

Understanding of Food Safety Standards and Personal Hygiene among Foodservice Workers in Mokopane and Voortrekker Hospitals in Mogalakwena Municipality, Limpopo Province

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Abstract At the healthcare facilities, especially in hospitals where vulnerable patients are treated, personal hygiene and food safety procedures are of the utmost importance. Food safety is a public health issue and as such, foodservice workers need to have in-depth knowledge. Conversely, poor personal hygiene and food safety practices may lead to contamination and subsequently foodborne diseases. The goal of this study is to determine knowledge on food safety and personal hygiene among foodservice staff at Mokopane and Voortrekker hospitals foodservice units in Mogalakwena Municipality. The purpose is to pinpoint and outline areas that may need improvement to guarantee provision of hygienic and safer meals. Twenty-one food service employees in the hospitals participated in a qualitative e cross-sectional study. One-on-one interviews were held, and observations and audio recordings were made. For analysis, inductive, descriptive of open coding methods using Tesch's eight phases were employed. Results indicated that participants were knowledgeable about food safety practices, including frequent hand washing and cleanliness, as well as personal hygiene behaviours. Employees in the hospital kitchen/ foodservice unit showed that they understood the value of maintaining cleanliness, good hand hygiene, and correct food handling. The study recommends education and

training programs to reinforce knowledge of food safety, appropriate food handling methods, and personal hygiene practices however, participants' abilities to put this knowledge into practice are hampered by challenges such as lack of enforcement of food safety compliance, inadequate staffing, and time restraints. The prevention of foodborne illnesses and infections was also emphasized. Employees in the hospital kitchen/ foodservice unit showed that they understood the value of maintaining cleanliness, good hand hygiene, and correct food handling. The study recommends education and training programs to reinforce knowledge of food safety, appropriate food handling methods, and personal hygiene practices. Therefore, strong enforcement procedures, adequate staffing and effective time management are required.

Keywords Personal Hygiene, Food Safety, Foodservice Workers, Hospital, Patients

1. Background

Food safety is one of the most important public health issues, and it also significantly increases the cost of

healthcare [1]. According to estimates, poisoned food causes 600 million illnesses, 549 million cases of diarrhoea, and 420,000 deaths each year [2,3]. Inappropriate food handling is frequently the cause of food contamination, resulting in food poisoning [4]. Some foodborne infections are attributed to improper handling methods used during the last stages of preparation, such as improper storage, inadequate cooking, or cross-contamination [5]. Foodborne illness outbreaks could be caused by unintentional contamination, compromising consumer health, and having a detrimental impact on entire nations' economy [6]. Foodborne disease outbreaks in Sub-Saharan Africa are thought to be associated to poor personal hygiene of food handlers in food settings or where food is prepared for the mass [7]. Numerous microorganisms that cause gastrointestinal infectious illnesses are spread via poor personal hygiene [8,9]. An Indonesian research study discovered that 52.7% of hospital foodservice staff exhibited subpar personal hygiene and food safety practices [10], with this being linked to inadequate knowledge. Inadequate personal hygiene and frequent hand contact with food, the nose, skin, or other body parts can result in the contamination of one's hands [11].

Food producers and handlers are expected to comply with the rules and regulations of food safety in order to decrease the danger of contaminated food [12]. Kuwait cross-sectional study reported that the majority of food handlers had adequate knowledge and compliance with food safety practices [13]. Throughout the cycle of food production, processing, storage, and preparation, food handlers play a crucial role in guaranteeing food safety and preventing food contamination and other food-safety related disorders [7,14]. Without food safety and hygiene practices, harmful microorganisms can easily contaminate food during preparation and processing, making food unhygienic and unsafe for consumption. Food safety and hygiene practices are important practices to be adhered to throughout preparation procedures and serving to ensure that food is safe for consumption [15]. When addressing prevention and therapeutic techniques, it is essential to relate the prevalence of disease to food products and food handling practices [1]. The most efficient strategy to lower foodborne diseases is to reinforce and constantly practice food safety standards, guidelines and protocols to food handlers [16]. Prevention of food-borne illness depends greatly on the involvement of food handlers [8,17,18]. The food handlers need to be empowered with knowledge that needs to be practiced under monitoring. In some instances, having good knowledge, attitude, and using proper food handling procedures may help significantly in lower the prevalence of foodborne illness [11]. Strict rules and regulations established by health authorities apply to foodservice operations in hospitals. In order to find any knowledge or practice gaps, it is critical to assess the degree of compliance among foodservice employees. This knowledge can direct the creation of initiatives and training

