Evaluation of Food Safety Training Programs in the Food Service Industry in Tanzania

Akida Adil

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Abstract

Purpose: The aim of the study was to investigate evaluation of food safety training programs in the food service industry in Tanzania

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: The evaluation of food safety training programs in the food service industry in Tanzania revealed positive outcomes. Training initiatives led to significant improvements in food safety knowledge and practices among restaurant and food establishment staff. Compliance with food safety regulations increased, contributing to a reduced incidence of foodborne illnesses. However, challenges related to resource constraints and long-term sustainability were identified, calling for tailored strategies to address these issues. Overall, food safety training programs were effective in enhancing food safety standards in the Tanzanian food service industry but require ongoing support and adaptation to maintain their impact.

Unique Contribution to Theory, Practice and Policy: Health belief model, Social cognitive theory , Theory of planned behavior may be used to anchor future studies on evaluation of food safety training programs in the food service industry in Tanzania. Implement continuous assessment mechanisms within food safety training programs. Encourage policymakers to establish and enforce regulations that require individuals to complete certified food safety training before working in food service roles.

Keywords: *Food Safety Training Program, Food Service Industry*

INTRODUCTION

Food safety practices are the measures taken to ensure that food is safe and wholesome for human consumption. Food safety practices can vary depending on the level of development, resources, infrastructure and regulations of different countries or regions. WHO, (2022). According to the World Health Organization (WHO), foodborne diseases cause an estimated 600 million cases and 420 000 deaths worldwide each year. In developed economies, the most common causes of foodborne diseases are bacteria such as Salmonella, Campylobacter and Escherichia coli. A study by the European Food Safety Authority (EFSA) found that the annual burden of foodborne diseases in the European Union was 2.4 million cases and 4 700 deaths in 2019.

In developed economies, such as the USA, Japan or UK, food safety practices are generally well-established and enforced by government agencies, industry standards and consumer awareness. Some examples of food safety practices in these countries are: Implementing hazard analysis and critical control point (HACCP) systems to identify and control potential hazards in food production, processing, distribution and preparation. Conducting regular inspections, audits and surveillance of food facilities, products and imports to ensure compliance with food safety regulations and standards. Establishing traceability and recall systems to quickly identify and remove unsafe food from the market in case of outbreaks or emergencies. Promoting good hygiene practices among food handlers, such as washing hands, wearing gloves, using clean utensils and equipment, and avoiding cross-contamination. Educating consumers about safe food handling, storage and preparation at home, such as washing fruits and vegetables, cooking meat thoroughly, refrigerating leftovers and checking expiry dates.

In developing economies, such as India, Brazil or Nigeria, food safety practices are often less developed or implemented due to lack of resources, infrastructure, regulations or awareness. Some examples of food safety challenges in these countries are: Lack of access to safe water, sanitation and hygiene facilities, which increases the risk of contamination of food by fecal matter, pathogens or chemicals. Lack of adequate cold chain infrastructure, which affects the quality and shelf life of perishable foods such as meat, dairy and fruits. Lack of effective monitoring and enforcement of food safety standards and regulations, which allows the entry of substandard or adulterated foods into the market. Lack of consumer education and awareness about safe food handling, storage and preparation at home, which increases the exposure to unsafe food practices such as reusing cooking oil, eating raw or undercooked foods or using unclean utensils.

In developing economies, food safety practices remain a critical concern as these regions grapple with unique challenges. One notable example comes from India, where the Food Safety and Standards Authority of India (FSSAI) has been actively working to enhance food safety regulations and enforcement. A study published by Sharma (2018) discussed the impact of FSSAI's initiatives in reducing adulteration and contamination in food products. The research found a significant

improvement in food safety compliance, with a steady decline in reported foodborne illness cases in recent years.

Another prominent illustration can be found in Brazil, where the government has implemented the National Plan for Food Safety (PNASAN) to address food safety concerns. A study by (Sant'Ana , 2017) highlighted that PNASAN has contributed to the reduction of foodborne outbreaks and improved food safety practices in the country. This includes enhanced surveillance, risk assessment, and regulatory measures. Despite these positive developments, it's important to note that challenges persist in developing economies due to resource constraints, infrastructure limitations, and the need for ongoing capacity building efforts.

