Terengganu students. The findings may lead to a better understanding of student food hygiene behaviour and provide valuable insights for developing more targeted food hygiene education and intervention programmes within the university setting.

Literature Review

Knowledge, Attitudes and Practices (KAP) Model

KAP Model is a well-known theory. It is used in public health and food safety research. The model suggests that individual behaviour is influenced by three main components. They are knowledge, attitude and practices. Knowledge refers to what individuals understand while attitudes represent their perceptions and beliefs. The third component is practices which reflect their actual behaviours. According to the World Health Organization (2021), the KAP model is useful for evaluating awareness and identifying the gaps between knowledge and behavioural outcomes. Due to its simple and structured approach, the model has been widely applied among different subjects such as students, consumers, food handlers, and healthcare workers.

The KAP model has been used to examine whether knowledge and attitudes are displayed in the actual hygiene practices. For example, Halim-Lim et al. (2023) found that respondents were not always reflected in their daily practices although they have good food safety knowledge. Similarly, Ma et al. (2024) reported that university students generally possessed good food safety awareness but still lack in applying food hygiene principles during food preparation. Therefore, these findings show that the KAP model is valuable not only for measuring awareness but also for identifying gaps between their knowledge and practices.

Previous research has also explored the relationships on knowledge, attitudes, and practices within the KAP framework. Ma et al. (2024) found that food safety knowledge was positively associated with attitudes, while attitudes significantly influenced food handling practices. Similarly, Tuglo et al. (2021) reported that individuals with more positive attitudes towards food hygiene were more likely to engage in safe food handling behaviours. These findings support the assumption of the KAP model that attitudes play an important role in transforming knowledge into actual practices.

Though the model has an extensive application, the KAP model has several limitations. Makhunga et al. (2023) highlighted that many KAP studies depend on self-reported questionnaires, which may result in respondents reporting socially desirable behaviours rather than their actual practices. In addition, the traditional KAP framework may not fully consider external factors such as limited facilities, financial constraints, time limitations, and living environments that can influence food hygiene behaviour. However, the model remains a useful framework for identifying behavioural gaps and understanding factors associated with health-related practices.

Overall, the KAP model provides a suitable theoretical foundation for examining food hygiene behaviour among university students. The framework allows researchers to assess how students' knowledge and attitudes relate to their actual hygiene practices, particularly among those living independently or in campus accommodation. Therefore, applying the KAP model in this study is appropriate for investigating food hygiene behaviour among UiTM Terengganu students and supporting the development of effective food hygiene education and intervention strategies.

Knowledge of Food Hygiene

Food hygiene knowledge is defined as an individual's understanding of safe food handling practices, preparation, and storage to prevent food contamination. Knowledge is the first component of the KAP model and serves as the fundamental starting point for behavioral adaptation. In general, knowledge provides the facts and rules that people need to make safer choices when handling food.

However, research by Aljasir (2023), proves that while individuals often demonstrate a strong knowledge on the theoretical food safety rules, they also reveal that there is a knowledge and practice gap as the high examination scores fail to apply into real world safe kitchen habits. Recent public health literature emphasizes that assessing these baseline knowledge scores allows institutions to identify exactly where a population's theoretical awareness fails to transition into safe operational habits (Hasan et al., 2024).

Food hygiene knowledge is recognised as an important factor influencing safe food handling behaviour. It refers to an individual's understanding of food safety principles, including personal hygiene, cross-contamination prevention, safe cooking temperatures, food storage, and methods of reducing the risk of foodborne illnesses. Within the Knowledge, Attitude and Practice (KAP) model, knowledge forms the basis upon which individuals develop appropriate attitudes and behavioural practices related to food safety. However, previous studies indicate that although many university students possess basic awareness of food hygiene, their understanding of specific food safety principles remains incomplete.

Ahmad et al. (2024) finding shows that students were usually aware with basic hygiene practices, such as handwashing, but shows low understanding of technical aspects of food safety such as appropriate cooking temperatures, refrigeration requirements, and prevention of cross-contamination. These differences contribute to unsafe food handling behaviours among students who prepare meals independently or use shared kitchen facilities. This determine that awareness of hygiene does not reflect a complete understanding of the practices required to prevent foodborne illnesses.

