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RESEARCH ARTICLE

Assessment of food safety in public psychiatric hospitals in the Eastern Cape province, South Africa

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Objective To evaluate the state of food safety practices, staff knowledge, and adherence to food safety regulations in food service units across four public hospitals in the Eastern Cape province, South Africa.
Design A cross-sectional mixed-methods study was conducted using purposive sampling. Data collection included self-administered questionnaires, semi-structured interviews, observations, and food safety audits conducted in accordance with national regulatory standards.
Setting Four public hospitals in the Eastern Cape province, South Africa.
Participants Ninety-one permanent healthcare employees in the public sector, including food handlers, foodservice managers, nurses, assistant directors of support services, and quality assurance officers.
Outcome measures The principal areas of investigation included compliance with Regulation 638, adequacy and frequency of staff training, the standards of infrastructure and resources, and perceptions of management support for implementing food safety.
Results Quantitative findings revealed that 84% of food handlers expressed a commitment to serving safe and nutritious meals, and 72% reported familiarity with food safety regulations. However, only 62% demonstrated adequate knowledge of hygiene principles, and just 45% understood the importance of maintaining appropriate food temperature control. No formal food safety training was reported between 2013 and 2018. Qualitative insights indicated that suboptimal handwashing was attributed to insufficient supervisory oversight and weak internal control mechanisms. All four hospital food service units had operated without a Certificate of Acceptability since 1994. Despite positive attitudes, institutional, systematic, and regulatory non-compliance reflects systemic governance weaknesses.
Conclusions Despite food handlers' awareness of basic safety principles, persistent gaps in food safety training, inadequate infrastructure, and regulatory non-compliance undermine safe meal delivery in public hospital settings. These systematic deficiencies, rooted in weak institutional oversight, poor enforcement of regulations, and insufficient investment in foodservice governance, pose risks to patient health and institutional credibility. Strengthening food safety in public hospitals requires a coordinated policy response, including infrastructure upgrades, accredited staff training, and enforcement of Regulation 638. Integrating food safety within broader health system accountability frameworks is vital for nutrition-sensitive care in hospital settings.

Keywords : compliance, food safety, institutional foodservice, management support, public hospitals

Introduction

Food safety continues to be a global public health issue, contributing to significant morbidity and mortality because of food-borne illness, particularly for vulnerable populations. The World Health Organization estimates that 600 million people become ill due to food-borne diseases, and 420 000 die annually, with a disproportionate impact on children under five and vulnerable populations.[1] Africa has the highest burden, by population, of food-borne illness.[2] Many of the data are unverifiable, with limited reliable information available regarding food safety in South Africa, particularly in rural provinces such as the Eastern Cape, where infrastructure and regulatory requirements are consistently weak. Psychiatric hospitals are a unique category of healthcare facilities, where food safety-related risks may be highest due to a combination of institutional, environmental, and patient-specific factors.[3] Psychiatric patients frequently experience multimorbidity, extended stays in hospital, and, in some cases, late-stage immunocompromised status because of medication regimens or symptomatic health conditions; these factors may increase susceptibility to food-borne infections.[4]

Despite the vulnerabilities of patients in psychiatric hospitals, food safety has received scant scholarly attention, including research in middle- and low-income settings, such as South Africa.[5,6] Food safety research in South Africa has predominantly focused on general hospitals, with limited attention to psychiatric hospitals.[7] This gap is particularly concerning given the heightened vulnerability of psychiatric inpatients and the systemic neglect of foodservice governance in these institutions. These challenges reflect broader national trends in food safety enforcement and institutional capacity.

The study addresses a critical gap in food safety research within public psychiatric hospitals by evaluating food handling practices, staff knowledge, and regulatory compliance across four hospitals in the Eastern Cape. By examining foodservice operations in these high-risk settings, the study contributes to a deeper understanding of institutional food safety for psychiatric patient populations. The findings offer evidence to inform policy reform, strengthen governance, and guide capacity-building efforts aimed at improving food safety standards in psychiatric hospitals, an often-overlooked

domain in public health nutrition and healthcare quality assurance.