The WHO estimated that the impact of unsafe food costs low- and middle-income economies around US$ 95 billion in lost productivity each year. In developing economies, the most common causes of foodborne diseases are bacteria such as Vibrio, Shigella spp. and Salmonella Typhi , which cause diseases. A study by the International Food Policy Research Institute (IFPRI) found that the annual burden of foodborne diseases in low- and middle-income countries was 156 million cases and 255 000 deaths in 2018.

In developed economies like the USA, food safety practices have undergone significant improvements over the years. One prominent example is the implementation of the Food Safety Modernization Act (FSMA) in 2011, which aimed to enhance food safety through preventive measures. According to a study published in the Journal of Food Protection (Smith et al., 2018), FSMA has contributed to a noticeable decline in foodborne illnesses. The study reported that between 2006 and 2016, there was a 22% decrease in the incidence of foodborne illnesses, showcasing the positive impact of such regulatory initiatives. Another noteworthy example comes from Japan, where the Food Safety Basic Act was introduced in 2003. This act established the fundamental principles for ensuring food safety in the country. A study by Wakai, (2017) highlighted that Japan's stringent regulations and thorough food safety inspections have resulted in an exceptionally low rate of foodborne illnesses, with a steady decline over the past decade, making it one of the safest places to consume food.

In developing economies, food safety practices face distinct challenges, but efforts are being made to improve them. For instance, in the UK, there have been initiatives to support food safety in developing countries through partnerships and knowledge sharing. Jones, (2016), which focuses on capacity building and knowledge transfer to enhance food safety in developing nations. Similarly, in the USA, organizations like the World Food Program have been involved in food safety programs in developing countries, aiming to reduce foodborne illnesses. While there is progress, food safety remains a concern in these economies due to limited resources and infrastructure challenges.

In developing economies such as those in parts of Africa, food safety practices face multifaceted challenges. One example is in Nigeria, where the National Agency for Food and Drug

Administration and Control (NAFDAC) has been working to improve food safety standards. A study by Abdul-Mutalib, (2017) highlighted the challenges and progress made in enforcing food safety regulations in Nigeria. Despite facing obstacles like limited resources and inadequate infrastructure, NAFDAC's efforts have contributed to a reduction in the incidence of foodborne illnesses.

Another case can be observed in Vietnam, where rapid economic growth has led to increased concerns about food safety. The Vietnamese government has introduced measures to enhance food safety and quality, including stricter regulations and surveillance systems. A study published by (Nga ,2018) examined the impact of these measures on food safety in Vietnam and reported positive outcomes, with a declining trend in foodborne illness cases over the years. However, challenges persist in ensuring food safety in developing economies, necessitating continued investments in education, infrastructure, and regulatory enforcement. In sub-Saharan economies, such as Ethiopia, Kenya or South Africa, food safety practices are also influenced by factors such as poverty, climate change, urbanization and globalization. Some examples of food safety issues in these countries are: High prevalence of malnutrition and hunger, which affects the immune system and increases the susceptibility to foodborne diseases. High exposure to environmental contaminants such as pesticides, heavy metals or aflatoxins, which can accumulate in crops or animals and cause chronic diseases such as cancer or liver damage. High dependence on informal food markets , which often lack adequate hygiene standards , quality control or labelling requirements. High consumption of traditional foods , such as fermented milk ,bushmeat or insects , which may pose health risks if not prepared properly or sourced from safe sources.

Sub-Saharan economies face unique food safety challenges. Limited access to clean water, inadequate sanitation facilities, and a lack of resources for proper food handling and storage contribute to higher rates of foodborne illnesses. A study by Mhlanga (2019) highlighted that sub-Saharan Africa experiences a disproportionately high burden of foodborne diseases compared to developed economies, with an upward trend in reported cases. Food safety interventions in these economies require a multi-faceted approach, including infrastructure development, education, and capacity building, to address the root causes of foodborne illnesses.

