

**Review Article****KNOWLEDGE, ATTITUDE AND PRACTICE (KAP) STUDY OF FOOD SAFETY AND HYGIENE PRACTICES OF HOUSEHOLD CONSUMERS****Afia Saadat¹ | Muhammad Siddique^{2*} | Malik Muhammad Hashim³**

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ABSTRACT:

Background: The developed states of the world make huge investments in food safety and hygiene to prevent food-related illnesses, enhancing public health and reducing healthcare costs. However, the developing and poorer states often lack the resources to match these efforts. Studies have shown that food borne illnesses can have severe impacts on a country's economy, trade, and tourism, and can even result in litigation. Most efforts in food safety focus on the macro level, encompassing raw materials, industrial production, distribution, and retail. However, there is a gap in research and action at the micro level, particularly regarding consumer practices. Domestic food handlers often lack sufficient knowledge about food safety, handle food poorly, and store it inefficiently, leading to vulnerability to food borne illnesses. These handlers often rely on trial-and-error methods and traditional practices, posing significant health risks.

Material and Methods: This study specifically examines the consumers' Knowledge, Attitude and Practices of food safety and Hygiene, particularly at household level. This focus is crucial as it addresses the need for improving food safety knowledge and practices at the consumer level to prevent health threats. By exploring the Knowledge, Attitude, and Practices of Food Safety and Hygiene, the study aims to identify gaps and suggest targeted interventions that can enhance food safety at the domestic level.

KEYWORDS:

Advance Countries, Developing Countries, Knowledge, Attitude, Practice, Food Safety and Hygiene.

1 | INTRODUCTION

Advanced countries spend substantial amounts of money each year on devising ways and means to ensure the provision of pure, safe, and hygienic food to their citizens. For example, the United States allocates billions of Dollars annually to food safety programs implemented by agencies such as the Food & Drug Administration (FDA) and United States Department of Agriculture (USDA). These investments aim to mitigate the risks of foodborne illnesses and ensure consumer confidence in food products. On the flip side, developing countries often suffer from inattention from their governments in the provision of safe and hygienic food to their masses. This neglect is primarily due to poor economic conditions, which restrict the ability of these states to invest in comprehensive food safety systems¹. In countries like Pakistan, India and Nigeria, limited governmental resources are stretched thin, often prioritizing immediate economic concerns over long-term health initiatives. This disparity in resource allocation means that food safety often takes a backseat to more pressing economic issues. Moreover, at the consumer level, insufficient awareness and education on food safety contribute to poor and unhygienic food handling practices. For instance, a study conducted in rural areas of Kenya revealed that many households lack basic knowledge about safe food storage and preparation, leading to high incidences of foodborne diseases. This lack of

knowledge exacerbates the public health challenge; as unsafe food handling practices can negate any progress made through governmental efforts².

The disparity in food safety practices has significant public health implications. In developing countries, foodborne illnesses are prevalent and place a considerable burden on healthcare systems. The World Health Organization estimates that foodborne diseases result in 420,000 deaths each year, with a disproportionate number occurring in low-income regions. This stark statistic underscores the urgent need for comprehensive food safety interventions in these areas³. Addressing these issues requires a multifaceted approach. Advanced countries can share their expertise and resources to help develop robust food safety systems in poorer nations. Collaborative efforts, such as capacity-building initiatives and technology transfers, can significantly enhance food safety standards in developing countries. Furthermore, improving consumer education on food safety can empower individuals to adopt better practices, regardless of their economic conditions. Effective education campaigns can raise awareness about the importance of safe food handling, storage, and preparation, thereby reducing the incidence of foodborne diseases⁴. In this regard, this study is an attempt to explore the Knowledge, Attitude, and Practices of Food Safety and Hygiene. By focusing on the food-handling behavior of consumers at household level, this research aims to identify gaps in knowledge, attitude and practice to draw conclusions about the issue and give recommendations that can contribute to the development of effective strategies for improving food safety at the domestic level, ultimately enhancing public health outcomes.

