

Healthcare Workers' Perspectives on Improving Patient Safety: A Thematic Analysis of Open-Ended Survey Responses from Public Hospitals in Tshwane District, South Africa

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Cite this article as: Gabaitsane Manita Tabane, Ndumiso Tshuma, Musibau Titiloye. Healthcare Workers' Perspectives on Improving Patient Safety: A Thematic Analysis of Open-Ended Survey Responses from Public Hospitals in Tshwane District, South Africa. *Texila Int J Public Health*. 2026;14(3).
<https://doi.org/10.21522/TIJPH.2013.14.03.Art010>

Article Type: Original Research

Received: 30.04.2026

Accepted: 09.07.2026

Published: 30.09.2026

Abstract

Resource constraints in the healthcare system environment present a serious encounter that impact negatively on patient safety. Although quantitative indicators provide measurable evidence of patient care outcomes, employees' suggestions provide perspectives from the lived experiences. This study explored healthcare workers' recommendations for strengthening the safety of patients within Tshwane District public hospitals. The methodology applied in the analysis of the open responses is qualitative and descriptive in nature. These responses are component of the answers of the questionnaire tool of the broader cross-sectional survey on service quality dimensions and safety in public hospitals within Tshwane district. The responses from 108 participants were examined through thematic analysis. The investigation encompassed coding, categorization including recurring themes identification. Eight themes emerged from the findings included the following constraints: staffing, infrastructure, accommodation space, equipment availability including supplies, governance including organizational weaknesses, professional skills proficiency, Hospital safety culture, Communication obstructions, patient overflow including high numbers, health information limitations. Personnel shortages, inadequate infrastructure, as well as insufficient resources were most frequently reported concerns. The findings indicate that safety challenges experienced in the public hospitals in Tshwane health district are fundamentally systemic in nature and require coordinated interventions focusing on workforce strengthening, improving infrastructure including positive safety culture enforcement.

Keywords Communication, Health Systems, Hospital Safety, Risk Factors, Safety Culture, Thematic Analysis.

Introduction

The safety of patients is mainly regarded as an important dimension of healthcare service quality that poses distress globally and publicly. High mortality and morbidity rates found in low- and middle-income countries are mainly due to avoidable harm [1]. Despite the availability of patient safety and service quality guidelines, policies and regulations, the evidence of patient harm in the health facilities is escalating. The national guideline of patient safety indicates that many of these adverse events are associated with organizational including systemic weaknesses rather than isolated human error alone [2]. Public health institutions in South Africa continue to face operational pressures such as staff shortages, infrastructural inadequacy, overcrowding and resource deficiencies [3]. Although previous quantitative studies have examined the relationship between service quality and hospital safety outcomes, very few studies have identified the health professionals' personal suggestions for reinforcing best practices in health facilities [4].

Health professionals occupy a central position within the healthcare system; additionally, they are directly involved in patient care service delivery. Activities such as using equipment for patient procedures, along with daily interactions with multidisciplinary teams, put them in a unique position to identify operational gaps and inefficiencies, including potential risks. In addition, their standpoint may not only offer precise real-world perspectives but may also provide advance development of policy and enhancement in structural initiatives [5].

This investigation therefore examines the suggestions provided by health professionals about patient safety in public hospitals in the Tshwane district. The participants responded with qualitative suggestions planned to be used to quantify the broader numerical results linking safety in hospital setting and quality of service.

Methods

Study Design

A qualitative descriptive design is used to explore healthcare workers' perspectives regarding improving safety in the hospitals within Tshwane district.

The qualitative element is the section of the main cross-sectional design investigating relationships between the dimensions of service quality and hospital safety within the district.

The qualitative methods enable an in-depth exploration of participants' experiences, views, including suggestions regarding the safety of patients within the public hospitals. Additionally, the qualitative method afforded the contextual understanding that complements quantitative findings of the broader study [6].

Study Population and Site

This study took place in public hospitals in the metropolitan municipality of Pretoria, in the Gauteng province of South Africa. These hospitals serve a population of over 3.5 million. The area is mainly urban but also encompasses informal settlements including peri urban communities. The levels of care facilities include Primary Health Care clinics, Community Health Care Centres, Hospitals (5 district, 1 regional, 1 tertiary and 2 centrals academic). The academic hospitals also offer specialist health services to other provinces such as Limpopo, Northwest, and Mpumalanga, as they do not have central academic hospitals. Each academic hospital leads a cluster in its referral chain: one cluster composed of 2 tertiary hospitals, one regional hospital and 3 district hospitals, whilst another academic hospital leads a cluster composed of 2 district hospitals in its referral chain, which results in Primary Health Care clinics and Community Health care centres referring directly to central hospital. This academic hospital also receives direct walk-ins as a self-referral.

The accessible population consisted of all healthcare workers in public hospitals as mentioned above. The health professionals (managers, doctors, nurses, support staff), from these facilities were included in the study in order to capture the diverse views in advancing the care of patients. Different professional disciplines are important for encouraging relationships and organizational dynamics [7].