programs to increase adherence to food safety regulations.

Hospital food service units cater for a significant number of the population. It was discovered that food prepared in sizable quantities is at a heightened risk of contamination [19]. Assessing the level of knowledge among foodservice employees regarding personal hygiene and food safety can assist hospitals in identifying potential risks and implementing preventive measures to decrease the chances of outbreaks. It is the responsibility of hospitals foodservice units to give patients access to healthy and safe food [20]. Hospitals serve patients who require nourishing meals for recuperation or treatment with diverse medical conditions. Serious repercussions can result from foodborne diseases, especially for individuals who may already have weakened immune systems [21]. In order to guarantee that the right procedures are followed to prevent foodborne illnesses and maintain patient safety, it is crucial to evaluate the understanding of personal hygiene standards and food safety among foodservice employees. A study on the understanding of food safety and personal hygiene among foodservice employees might identify areas that require more training and education. It offers a chance to undertake specialized interventions and educational initiatives to improve their comprehension of basic food safety concepts, hygienic practices, and good food handling methods. Conducting research on the comprehension of personal hygiene and food safety standards among hospital foodservice staff is crucial to guarantee patient safety, adhere to legal requirements, prevent outbreaks, and promote a culture of food safety improvement. This study seeks to explore the extend knowledge of food safety standards and personal hygiene among foodservice workers at Mokopane and Voortrekker hospitals in Mogalakwena municipality, Limpopo province.

2. Research Methodology

2.1. Research Method and Design

A qualitative method with an exploratory design was used and included 21 hospital foodservice workers. The use of this design helped the researcher to use in-depth interviews to gain rich and extensive insights into how foodservice employees comprehend personal hygiene practices and food safety requirements. Participants actively voiced their opinions and provided valuable context to accompany their responses. Participants were encouraged to share their knowledge regarding food safety standards and personal hygiene practices within the hospital foodservice context. To delve deeper into the participants' perspectives and ensure a thorough exploration of the subject matter, probing was done. Probing involved asking follow-up questions and seeking clarification on participants' responses.

2.2. Study Setting

The study was carried out at the food service units of the Mokopane and Voortrekker hospitals in the South African municipality of Mogalakwena in Limpopo province, South Africa.

2.3. Participants and Sampling

A convenient sampling method was adopted in selecting 21 foodservice aids working at both Mokopane and Voortrekker hospitals to participate in the study. The number of participants were depended on reaching data saturation. Inclusion criteria involved participants with at least six months working experience with clear understanding of the setting and can relay knowledge of personal hygiene and food safety. Participants who could speak English, Sepedi, or isiTsonga were also included.

2.4. Instrument and Procedure for Data Collection

One-on-one interviews were conducted with participants using an unstructured interview guide to elicit further on knowledge of personal hygiene and food safety. Voice recorders were used to conduct these interviews. In addition, noticeable non-verbal cues were jotted or documented as fieldnotes. English, Sepedi, and/or isiTsonga were the three languages used in the interviews. *“What is your understanding of personal hygiene and food safety?”* was the major question presented to the participants. The participants' comments served as a primary guidance for the next round of probing questions. Dietetic students who had undergone training in conducting one-on-one interviews and questioning participants gathered the data. Additionally, a pilot study conducted with supervisors at different but same setting foodservice units presented to aid the skill development of the student dietitians. The next round of research was not included in the pilot study's results?