Jeinie and Md Nor (2022) reported that students who obtained food handling training or studied related field showed better knowledge compared to students who doesn't. Additionally, access to reliable sources such as university awareness programmes, educational materials, and online platforms was associated with improved knowledge levels. These findings highlight the importance of educational exposure and information accessibility in shaping students' understanding of food hygiene.

The depth of food hygiene knowledge is another important factor in KAP research. Islam et al. (2022) stressed that most studies assess knowledge through structured questionnaires. However, choices exist in terms of question content and scoring methods due to differences in local food safety guidelines. These differences may affect the studies across research settings. Therefore, the use of validated and standardised instruments is important to ensure reliable assessment of food hygiene knowledge.

However, previous studies show that knowledge does not always lead to proper practices. Mshelia et al. (2022) reported that respondents demonstrated difficulties in identifying high-risk foods and understanding foodborne illnesses. Shows that knowledge alone was not enough

to forecast preventive behaviours. Similarly, Hasan et al. (2025) suggested that behavioural change requires not only knowledge but also other conditions such as limited food preparation facilities, inadequate hygiene resources, and restricted living conditions.

Overall, the literature finds food hygiene knowledge as main component of safe food handling behaviour among university students. While knowledge alone may not be sufficient to ensure appropriate hygiene practices, it provides the foundation upon which positive attitudes and safe behaviours can be developed. Based on the evidence presented in previous studies, this study proposes that food hygiene knowledge is positively associated with food hygiene practices among university students.

H1: There is a significant relationship between food hygiene knowledge and food hygiene practices among university students.

Attitudes towards Food Hygiene

Attitudes refer to an individual's beliefs, perceptions, and feelings towards food hygiene and food hygiene practices. Positive attitudes are essential for motivating individuals to consistently practice safe food handling behaviours. In the KAP model, attitudes represent the psychological factor that influences whether knowledge is taken seriously and translated into action. Individuals with positive attitudes are more likely to value food hygiene, perceive foodborne illness as a serious problem and feel responsible for practicing safe food handling behaviours. A recent study said that most of the students have a genuinely positive attitude toward food safety. The study concludes that university students demonstrate a good attitude and a solid sense of responsibility regarding food safety. (Islam et al., 2022).

A study conducted among university students found that although most respondents acknowledged the importance of keeping proper food hygiene, differences were observed in their personal perception of food safety risks. Previous researchers have suggested that examining knowledge and practices alone may not provide a complete understanding of food hygiene behaviour, as individuals' perceptions and beliefs towards food safety can influence whether they apply their knowledge in real-life situations (Nițescu, 2025). Therefore, understanding attitudes of the students is important in explaining the gap between food safety awareness and actual hygiene practices.

Previous studies have suggested that food safety knowledge is often associated with more positive attitudes towards hygiene. For example, Hussein et al. (2022) found that Palestinian university students with better food safety knowledge generally showed greater concern and attitudes about foodborne illnesses. Besides that, the study also revealed that some students acknowledged the importance of food hygiene but perceived their personal risk of experiencing foodborne illness as low. This suggests that awareness alone may not be adequate to encourage safe food handling practices. Students who consider food hygiene an important part of their daily responsibilities may be more likely to adopt safer food practices.

Several studies have also mentioned that food hygiene attitudes are influenced by factors such as risk perception, personal experiences, and social influences. Ishra et al. (2026) showed that perceived risk plays an important role in shaping food safety behaviour. As individuals who understand the potential consequences of unsafe food handling are more likely to adopt preventive practices. Factors such as previous experience to foodborne illness may further

increase awareness and strengthen positive attitudes towards food hygiene. In contrast, students who believe that foodborne illness is unlikely to occur may show lower levels of concern and motivation to practise proper hygiene behaviours.

The importance of attitude in influencing food safety behaviour has also been supported by Malaysian research. Soon et al. (2020) reported that Malaysian consumers generally showed good attitudes towards food safety though the level of these attitudes differed among individuals. The study also found out that attitude had a stronger influence on food safety practices compared to knowledge signifying that efforts to improve food hygiene behaviour should focus not only on increasing awareness but also on developing stronger safety perceptions and personal accountability towards food handling.