Food safety training programs are designed to educate food handlers and managers on the best practices to prevent foodborne illnesses and ensure food quality. There are different types of food safety training programs, depending on the level of risk, the type of food, and the regulatory requirements. Some of the most common food safety training programs are: ServSafe: This is a nationally recognized program that covers topics such as food hazards, personal hygiene, cross-contamination, time and temperature control, cleaning and sanitizing, and pest management. ServSafe offers certification for food handlers, managers, and instructors (National Restaurant Association, 2021).

Food Handler Training: This is a basic program that teaches food handlers the fundamentals of food safety, such as hand washing, proper storage, cooking temperatures, and avoiding cross-contact. Food handler training is usually required by state or local health departments for anyone who works with food (FoodHandler, 2021). HACCP Training: This is an advanced program that focuses on the Hazard Analysis and Critical Control Point (HACCP) system, which is a preventive approach to identify and control food safety hazards throughout the food production process. HACCP training is required for certain food sectors, such as seafood, juice, meat, and poultry (FDA, 2021).

Allergen Awareness Training: This is a specialized program that educates food handlers and managers on how to prevent allergic reactions and anaphylaxis in customers with food allergies. Allergen awareness training covers topics such as allergen sources, labeling, cross-contact prevention, and emergency response (FARE, 2021). Food safety training programs can help improve food safety practices by increasing the knowledge, skills, and attitudes of food workers and managers. By following the principles and guidelines of food safety training programs, food businesses can reduce the risk of foodborne outbreaks, comply with regulatory standards, enhance customer satisfaction, and improve their reputation and profitability.

Problem Statement

Food safety training programs are essential for ensuring the quality and safety of food products and preventing foodborne illnesses. However, the effectiveness of these programs in the food service industry in Tanzania is not well understood. There is a lack of empirical evidence on the impact of food safety training on the knowledge, attitudes, and practices of food handlers and managers, as well as on the compliance with food safety standards and regulations. Therefore, this study aims to evaluate the food safety training programs in the food service industry in Tanzania, using a mixed-methods approach that combines quantitative and qualitative data collection and analysis. The study will also identify the challenges and opportunities for improving the design, delivery, and evaluation of food safety training programs in the country (Mwita , 2020).

Theoretical Framework

Health Belief Model (HBM)

The Health Belief Model, developed by Hochbaum, Rosenstock, and Kegels in the 1950s, revolves around the idea that an individual's health-related behavior is determined by their perception of the severity of a health threat, susceptibility to that threat, the benefits of taking a specific action to reduce the threat, and the barriers to taking that action. The HBM can be applied to the evaluation of food safety training programs in the food service industry by assessing employees' perceptions of the severity of foodborne illnesses, their susceptibility to such illnesses, the perceived benefits of following food safety guidelines, and the barriers they face in implementing these guidelines.

This theory helps in understanding and addressing factors that influence the effectiveness of food safety training programs (Rosenstock, 1974).

Social Cognitive Theory (SCT)

Social Cognitive Theory, developed by Albert Bandura, emphasizes the importance of observational learning, self-efficacy (belief in one's ability to perform a behavior), and social influences in shaping individual behavior. It suggests that people learn from observing others and that their behavior is influenced by their self-perceived capabilities. SCT can be applied to the evaluation of food safety training programs by examining how employees' observations of coworkers and the social environment within the food service establishment affect their adoption of food safety practices. Additionally, assessing employees' self-efficacy in implementing food safety measures can help determine the effectiveness of training programs in building their confidence and skills (Bandura, 1986).

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior, developed by Icek Ajzen, posits that individual behavior is influenced by their intention to perform the behavior, which is in turn shaped by their attitude toward the behavior, subjective norms (perceived social pressures), and perceived behavioral control (the extent to which they believe they can control the behavior). TPB can provide valuable insights into the evaluation of food safety training programs by examining employees' intentions to adhere to food safety guidelines. By assessing their attitudes, perceptions of social norms in the workplace, and their perceived control over implementing food safety measures, researchers can gain a better understanding of the factors that influence employees' compliance with food safety practices (Ajzen, 1991).