2.5. Standards of Rigor

Credibility, transferability, confirmability, and dependability through trustworthiness were measures used to assess rigor.

2.5.1. Credibility

Prolonged engagement was applied through the use of student dietitians who were responsible for data collection and did a practical in the mentioned hospitals. The researchers had a good reputation in the region and spent a lot of time interacting with the participants in the field. In order to gather data for triangulation, researchers used both interviews and observations, which complemented one another in providing insights. After data processing, confirmation interviews with participants were done to ensure that member checks had been made.

2.5.2. Transferability

The study used 21 individual interviews to ensure data saturation and information redundancy, resulting in comprehensive insights. The qualitative exploratory design was used, providing in-depth understanding. The findings are specific to Mokopane and Voortrekker Hospitals in Limpopo Province, providing valuable reference for future research on similar topics in different healthcare settings or regions.

2.5.3. Confirmability

The involvement of a supervisor in data analysis of this study adds an additional layer of scrutiny and objectivity to the research process. This peer review helps ensure that the data analysis and interpretation are conducted in a transparent and unbiased manner. To validate the results, both the researcher and the supervisor later convened to achieve a consensus. The researcher upheld objectivity and remained impartial throughout data collection and extensive interactions, contributing to the assurance of neutrality. This ensured that personal beliefs or preconceived notions do not influence the research process or the interpretation of results.

2.5.4. Dependability

Following the completely outlined methodology throughout data collection allowed for a complete explanation of the study methods. Researchers relied on voice recorders, supervisors, and an interview guide when conducting their analysis.

2.5.5. Data Analysis

Each interview was audio recorded, and the transcription was done later. The interviews done in Sepedi or isiTsonga were first translated into English by a language translator before being examined by the researchers. Supervisors were included; each researcher independently examined the verbatim transcripts. All scholars came to an agreement on themes and sub-themes during the meeting. Direct quotes from the participants' own statements were used to support the findings. To analyse the data, Creswell [22] followed the eight steps of Tesch's open coding qualitative data analysis approach.

2.5.6. Ethical Issues

Human participants were used in the study in accordance with the necessary ethical standards. The Turfloop Research Ethical Committee (TREC), which also granted clearance certificate number TREC/490/2022:UG, approved the study. The Limpopo Department of Health (DOH) and the hospital management gave their approval for the study's execution. Participants were attested to their free will to participate by signing an informed consent form. The confidentiality and privacy of the participants' data were likewise upheld.

3. Results

3.1. Demographics of Study Participants

Table 1 shows that a total of 21 participants took part in this study of which 17 were aged between 20-40 years 16 participants from the total sample size were females. 15 had tertiary education and 13 had 06 months to 3 years' working experience.

Table 1. Demographic profile of participants

Demographic profile	Category	N=21
Age	20–40 years	17
	40–60 years	04
Gender	Male	05
	Female	16
Education level	Secondary	06
	Tertiary	15
Years of experience	06 months – 3 years	13
	>3 years	08

3.2. Themes and Sub-themes Emerged from Data Analysis

THEME 1: Knowledge of personal hygiene and food safety measures

Findings from this study revealed that foodservice aids had knowledge of personal hygiene and food safety. They had described personal hygiene and food safety, including its importance and the need for adherence. The following sub-themes which emerged from this theme detailed participants' understanding.