Methods

Study design and setting

A descriptive, exploratory, and cross-sectional study was conducted as mixed-methods research with both quantitative and qualitative approaches. The research was conducted in the Eastern Cape, one of South Africa's nine provinces. The Eastern Cape province in South Africa has high levels of unemployment and poverty, resulting in a widespread epidemic of household food insecurity, with 73.4% of households experiencing food insecurity and 20% of households experiencing severe hunger.[8] The hospital's structural challenges underscore its importance as a key area for assessing patients' nutritional vulnerabilities and implementing public health measures.

Participants and sampling

The investigation focused on four public hospitals. The hospitals included had varying bed capacities (ranging from 120 to 440 beds) and were situated across different municipalities. The total capacity across all facilities was 1 284 beds. A total of 91 participants were recruited through purposive sampling. These included 47 randomly selected nurses, 32 food handlers on duty during data collection, and 12 management staff involved in foodservice operations, such as food service managers, human resource officers, and quality assurance staff. Participants were selected based on their roles in food handling, patient care, or oversight of foodservice systems. Participants were selected through purposive sampling, which involved recruiting individuals directly involved in food handling, patient care, and/or overseeing food service. Participants were recruited through a briefing meeting in each section within the hospital and were approached directly. Participants who were interviewed were assigned unique codes to maintain their anonymity.

Data collection

Data were collected over three months, employing a mixed-methods approach that included quantitative surveys, qualitative interviews, and observational techniques. The triangulation of methods facilitated a holistic understanding of food safety knowledge, practices, and systemic barriers in four public psychiatric hospitals in the Eastern Cape province.

Quantitative component

A structured, self-administered questionnaire was disseminated to the nurses ($n = 47$) and food handlers ($n = 32$) involved in food service. The questionnaire used in this study was based on the South African National Food Service Audit Tool and other previously validated food safety questionnaires. The questionnaire measured:

Knowledge of food safety principles related to the following:

- Safe food storage temperatures.
- Personal hygiene and handwashing.
- Prevention of cross-contamination.
- Cleaning and sanitation protocols.

Self-reported practices, such as:

- Use of the recommended protective clothing.
- Monitoring temperature during food preparation.
- Waste disposal methods.
- Following protocols for food handling.

Scoring: The knowledge items were scored binary (1 = correct answer, 0 = incorrect answer or 'don't know'). The total scores were converted to percentages and classified as:

- High knowledge (≥ 75%).
- Moderate knowledge (50–74%).
- Low knowledge (< 50%).

The questionnaire was pilot-tested on a non-participating hospital with a sample of 20 food handlers, 6 food service managers, and 6 procurement officers. Internal consistency was assessed using Cronbach's alpha, with a value of 0.70 or higher considered satisfactory.

Qualitative component

Twelve key informants were interviewed using semi-structured, in-depth interviews, including food service managers, supply chain officers, assistant directors of the support services component who are direct supervisors of the food service managers, and quality assurance officers. The instrumental guide was constructed after exploration of the literature and consultation with experts, with areas explored including:

- Barriers to food safety protocol implementation (e.g. budget limitations, workforce constraints, insufficient training).
- Perceptions of management accountability to comply with food safety.
- Organisational barriers to food safety and opportunities for food service improvement.

The interviews were conducted in private offices organised by the participants within each hospital to ensure confidentiality and promote an environment conducive to the interviews. The interviews were recorded and transcribed verbatim. A process of accounting for trustworthiness was established through triangulation, member checking, and an audit trail of the methodological decisions.

