PATIENT SAFETY CULTURE: DEVELOPMENT AND EVALUATION OF AN INTERVENTION TO ENHANCE NURSES' PERCEPTION ON HANDOFFS AND SAFETY IN KATSINA STATE PUBLIC HOSPITALS, NORTH-WESTERN NIGERIA

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UNIVERSITI SAINS MALAYSIA

2024

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by

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Thesis submitted in fulfilment of the requirements
for the degree of
Doctor of Philosophy

JULY 2024

ACKNOWLEDGEMENT

Praise is due to Almighty who in His infinite mercy enabled me to complete this Ph.D. journey. May His peace and blessings be upon His Prophet Muhammad, His family and successful companions. It is my utmost pleasure to acknowledge and express my sincere appreciation to my main supervisor, Associate Prof. Dr. Mohd Ismail Ibrahim for his immense assistance, unwavering guidance, mentorship, and invaluable insights throughout my study. Also, I would like to acknowledge the commitments of my co-supervisors: Associate Prof. Dr. Mohd Nazri Shafei and Dr. Suhaily Mohd Hairon, whose expertise and dedication have been instrumental in shaping the direction of this study. The contribution of my able field Supervisor Dr Abduljaleel Umar Abdullahi of the Department of Community Medicine, Umaru Musa Yar'adua University Katsina (UMYU) can never be over-emphasized, who supports the entire data collection activities of the research. Besides, I would not forget with efforts of Dr. Maryam Abdul (DNS General Hospital Katsina) who also supported my data collection and smooth conduct of the intervention training program. Furthermore, I would like to extend my gratitude to the management of Universiti Sains Malaysia (USM) for funding this research under the Graduate Development Incentive Grants PhD. I am equally appreciative to UMYU and the Tertiary Education Trust Fund (TETFund) Nigeria for sponsoring my Ph.D. program. Furthermore, my deepest appreciation goes to Mal. Kabir Abdullahi Bindawa for his support and encouragement during the entire research process. Finally, I extend my enormous thanks to my parents, wife, brothers, sisters, friends and relatives for their tireless support, motivation, and prayers that were crucial in the successful

completion of this Ph.D. journey. May Allah reward them abundantly and I thank you all.

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LIST OF SYMBOLS

$	Dollar
%	Percentage
Z_{α}	1.96 for a 95% Confidence interval
Δ	0.05 Precision
α	Type 1 error
m	Ratio
P0	Proportion of negative patient safety culture among control group
P1	Proportion of negative patient safety culture among intervention group
$X2$	Chi-square

LIST OF ABBREVIATIONS

AHRQ	American Agency for Healthcare Research and Quality
AIDS	Acquired Immune Deficiency Syndrome
ANOVA	Analysis of Variance
AOR	Adjusted Odds Ratio
CHEWs	Community Health Extension Workers
CI	Confidence Interval
CoPSQI	Committee on Patient Safety and Quality Improvement
CPOE	Computerized Physician Order Entry
COR	Crude Odds Ratio
CVI	Content Validity Index
DALYs	Disability Adjusted Life Years
df	Degree of Freedom
EHRs	Electronic Health Records
EUNetPaS	European Union Network for Patient Safety
f	Frequency
FCT	Federal Capital Territory
FMCs	Federal Medical Centres
HAIs	Healthcare-Associated Infections
HIV	Human Immunodeficiency Virus
HSOPSC	Hospital Survey on Patient Safety Culture
IBM	International Business Machines Corporation
I-PASS	Illness severity, Patient summary, Action items, Situation awareness and contingency planning and Synthesis by the receiver
JEPeM	Jawatankuasa Etika Penyelidikan Manusia
KSHMB	Katsina State Hospital Management Board
M	Mean
MaPSaF	Manchester Patient Safety Assessment Framework
MOH	Ministry of Health
NPC	National Population Commission

n	Sample size
NY	New York
PI	Principal Investigator
PSCHO	Patient Safety Climate in Healthcare Organizations
P	Proportion of Negative Patient Safety culture among nurses
POC	Point of Contact
r	Reversed question
SAQ	Safety Attitudes Questionnaire
SCSu	Safety Climate Survey
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
S-CVI	Scale level Content Validity Index
TPB	Theory of Planned Behavior
UA	Universal Agreement
UK	United Kingdom
USA	United States of America
USM	Universiti Sains Malaysia
WHO	World Health Organization