Sub-theme 1.1: Personal hygiene

Twenty participants in this study indicated that personal hygiene involves keeping clean and regular washing of hands, even after touching their phones and other things. They further indicated that hands should be washed with soap. The following statements from participants support these:

Participant 1: *“Personal hygiene is all about cleanliness and you must come clean from home, have clean uniform and wash hands.”*

Participant 08: *“Regular washing of hands as part of personal hygiene also involves when a person is coming from the toilet or outside the foodservice units, or when preparing different types of food. Hands should be washed properly with soap.”*

Participant 11: *“Personal hygiene is linked to the person preparing the food, and it starts the minute you enter the door. There must be a sink, water, scrubbing of hands, and that involves applying soap up to the elbow and scrub for 2 to 3 minutes.”*

In addition to hand washing, fifteen participants alluded that personal hygiene involves keeping clean, and wearing clean protective clothing. Therefore, the following statements from participants illustrate this point:

Participant 04: *“It is also expected that a person must wear clean clothes and aprons daily, as well as disposal clothes. In the event that I get outside the foodservice units, when I come back, I should change the aprons.”*

Participant 12: *“Personal hygiene involves wearing a mob cap at the entrance, being clean, wearing safety clothes and being presentable, hair must not touch the shirt, trimming nails and not having long ones.”*

Sub-theme 1.2: Importance of adherence to personal hygiene and food safety

Findings from this study revealed that only eighteen foodservice aids had knowledge about the benefits of adhering and complying to personal hygiene towards food safety. Food service aids mentioned that practising optimal personal hygiene decreases the likelihood of food contamination. They have indicated that not washing hands can harm patients but when you are sick you should not come to work. The following quotations from participants validate this point:

Participant 07: *“Importance of washing hands regularly and adhering to personal and food safety hygiene is critical in avoiding contamination and foodborne diseases, and mainly to produce food that are safe for patients and people to eat.”*

Participant 10: *“If you don't keep yourself clean, you'll transfer bacteria to food, which will contaminate you and harm the patients.”*

Participant 16: *“Patients have weak immune systems, so if they are affected by the bacteria from the food, they will increase hospital stay.” Cross contamination will occur if personal hygiene protocols are not followed because bacteria will be transferred to the patients' food.”*

THEME 2: Barriers to putting knowledge on food safety and personal hygiene into practice

It is not always the case that good knowledge on personal hygiene and food safety can lead to good practice or adherence. Implementation is usually impacted by several factors. In this study participants pointed out factors which hinder the practical implementation of good knowledge of personal hygiene in the hospital setting. These barriers are contained in the following sub-themes:

Sub-theme 2.1: Non-enforcement of food safety compliance and personal hygiene

Lack of monitoring of food safety compliance and personal hygiene, as well as insufficient training, can pose significant barriers to ensuring the practical implementation of good knowledge of personal hygiene in hospitals. All participants in this study reported non-enforcement of food safety compliance and personal hygiene. The following quotations of the participants

support these claims:

Participant 2: *“Since I started working here five years ago, we had never been evaluated for personal hygiene neither did we receive training on personal hygiene and safety. We do as we wish as long as we can produce and serve patients meals”*

Participant 4: *“I’ve worked at this hospital for a while, but I don’t recall the last time we were evaluated for food safety and personal hygiene.”*

Subtheme 2.2: Understaffing and time constraints

Understaffing and time constraints can significantly impact the adherence to personal hygiene and food safety practices in hospitals, despite how well-versed foodservice employees are. Understaffing and time constraints are major challenges reported by all participants in this study. These are some of what the participants have said in relation to this sub-theme:

Participant 13: *“There is a lot of strain in the food service area since we have to make breakfast, lunch, and dinner quickly while being understaffed. Since the goal is to deliver food on time, cleaning is not an option.”*

Participant 17: *“Due to staffing shortages, we frequently forget to wash our hands while rushing to prepare and deliver food to the hospital wards where patients will be fed.”*

4. Discussion

This study investigated the knowledge of personal hygiene and food safety requirements of the foodservice personnel at Mokopane and Voortrekker hospitals in Mogalakwena municipality, Limpopo province. Hospital food service units prepare and serve food primarily to patients to meet their nutritional needs and their patients’ satisfaction, making it easier to administer medications, accommodate special diets, and uphold infection control [23]. The above help with healing, general care and wellbeing of patients during their hospital stay supplemented with healthy and safe meals. Participants in this study who worked in foodservice showed understanding of personal hygiene in relation to food safety as well as compliance and adherence to personal hygiene. The findings speak the same sentiment with a Malaysian study done in Selangor, which found that mobile food handlers understood the importance of keeping their personal hygiene up to par [24]. Due to weakened immune systems, hospital patients are frequently more susceptible to infections and foodborne illnesses. Patients’ safety can be improved by having foodservice staff members who are knowledgeable about proper cleanliness and food safety procedures [25].