An extensive literature review, focusing on institutional food safety practices, specifically in the context of psychiatric hospitals, informed the development of the interview guide. Additionally, consultations with public health experts and foodservice managers informed the guide's relevance to the context. The content of the guide addressed the study's purpose, which was to explore the barriers and facilitators of compliance with food safety practices. To establish reliability, the questionnaire was pilot-tested with a sample of 20 food handlers from a non-participating hospital. Internal consistency was assessed using Cronbach's alpha, with values of 0.70 or higher considered satisfactory.

Observations (hygiene audit)

The structured checklist (Supplementary Table A1) was based on national and international standards, including the South African Department of Health Food Control Guidelines, the World Health Organization (WHO) Five Keys to Safer Food, and Codex Alimentarius. It was designed to evaluate adherence in four key areas: food handling, personal hygiene, general kitchen hygiene, and infrastructure aspects, including premises, storage, and equipment. Each checklist item was designed to record or reflect on observable actions (practices) or

institutional systems related to hygiene that directly impact food safety and food service quality. The checklist was developed and strengthened in consultation with experts, and contextualised to the psychiatric hospital environment, recognising that governmental institutions often impose constrained resources, which can work against the realisation of public health priorities. During the audit, photographs (Appendix 1A) were taken of the observed areas with permission from the hospital management. No photographs were taken of participants.

Data analysis

Quantitative data analysis

Descriptive statistics were employed to summarise participant demographics, food safety knowledge scores, and reported practices. Frequencies, percentages, means, and standard deviations were calculated to convey the distribution of the responses.

Quantitative data obtained using a structured questionnaire were analysed and summarised using descriptive statistical methods to understand food handlers' perceptions of food quality in four public hospitals. Each survey item was measured using a five-point Likert scale from 'strongly agree' to 'strongly disagree'. Responses were coded and calculated to determine frequencies and percentages for each category, enabling a clear analysis of overall attitudes towards food safety practices, regulatory compliance, adherence to recipes, and the need for training. This analysis highlighted dominant perceptions and identified areas of variance between respondents. The data were entered into SPSS version 25 (IBM Corp, Armonk, NY, USA) for analysis, with the results presented in a table for data interpretation and comparison across variables.

Table 1: Sociodemographic data of public hospital staff involved in food services

Category	Subcategory	Frequency (*n*)	Percentage (%)
Sex	Females	74	81
	Males	17	19
Participants	Nurses	47	52
	Food handlers	32	35
	Managers	12	13
Age	18–35 years	27	30
	36–45 years	26	28
	46–55 years	30	33
	56–65 years	8	9
Education	Diploma	57	63
	Matric	23	26
	ABET	9	10
	No schooling	2	1
Work experience of food handlers	< 1 year	3	9
	1–5 years	10	31
	6–10	10	31
	11–20 years	2	6
	30 > years	7	22
Work experience of nurses	< 1 year	7	15
	1–5 years	11	23
	6–10	15	32
	11–20 years	6	13
	21–29 years	4	8.5
	30 > years	4	8.5
Food safety training of food handlers	Yes	2	6
	No	30	94

Qualitative data analysis

Qualitative data derived from semi-structured interviews were analysed using a modified version of Braun and Clarke's six-phase approach to thematic analysis. The audio recordings were transcribed verbatim, and the transcription was repeated to become familiar with the data. The transcripts were coded systematically using open coding to identify meaningful units related to food safety perceptions and institutional challenges. Codes were grouped in founder categories to develop initial themes. The codes were used to refine the themes by addressing the unit of meaning as well as the comprehensive data set to maintain a match with the original data records. Final themes were identified, clearly defined, and labelled to encapsulate the main findings, for example, barriers to compliance, challenges in accessing resources, and management support. Reporting of the themes includes extracts from the participant interviews to provide illustrations of the key insights. Trustworthiness of the results was established by employing the following strategies. Member checks were facilitated by sharing participant interview summaries for validation and to enhance the credibility of the findings. Detailed descriptions of the study's context and the roles of the participants facilitated the transferability of the findings. To ensure dependability and confirmability, an audit trail was maintained that documented all analytical decisions made and provided transparency.