2 | LITERATURE REVIEW

2.1 | FOOD SAFETY AND HYGIENE

Food safety and hygiene are achieved through a series of practical steps based on scientific procedures and protocols that counteract traditional food handling methods. These standard procedures are meticulously applied in the acquisition, handling, preparation, and storage of food to ensure that it is pure, hygienic, and safe for human consumption. In essence, food safety and hygiene refer to the degree to which food is suitable for human use⁵. Researchers, including Martins et al (2012), have emphasized that domestic food handlers often lack the necessary knowledge, attitudes, and practices related to food safety and hygiene, thereby putting the health of their families at risk. This lack of adequate food safety knowledge and practice can lead to improper handling and storage of food, increasing the likelihood of foodborne illnesses. Therefore, it is crucial to address these gaps in knowledge and practice to improve overall food safety and public health⁶.

To address these challenges, educational interventions that focus on enhancing food safety knowledge and practices among domestic food handlers are essential. Such interventions should be culturally tailored and accessible to ensure they effectively reach and impact the target audience. By improving the food safety practices of individuals, particularly those who play key roles in food preparation within households, significant strides can be made in reducing the incidence of foodborne illnesses and promoting better public health outcomes⁷.

2.2 | KNOWLEDGE

Knowledge about food safety and hygiene is crucial for ensuring safe, healthy, and hygienic food handling practices at both industrial and domestic levels. In industrial settings, Standard Operating Procedures (SOPs) are meticulously followed by each worker to guarantee safe food handling. However, domestic food handlers in developing countries often receive little attention in this regard. Conversely, advanced states around the world show significant academic and practical interest in consumer-level food safety and hygiene issues¹. Previous studies indicate that consumers in developing countries often lack knowledge about the correct temperatures required for the preparation and storage of various food items. They are also generally unaware of pathogens and other disease-causing bacteria that pose risks to human health. This lack of awareness leads to unsafe food handling practices, increasing the risk of foodborne illnesses. Therefore, there is a pressing need for developing countries to educate their populations about safe and hygienic food handling practices to mitigate these risks. Such education can empower individuals with the knowledge necessary to protect themselves and their families from foodborne diseases. Implementing widespread educational programs and campaigns can raise awareness and promote better food safety practices at the domestic level, thereby improving public health outcomes².

2.3 | ATTITUDE

The attitude of individuals handling food plays a crucial role in the implementation of healthy, safe, and germ-free food practices, which can significantly reduce the incidence of food-related illnesses. Thus, the perspective and approach of food handlers are vital in determining the safety and hygiene of food Marais et al.,⁸. Several factors reflect the attitude of food handlers towards food safety and hygiene, including: a) Personal Cleanliness of Food Handlers- Maintaining high standards of personal hygiene to prevent the introduction of pathogens during food preparation; b) Prevention of Cross-Contamination- Implementing practices to avoid the transfer of harmful microorganisms from one food item or surface to another; c) Sourcing Food from Safe and Reliable Sources- Ensuring that food is obtained from suppliers that adhere to strict safety standards; d) Proper Cooking and Heating of Food- Cooking food to the recommended temperatures to kill harmful bacteria; and e) Storing Food at Recommended Temperatures- Keeping food at safe temperatures to prevent the growth of pathogens².

These practices are essential in ensuring food safety and hygiene, and a positive attitude towards these practices can greatly enhance food safety outcomes. By fostering a proactive and informed approach to food handling, food handlers can play a significant role in reducing the risks of foodborne illnesses and promoting overall public health⁴.