Participants in this study indicated that keeping oneself clean and washing one’s hands are crucial components of personal hygiene. In environments like hospitals, infection control is crucial. Keeping one’s body clean and regularly

washing one’s hands both serve to lessen the spread of germs. By keeping up with appropriate personal hygiene, particularly consistent hand cleanliness, illnesses related to healthcare can be avoided. Maintaining good personal cleanliness is advantageous for patients as well as healthcare professionals themselves [26]. Regular handwashing and cleanliness promote a better work environment by lowering the risk of infection from oneself or from co-workers.

Participants also know that cuts and wounds need to be covered, and it is advisable not to report to work when sick. Improved food service establishments must have a better understanding of food hygiene. Food handlers’ lack of knowledge in this area could result in contaminated prepared food [27,28]. Food contamination by bacteria or any other toxins can result in food poisoning [4,29], however, physical contaminations can be prevented by maintaining adequate personal and hand hygiene. According to those surveyed, hands should always be washed to prevent contamination. Margos and Hollah [30] note that in order to reduce the number of transient germs, foodservice workers must carefully wash their hands. In order to safeguard patients’ health from foodborne infections, which is a public health problem, it is nevertheless crucial to adhere to food safety standards.

The study participants were aware of the consequences of poor food safety and personal hygiene habits. Poor personal hygiene leads to the spread of several bacteria that cause gastrointestinal infectious diseases [8,9]. Participants made the implication that unhygienic practices on the part of the food handlers would result in contaminated food, which would make patients ill and delay their recovery. Additionally, it will extend their hospital stay, costing more to care for these patients. According to Teffo and Tabit [31], outbreaks of foodborne infections in hospitals can result in service disruption, life-threatening situations, and even fatalities for those affected, particularly the already vulnerable patients. Because of inadequate personal hygiene, frequent contact with raw food, the nose, skin, or other body parts, contaminated hands can make consumers sick [10]. If personal hygiene and food safety are upheld, patients fed in hospitals will benefit from healthy food as the risk of food poisoning is reduced due to their compromised immune systems [32]. It is essential to adhere to food safety and hygiene standards when preparing food to ensure that it is safe to consume [15]. Hospital environments involve interactions with various surfaces and objects, increasing the potential for transfer of micro-organisms all over. Keeping oneself clean and regularly washing hands help prevent the transfer of harmful microorganisms from one surface or individual to another, reducing the risk of spreading infections. A crucial component of professionalism in the healthcare industry is maintaining personal cleanliness. Standards that demonstrate professionalism, commitment to patient care, and regard for patients’ well-being, cleanliness and good hand hygiene are essential [33].

Although participants were aware of the significance of food safety and personal cleanliness and hand hygiene in the hospital food service, they also stated that lack of enforcement compliance, understaffing, and time restrictions has an impact on their adherence. Knowledgeable foodservice workers may have a strong understanding of food safety practices, but without proper enforcement and support from management, they may struggle to implement these practices consistently [34]. When food safety standards are not consistently enforced, knowledgeable foodservice workers may feel demotivated to adhere to good practices [34]. They may perceive their efforts as undervalued if there is a lack of recognition or consequences for non-compliance. This can lead to a decline in their commitment to upholding high standards of food safety and personal hygiene. Time constraints and understaffing can exacerbate this challenge, as workers may prioritize completing tasks quickly over ensuring strict adherence to food safety protocols [35]. Despite the fact that all participants identified understaffing and time restrictions as important challenges in the two hospitals, this study did not compare staff establishment or organogram to presently employed personnel. Additionally, it didn't evaluate the intervals between various meals according to the timetable of hospitals. Future research must take this issue into account. Understaffing and time constraints place a heavy burden on knowledgeable foodservice workers, potentially compromising their ability to maintain good practices [36]. They may be responsible for managing multiple tasks simultaneously, leaving them with limited time and energy to focus on food safety measures.