LIST OF APPENDICES

BUDAYA KESELAMATAN PESAKIT: PEMBANGUNAN DAN EVALUASI INTERVENSI UNTUK MENINGKATKAN PERSEPSI JURURAWAT TERHADAP PENYERAHAN DOKUMEN PESAKIT DAN KESELAMATAN DI HOSPITAL AWAM NEGERI KATSINA, BARAT DAYA NIGERIA

ABSTRAK

Keselamatan pesakit melibatkan mencegah kemudaratan yang boleh dielakkan semasa penyampaian penjagaan kesihatan dan telah menjadi kebimbangan mendesak dalam sektor kesihatan disebabkan oleh peningkatan kesedaran terhadap risiko dan kesilapan yang berpotensi. Di Nigeria, beban penjagaan yang tidak selamat membawa akibat mendalam, termasuk kesilapan perubatan, jangkitan, tempoh penginapan hospital yang berpanjangan, kos penjagaan kesihatan yang meningkat, dan penurunan kualiti hidup pesakit. Kajian ini menentukan tahap budaya keselamatan pesakit, mengenal pasti faktor-faktor yang berkaitan dengan persepsi negatif terhadap budaya ini, membangunkan dan mengesahkan modul intervensi pendidikan, dan menilai keberkesanannya di kalangan jururawat di Hospital Awam Negeri Katsina, Nigeria Utara-Barat. Dalam Fasa I, satu kajian keratan rentas menggunakan Hospital Survey on Patient Safety Culture (HSOPSC) menilai budaya keselamatan pesakit di kalangan 430 jururawat di 20 hospital. Analisis data, dilakukan menggunakan SPSS v.23, menghuraikan latar belakang dan ciri-ciri berkaitan pekerjaan responden serta persepsi mereka terhadap budaya keselamatan pesakit. Analisis regresi logistik mudah dan berganda mengenal pasti faktor-faktor yang berkaitan dengan persepsi negatif. Dalam Fasa II, teknik Delphi mengesahkan modul intervensi pendidikan yang dibangunkan. Dalam Fasa III, reka bentuk Quasi-

Eksperimen digunakan untuk menilai keberkesanan intervensi terhadap persepsi jururawat terhadap penyerahan dan keselamatan pesakit. ANOVA ukuran berulang digunakan untuk menilai impak intervensi, dengan tahap kepentingan ditetapkan pada $\alpha = 0.05$. Kajian ini menunjukkan bahawa majoriti peserta adalah perempuan (59.8%), berusia 30–39 tahun. Kebanyakan mempunyai pengalaman hospital 1–5 tahun, dengan 46.4% bekerja 40–59 jam seminggu. Hampir semua (96.9%) mempunyai hubungan langsung dengan pesakit. Kajian mengenal pasti empat faktor yang signifikan berkaitan dengan persepsi keseluruhan yang negatif terhadap budaya keselamatan pesakit. Ini termasuk jururawat yang melaporkan peristiwa yang lebih sedikit (lima atau kurang) dalam 12 bulan terakhir dengan nisbah peluang disesuaikan sebanyak 2.66, (95% CI = 1.03–4.97), pembelajaran organisasi dan penambahbaikan berterusan 2.39 (95% CI = 1.40–4.10), keprihatinan 3.15 (95% CI = 1.34–7.17), dan penyerahan dan peralihan pesakit 1.48 (95% CI = 1.09–3.12). Modul pendidikan mencapai kesahan kandungan yang baik. ANOVA ukuran berulang menunjukkan perbezaan min yang signifikan di seluruh tiga titik masa penilaian (pra-intervensi, 3.05±0.32, Selepas intervensi, 3.43±0.45, Tindak balas, 3.34±0.40), dengan intervensi pendidikan menghasilkan kesan yang signifikan, F Stat 67.58, $p<0.001$. Perbandingan berpasangan post-hoc, menggunakan pembetulan Bonferroni, mendedahkan perbezaan min yang signifikan secara statistik dalam skor persepsi penyerahan dan keselamatan pesakit di seluruh titik masa penilaian. Kesimpulannya, kajian ini menekankan kepentingan menangani budaya keselamatan pesakit di kalangan jururawat di hospital awam Nigeria. Ia mengenal pasti bidang-bidang untuk penambahbaikan dalam budaya keselamatan pesakit dan berkesan membangunkan, mengesahkan, dan menunjukkan keupayaan modul intervensi pendidikan untuk meningkatkan persepsi penyerahan dan keselamatan pesakit di kalangan jururawat.