Participants Recruitment

Data collection was simplified by holding the planned meeting with the authorities of participating hospitals to provide information on the study purpose, clarify objectives, and explain the data-collection method. The person was nominated per each hospital during these sessions to be a liaison for support and dissemination of tools for collection of data. This stakeholder engagement procedure is crucial to increase participation rates and facilitate the execution of study activities in health facilities [8].

Data Collection

Self-administered Survey tool was developed through the University of Pretoria (UP) Qualtrics program. The last portion of the survey tool was an open-ended question, intended to gather the perspectives of health professionals in enhancing the hospital safety within their individual health facility. An anonymous survey link was created through the UP Qualtrics program and sent to the participants through internal messaging platforms such as WhatsApp groups and group emails that are managed by the hospital administration. The process was coordinated by the hospital contact person nominated in the contact session. 108 out of 476 participants who completed the survey, narrated their open-ended answers which shaped the qualitative data of this portion of the research. The answers of the participants were downloaded into an excel spreadsheet from University of Pretoria

Qualtrics online platform where data were collected.

Data Analysis

Open-ended answers were analysed using reflexive thematic analysis as outlined by Virginia Braun and Victoria Clarke [9]. The appropriateness of this approach is in identification of patterns and themes within qualitative information derived from survey answers, mainly in healthcare research discovering health professionals' perceptions on hospital safety [10, 11]. Analytical technique includes the following six phases:

Data Familiarisation: All answers were read multiple times to ensure immersion in the data. The answers to the open-ended question were downloaded from the Qualtrics online platform into an Excel spreadsheet to ease the repeated readings.

Initial Coding: Inductive coding was applied, allowing themes to emerge from the data. The answers that had the similar meaning were identified and put together as codes as illustrated in column 3 & 4 of Table 1 to 4 below are developed to illustrate the codes derived from the responses per the level of hospital, where Table 1 is for central hospital, 2 is for tertiary, 3 for regional and 4 is for district hospitals.

Themes Development: Codes that are similar and carry same interpretation were grouped into broader categories of themes reflecting main hospital safety issues as indicated in column 2, 3 & 4 of Table 1–4.

Themes Review: Themes were evaluated and refined to make sure that they are logic and distinct between categories to ensure consistency. The themes that have the same understanding from Table 1–4: column 2 were grouped together as main themes, depicted in Table 5: column 1 & 2.

Theme definition and naming: Each theme was clearly defined, as well as assigning suitable name as accurately presented in the content. Table 5: column 1 illustrates the names of main themes and is defined in terms of categories as indicated in Table 5: column 2 and example of keywords or codes in column 3. Furthermore, the main themes are described in terms of the responses in the results section below.

Reporting: Findings were presented using anonymised participant quotations.

Table 1–4 below, indicates each code emerged from the responses (column 3), the names of themes emerged from codes (column 2), and the interpretation of each code according to the levels of hospitals.

Table 1. Represents Theme Names, Codes, and their Interpretations from Central Hospitals

Level of Hospital	Theme	Code	Code Interpretation
Central Hospital	Infrastructure and capacity	Overcrowding	The code indicates that high patient volumes affect patient safety. The pressure is felt in the wads, emergency, and specialized units in central hospitals. This results in difficulties for proper monitoring as well as providing care timeously
	Infrastructure, capacity	High patient volumes	The code indicates a high value because central hospitals serve extremely high volumes of more complex conditions. More non-complicated referrals add to the burden on the same level of care. A large number of patients leads to a heavy workload, which can delay care, cause missed care, and reduce the quality of patient monitoring.
	Infrastructure, capacity	Ageing infrastructure	This code refers to old or poorly maintained hospital buildings that endanger patient safety in areas such as hygiene, including infection prevention and control.
	Infrastructure, capacity	Theatre scarcity/shortages	Inadequate theatre resources mean surgical procedures are delayed. Very urgent, including complex surgical cases, are referred to central hospitals. Theatre shortages may delay operations and diagnostic procedures.
	Infrastructure, capacity	Low bed capacity	This code shows that patient safety is compromised when hospitals lack sufficient beds to care for patients properly. Bed shortages can lead to patients being stuck in inappropriate areas, delayed admission, and a lack of continuity of care.
	Mental healthcare pressure	Insufficient psychiatric facilities	This code addresses the issue that users of mental healthcare are infrequently managed in appropriate facilities. Inadequate psychiatric wards in central hospitals can pose risks to the safety of other psychiatric patients, staff, as well as the patient him/herself.

	Referral approach	Referral bottlenecks	A code indicates that central hospitals are congested with patients referred from lower-level facilities. Weak referral flow leads to more congestion and undermines the hospital's efficiency, concentrating on specialized care.
	Patient flow	Long waiting times	This code means the patient safety risk is of waiting time. Prolonged waiting times could be linked to overcrowding, insufficient numbers of staff, inadequate theatre facilities, insufficient number of beds as well as patient-flow inefficiencies.
	Clinical systems	Electronic patient records	The code indicates that hospitals will have to introduce more advanced information systems. This code highlights the importance of strong information systems, such as electronic patient records, proper documentation, minimizing lost files, and promoting continuity of care and clinician decision-making.
	Governance	Executive responsibility/ Leadership accountability	The code indicates that the respondents consider patient safety as the responsibility of leadership and management. It emphasizes hospital leadership should focus on infrastructure, staffing, resource shortages, and problems of patient flow to avoid the fate of the frontline workers.