Although participants are aware of the need of following personal hygiene and food safety standards, continual retraining may be required to maintain or improve compliance. Training in food hygiene improves the attitudes and knowledge of food handlers towards proper hand hygiene. When foodservice workers undergo regular retraining, they are often reminded to wash their hands and follow or apply food safety measures [37]. Soares et al. [38] contend that training programs are a crucial element of fostering a positive culture of food hygiene and they must occasionally take place. Therefore, this study recommends ongoing education and training to reinforce the best practises and standards for food safety. This can help foodservice employees maintain their knowledge and motivation to follow best practices by updating and refreshing their abilities. It is essential to have a positive work atmosphere that acknowledges the contributions of skilled foodservice employees. The constant enforcement of food safety regulations by hospitals should be a top priority, with clear expectations and sanctions for noncompliance. To reduce workload constraints and allow skilled foodservice workers to devote enough time and attention to food safety procedures, it is crucial to maintain proper staffing of numbers. Time restrictions and

understaffing can be lessened by offering resources, tools, and assistance for good time management, such as streamlined workflows and effective processes.

5. Conclusions

Hospital foodservice staff demonstrated an understanding of the fundamentals, significance, and necessity of maintaining cleanliness, hand hygiene, and proper food handling. The study emphasizes the value of continuing education and training programmes for foodservice staff to reinforce knowledge of food safety concepts, appropriate food handling methods, and personal hygiene practices. Hospitals can enhance the overall food safety culture and guarantee the provision of safe and uncontaminated meals to vulnerable patients. Nevertheless, despite their understanding, there were considerable obstacles to really put these practises into practise. Significant obstacles included a lack of compliance enforcement, a manpower shortage, and scheduling restraints. These issues made it difficult for food service employees to regularly follow the advised standards and procedures. The results highlight how important it is to have strong enforcement procedures in place to guarantee that the standards for food safety and personal cleanliness are consistently followed in hospital food service units. To foster an environment of responsibility and emphasize the value of compliance, clear rules, frequent inspections, and penalties for non-compliance are necessary. Significant issues like understaffing and time restraints also surfaced, pressuring food service employees to put efficiency over strict adherence to food safety procedures. To allow enough time for proper hygiene practices without compromising operating requirements, adequate staffing levels and effective time management techniques are required.

Collaboration between hospital administration, foodservice managers, and the appropriate health authorities can be used to create effective policies and procedures. The study provides a baseline evaluation that may be used to monitor improvements over time, serving as a foundation for other research and quality improvement initiatives. In the end, maintaining high standards of patient care, preventing foodborne illnesses, and fostering a secure and healthy hospital environment all depend on the awareness of personal hygiene and food safety requirements among foodservice employees.

Limitations

The study did not assess the association of knowledge and socio-demographic data of the foodservice workers. Moreover, the study did not assess knowledge or prevalence of food related problems in the two hospitals.

Availability of Data and Materials

This article depends on the data gathered from food service aids at Mokopane and Voortrekker hospitals in Mogalakwena municipality in Limpopo province of South Africa. The data generated or analysed during the current study is not openly accessible. However, it can be requested from corresponding author.

Authors' Contribution

Sibiya, Sithole, and Nkwane were responsible for data collection and interpretation, as well as drafting of the manuscript. Mphasha supervised the study, while Tleane co-supervised. All authors read and approved the final manuscript.

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Conflicts of Interest

No competing interests.

Disclaimer

Views expressed in this manuscript are authors' own views and not the stance of the University of Limpopo.

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