Similarly, recent studies have shown that attitude is a stronger predictor of food hygiene practices compared to knowledge. Yi and Choi (2024) found that positive attitudes towards food safety were allied with safer food handling behaviours, indicating that individuals with stronger commitments towards hygiene were more likely to apply safe practices even when their knowledge levels were moderate. In addition, Marklinder et al. (2022) reported that food safety knowledge influences behaviour indirectly through attitudes, suggesting that knowledge contributes to behavioural change when it strengthens individuals' beliefs and perceptions regarding food hygiene.

Overall, previous literature suggests that food hygiene attitude is an important factor influencing food hygiene practices among university students. Although many students understand the importance of food safety, their attitudes may vary depending on perceived risk, personal experiences, and environmental conditions. Students who have stronger beliefs regarding the importance of food hygiene and greater concern about foodborne illnesses are generally more likely to practise safe food handling behaviours. Therefore, based on the evidence presented in previous studies, this study proposes that food hygiene attitude has a significant relationship with food hygiene practices among university students.

H2: There is a significant relationship between food hygiene attitude and food hygiene practices among university students.

Practices of Food Hygiene

Food hygiene practices refer to the actual actions people take when handling, preparing, and storing food. These practices include personal hygiene, washing hands before preparing food, avoiding cross-contamination between raw and cooked food, cooking food properly, and storing food at safe conditions. In the KAP model, practices represent the final behavioural outcome that may be influenced by an individual's knowledge and attitude towards food safety. Therefore, examining food hygiene practices helps determine whether students are able to apply their food safety knowledge and beliefs in their daily lives.

University students are considered an important group to study in relation to food hygiene practices because many of them begin preparing their own meals after living away from their families. Changes such as staying in hostels or sharing accommodation, may affect the way students handle, prepare, and store food. Afrin et al. (2024) found that students who lived independently showed differences in food handling behaviours especially in food preparation and storage practices. These behaviours were also linked to a higher occurrence of self-reported

foodborne illness experiences. This indicates that adjusting to independent living is a challenge for students in maintaining proper food hygiene.

Previous studies have also acknowledged a gap between students' food safety awareness and their practices. Islam et al. (2024) reported that even though students were aware about foodborne illnesses, this concern did not always result in consistent hygiene practices, especially in areas such as separating raw and cooked food during preparation. This shows that being aware does not automatically mean that students will always practise safe food handling behaviours.

Apart from individual factors, the living environment also plays an important role in shaping food hygiene practices. Kota et al. (2022) found that students living in hostels and shared accommodation faced more challenges in maintaining food safety practices compared to those with more independent living arrangements. Limited kitchen facilities, shared cooking areas, and restricted food storage spaces may make it difficult for students to follow recommended hygiene practices. These findings suggest that students' daily environments can influence their food handling behaviours in addition to their knowledge and attitudes.

Access to proper facilities and resources is another factor that may affect students' ability to practise safe food handling. Chen et al. (2024) mentioned that limited access of proper storage and preparation space may contribute to the gap between food safety knowledge and actual practices. Although students recognise the importance of proper hygiene procedures, they may encounter difficulties applying them when their living environment does not support safe food preparation. Therefore, food hygiene practices are influenced by both personal factors and external conditions.

Overall, previous studies reveal that food hygiene practices among university students are influenced by various factors, including knowledge, attitudes, living arrangements, and environmental conditions. Assessing food hygiene practices among UiTM Terengganu students is important to identify unsafe behaviours and understand the factors that contribute to these practices. The findings may support universities in developing more effective food hygiene education programmes, improving student facilities, and implementing awareness strategies to encourage safer food handling behaviours.