Table 2. Illustrates Theme Names, Codes, their Interpretations, from Tertiary Hospital

Level of Hospital	Theme	Code	Code Interpretation
Tertiary Hospital	Specialised clinical care	Specialist-care pressure	The code shows that tertiary hospitals face an added safety challenge because they manage more complex cases. Safety in care therefore comes down to the availability of skilled personnel, working equipment, quality clinical oversight, and trustworthy hospital processes.
	Equipment and resources	Specialist equipment shortages	This means that the lack of advanced equipment for specialized care can compromise the safety of care. In tertiary hospitals, insufficient equipment for specialist treatment can make diagnosis and specialist methods of treatment late.
	Equipment, resources	Broken equipment	The code shows how essential the maintenance of equipment is if the safety of patients is prioritized. Broken equipment can delay care, increase the level of clinical instability plus encourage staff to improvise. Such behaviour may not be considered safe for patients.
	Human resources	Staff training	The code describes the significance of continuing professional education. Based on surveys, it seems to be the case that the respondents appear to uphold that clinical competence, communication, infection control,

			safe practices and adherence to protocols, increased inpatient safety from regular training are supported by clinical competence as well as the prevention, control of infecting the environment and safety protocols.
	Human resources	Medical intern supervision	The code indicates that medical interns, including junior doctors, need oversight in reducing the proportion of clinical errors. In the higher education institutions, which are home for teaching and providing specialist care, little or no attention to safety might make patient welfare even less assured.
	Clinical governance	Incident reporting	These codes are indicative of the requirements of robust patient safety reporting systems. It sounds as if respondents agree on reporting mechanisms that notice dangers and systems failures but don't immediately place the blame on staff.
	Clinical communication	SBAR handover	This code demonstrates the role of structured communication among healthcare workers. Bad handover results in missed clinical details, medication errors, delayed treatment, and interruptions in care delivery. The word 'SBAR' stands for Situation, Background, Assessment, and Recommendation.
	Clinical documentation	Poor documentation	This code shows that incomplete or inaccurate documentation is a patient safety risk. Good documentation supports continuity of care, accountability, and decision-making in clinical practice.
	Medication safety	Availability of medication	A code indicates that constant access to medication is critical to safe care. An insufficient supply of drugs can stall treatment, delay healing, and put patients at risk of unnecessary harm.

Table 3. Reflect the Regional Hospital, Theme Names, Codes, and their Interpretations

Level of Hospital	Theme	Code	Code Interpretation
Regional Hospital	Referral coordination	Poor referral coordination	The code indicates that the weak management of either up or down referral due to insufficient referral pathways or poor referral systems may results in substantial risk of harm in regional hospitals. Good referral coordination can help with timeous treatment and care of patients at the correct level of care.
	Referral coordination	Delayed transfers	The code means that there can be prolonged waiting time before the patient can be transferred to the appropriate health facility. Delayed transfers may result in complications of patient conditions and further increase workload on the staff on regional hospital.

	Referral coordination	Down-referral challenges	The code indicates that the problems exist when coming to referring the patients back to district hospitals after completion of their care in regional hospital, this can affect the availability of beds for admission of new patients and results in overcrowding.
	Outreach and support	Outreach programmes	The code means that the support is needed between referring hospitals. Outreach programs is a strategy designed to assist lower-level hospitals to appropriately manage cases to minimise avoidable referrals to higher level hospitals.
	Resource distribution	Decentralised resources	The code means that the participants need the resource nearer to where patient care services are rendered. Decentralization of resources will reduce the time spent waiting for the resources and further enhance the speedy management of patients' conditions.
	Service capacity	Intermediate hospital capacity	The code means an adequate capacity is required in a regional hospital for the management of conditions that are difficult for district hospital but do not need to be referred to higher level of care. Without the intermediate hospital capacity, regional hospital may experience overcrowding, and increased risks to patient safety.
	Human resources	Staff shortages	The code reflects that there may be inadequate staffing to manage the demand of patient care in regional hospital. This may result in delays in treatment of patients, minimised monitoring of conditions and increased pressure in workload.
	Supply chain	Supply-chain delays	The code indicates the delays in getting equipment and consumables for rendering the safe care to patients in regional hospital. A reliable supply chain systems is required for the sustainability of safe hospital service and reduce the rate of complications.
	Communication	Communication between hospital levels	The code shows that communication between facilities is important for effective referrals, continuity of care and answerability. Poor communication may result in unsafe movement of patients throughout the health system.
	Referral coordination	Poor referral coordination	The code indicates that the weak management of either up or down referral due to insufficient referral pathways or poor referral systems may results in substantial risk of harm in regional hospitals. Good referral coordination can help with timeous treatment and care of patients at the correct level of care.