2.4 | PRACTICE

The practices of food handlers to ensure safety and hygiene involve the implementation of specific protocols during the preparation, storage, and consumption of food items. These protocols include: a) Selecting and Acquiring Safe Food Items for Meal Preparation- Ensuring that food is sourced from reputable suppliers who adhere to safety standards; b) Washing and Cleaning Food items before Cooking or Storage- Removing dirt, pesticides, and contaminants from food items to prevent contamination; c) Using Standardized Processing with Proper Temperature Control- Cooking and processing food at appropriate temperatures to eliminate harmful microorganisms; d) Appropriately serving Meals- Ensuring that food is served in a hygienic manner to prevent contamination; e) Properly disposing-off Food Waste- Managing food waste in a way that prevents the attraction of pests and the spread of pathogens; f) Storing Food according to Specified Guidelines- Keeping food at recommended temperatures and conditions to maintain its safety and quality; g) Reheating Food safely for Reuse- Ensuring that reheated food reaches safe temperatures to eliminate any potential bacteria. These practices are essential for ensuring contamination-free food and minimizing the likelihood of foodborne illnesses^{2,9}. Food safety practices can be categorized into objective and subjective measures. Objective Measures are fact-based and scientific in nature, aimed at identifying and reducing potential risks associated with each food item. These measures include temperature control, microbial testing, and adherence to regulatory standards. However, the Subjective Measures are less scientific and often based on societal customs and personal beliefs. These practices include traditional methods of food preparation and cultural habits related to food handling. Despite their differences, both objective and subjective measures of food safety are interconnected and equally important in maintaining food safety and hygiene. Combining scientific approaches with cultural practices can create a comprehensive food safety strategy that is both effective and culturally appropriate¹⁰.

2.5 | THEORETICAL FRAMEWORK

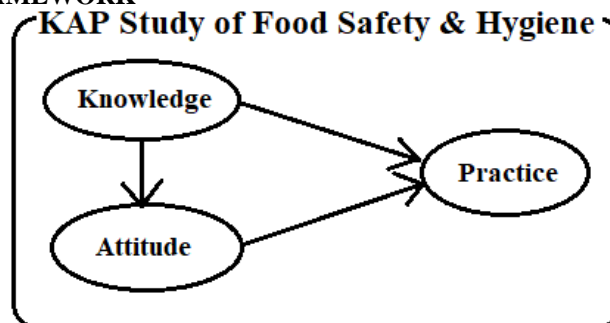


Figure 1 Theoretical Framework

The above model shows the theoretical connection of Knowledge of domestic consumers with their Attitude and Practice on Food Safety and Hygiene. This relation has been discussed in detail in the proceeding section of this paper.

3 | DISCUSSIONS

3.1 | EFFECTS OF FOOD SAFETY KNOWLEDGE & HYGIENE ON THE ATTITUDE OF CONSUMERS

The effects of knowledge of food safety and hygiene practices on the attitude of consumers are significant and multifaceted. Knowledge plays a critical role in shaping consumers' attitudes and behaviors towards food safety and hygiene. Here are some key effects:

a. **Increased awareness and understanding:** Consumers with better knowledge of food safety are more likely to make informed decisions regarding the selection, preparation, and storage of food. This awareness helps them avoid potential hazards and reduce the risk of foodborne illnesses. Similarly, understanding the risks associated with improper food handling can change consumers' attitudes towards food safety, making them more cautious and conscientious about their practices¹¹.

b. **Positive Behavioral Changes:** Knowledgeable consumers are more likely to adopt safe food handling practices, such as washing hands before cooking, using separate cutting boards for raw and cooked foods, and cooking foods to the appropriate temperatures. Similarly, a well-informed consumer is more likely to consistently follow hygiene practices, leading to sustained improvements in food safety behavior over time¹².

c. **Increased Responsibility and Accountability:** Consumers who understand the impact of food safety on personal and public health are more likely to take responsibility for ensuring that their food handling practices do not pose a risk to themselves or others. Moreover, knowledgeable consumers can influence the attitudes and behaviors of those around them, promoting a culture of food safety within their communities.

d. **Reduction in Foodborne Illnesses:** Educated consumers are better equipped to implement preventative measures that reduce the incidence of foodborne illnesses, such as proper refrigeration, thorough cooking, and avoiding cross-contamination. Also, with greater knowledge, consumers are more likely to recognize early signs of food spoilage or contamination and take appropriate actions to prevent illness¹³.

e. **Enhanced Trust in Food Systems:** When consumers are knowledgeable about food safety practices, they tend to have greater confidence in the food they consume and in the systems that regulate and ensure food safety. The informed consumers are more likely to support and comply with food safety policies and regulations, contributing to the overall effectiveness of public health initiatives¹⁴.

f. **Economic Benefits:** By reducing the incidence of foodborne illnesses, knowledgeable consumers can help decrease healthcare costs associated with treating such illnesses. Additionally, fewer instances of food spoilage and waste can result in economic savings for households. The informed consumers may drive demand for safer food products, encouraging producers and retailers to prioritize food safety in their operations¹¹.