Empirical Studies

Smith (2017) evaluated the effectiveness of a food safety training program implemented in a chain of fast-food restaurants. The purpose of the study was to assess whether the training program led to improvements in food safety knowledge and practices among restaurant employees. The researchers utilized a mixed-method approach, combining pre- and post-training assessments of employee knowledge and observations of food handling practices. The findings from this study indicated a statistically significant improvement in food safety knowledge and adherence to recommended food handling practices among the participating employees. Based on these results, the study recommended the regular implementation of refresher training sessions to sustain and further improve food safety practices, as well as ongoing monitoring of food handling behaviors to ensure long-term compliance.

Brown and Johnson (2016) embarked on a study with the primary objective of evaluating the impact of a food safety training program on the reduction of foodborne illness incidents in a group

of restaurants. The researchers conducted a retrospective analysis of health department records covering a period before and after the implementation of the training program. The study found a substantial decrease in reported foodborne illness cases following the training program's introduction. This decline suggested a positive impact of the training on food safety practices within the restaurants. The research recommended that authorities and restaurant management continue to enforce food safety protocols rigorously and regularly update training programs to ensure their continued effectiveness in preventing foodborne illnesses.

Garcia (2018) evaluated the effectiveness of a food safety training program in improving compliance with hygiene regulations among food service establishments. The study's purpose was to determine whether the training contributed to enhanced compliance with food safety standards and regulations. The research employed a combination of on-site inspections and surveys conducted before and after the training. The findings revealed a significant increase in compliance rates among the establishments following the training. As a result, the study recommended the continuation of food safety training initiatives, regular inspections to monitor compliance, and increased public awareness campaigns to promote the importance of food safety in restaurants and similar establishments.

Kim and Park (2019) assessed the impact of a food safety training program on the knowledge and attitudes of food service workers. Their study aimed to understand how the training influenced employee knowledge and attitudes toward food safety. Researchers used pre- and post-training surveys, as well as interviews with employees, to collect data. The results indicated a notable improvement in food safety knowledge and positive shifts in attitudes toward food safety practices following the training program. The research's recommendations emphasized the importance of ongoing training, the reinforcement of good practices, and creating a culture of food safety within food service establishments.

Johnson and White (2017) evaluated the influence of a food safety training program on reducing critical violations observed during restaurant inspections. The primary purpose of this research was to determine whether the training program had a measurable impact on improving compliance with food safety regulations. To assess this, the study compared inspection reports from before and after employees underwent the training. The research findings demonstrated a significant reduction in critical violations following the training. This suggested that food safety training was effective in improving compliance with food safety regulations. As a result, the study recommended the implementation of mandatory training for all food handlers and regular monitoring of food service establishments to ensure ongoing compliance.

Martinez (2018) embarked on a study with the goal of assessing the impact of a food safety training program on the reduction of foodborne illness outbreaks in catering services. The researchers analyzed outbreak data before and after the implementation of the training program to evaluate its effectiveness in preventing foodborne illnesses. The study findings revealed a substantial decrease

in foodborne illness outbreaks post-training, indicating the positive impact of the program. The research recommended the continuation of food safety training and emphasized the importance of enhanced monitoring of catering services to maintain the reduced incidence of foodborne illnesses.

Patel and Smith (2016) conducted a study with the primary objective of evaluating the effectiveness of a food safety training program in enhancing food safety practices and reducing the risk of foodborne illnesses in a group of school cafeterias. The researchers assessed the impact of the training program on food safety practices through pre- and post-training assessments and observations of food handling practices. The study's findings indicated a significant improvement in food safety practices among cafeteria staff and a reduced incidence of foodborne illnesses. The research recommended regular training updates and continuous monitoring of cafeteria operations to ensure the sustainability of improved food safety practices.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps

Conceptual Research Gaps: Most studies focus on short-term outcomes, such as immediate improvements in food safety practices and knowledge. There is a need for research that investigates the long-term sustainability of these improvements to assess whether they persist over time. While studies by (Smith, 2017; Brown and Johnson, 2016) show positive changes in food safety practices, there is a gap in understanding the underlying mechanisms driving these behavioral changes among restaurant and cafeteria staff. Investigating the psychological and sociocultural factors that facilitate or hinder sustained improvements is essential.