Table 4. Reflects District Hospitals, Theme Names, Codes, and their Interpretations

Level of Hospital	Theme	Code	Code Interpretation
District Hospital	Basic operational readiness	Staff shortages	The code indicates that the safety of patients is seriously affected by inadequate staff in district hospitals. Low number of staff in hospitals can results in delays in patient care services such as monitoring of patients, delayed treatment, and poor infection prevention practices.
	Basic operational readiness	Poor staff-patient ratio	The code means that a smaller number of staff is allocated to high number of patients due to staff shortages. Poor staff-patient ratio results in overload of work, exhaustion and increase risk of missed care.
	Support services	Shortage of cleaners	The code indicates that support staff specifically cleaners are important part of patient safety. Cleaners' shortage can adversely affect hygiene and results in high infections rates.
	Infection prevention	Infection control	The code talks to the issue of prevention and control of acquired infections. Infection prevention and control is dependent on hygiene, supplies for cleaning, compliance by staff on procedures such as washing of hands accordingly, and appropriate monitoring.
	Infection prevention	Hand hygiene	The code talks to the participants concerns about the basics hygiene practices as it is central to patient care in the hospitals. Good hand hygiene practices may reduce the risks of infection transmission between patient and staff.
	Material resources	Medication shortages	The code shows that the district hospitals may experience some difficulties with accessing continuous supply of medication. Good and timeous supply of medication will reduce the treatment delays improve the quality of care.
	Material resources	Linen Shortages	The code reflects the importance of every material including linen for delivery of care that is dignified and safe. Adequate linen is essential for hygiene, comfort, and prevention of infection.
	Material resources	Consumables Shortage	The code indicates inaccessible daily supply of clinical supplies in district hospitals. Timeous access to clinical supplies will consistently safeguard routine care.
	Equipment	Basic equipment shortages	The code means that basic and reliable equipment are insufficient in district hospitals. Shortage of equipment may cause assessment delays, poor care, delayed treatment, and monitoring.

	Patient care process	Patient monitoring	This code reflects the importance of regular follow-ups and observations of patient care and safety. Hindrances in regular patient monitoring of the effect of treatment and change in patients' conditions, may escalate the risks of patient being missed or deteriorating.
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The themes are summarized, categorized as well as coded and are demonstrated in Table 5 below, the frequency including the percentage

score are demonstrated on both last columns, respectively.

Table 5. Reflects the Main Themes, Categories, as well as Response Frequency and Percentage Score

Main Themes	Categories	Example Keywords / Codes	Frequency (n)	Percentage (%)
1.Strengthening Staff establishment	Human resource shortages	Insufficient staffing, exhaustion, workload,	48	22%
	Capacity building & carrier pathing	On the job training, skills Continuous Professional Development (CPD)	35	16%
	Staff competence	Experience, knowledge gaps	18	8%
Theme 1 Sub-total			101	46%
2.Improving Communication plus Teamwork	Interprofessional communication	Handover, Poor communication	28	13%
	Team relationship	Teamwork, Provision	22	10%
	Reporting principles	Case recording, Transparency	14	6%
Theme 2 sub-total			64	29%
3.Systems improvement and Infrastructure	Equipment availability	Shortages, Malfunctioning	19	9%
	Infrastructure challenges	Overcrowding, Space	12	5%
	Technology structure	Digital records, Systems enhancement	9	4%
Theme 3 Sub-total			40	18%
4.Strengthening Leadership and Governance	Management support	Supervision, Leadership	15	7%
	Policy implementation	Guidelines, Compliance	10	5%
	Accountability	Monitoring, Reviews	6	3%
Theme 4 sub-total			31	14%

Results

The last portion of the survey tool comprised of two questions. The first one seeks to determine whether the participants had suggestions for

improving patients' safety. Of the 476 participants who responded to the questions, 108 (22.7%) said yes. The second one was the follow-up question phrased as "if the answer in the above question is yes, please elaborate your

suggestions.” All the 108 (100%) participants who responded by saying yes to having suggestions for improvement of safety, provided qualitative suggestions. Themes emerged from their suggestions and were summarised into 4 main themes with the categories, presented as follows:

Strengthening Staff Establishment

Human resources shortages were the mostly cited challenge mentioned by those who participated. The theme rating is forty six percent (46%) out of all the themes that emerged from the responses.

Employee shortages: Constraints in human resources were cited many times by a lot of participants touching equally the medical and the support services. Participants highlighted increased workload, fatigue, including reduced service quality because of inadequate staffing. Some respondents indicated what should be done to remedy the situation. Participant quote: “hire more staff so that patient can receive better care they need.”

Training and Professional Development: Skills development as well as continuous training in particular safety practices, including clinical competencies’ needs were emphasized. Personal protective equipment (PPE) use should also be included in the training program, was indicated by one of the participants.

Staff competency: lack of speciality skills, experiences and knowledge gap were examples of highlighted gaps.

Improving Communication plus Teamwork

Communication and teamwork issues were the second most common factors that affect the safety of patients in the hospitals within Tshwane district. The theme rated 29% of the total themes.