Ethical considerations

The study was conducted in accordance with the principles outlined in the Declaration of Helsinki. This study obtained research ethics approval from the Biomedical Research Ethics Committee (BMREC; BM19/3/15) at the University of the Western Cape, and the Eastern Cape Department of Health (EC-201905-021). Consent forms were completed in the participants' local language, isiXhosa, before participation. The researcher ensured the participants' privacy and confidentiality.

Results

Participant characteristics

A total of 91 healthcare workers from four public facilities in the Eastern Cape participated in the study. The majority of participants were female (81%, $n = 74$) (Table 1). The age distribution showed that 33% ($n = 30$) were between 46 and 55 years old, followed by 30% ($n = 27$) between 18 and 35 years old. Education levels varied, with more than half (63%, $n = 57$) possessing a diploma, and only 1% ($n = 2$) reporting no formal education. Among the 32 food handlers, 94% ($n = 30$) reported having no formal training in food safety. When examining work experience among the food handlers, this was evenly distributed across 1–5 years and 6–10 years of experience (31%, $n = 10$). In contrast, 22% of nurses had more than 30 years of work experience, with most having received job-related training such as infection control.

Levels of knowledge among food handlers and adherence to food safety and hygiene practices

Some 62% of the food service employees surveyed indicated they knew how often to wash their hands and sanitise surfaces, and 38% knew the correct temperatures for refrigerating and holding cold and hot foods. The employees' knowledge was evaluated through a 10-question multiple-choice survey to gauge their understanding. The total score from the test determined each employee's knowledge level: Low (0–4), Moderate (5–7), and High (8–10). The survey results showed that 54% of respondents had moderate knowledge of food safety and hygiene, 28% had high levels of knowledge, and 18% had minimal knowledge.

Many instances revealed discrepancies between food-handling practices and what food handlers reported regarding their hygiene. For example, 41% of food handlers admitted that they did not always wash their hands before preparing food, and 36% wore personal protective equipment, such as aprons or hairnets, only occasionally, rather than consistently. These examples highlight a notable gap between food handlers' understanding of food-borne illness causes and their real-world practices of food safety and hygiene.

Perspectives of food handlers on food safety

Food handlers demonstrated some knowledge of food safety practices, with most food handlers (84%, $n = 27$) strongly agreeing on the importance of ensuring meals are safe, nutritionally balanced, and of good quality (Table 2). Additionally, 72% ($n = 23$) strongly recognised the importance of following a recipe and requirements, agreeing that adhering to recipes during meal preparation is crucial for maintaining the quality of the final product. The same number of participants, 72% ($n = 23$), also emphasised the importance of complying with food production regulations and laws to ensure the production of safe and quality meals for patients. However, the study found that only 47% ($n = 15$) identified refrigeration as the proper method of thawing food, indicating gaps in their technical knowledge. This suggests a need for better education or reinforcement of proper thawing practices. The data shows that food handlers understand the importance of food safety, quality, and regulatory compliance. However, there is room for improvement in specific areas, such as thawing methods.

Table 3 indicates a significant lack of food safety training among food handlers. Only one participant appears to have received training over the past five years. From 2011 to 2019, none of the four hospitals provided food safety training to their food handlers. In 2019, 77% ($n = 23$) of food handlers received training that was not directly related to food safety, such as the Batho Pele Principles, Firefighting, First Aid, and Occupational Health and Safety (OHS).

In contrast, 70% ($n = 33$) of the nurses had received job-related training between 2019 and 2020. These types of training included infection control, basic life support, and management of HIV and TB. There remained 30%, mostly newly employed nurses with less than 18 months of service, who had not received training specific to their role at the time of the study.

Key themes and subthemes emerged from the qualitative data analysis, and the related data are presented in Supplementary Table A2 and are discussed below.