In summary, knowledge of food safety and hygiene practices significantly influences consumer attitudes, leading to safer food handling behaviors, improved public health outcomes, and increased confidence in food systems. Efforts to educate consumers about food safety are crucial in fostering a culture of health and safety in both domestic and community settings.

3.2 | EFFECTS OF FOOD SAFETY KNOWLEDGE & HYGIENE ON THE CONSUMERS' PRACTICES

The knowledge of food safety and hygiene has profound effects on the practices of consumers. Here are several ways in which increased knowledge influences consumer behaviors and practices.

a. **Improved Food Handling:** Consumers who are knowledgeable about food safety are more likely to use correct food handling techniques, such as washing hands thoroughly before and after handling food and ensuring that utensils and surfaces are properly sanitized. Also, understanding the risks of cross-contamination leads knowledgeable consumers to adopt practices that prevent it, such as keeping raw meats separate from other foods during preparation and storage².

b. **Proper Food Storage:** Knowledgeable consumers are more aware of the importance of maintaining proper temperatures for storing different types of food. They are diligent in keeping perishable items refrigerated or frozen and understand the significance of the temperature danger zone. They follow guidelines for how long food can be safely stored, reducing the risk of consuming spoiled or unsafe food⁹.

c. **Safe Food Preparation:** Consumers with food safety knowledge understand the importance of cooking foods to the correct internal temperatures to kill harmful bacteria. They are more likely to use food thermometers to ensure foods reach safe temperatures. They know and follow safe thawing methods, such as thawing in the refrigerator, under cold running water, or in the microwave, rather than at room temperature¹⁵.

d. **Increased awareness and Risk protection:** Knowledgeable consumers are better at identifying potential food safety hazards and take proactive steps to mitigate these risks. They have an awareness of common foodborne pathogens and their sources, which inform their decisions about food handling and consumption¹⁶.

e. **Effecting Cleaning Practices:** Knowledgeable consumers understand the importance of thoroughly cleaning and sanitizing kitchen surfaces, utensils, and equipment to prevent contamination. These consumers are more likely to regularly clean refrigerators, freezers, and pantry areas to maintain a hygienic environment¹⁷.

f. **Informed Purchasing Decisions:** Such consumers are more discerning when purchasing food, checking for signs of spoilage, reading labels for safe handling instructions, and choosing products from reputable sources. They also avoid high-risk foods, such as raw or undercooked meats and eggs, and are cautious about food products that are past their expiration dates².

g. **Response to Food Recalls and Warnings:** These consumers stay informed about food recalls and safety warnings and take appropriate actions, such as returning or discarding recalled products. They also follow public health advisories regarding food safety practices, especially during outbreaks of foodborne illnesses¹⁸.

h. **Community Influence:** Knowledgeable consumers can influence the practices of those around them by sharing information and encouraging safe food handling behaviors within their families and communities. They serve as role models for proper food safety practices, demonstrating the importance of maintaining hygiene in food preparation and storage¹⁹.

i. **Health Outcomes:** By following safe food handling practices, knowledgeable consumers are less likely to suffer from foodborne illnesses, leading to better health outcomes. Also, consistent application of food safety knowledge contributes to long-term health benefits by preventing exposure to harmful pathogens⁸.

In summary, knowledge of food safety and hygiene empowers consumers to adopt safer food handling, preparation, and storage practices. This knowledge leads to a proactive approach to preventing foodborne illnesses, enhancing both individual and public health outcomes.