Propose Conceptual Framework

The reviewed literature suggests that food hygiene knowledge and attitudes play an important role in shaping students' hygiene behaviours. However, previous studies also show that having good knowledge and positive attitudes does not always result in consistent food hygiene practices. Factors such as living environment, availability of facilities, and personal perception of food safety risks may affect how students apply their knowledge in daily situations. Therefore, further research is needed to better understand the relationship between knowledge, attitudes, and practices, especially among university students in Malaysia. Based on the findings from previous studies, this literature review provides support for the proposed conceptual framework and the examination of food hygiene knowledge, attitudes, and practices among UiTM Terengganu students.

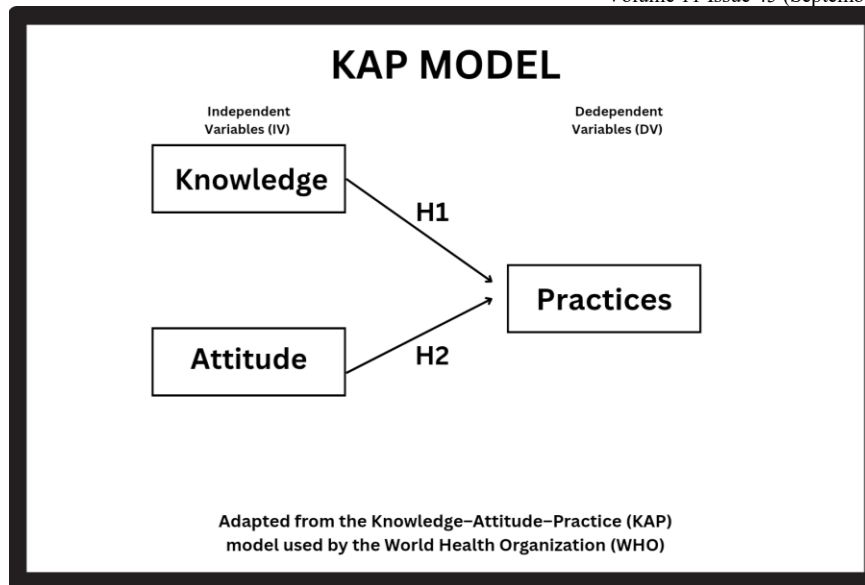


Figure 1: Conceptual Framework

Source: Adapted From the Knowledge-Attitude-Practice (KAP) Model Used By The World Health Organization (WHO)

Propose Research Methodology

This concept paper proposes a quantitative research approach to examine food hygiene practices among university students using the Knowledge, Attitude and Practice (KAP) model. The proposed framework suggests that students' food hygiene knowledge and attitudes may influence their actual food hygiene practices. To investigate these relationships, a cross-sectional correlational research design is recommended for future empirical studies.

A cross-sectional correlational design is suitable for examining the relationship between variables without changing or controlling the respondents' existing conditions. By collecting data at one specific point in time, this design allows researchers to identify the relationship between food hygiene knowledge, attitudes, and practices among university students. It is also practical for university-based research because data can be collected efficiently from a larger group of respondents within a limited timeframe.

The proposed study focuses on undergraduate students at Universiti Teknologi MARA (UiTM) Terengganu. University students are considered an appropriate study population because they are regularly involved in food-related activities either on campus or at their place of residence. Students from different backgrounds, study levels, and living arrangements may have different experiences that influence their food hygiene knowledge, attitudes, and practices. Therefore, examining this group may provide a better understanding of factors related to food hygiene behaviour in a university setting.

A convenience sampling technique is proposed for future data collection. This method allows researchers to approach respondents who are easily available while encouraging participation from students across different faculties and programmes. Although convenience sampling is practical and cost-effective, its limitation regarding generalisation should be considered. Since respondents are not selected randomly, the findings may not fully represent the wider Malaysian university student population. However, this method remains applicable for an

exploratory study that focuses on examining relationships within a specific institution, namely UiTM Terengganu.

A structured questionnaire is proposed as the instrument for data collection. It will consist of four sections. The first section will collect demographic information, including gender, age, faculty, year of study, and living arrangement. The remaining sections will measure food hygiene knowledge, attitudes towards food safety, and food hygiene practices using items adapted from previous studies. Some alterations may be made to ensure that the questions are suitable for the UiTM Terengganu while preserving their original meaning. Attitude and practice items may be measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Before conducting the actual study, a pilot test is recommended to assess the clarity and reliability of the questionnaire. A Cronbach's alpha value of 0.70 and above is generally considered acceptable for measuring internal consistency.