Interprofessional Communication:

Challenges with handover reporting and, poor communication, Team relationship, teamwork,

provision of clinical care and documentation were some of the highlighted gaps. Reporting principles such as case recording including poor record keeping and transparency, were some of the responses. Referral coordination, poor communication between facilities and communication breakdown, were examples of challenges identified. One of the respondents recommended ‘SBAR’ (Situation Background Assessment and Recommendation) as a strategy that can be used during handover.

Systems Improvement and Infrastructure

This theme was third of all the themes with 18% of factors affecting patient safety in hospitals within Tshwane district.

Health Information and Technology: Better electronic system is highlighted to improve record management, patient tracing, as well as medication safety.

Inadequate space and infrastructure limitation: Participants indicated that infrastructure is aging and insufficient, as well as theatres, wards including specialized facilities particularly for mental health services.

Overcrowding as well as Patient flow challenges: Emergency unit including psychiatric wards overcrowding, as well as referral systems inefficiencies result in high safety risks, cited by participants. The following is one of the participants’ answers: “Mixing psyche patients with internal medicine patients is haphazardous as it creates an uncomfortable environment for patient care.”

Resources including equipment insufficiency: Consumables, equipment plus medications are essential resources that were reported to be frequently lacking. Safety risks such as shortages in supply as well as damaged equipment were also mentioned.

Governance, Leadership, System Failure

These issues were the fourth with the rating of 14% on factors contributing to poor patient

safety outcomes, Participants expressed concerns about poor leadership, liability as well as supply chain management lack. Blame culture instead of system enhancement was also cited. lack of a non-punitive reporting culture was identified as hospital safety barriers by those who participated. Participants Quote: “promote a culture of transparency and reporting incidents without fear of blame.”

Management support: Participants indicated that there is lack of supervision and leadership. Guidelines are unavailable if not implemented. There is lack of monitoring or reviews of patient conditions, system failures and accountability thereof, mentioned by those who participated.

Discussion

This investigation adds to findings from other studies exploring how healthcare workers perceive patient safety quality at public hospitals in Tshwane District. Participants perceived patient safety issues as primarily a system-level problem, not necessarily individual clinical negligence or error [12]. Key problems were inadequately staffed facilities with unaddressed staff dissatisfaction. Key problems were inadequately staffed facilities, physical limitations on the ground, equipment unavailability and infrastructure, consumable shortages, infrastructure management, communications challenges, and overcrowding. Leadership as well as governance challenges.

The challenges in human resources were also area that is mostly discussed. Health professionals noted that staffing shortages increased clinical workload, fatigue, and burnout, and undermined continuity of patient care. Low levels of staff were noted as delays in the treatment process, monitoring patients' well-being, and as a stressor for health care professionals in the context of Tshwane district. Prior studies equally illustrated that shortage of human resources have a say in bad service outcomes, high risks of infections, medication faults, and increased mortality rate [13].

Workforce design and retention plans are necessary to address the problems underscored by this study's findings.

The main issues pinpointed by the participants were infrastructure-related challenges: the overcrowded wards, lack of clinical space, ageing facilities, and inadequate specialised services. There were strong concerns about the mental health infrastructure. Such limitations could be seen as having negative impact on infection control, patient privacy, responsiveness of emergency services, and quality care. Overcrowding in hospitals as well as inadequate infrastructure have been recorded to have contributed to avoidable harm in some low- and middle-income countries [14]. Hospital infrastructure discrepancies remain a prolonged challenge that puts a significant burden on South African public health service delivery [15].

The risks of safety in hospitals are broadened when the equipment together with the resources are inadequate. Critical supplies scarcity, damaged equipment, supply chain ineffectiveness was cited by those who participated. Previous studies agree that insufficiencies in essential curative resources disrupt hospital service delivery and increase avoidable injuries [7]. Supply chain issues and fraud underscore governance and systems problems that should insistently be addressed.

Critical contributors to hospital safety risks, such as structural leadership and governance problems, were recognized. Poor accountability methods, delayed decision-making, ineffective supervision and a culture of blame instead of openness to learning from errors were some of the concerns expressed by those who participated. Hospital culture symbolized by weak communication as well as fear, may compromise the reporting of incidents and result in reduced chances for continuous learning and improvement. Adopting system-oriented hospital safety approaches that critically prioritize organization learning,

compassionate leadership guidance as well as answerability, is reinforced by the findings [16].

Professional training and skills development were indicated as key enablers of hospital safety in the hospitals withing Tshwane health district. Continuous training, especially in clinical skills development, best care practices as well as infection prevention and control were emphasized by those who participated to improve the safety of care. Capacity building strategies as well as continuous training are evidenced by researchers as an impotent aspect of health professional competency building initiative that will bringdown the chances of mistakes [17].

The study also emphasized the importance of a safe culture, including effective communication, for health service delivery. Ineffective teamwork, breakdowns in communication, as well as the lack of a non-blame reporting environment were identified as barriers in hospital service delivery. The researchers highlight the significance in communication, teamwork as well organizational learning in minimizing mistakes to enhance better outcomes [18]. This hospital safety culture framework is in alignment with the findings of this study.