Oleh itu, ia harus disatukan dalam pendidikan dan amalan kejururawatan untuk meningkatkan kualiti penjagaan kesihatan dan mengurangkan peristiwa buruk di Nigeria.

PATIENT SAFETY CULTURE: DEVELOPMENT AND EVALUATION OF AN INTERVENTION TO ENHANCE NURSES' PERCEPTION ON HANDOFFS AND SAFETY IN KATSINA STATE PUBLIC HOSPITALS, NORTH-WESTERN NIGERIA

ABSTRACT

Patient safety entails preventing avoidable harm during healthcare delivery and has become a pressing concern in the healthcare sector due to growing awareness of potential risks and errors. In Nigeria, the burden of unsafe care carries profound consequences, including medical errors, infections, prolonged hospital stays, elevated healthcare costs, and reduced patient quality of life. This study determined the level of patient safety culture, identified factors linked to negative perceptions of this culture, developed and validated an educational intervention module, and evaluated its effectiveness among nurses in Katsina State Public Hospitals, North-West Nigeria. In Phase I, a cross-sectional study employing the Hospital Survey on Patient Safety Culture (HSOPSC) assessed patient safety culture among 430 nurses across 20 hospitals. Data analysis, performed using SPSS v.23, described the background and job-related characteristics of respondents and their perception of patient safety culture. Simple and multiple logistic regression analyses identified factors associated with negative perceptions. In Phase II, a Delphi technique validated the developed educational intervention module. In Phase III, a Quasi-Experimental design was employed to evaluate the intervention's effectiveness on nurses' perceptions of patient handoff and safety. Repeated-measures ANOVA was used to assess the intervention's impact, with a significance level set at $\alpha = 0.05$. The study revealed that a majority of participants were female (59.8%), aged 30–39

years. Most had 1–5 years of hospital experience, with 46.4% working 40–59 hours per week. Nearly all (96.9%) had direct patient contact. The study identified four factors that were significantly associated with overall negative perceptions of patient safety culture. These include nurses who reported fewer events (five or less) in last 12 months with adjusted odds ratio of 2.66, (95% CI = 1.03–4.97), organizational learning and continuous improvement 2.39 (95% CI = 1.40–4.10), staffing 3.15 (95% CI = 1.34–7.17), and patient handoffs and transitions 1.48 (95% CI = 1.09–3.12). The educational module achieved good content validity. Repeated-measures ANOVA indicated significant mean differences across three assessment time points (pre-intervention, 3.05±0.32, post-intervention, 3.43±0.45, Follow-up, 3.34±0.40), with the educational intervention producing significant effects, F Stat 67.58, $p<0.001$. The post-hoc pairwise comparison, using the Bonferroni correction, revealed statistically significant mean differences in patient handoffs and safety perception scores across assessment time points. In conclusion, this study highlights the significance of addressing patient safety culture among nurses in Nigerian public hospitals. It identifies areas for improvement in patient safety culture and effectively develops, validates, and demonstrates the educational intervention module's ability to enhance patient handoff and safety perceptions among nurses. Thus, it should be integrated into nursing education and practice to enhance healthcare quality and reduce adverse events in Nigeria.