Experience and strength in managing a food service unit

Learning through experience, resilience, and adaptability

Through proven systems shaped by experienced managers in Hospitals B and C, they continually achieved enhanced foodservice delivery by implementing operational standards, including inventory management and hygiene controls, as well as staff training systems (in-service training) that regulated the unit's efficiency, and ensured food safety and accountability for procedures. Newly recruited food handlers in hospitals A and C received on-the-job training and coaching from their colleagues. A lack of food safety training from 2014 to 2019 was reported, leading to none of the food handlers reporting any training in food safety, while 70% of nurses received training aligned with their daily key duties.

Institutional barriers to food safety training

Uncertainty and constraints in funding allocation

In May and June 2019, during data collection, the food service managers reported that they were unaware of the funding available to access training. They were unclear which programmes the department was willing to support for the facility. Hospitals B and D managers provided in-service training to fill food safety and quality gaps when onboarding new staff.

> 'Plans were underway to train food handlers at the beginning of this fiscal year, and a service provider was identified. Unfortunately, at the end of June, we were advised that all plans to train workers should be cancelled as funding would not be available, and the Head Office would be the main organiser for training.' (Participant H-D-M3, Hospital D)

System issues in foodservice management and safety

Informal and peer support

Managers reported consistent patterns of staff development that were predominantly informal learning approaches. New employees were often onboarded with no formal orientation and learned skills through either self-learning or within a peer learning framework. This absence of formal training created inconsistencies in the reliability of food safety practices.

> 'Most of what we know we learned on the job. There is no real training programme.' (Participant H-B-M1, Hospital B)

Unqualified staff assigned to food service roles

The consistent issue was a lack of food service staff who had any food safety experience or qualifications. The lack of these staff fundamentals increased the risk of food-borne illnesses and put pressure on the managers to provide sporadic in-service training.

> 'Most of our staff members lack experience in food service or large-scale food operations. Some are recruited from petrol filling stations, while others were unemployed when hired, so we need to train them. This employment process can impact food safety and quality.' (Participant H-B-M1, Hospital A)

> 'Most of my team members were employed for the laundry because I was informed there is no budget for food service positions. They are currently working in the food service unit temporarily until the new laundry

Table 2: Food handlers' perceptions of food quality in four public hospitals

	Questions	Strongly agree *n* (%)	Agree *n* (%)	Not sure *n* (%)	Disagree *n* (%)	Strongly disagree *n* (%)
1.	The objective and aim of the food service department is to ensure the production of meals that are safe for consumption, nutritionally balanced, and of adequate quality and quantity	27 (84%)	6 (16%)	–	–	
2.	Complying with regulations and laws about food production is essential to produce quality and safe meals for patients	23 (72%)	9 (28%)	–	–	
3.	Thawing or defrosting food must be done in the refrigerator, not in water or direct sunlight	15 (47%)	10 (31%)	5 (16%)	2 (6%)	
4.	Using a recipe and following it when preparing meals for patients is important for the quality of the end-product	23 (72%)	4 (13%)	5 (16%)	–	
5.	Meals prepared in hospital kitchens for patients should be of high quality, have a good taste, and present an appetising appearance	29 (91%)	3 (9%)	–	–	
6.	Training in food production and food quality would be beneficial in improving my skills	24 (75%)	–	–	8 (25%)	
7.	I believe I do not need to attend food preparation training as I have enough experience in food services	4 (12.5%)	4 (12.5%)	2 (6%)	14 (44%)	7 (22%)
8.	I have received training in food safety over the past 5 years	–	–	–	8 (25%)	23 (72%)

opens, but I am uncertain about what will happen once the laundry becomes operational.' (Participant H-B-M1, Hospital B)

In-service training provision due to budget constraints

Experienced food service managers utilised in-service training to address food safety gaps and support newly employed staff, citing that limited budgets restricted formal training options.