3.3 | EFFECTS OF CONSUMERS' ATTITUDE ON FOOD SAFETY & HYGIENE PRACTICES

The attitude of consumers regarding food safety and hygiene significantly impacts their practices of food safety and hygiene. Here are several ways in which consumer attitudes influence their behaviors.

a. **Motivation to Follow Safe Practices:** Consumers with a positive attitude towards food safety are more motivated to follow safe food handling practices. They recognize the importance of these practices and are more diligent in implementing them. A positive attitude fosters a sense of responsibility and commitment to maintaining high standards of food safety and hygiene²⁰.

b. **Adherence to Guidelines and Recommendations:** Consumers with a strong belief in the importance of food safety are more likely to comply with guidelines and recommendations provided by health authorities. This includes following proper cooking temperatures, safe food storage practices, and regular handwashing. A positive attitude leads to consistent application of food safety practices, reducing the risk of lapses that can lead to contamination⁴.

c. Proactive Measures: Consumers who value food safety are proactive in taking preventive measures to avoid contamination. This includes regular cleaning of kitchen surfaces, using separate cutting boards for raw and cooked foods, and ensuring food is stored at the correct temperatures. A positive attitude towards food safety encourages consumers to manage risks effectively, such as promptly discarding expired or spoiled food items⁵.

d. Influence on Household Practices: Consumers with a strong commitment to food safety often influence the practices of others in their household. They set an example and educate family members about the importance of safe food handling. A positive attitude towards food safety fosters a culture of shared responsibility within the household, ensuring that everyone contributes to maintaining high standards of hygiene²¹.

e. Willingness to Learn and Improve: Consumers who prioritize food safety are more open to learning and improving their practices. They seek out information, attend workshops, and stay updated on best practices in food safety. A positive attitude makes consumers more adaptable to new information and willing to change their practices to enhance food safety²²⁻²³.

f. Impact on Health Outcomes: Consumers who practice good food safety and hygiene due to their positive attitude are less likely to experience foodborne illnesses. This leads to better overall health and well-being. Similarly, consistent application of safe food handling practices contributes to long-term health benefits by preventing chronic health issues related to foodborne pathogens³.

g. Support for Safe Food Systems: Consumers with a strong attitude towards food safety may advocate for better food safety policies and regulations. They support initiatives that enhance food safety standards and hold producers and retailers accountable. A positive attitude towards food safety can drive market demand for safer food products, encouraging the food industry to prioritize safety and hygiene in their operations¹⁴.

In summary, the attitude of consumers towards food safety and hygiene plays a crucial role in shaping their food handling practices. A positive and informed attitude leads to diligent adherence to safety guidelines, proactive measures to prevent contamination, and a culture of shared responsibility within households. This ultimately results in improved health outcomes and a safer food supply.

4 | CONCLUSION

Consumers with knowledge and positive attitude towards food safety are more likely to comply with food safety guidelines and recommendations. They see these guidelines as essential for protecting their health and the health of their families. They adopt food safety practices, such as proper hand washing, safe food handling, and storage, reducing the risk of contamination. Since, they have a heightened awareness of the risks associated with unsafe food handling practices. They understand the potential consequences of foodborne illnesses and are motivated to prevent them. In this regard, they take proactive measures to mitigate risks, such as avoiding cross-contamination, cooking food to appropriate temperatures, and storing food properly. They also recognize their role in preventing foodborne illnesses and are committed to practicing safe food handling behaviors. They also influence the practices of others, such as family members or friends by encouraging them to adopt similar food safety practices. They seek out information from reliable sources, attend workshops or seminars, and stay updated on best practices. Last but not the least, they foster adaptability to new information and willingness to change practices based on new knowledge or recommendations.

REFERENCES

1. Webb M, and Morancie A. Food safety knowledge of food service workers at a university campus by education level, experience, and food safety training. *Food Control*, 2015; 50:259–264.
2. Akabanda F, Hlortsi EH, and Owusu-Kwarteng J. Food safety knowledge, attitudes and practices of institutional food-handlers in Ghana. *BMC Public Health*, 2017; 17: 40
3. Greig JD, Todd EC, Bartleson CA, and Michaels BS. Outbreaks where food workers have been implicated in the spread of foodborne disease. part 1. description of the problem, methods, and agents involved. *Journal of Food Protection*, 2007; 70(7): 1752–1761.