For future research, data collection may be conducted through an online. Participation should be voluntary, and respondents should be informed about the purpose of the study, confidentiality of their responses, and their right to withdraw at any time. The questionnaire is expected to take approximately five to ten minutes to complete, which may aid higher participation among students.

After data collection, IBM SPSS Statistics may be used for data analysis. Descriptive statistics can be applied to describe respondents' demographic. Multiple regression analysis may also be conducted to examine whether food hygiene knowledge and attitudes significantly influence students' food hygiene practices. This analysis is suitable for determining the role of each independent variable towards the dependent variable. Future research may also consider using Structural Equation Modelling (SEM) for a more detailed analysis as it allows researchers to examine both measurement and structural models at the same time, providing a deeper understanding of the relationships between knowledge, attitudes, and practices within the KAP framework.

The findings from future empirical research may help determine whether the proposed conceptual framework is supported. In addition, the findings may offer useful data for universities and associated stakeholders to develop better food hygiene education programmes, awareness campaigns, and supportive campus environments that encourage safer food handling practices among students.

Conclusion

This concept paper proposed the Knowledge, Attitude and Practice (KAP) model as a theoretical framework to understand food hygiene behaviour among university students at Universiti Teknologi MARA (UiTM) Terengganu. Based on previous literature, food hygiene knowledge and attitudes are considered important factors that may influence students' food hygiene practices. However, these relationships have not yet been tested among UiTM Terengganu students because this paper focuses on developing a conceptual framework rather than conducting empirical research.

The proposed framework serves as a foundation for future studies by providing a structured way to examine how students' knowledge and attitudes may affect their food hygiene practices. Future researchers may validate this framework by collecting data from UiTM Terengganu

students and using suitable statistical methods to investigate the proposed relationships. The findings may provide a better understanding of food hygiene behaviour among university students and support universities, health educators, and related stakeholders in developing more effective food hygiene education programmes, awareness activities, and supportive campus environments. Improving students' food hygiene practices may help reduce the risk of foodborne illnesses within university communities.

-
- Acknowledgements:** The authors would like to express their sincere gratitude to Universiti Teknologi MARA Malaysia for providing the necessary resources and support throughout the course of this research. Special appreciation is extended to colleagues and peers who contributed valuable insights and constructive feedback, which greatly enhanced the quality of this paper.
- Funding Statement:** No Funding
- Conflict of Interest Statement:** The authors declare that there is no conflict of interest regarding the publication of this paper. All authors have contributed to this work and approved the final version of the manuscript for submission to the International Journal of Tourism, Hospitality and Environment Management (JTHER).
- Ethics Statement:** This manuscript is a concept paper and does not involve human participants, animals, or the collection or analysis of primary data. Consequently, ethical approval and informed consent were not required. The authors confirm that the manuscript was prepared in accordance with accepted principles of academic integrity and publication ethics.
- Author Contribution Statement:** All authors take part to the development of this concept paper. Noor Aziean Abd Karim contributed to the conceptualization of the study, development of the theoretical framework and relevant literature. Nur Auni Syazwina Saharipudin conducted the literature review, prepared the initial manuscript draft, and contributed to the revision and editing process. Siti Aisyah Tumin contributed to the review of the manuscript, enhancement of content and language, and proofreading of the final version prior to submission. Mohamad Arif Abdul Kadir be responsible for overall supervision, academic guidance, and support in refining the conceptual framework and manuscript structure. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work, including its accuracy and integrity.
-