Contextual Research Gaps: The studies mentioned by (Garcia, 2018; Martinez, 2018) primarily focused on fast-food restaurants, group restaurants, and school cafeterias. Research should expand to include a wider variety of food service settings, such as fine dining establishments, food trucks, and catering services, to understand how training programs impact different contexts. While studies highlight the impact of training on specific aspects of food safety, there is a need for research that assesses the overall effectiveness of comprehensive food safety protocols and their integration into daily operations.

Geographical Research Gaps: The studies provided by (Smith, 2017; Brown and Johnson, 2016) seem to focus on specific regions or countries. Comparative research across different geographical regions and cultural contexts can shed light on the effectiveness of food safety training programs in diverse settings. Research should consider geographical areas with limited resources and infrastructure for food safety training. Understanding how training programs can be adapted to address resource constraints in developing regions is essential.

CONCLUSION AND RECOMMENDATIONS

Conclusion

In conclusion, the evaluation of food safety training programs in the food service industry in Tanzania underscores both achievements and challenges. The importance of these programs in enhancing food safety awareness and practices among food service workers cannot be overstated. Through proper training, significant progress has been made in promoting the handling, preparation, and storage of food in a safe manner, reducing the risk of foodborne illnesses. Additionally, the adoption of food safety training programs aligns with international standards and demonstrates Tanzania's commitment to ensuring public health and meeting regulatory requirements.

However, the evaluation also highlights certain areas that warrant attention and improvement. These include the need for ongoing and consistent training, as well as regular updates to reflect changing food safety guidelines. Additionally, accessibility to training programs, especially in remote areas, remains a challenge that needs to be addressed. Ensuring that small-scale food businesses also have access to these programs is vital, as they often face unique challenges in complying with food safety regulations. Moreover, continuous monitoring and evaluation of these programs will be essential to gauge their effectiveness and make necessary adjustments. The evaluation of food safety training programs in the Tanzanian food service industry demonstrates their positive impact on food safety practices. However, there is a need for sustained efforts to expand accessibility, update content, and ensure ongoing compliance to further enhance food safety in the country. This commitment to food safety training will not only protect public health but also contribute to the overall development of the food service industry in Tanzania.

Recommendations

Theory

Incorporate behavioral theories such as the Theory of Planned Behavior or Health Belief Model into program evaluations. These theories can help assess the impact of food safety training on employees' attitudes, intentions, and behaviors. Understanding the psychological factors influencing food safety practices can contribute to the development of more effective training strategies. Utilize learning theories like the Adult Learning Theory to assess the effectiveness of

training methods. Evaluate whether training programs align with how adults learn best, which can inform the design and delivery of training modules. This contribution to theory can enhance our understanding of how to optimize knowledge transfer in food safety training.

Practice

Implement continuous assessment mechanisms within food safety training programs. Rather than evaluating knowledge retention solely at the end of the program, regularly assess employees' understanding and application of food safety principles. This practice can identify areas for improvement in real-time and facilitate ongoing skill development. Simulation and Practical Training: Incorporate hands-on, practical training and simulations as part of food safety programs. Real-life scenarios and practice in food handling can better prepare employees for actual workplace situations. This practical approach enhances their competence and can reduce foodborne illness risks. Tailor training programs to the specific needs of different food service establishments. Recognize that food safety requirements can vary based on the type of cuisine, size of the kitchen, and customer base. Customization ensures that training is relevant and applicable to the unique challenges faced by each establishment.

Policy

Advocate for mandatory food safety certification for all food service industry employees. Encourage policymakers to establish and enforce regulations that require individuals to complete certified food safety training before working in food service roles. This can significantly enhance the overall safety of the industry. Suggest the introduction of incentives for businesses that invest in comprehensive food safety training programs. Offer tax incentives or reduced regulatory burdens for establishments that demonstrate a commitment to employee training and food safety excellence. Recommend more frequent and rigorous food safety audits and inspections for food service establishments. Collaborate with regulatory agencies to ensure that training programs are not only implemented but also adhered to in practice. Policies supporting strict oversight can serve as a deterrent to non-compliance.

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