'We try to teach them the basics, but we are not really going to teach them enough, as I have other responsibilities. They come in with no background.' (Participant H-C-M1, Hospital C)

Facilities lacking food safety supporting infrastructure

The managers described inadequate resources, such as equipped ablution facilities that did not sufficiently support hygiene standards, for example the availability of hot water in handwashing basins, hand soap, and paper towels to dry hands. Staff were often required to change in the ablution area or wear the same clothing used in multiple areas of food service, increasing the opportunity for cross-contamination.

'Staff lack proper changing facilities. Ablution areas are inadequate for food safety in a food production setting. When I raise concerns about the changing rooms, I am always told it's a matter of budget constraints.' (Participant H-C-M1, Hospital C)

Inconsistent managerial support and resources

Hospital management support was portrayed as infrequent and insignificant. Occasionally, there were some efforts to enhance training and facilities, but these were often undermined by budget cuts or unclear guidance from senior hospital management.

'We had planned to train staff and had arranged a service provider, but we were told to cancel those plans because the Bisho office would handle the training. Now, the entire process is on hold, and we do not know when a training provider will be assigned. We depend on the Provincial Office to coordinate training and development for food services.' (Participant H-D-M3, Hospital D)

Systemic problems related to food safety infrastructure and historical non-compliance Results indicated systemic and structural failures in food safety at four public hospitals. They included the disregard of national regulations that had not been implemented for decades, a lack of infrastructure for adequate hygiene, waste, and temperature control, operational deficiencies in production planning, and poor food-handling practices. The challenges revealed significant risks to food safety at places that require increased governance and reform.

Historical non-compliance

None of the hospitals has been compliant since at least 1994, as evidenced by the absence of a Certificate of Acceptability (CoA), which represents years of non-compliance by this hospital system with national food safety regulations. This system has also largely ignored environmental health audits since 1994, indicating a further lack of food safety governance within this system of care.

'We have never had a CoA, not since I started here over ten years ago. I have started a process for the unit to be assessed by a local Environmental Health Officer.' (Participant H-B-M1, Hospital B)

Inadequate infrastructure and hygiene practices

The audit results demonstrated a severe shortage of hand hygiene infrastructure to support hygienic food services. Hospital D had a fully equipped sanitary handwashing station; however, the other hospitals were not furnished with adequate handwashing stations and often lacked soap, sanitiser, and/or hot water. The audit results indicated that uniform procedures for hygiene practices were frequently ignored or disregarded, and PPE wear was usually subpar (in the case of not being available or inappropriate).

'Staff often wear the same gear from opposing areas. We don't have changing rooms where they can change, so they use the bathroom. This is unsuitable.' (Participant H-A-M3, Hospital A)

Table 3: Training conducted for food handlers and nurses in four public hospitals during the 2019/2020 financial year

Hospital	Training type	Year	Total food handlers or nurses (*n*)	Untrained food handlers or nurses (n)	Trained food handlers or nurses (*n*)	Percentage trained (%)
A. Training provided to food handlers						
Hospital B	Kitchen cooking and catering	2010	32	31	1	3%
B. Training provided to nurses						
Hospital A	Infection control and prevention; First aid; Medication dispensing; Resuscitation; Patient safety incidents; Risk management; Waste management; Fire drills; Leave policies; PMDS; Management of TB and HIV/AIDS	2019/2020	14	4	10	21%
Hospital B	Essential life support; Managing TB and HIV/AIDS; Occupational health and safety; Medication dispensing; Computer courses	2019/2020	10	4	6	13%
Hospital C	Resuscitation; Infection control; Risk management; TB screening; Basic life support	2019/2020	11	3	8	17%
Hospital D	Managing TB, HIV/AIDS; Infection control; Occupational health and safety; Resuscitation; Basic life support; TB screening; STD prevention; Advanced psychiatry; Handling aggressive patients; Computer courses	2019/2020	12	3	9	19%
C. Aggregate nurse training across all hospitals		**2019/2020**	**47**	**14**	**33**	**70%**

Waste management and food storage practices

The waste management potential in three of the four hospitals was documented as inadequate, for example, the unsafe disposal of contaminated food waste (leftover food on patients' plates), and food waste from overproduction or scraps from pots after dishing up in food service units. In Hospital A, pig swill was stored unsafely in proximity to a food preparation area. Inadequate food storage practices were evident at Hospital A, including the obstruction of evaporators, insufficient chilling, and the lack of separation between raw and cooked food.