4. Farber CR, Bennett BJ, Orozco, Zou W, and Lira A. Mouse Genome-wide Association and Systems Genetics Identify: *Asxl 2* as a regulator of bone mineral density and osteoclastogenesis. *PLoS Genet* 7: e1002038.
5. Sharif L, and Al-Malki T. Knowledge, attitude and practice of Taif University students on food poisoning. *Food Control*, 2010; 21(1):55–60
6. Ansari-Lari M, Soodbakhsh S, Lakzadeh L. Knowledge, attitudes and practices of workers on food hygienic practices in meat processing plants in Fars, Iran. *Food Control*, 2010; 21(3): 260–263.
7. World Health Organization. *World Health Statistics*. 2010
8. Marais M, Conradie N, Labadarios D. Small and micro enterprises—aspects of knowledge, attitudes and practices of managers and food handlers’ knowledge of food safety in the proximity of tygerberg academic hospital, Western Cape. *South African Journal of Clinical Nutrition*, 2008; 20(2):50–61.
9. Angelillo IF, Foresta MR, Scozzafava C, and Pavi, M. Consumers and food-borne diseases: knowledge, attitudes and reported behavior in one region of Italy. *International Journal of Food Microbiology*, 2001; 64: 161-166.
10. Luo X, Xu X, Chen H, Bai R, Zhang Y, Hou X, Zhang F, Zhang Y, Sharma M, Zeng, H, and Zhao Y. Food safety related knowledge, attitudes, and practices (KAP) among the students from nursing, education and medical college in Chongqing, China. *Food Control*, 2019; 95: 181-188.
11. Barrie, D. The provision of food and catering services in hospital. *Journal of Hospital Infection*, 1996; 33(1): 13–33.
12. Jay LS, Comar D, and Govenlock LD. A Video study of Australian domestic food handling practices. *Journal of Food Protection*, 1999; 62(11): 1285–1296.
13. World Health Organization. (1999). *Strategies for implementing HACCP in small and/or less developed businesses*. The Hague, 16–19.
14. Adams M, and Motarjemi Y. *Basic food safety for health workers*. Geneva: World Health Organization: 1999; 113–114.
15. Jevšnik M, Hlebec V, and Raspor P. Consumers awareness of food safety from shopping to eating. *Journal of Food Control*, 2007; 19: 737-745.
16. Andersen AS, Hansen PH, Schaffer L, and Kristensen C. A new secreted insect protein belonging to the immunoglobulin super family binds insulin and related peptides and inhibits their activities. *Journal of Biological Chemistry*, 2000; 275:16948-16953.
17. Medeiros LC, Hillers VN, Chen G, Bergmann, V, and Kednall P. Design and development of food safety knowledge and attitude scales for consumer food safety education. *Journal Am Dietetic Association*, 2004; 104: 1671-1677.
18. Walker, E., Pritchard, C., and Forsythe, S. Food handlers’ hygiene knowledge in small food businesses. *Food Control*, 2003; 14(5):339–343.
19. Buccheri C, Casuccio A, Giammanco S, Giammanco M, La Guardia M, Mammina C. Food safety in hospital: knowledge, attitudes and practices of nursing staff of two hospitals in Sicily, Italy. *BMC Health Serv Res*, 2007; 7(1):1.
20. Redmond EC, and Griffith CJ. Consumer food handling in the home: A review of food safety studies. *Journal of Food Protection*, 2003; 66: 130-161.
21. Ehiri JE, and Morris GP. Hygiene training and education of food handlers: Does it work? *Ecology of Food and Nutrition*, 1996; 35(4): 243–251.
22. Howes M, McEwen S, Griffiths M, and Harris L. Food Handler Certification by Home Study: Measuring changes in knowledge and behavior. *Dairy, Food Environment Sanitation*, 1996; 16(11): 737–744.
23. Martins RB, Hogg T, and Otero JG. Food handlers’ knowledge on food hygiene: The case of a catering company in Portugal. *Food Control*, 2012; 23(1):184–190.