CHAPTER 1

INTRODUCTION

1.1 Introduction to the Chapter

This chapter presents the background and an overview of patient safety culture, factors associated with poor patient safety culture and the consequences of unsafe patient care in both developed countries and low- and middle-income countries. It further described the concept of patient handoff and safety. Additionally, the research problems, justification, research questions, research hypothesis general and specific objectives were stated.

1.2 Background of the Study

Safety culture is a term used to appertain "the attitudes, beliefs, and perceptions shared by natural groups as defining norms and values (Bisbey *et al.*, 2021), which determine how they react concerning reporting, analysing, and preventing errors which can develop into life-threatening circumstances or outcomes. This was linked to the concepts of assessing hazards, risk, harm, and identification of errors, events, and incidents (Simsekler et al., 2019).

Patient safety is one of the major global public health problems, but the issues around patient safety differ, depending on the setting, local culture, and available resources. World Health Organization (WHO) has also regarded patient safety as a fundamental principle of healthcare (Lee *et al.*, 2019).

According to the Institute of Medicine, healthcare systems and organizations are responsible for ensuring patient safety, and patients should be protected from harm that may occur as a result of interactions with these systems and organizations (WHO,

2021b). The majority of mistakes are attributed to organizational factors, which have been called the "blunt end"; whereas clinicians are considered as the “sharp end” (Singh *et al.*, 2024).

1.3 Consequences of Unsafe Care in High-income Countries

Some literature from some high-income countries has shown that a significant number of patients are being harmed in the process of healthcare leading to either the increased cost of medical care, more extended time of stay in the healthcare facilities, permanent disabilities and or even death (Klazinga, 2022). For example, recent studies have revealed that medical errors are the third leading cause of death in the United States of America after cancer and heart disease (Domer *et al.*, 2022).

Moreover, it is further estimated that the overall annual frequency of hospitalization has reached up to 421 million worldwide out of which 42.7 million adverse events occurred to hospitalized patients (WHO, 2018; Mgobozi and Mahomed, 2021). Another research has also divulged that, on average, every 35 seconds, at least one case of patient harm is reported in the United Kingdom (UK) (Yenet *et al.*, 2023).

Two other separate studies, one conducted in Colorado and Utah, while the other conducted in New York have also revealed that nothing less than 44,000 and as many as 98,0000 American people die in hospitals as a result of preventable medical errors such as medication, surgical and diagnostic errors in the United States of America each year (Hodkinson *et al.*, 2020). The reports further ascertained that even if the lowest estimate was considered, it has surpassed the number of deaths ascribed

to motor-vehicle accidents, breast cancer, and AIDS (Hodkinson *et al.*, 2020; Singh *et al.*, 2024).

1.4 Consequences of Unsafe Care in Low and Middle-income Countries

Comparatively, in low and middle-income countries, an admixture of undesirable factors such as understaffing, inadequate infrastructure, poor hygiene, and sanitation, overcrowding, lack of health care commodities and shortage of essential equipment has enormously contributed to the grievous condition of patient safety (Yenet *et al.*, 2023). All these factors could lead to an increased incidence of hospital-associated infection which might cause more complications for patients. It is further stated that low and middle-income countries account for about 2/3 of the global burden of all adverse events (Mgobozi and Mahomed, 2021).

Nigeria is the most populous African country with a population of about 200 million people, according to the World Bank's Population data projection 2017. Its significant population is one of the key reasons why effective patient safety policies, practices, and infrastructures are essential (World Bank, 2024).

In Nigeria, poor patient safety practice in public healthcare facilities has become one of the significant public health challenges due to one or a combination of facilities, healthcare providers or patient-related factors. The most common patient safety challenges in Nigeria include but are not limited to those related to Surgery, Medications, diagnostics, Transfusion, Healthcare-Associated Infections, Competency of Staff, Emergency Management, Medical Equipment, Communication, accessibility, and reduced error reporting and management systems (Isemede, 2018a).