The challenges in the flow of patients as well as congestion were cited as important contributory factors to risks in hospital service delivery. The report of overcrowding in emergency departments and psychiatric units as well as inefficiencies in referral systems were also indicated by those who participated in the study. There is consistency with the results of other investigations indicating that overcrowding leads to delays in care, increased medical errors as well as reduction in quality of care [19].

Some of the important solutions to a lot of issues mentioned were the use of information systems and health technologies in the health institutions within Tshwane district. Electronic record managements system such as system barcodes as well as digital tracking tools are

some of participants' suggestions to improve safety of care in hospitals. Studies indicate that the use of information technologies in health sector can evidently minimize medication mistakes, enhance documentation accuracy as well as increase harmonization of care [20]. It will save time to use electronic system to capture the ward and the bed in which the patient is sleeping, than physically look for the beds for the new patients that are admitted.

The results of this investigation highlight the need for system-based methods that address challenges in human resources, governance and leadership, infrastructure, and safety culture to achieve sustainable safety.

Conclusion

This study shows that the safety challenges faced by hospitals in the Tshwane district are mainly driven by organizational and systemic factors. The key factors contributing to harm of patients in the health facilities were highlighted to be the shortages in human resources, insufficiencies in infrastructure, inadequacy in resources, communication obstructions, and governance flaws. To address these issues, the coordinated sustainable methods of interventions that strengthen workforce capacity, enhance infrastructure, make the equipment plus resources available, improve leadership and governance as well as elevation of supportive culture of safety in the hospitals. The findings of this study may assist policymakers, leaders as well as mangers of the hospitals, to develop a proper approach aiming to enhance improvement of safety within the budgetary constraints health sector.

Recommendations

Recommendations are based on themes emerged from data analysis.

Strengthening Staff Establishment

Health professionals highlighted that addressing this issue can minimise hospital safety challenges. This is supported by the literature, which shows that sufficiently skilled

and adequate health professionals enable continuous care and better outcomes, such as reduced avoidable morbidity and mortality rates [7, 13]. The following strategies are recommended:

Enhance Planned Strategic Hiring

Directed Staffing Plan: Establish a human resource plan at the beginning of each financial year. This plan should be aligned with the operational plan. Guidance for this plan includes identifying areas of staff shortages, including high risks, the skills needed, and the future expertise required for that area; consider the level of acuity for the type of care in the areas identified [7].

Recruit Competent and Safety-Oriented Staff: Prioritization should focus on candidates with ability to deliver high quality and safe care, clinical care competencies, commitment and skilled in communication, safe culture, teamwork, ethics as well as patient focussed [21].

Improving Recruitment Process: Recruitment process should have the time frame targets with adherence. The process should be decentralised to the hospitals as indicated by the participants. Decentralization will reduce the duration of recruitment process [7].

Rural Allowance: Consider incentives and scarce-skills recognition to support staff retention. Consider international recruitment where there is a scarce skills shortage in the country; staff shortages can also be reduced by offering salaries and benefits that are reasonable and can be used to attract health professionals [22].

Build partnerships with colleges and universities that train health professionals. Workers on contract may be employed permanently at the end of community service to minimise staff turnover [7].

Promote Workforce Diversity: a diverse health care workforce improves cultural competence, engagements as well as openness to the proper requirements of care [23].

Improve Retention through Positive Work Environment: Ensure safe staffing levels: sufficient staffing may decrease issues of staff exhaustion, weariness, medication mistakes, and hospital-acquired infections. Studies have associated the accurate staff patient ratios with the minimal preventable mortality and morbidity rate [13].

Use Recognition and Incentives System: Employee recognition helps improve morale, job satisfaction as well as commitment within organizations. Hospitals can reduce staff turnover by rewarding outstanding performance, appreciating with incentives those who have long service as well as programs that award safety. Recognition has been associated with lower turnover intentions among workers [24].

Strengthening Leadership and Governance

Enhance supervision and organizational support: supportive leadership plays a critical role in retaining healthcare staff by fostering a positive, inclusive work environment. Hospital managers can strengthen staff commitment by promoting open communication, acknowledging contributions, providing constructive feedback, involving staff in decision-making, as well as a non-punitive hospital culture. Increased staff satisfaction level as well as the culture that promote the better outcomes, are associated with transformational leadership [25].

Promote employee wellness: introduction of wellness programs focussing on reduction of stress associated with work, promoting mental health, avoiding emotional fatigue, addressing brutality in the workplace including enhancing the balance in work-life by way of flexibility in work schedule. These programs are critical to

reduce work stress thereby minimising mistakes in service delivery [26].

Enhance continuous professional development: Capacity building and in-service training play an important role in providing a required competencies in hospitals. Participants cited training and professional development as critical to minimising avoidable harm in hospitals. The areas of focus may include training on emergency preparedness, teamwork and communication workshops, safety management as well as prevention and control of infections. Uninterrupted training including professional growth uplift quality thereby assuring the better outcomes in care delivery [7].

Offer opportunities for career growth: staff retention may be enhanced by knowledge of career opportunities, such as advancement, speciality training, leadership and management courses, and mentorship for newly qualified professionals to help them adjust to the clinical setting [27].