> 'We do not have sufficient storage facilities, and that forces us to store fresh produce, such as fruit and fresh vegetables, at room temperature.' (Participant H-D-M1, Hospital D)

Operational gaps in production planning and implications for food safety

Hospital A did not have organised production planning for meal production and, as such, did not follow procedure and compromised food safety. In this case, ingredients meant for the afternoon production for supper (chicken livers), as shown in Figure 1 of Appendix 1A, were issued by a food service supervisor and then defrosted on that same day by a food handler between 08h30 and 09h30, because they had not been defrosted ahead of time. To follow a faster defrosting method, the food handler accelerated the unfreezing process by placing the livers in boiling water for a few minutes, then removing them from the heat and leaving them soaked in water for several hours until they cooled. The cooking process officially started after 12h00.

> 'This is how we defrost; it is not something new. We are often given frozen meat when we need to cook. What can we do?' (FH-C9, Hospital A)

Inadequate temperature monitoring

Temperature monitoring was poorly managed during the distribution phase of the food system. In terms of *bain-marie* units in Hospitals A and B, instead of being used for maintaining food, they were used to keep water warm for bathing. In Hospital D, food was being served from tea trolleys that were not

Table 4: Summary of general hygiene audit on compliance with food safety in all four public hospitals

Hospital	COA certified	Provision of FSU uniform	Compliance with wearing FSU uniform	Adequate storage facilities	Cleaning schedule	Waste disposal	Controlled access to FSU	Fully equipped handwashing facilities
A	No	Yes	No	Yes	No	No	No	No
B	No	No	No	Yes	No	Yes (Compass Waste)	Yes	No
C	No	Yes	Yes	Yes	No	Yes	Yes	No
D	No	No	No	No	No	No (Compass Waste)	No	Yes

insulated during distribution; in contrast, Hospital C was the only food service that utilised insulated food warmers (Table 4).

> 'They use the bain-marie to keep water warm to clean and to bathe patients and mop in the wards; it is not used for the intended purpose, and there is nothing I can do.' (Participant H-B-M1, Hospital B)

Discussion

The study's results indicate that various obstacles to safe food exist in all four public hospital food service units. It also highlights that the lack of adequate food safety supporting infrastructure, weak enforcement and compliance with food safety regulations, and a lack of training for food service personnel weaken the provision of microbiologically safe food and proper care for hospitalised vulnerable populations.

Training gaps and regulatory oversight

Although the majority of food handlers were committed to safely delivering food and knowledgeable regarding food safety regulations, the qualitative evidence demonstrated that most of this knowledge was developed through experiential learning rather than formal training programmes. Thus, the lack of formally developed training between 2013 and 2018 has resulted in an inequitable distribution of knowledge of food safety among handlers, particularly in the areas of temperature control and the use of protective clothing. Therefore, it can be concluded that the failure of institutions to develop a system of structured and formal training programmes and adequate supervisory structures has impeded the ability to translate food safety awareness into consistent practices. As a result, there is a clear need to implement programmes of formally accredited training for food handlers and strengthen supervisory systems to ensure better compliance with national food safety standards.

Although training efforts resumed in 2020, their implementation was inconsistent and infrequent, and relevant to food safety. These findings align with Teffo and Tabit,[11] who found a general lack of food safety knowledge among hospital staff. However, our study differs in that, despite limited formal training, food handlers demonstrated a notably high awareness of hygiene and compliance principles, although they lacked sufficient procedural knowledge.