References

- Afrin, S., Salma, N., Yeasmin, S., Promy, S. T., Salam, S., & Ali, M. K. M. (2024). Perceptions and perspectives towards safe food handling and its practices: a case study at Jahangirnagar University. *Journal of Health, Population and Nutrition*, 43(1). <https://doi.org/10.1186/s41043-024-00692-3>
- Ahmad, H., Abidin, S. A., & Quah, W. B. (2024). Keeping It Clean: The Role of Education in Food Safety Among Future Hospitality Professionals. *International Journal of Academic Research in Business and Social Sciences*, 14(9). <https://doi.org/10.6007/ijarbss/v14-i9/22824>
- Ali, M. T., Mahmud, S., Mohsin, M., Mian, A. U., Islam, A., & Ahmed, F. F. (2023). Knowledge, attitude, and practices toward food safety among students in Bangladesh: A cross-sectional web-based study. *Heliyon*, 9(4). <https://doi.org/10.1016/j.heliyon.2023.e14762>
- Aljasir, S. F. (2023). Food safety knowledge and practices among food handlers and consumers in Gulf countries: An integrative review. In *Global Public Health* (Vol. 18, Issue 1). Taylor and Francis Ltd. <https://doi.org/10.1080/17441692.2023.2287584>
- Chen, K., Lin, Z., do Prado, I., Mohammad, Z., Acosta, K. M., & Sirsat, S. A. (2024). College Students' Domestic Kitchen Food Safety Perceptions and Knowledge. *Journal of Extension*, 61(4). <https://doi.org/10.34068/joe.61.04.12>
- Firdani, F. (2022). Knowledge, Attitudes and Practices of Hygiene and Sanitation Implementation on Food Handlers. *Jurnal Kesehatan Lingkungan Indonesia*, 21(2), 131–136. <https://doi.org/10.14710/jkli.21.2.131-136>
- Halim-Lim, S. A., Mohamed, K., Sukki, F. M., David, W., Ungku Zainal Abidin, U. F., & Jamaludin, A. A. (2023). Food Safety Knowledge, Attitude, and Practices of Food Handlers in Restaurants in Malé, Maldives. *Sustainability (Switzerland)*, 15(17). <https://doi.org/10.3390/su151712695>
- Hasan, M. R., Chowhan, A., Khatun, M. R., Sultana Saema, M. M., Haque, T., Shuchy, S. I., Chandra Pramanik, S., & Akther, F. (2026). Food Safety, Hygiene, and Sanitation Practices Among University Campus Dining Personnel: An Institution-Based Cross-Sectional Study. *Journal of Nutrition and Metabolism*, 2026(1). <https://doi.org/10.1155/jnme/7216438>
- Hussien, A. A., Abdellattif, A. H., Abumunshar, A. A., Samara, A., Sharif, L., Alkaiyat, A., Koni, A. A., & Zyoud, S. H. (2022). Food Safety Concerns and Practices Among Palestinian University Students: A Cross-Sectional Study. *SAGE Open*, 12(3). <https://doi.org/10.1177/21582440221119490>
- Ishak, A. H., Norashikin, S., & Shaifuddin, M. (2023). Assessment of food safety knowledge, attitudes and practices among home-based food consumers in Kubang Pasu District. In *Healthscope 2023* (Vol. 6, Issue 1).
- Ishra, R., Sharif, S., Soar, J., & Khanam, R. (2026). Role of Food Safety Risk Perception and Attitude on Knowledge and Practice of Adult Consumers in Bangladesh: A Serial Mediation Model. *Food Science and Nutrition*, 14(2). <https://doi.org/10.1002/fsn3.71540>
- Islam, M. N., Hassan, H. F., Amin, M. B., Madilo, F. K., Rahman, M. A., Haque, M. R., Aktarujjaman, M., Farjana, N., & Roy, N. (2022). Food safety and handling knowledge and practices among university students of Bangladesh: A cross-sectional study. *Heliyon*, 8(12). <https://doi.org/10.1016/j.heliyon.2022.e11987>
- Jeinie, M. H., & Nor, N. M. (2022). Food Hygiene and Storage Practices towards the Understanding of Food Microbe among Universiti Malaysia Sabah (UMS) Students.