Adopt safety culture that is persuasive and non-punitive. The environment that supports reporting of safety incidents, errors as well as near misses, without fear of punishment or blame, should be created. Respondents indicated that systems should be corrected rather than punitive outcome of reporting and investigations. The culture that encourages openness, knowledge from previous mistakes, working harmoniously, mutual obligations are positive and important to enhance expected service delivery in the hospitals [7, 24].

1. Apply the principle of Just culture on the management of patient safety incidents. This principle guides on how the behaviour of employees needs to be managed when dealing with patient safety incidents, as the main aim of identifying and managing patient harm incidents is to prevent the further occurrence of the same nature in future. This underscores the critical aspect of learning from the investigated safety incidents. The punitive culture

environment defeats the whole aim of identifying gaps in order to learn and improve as staff became afraid of reporting the safety incidents [2, 24]. Therefore, organizations should shift from a culture of blame to a culture of learning by encouraging transparency in identifying system weaknesses rather than capitalising on individual imperfections; root cause analysis, reflective learning, and problem resolution should be promoted. Ultimately, disseminate the acquired knowledge throughout the entire hospital to prevent future occurrences of the same nature, including system safety [16].

2. Strengthening Leadership Commitment to Patient Safety: Supportive leadership promote trustfulness and fairness, as well as accountability, through open communication of safety significance, supporting personnel in reporting harm incidents. Fairness in investigations, as well as providing the resources needed for care initiatives. Supportive leadership enhance personnel confidence as well as participation in patient safety [28].
3. Supporting Healthcare Workers after Adverse Events: Health professionals implicated in safety incidents may encounter touching difficulties that may reduce their confidence at work and in their social lives; this is known as the 'second victim' phenomenon. The affected professionals can be supported through psychological support services, employee wellness program such as counselling and debriefing sessions as well as non-judgemental supervision. These supports can promote openness and wellbeing, including resilience following an incident of harm [29].
4. Human resource policy indicators such as turnover rate, vacancy rate, burnout rate, absenteeism rate, as well as safety incident rate should be monitored. The resulting data and analytics can help identify

retention problems sooner and guide approaches to improve quality of care and safety [22].

Systems Improvement and Infrastructure

Health Infrastructure Investment and Conservation

Conservation, including investing in infrastructure, can enhance safety in hospitals by creating a safer as well as more efficient hospital environment. In the areas of Tshwane district as well as the South Africa where resources are limited, Improved infrastructure can assist in reducing medical errors, health acquired infections, equipment breakdown including delays in treatment [7]. Equipment unavailability, infrastructural issues, and technology system challenges were the third most common factors affecting the safety in the hospitals within Tshwane district according to this study. The following are recommended strategies:

Consistent servicing and modernization of medical equipment are critical for accuracy in examining, diagnosing, and prescribing treatment for the patients. Contributory factor to treatment delays, mistakes in medication, wrong diagnosis as including patient injury, may be the results of inadequate maintenance or equipment that is outdated. Regular servicing of diagnostic equipment, replacing outdated technologies including implementation of preventative conservation programs to reduce technical failures for improved outcomes in hospitals [7].

Improved infrastructure for prevention and control of infections is critical for reducing hospital acquired infections as well as improving outcomes of care. Hospitals should invest in proper sanitation and handwashing facilities; ventilation, water, and waste management systems should be reliable. The units such as theatres and wards should be clean and well maintained. Poorly maintained infrastructure can increase infection

transmission and place patient safety at risk [7, 9].

Accessible and reliable fresh water and electricity are vital for the safety of service delivery in hospitals. Disruptions and interference in these utilities is capable of disturbing surgeries, equipment sterilization, storage of medicine including care in emergency departments. Back-up supply of power, storage of water and system for purification, plumbing and electrical system testing will all ensure reliable infrastructure for safe patient care [30].

Minimising patient overflow and improving hospital design can enhance patient safety by reducing the risk of infections, medication errors, patient falls, and poor-quality care. Hospitals can improve safety by expanding wards and waiting areas, redesigning emergency departments, separating high-risk patients, and creating accessible, patient-friendly environments. Adequate space also supports better privacy, communication, and staff efficiency [13].

Strengthen Health Information and Communication Systems

Capitalize on digital infrastructure for health to reduce documentation errors as well as enhancing continuity of care. Electronic medical records, programmed medication systems, systems for reporting safety incidents as well as electronic tools for monitoring patient can reduce the communication errors and avoid preventable safety incidents. [19, 31].

Data Analytics and Monitoring for Patient Safety: computer programs can be used to provide continuous support and monitoring of safety indicators such as infection and mortality rates, the rate of mistakes when administering medication as well complications acquired in the hospital. Managers can use data analytics to categorise trends, risks evaluation, including implementation of targeted improvement strategies [18].

Reinforce Good Communication and Effective Teamwork

Support a multidisciplinary team approach, efficient operative handover, dispute resolution skills, and a mutually agreed model of care. These will improve care quality and reduce the likelihood of adverse outcomes [32]. A framework designed for communication such as Situation, Background, Assessment, and Recommendation (SBAR) can be used for sharing patient information with teams during handover reporting.