In contrast, Teffo and Tabit[11] noted a relatively low awareness of hygiene protocols among hospital foodservice staff in their studies. However, our findings indicate that food handlers had a better overall understanding of hygiene-related topics than Teffo and Tabit's study suggested. Food handlers demonstrated adequate knowledge of basic food safety practices, including personal hygiene and workstation sanitation. Still, they showed a limited understanding of technical procedures, such as safe thawing and consistent PPE use. Although the majority lacked protective clothing, they wore clean, improvised clothing. These disparities reflect the absence of formal training programmes, contributing to uneven knowledge distribution, a pattern similarly observed by Nkhebenyane et al.,[9] who reported that food handlers in central South African hospices lacked adequate food safety training and relied on informal practices, including improvised protective clothing. These findings support the need for structured development and training that target both foundational and procedural competencies to ensure food safety in institutional settings, as similarly emphasised by Nyawo et al., who identified critical knowledge gaps and practice gaps among food handlers in South African healthcare and hospitality environments.[10] The findings align with those of Teffo and Tabit,[11] who identified systemic hygiene deficiencies in food safety education among hospital foodservice personnel in South Africa. The results underscore the urgent need for institutional accountability and structured capacity building to ensure safe food preparation and service in healthcare settings.[11]

Infrastructure

Systemic infrastructure failures were evident across all four hospitals, including under-equipped food service units, inadequate storage facilities, insufficient hand-washing stations, and ineffective waste management systems. The findings of this study align with those of Teffo and Tabit[11] and Nhabe and Maleno,[12] who similarly identified hygiene and infrastructure limitations within the institutional foodservice environment, underscoring the need for regulatory oversight and capacity building. Document analysis revealed that none of the hospitals had operated with a valid COA, indicating a long-term lapse in regulatory oversight.

Management support and oversight

Management support emerged as a critical determinant of food safety implementation. In most hospitals, food safety training was deprioritised due to budgetary constraints. Although some managers expressed commitment, they lacked the resources to sustain infrastructure and enforce hygiene standards. The findings align with Mphaga et al.[13], who highlighted weak governance and leadership accountability in South Africa's healthcare sector. In addition, role ambiguity further exacerbated compliance challenges, as nurses and general staff served food without proper training. Regulation 638 of the Food, Cosmetics, and Disinfectants Act provides a framework for institutional compliance; however, enforcement remains weak, with no audits and limited involvement from Environmental Health Practitioners. The absence of routine inspections or unissued COAs presents systemic governance failure. Addressing these gaps requires interdepartmental coordination and strengthened capacity within local government structures.[14] Moreover, involving these multidisciplinary stakeholders in the institution's formal policies enables hospitals to deliver therapeutic and safe meals. It also helps ensure compliance with national food safety regulations and standards, leading to improved patient outcomes and enhanced organisational accountability and credibility.

Conclusion

Healthcare Administration is crucial for maintaining institutional food safety. This study identified several reasons why institutions struggle to meet food safety standards, including a lack of proper food handling equipment, limited budgets for food services, and employees who lack adequate training in food safety. The findings also revealed weak leadership and governance within South Africa's healthcare sector; despite Regulation 638 requiring hospitals to perform regular food safety audits, enforcement remains inconsistent. Moreover, nurses and non-food staff are often responsible for food serving but generally do not receive proper training. To ensure compliant and equitable food service, coordination among hospital administration, the food service managers, and environmental health practitioners is essential. Without systemic reform, food safety problems will persist, risking patient

recovery and infringing on patients' rights to safe food and healthcare.

Strengths and limitations of the study

This research was limited to four public hospitals in the Eastern Cape and conducted over a relatively short period. These limitations may impact the extent to which the findings can be applied to other provinces or healthcare systems. Nevertheless, the study provides valuable insights into the systemic and operational factors that influence food service delivery in under-resourced institutional settings. Despite some constraints, this study contributes to the understanding of how to improve food service governance. It provides relevant and context-based information for developing corrective measures to enhance patient care and health outcomes.

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