- Malaysian Journal of Medicine and Health Sciences*, 18, 178–183.
<https://doi.org/10.47836/mjmh18.s15.24>
- Keczeli, V., Kóró, M., Tóth, V., Csákvári, T., Tisza, B. B., Szántóri, P., Asztalos, Á. C., Verzár, Z., & Kisbenedek, A. G. (2024). Food Safety and Food Hygiene Knowledge of Hungarian University Students. *International Journal of Environmental Research and Public Health*, 21(11). <https://doi.org/10.3390/ijerph21111410>
- Ma, X., Bo, L., & Zhou, X. (2024). Knowledge, attitude, and practice toward foodborne disease among Chinese college students: a cross-sectional survey. *Frontiers in Public Health*, 12. <https://doi.org/10.3389/fpubh.2024.1435486>
- Makhunga, S. E., MacHerera, M., & Hlongwana, K. (2023). Food handlers' knowledge, attitudes and self-reported practices regarding safe food handling in charitable food assistance programmes in the eThekweni District, South Africa: cross-sectional study. *BMJ Open*, 13(4). <https://doi.org/10.1136/bmjopen-2022-065357>
- Mani, N., Kota, K., Gunupati, S., Munagapati, S., Chadipiralla, K., Kumuda, M. V., Subramanyam, M., Srivalli, P., & Allam, U. S. (2022). KAP Analysis on Food Safety among University Students of South India. *International Journal of Food and Nutritional Sciences* |, 11(6). https://doi.org/10.4103/ijfans_150_22
- Marklinder, I., Eskhult, G., Ahlgren, R., Blücher, A., Börjesson, S. M. E., Moazzami, M., Schelin, J., & Danielsson-Tham, M. L. (2022). A Structural Equation Model Demonstrating the Relationship between Food Safety Background, Knowledge, Attitudes and Behaviour among Swedish Students. *Foods*, 11(11). <https://doi.org/10.3390/foods11111595>
- Masiku, G.-T. T., Mwijage, K. F. M., Ryoba, N. N. R., Ngulinzila, N. J., Mgimba, N. T., Njambilo, M. M., Shirima, L. J., Mboya, I. B., & Mavura, R. A. (2024). *Knowledge, attitude, and food safety practices among university students in Kilimanjaro region, northern Tanzania*. <https://doi.org/10.21203/rs.3.rs-4448935/v1>
- Mshelia, A. B., Osman, M., & Misni, N. B. (2022). A cross-sectional study design to determine the prevalence of knowledge, attitude, and the preventive practice of food poisoning and its factors among postgraduate students in a public university in Selangor, Malaysia. *PLoS ONE*, 17(1 January). <https://doi.org/10.1371/journal.pone.0262313>
- Nițescu, M., Nedelescu, M. M., Moroșan, E., Simionescu, A. A., Furtunescu, F. L., Ștefănescu, B. E., Tusaliu, M., Panaitescu, E., Stanciu, A. M., & Stoian, I. M. (2025). Assessment of Food Safety Knowledge and Practices Among Medical Students. *Foods*, 14(9). <https://doi.org/10.3390/foods14091636>
- Soon, J. M., Wahab, I. R. A., Hamdan, R. H., & Jamaludin, M. H. (2020). Structural equation modelling of food safety knowledge, attitude and practices among consumers in Malaysia. *PLoS ONE*, 15(7 July). <https://doi.org/10.1371/journal.pone.0235870>
- Tuglo, L. S., Agordoh, P. D., Tekpor, D., Pan, Z., Agbanyo, G., & Chu, M. (2021a). Food safety knowledge, attitude, and hygiene practices of street-cooked food handlers in North Dayi District, Ghana. *Environmental Health and Preventive Medicine*, 26(1). <https://doi.org/10.1186/s12199-021-00975-9>
- Tuglo, L. S., Agordoh, P. D., Tekpor, D., Pan, Z., Agbanyo, G., & Chu, M. (2021b). Food safety knowledge, attitude, and hygiene practices of street-cooked food handlers in North Dayi District, Ghana. *Environmental Health and Preventive Medicine*, 26(1). <https://doi.org/10.1186/s12199-021-00975-9>
- World Health Organization (WHO). (2021). *Assessing population knowledge, attitudes and practices (KAP)*.

Yi, N. Y., & Choi, J. H. (2025). Age differences in food safety knowledge, attitudes, and practices among consumers in Seoul. *Nutrition Research and Practice*, 19(3), 440–452. <https://doi.org/10.4162/nrp.2025.19.3.440>