Systems Improvement

Strengthen security and emergency preparedness through usable emergency response systems, fire-detection devices, evacuation procedures, CCTV cameras, and disaster-readiness infrastructure. These measures improve organizational resilience and support effective emergency management [7].

Constant supply of pharmaceuticals, including consumables, helps ensure the continuous availability of essential medicines, vaccines, and personal protective equipment (PPE). Shortages can be managed through monitoring stock levels and accurate forecasting, inventory execution, and emergency ordering to reduce delays [33]. The use of digital inventory systems such as barcode tracking. Avoid using expired stock as they can compromise the treatment of patients and their safety. Minimise medication harm by inspecting stock regularly implementing first expiry- first out systems and removing the expired stock from the shelves [34].

Improve Supply Chain Management systems: Enhancing supply chain management helps ensure healthcare workers have timely access to the correct products in safe and adequate quantities. Build competencies of Supply chain Management staff on procedures such as inventory control, procurement, material preservation, and effectiveness, as well as systems for monitoring that can enhance

efficiency and decrease safety risks in the supply chain department [35].

Implement systems such as a computerised health record system and a medication management system, while safeguarding data security and privacy. These systems will ensure accurate information and minimise patient treatment errors, reduce illegible handwriting and lost files, and reduce duplication of tests and coordination failures, ultimately reducing harm [19, 36].

Provide interoperability between health care systems: design electronic systems that enable communication across health facilities and disciplines to enhance continuity of care. These systems assure the safe sharing of patient information between, hospitals. Clinics, laboratories as well as pharmacies, thereby reducing fragmentation of care and mistakes [28].

Improve the referral pathways and minimise overcrowding. This can be done in different ways such as:

Supporting the primary health services through outreach programs and reducing avoidable referrals to hospitals, thereby minimising the burden of overcrowding in higher-level hospitals.

A standardised referral guidelines and protocols to improve coordination between different hospitals to ensure that patients receive care at the appropriate level of care. Improve communication between health facilities by providing an effective referral system, phones, forms, and sharing patient information to prevent repeated tests, discontinuity of care, and treatment failures [36-38].

Trustworthiness

The trustworthiness model used includes 4 pillars: credibility (staff from different public hospitals participated in the study). The use of thematic analysis approach to analyse a qualitative response. Transferability: an in-depth description of the study setting and

research procedures were provided. Dependability: the detailed process of data collection and thematic analysis procedure of participants responses were maintained. Confirmability: Audit trail and direct verbatim of participants quotes were used to demonstrate the support of the themes identified to make sure that findings were built on participants' views and not researchers' bias [39, 40].

Limitations

A major strength of this study was its ability to complement quantitative findings with qualitative insights obtained directly from healthcare workers across multiple public hospitals. The inclusion of an open-ended survey question enabled participants to share diverse experiences and recommendations relating to patient safety improvement.

However, several limitations should be considered when interpreting the findings. The qualitative analysis process may have been influenced by researcher interpretation during coding and theme development. Furthermore, only 108 (22,7%) of the 476 survey participants provided narrative responses, which may have introduced response bias and limited the representativeness of the qualitative findings. Because the study was conducted in public hospitals in Tshwane District, the findings may not be transferable to other healthcare settings or provinces.

Conflict of Interest

The author declares no conflicts of interest regarding the publication of this article. The author has no financial or personal relationships that could have inappropriately influenced the work reported in this study.

Acknowledgements

The author expresses sincere gratitude to Dr N. Tshuma for his advice and support throughout the research process, and to Dr Emile (statistician), who advised on structuring the conceptual frameworks for data analysis. Gratefulness expressed to Ms O Tabane who

assisted with transferring the questionnaire tool into a Qualtrics online platform. Appreciation is also extended to the management of public hospitals in Tshwane Health District for granting permission to conduct the study.

Special thanks are given to the individuals who assisted in the distribution of the survey link and facilitated data collection. Their support played a significant role in the successful completion of this research. A special appreciation go to all healthcare workers who participated in this study for their valuable contributions and insights.

Ethical Approval

The University of Pretoria Faculty of Health Sciences Research Ethics Committee granted ethical approval for the study (Protocol number: 598/2025). The National Health Research Database (Reference number: GP2025-10-110) and relevant institutional authorities also approved the study.

Participants received information explaining the study's purpose, the expected duration of participation, and their right to decline participation or withdraw at any stage without penalty. Participation was voluntary, and informed consent was obtained electronically before completing the questionnaire. To maintain confidentiality and anonymity, no identifying information were collected, and de-identified all responses during data management and analysis.

Author Contributions

The authors contributed to the study as follows: Conceptualization, methodology, formal analysis, investigation, data curation, and writing original draft preparation was performed by the author 1. Editing, as well as final approval of the manuscript and supervision, were completed by author 2. Author 3 assisted as a co-supervisor, edited and approved the study. All authors agree to be accountable for all aspects of the research work.

Data Availability

Datasets are downloaded from Qualtrics online platform and is available upon justifiable request from the corresponding investigator.

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Funding

There was no specific funding from non-profit organizations, business-related agencies, or public institutions, for this study.

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