In November 2017, the representative of the World Health Organization (WHO) in Nigeria, Dr Wondimagegnehu Alemu stated that "the burden of unsafe health care delivery is enormous, not only to the patient but to the healthcare system and the nation in the long run, as it results in loss of confidence in the system. He further added that the present situation requires more work to be done to achieve patient safety in the country and Africa at large (This Day Newspaper, 2017).

1.5 Patient Handoffs

Patient handoff is one of the most essential aspects of patient care in healthcare facilities. For a successful health service delivery, patient information needs to be communicated or transferred accurately, within the right time and using a standardized procedure. Patient handoff which is also known as patient handover, sign-out, sign-over, cross-coverage, and shift report (Desmedt *et al.*, 2021) was defined by experts as a process of transferring patients' related information and responsibilities between healthcare professionals, units, or facilities (Gordon *et al.*, 2018a; Mohebi *et al.*, 2018). The fundamental objective of the handoff is to relay patient information in a manner that guarantees continuity in the plan of care and patient safety, as well as to promote social contact, and teamwork habits, and to educate healthcare workers (Kim *et al.*, 2021). Continuity of care and treatment are supported by an efficient handoff that facilitates the transfer of important information (Desmedt *et al.*, 2021).

Poorly conducted handoffs have been attributed to some failures in patient care which include inaccurate assessments and diagnoses, delayed and inappropriate treatment, and medical errors, all of which can lead to higher rates of morbidity and mortality, longer hospital stays, and lower patient satisfaction (Gordon *et al.*, 2018a; Abdel- Aal *et al.*, 2020).

Recently, the World Health Organization and the Joint Commission published directives mandating healthcare institutions to standardize their approach to handovers and to include handover education in employee training in order to increase consistency and decrease the likelihood of errors (Gordon *et al.*, 2018b).

Because of the significance of the patient handoff, the well-known Healthcare Accreditation Organizations (The Joint Commission) established a national patient safety goal for handoffs in 2006 and it became effective in 2010 (Desmedt *et al.*, 2021). Nursing handovers occur regularly, not only between shifts and among part-time nurses, but also because nurses function as communication partners and informal coordinators for other healthcare providers in a 24-hour, seven-day-a-week setting to maintain continuity of care (Gordon *et al.*, 2018a).

When the fundamental cause of more than 4,000 adverse events was investigated by the Joint Commission, it was shown that 70% of sentinel incidents were caused by communication disruptions (Khater *et al.*, 2015; Wheeler, 2015; Joint Comission International, 2023). A report on the incidence of medical events by surgeons indicated that communication failures were a contributing factor to 43% of the incidents, with handoff issues accounting for two-thirds of these communication problems (Desmedt *et al.*, 2021).

1.6 Method for Effective Handoff Communication

Effective handoff communication involves both verbal and written communication and should include information such as the patient's status, treatment plan, medications, test results, and any relevant social or cultural factors. The

information exchanged should be accurate, concise, and relevant to the patient's care (CoPSQI, 2012).

There are many different strategies and tools that can be used to facilitate effective handoff communication, including standardized protocols, checklists, electronic medical records, and face-to-face communication (Blazin *et al.*, 2020). The use of standardized protocols and checklists can help ensure that all necessary information is exchanged, while electronic medical records can provide real-time access to patient information (Starmer, 2018).

Communication during patient handoffs can be conducted using different formats and methods such as verbal, written, or a combination of the two. Verbal communication can be in the form of face-to-face conversation, voice recording or telephone call. Experts agree that verbal communication is the best way of transferring patient information between healthcare providers because it allows direct contact between the report giver and the receiver, and also it allows direct question and answers (CoPSQI, 2012; Blazin *et al.*, 2020). On the other side, the non-verbal method of transferring patient information such as written permits the receiving party to save paper or computer-generated documents for future reference and more so, it helps the person delivering clinical information organize his or her thoughts and communicate relevant details (CoPSQI, 2012). Nevertheless, written communication or non-verbal communication loses the subjective interpersonal aspect of verbal communication (Gu *et al.*, 2012; Starmer *et al.*, 2012).

1.7 Educational Intervention in the Nursing Profession

Nurses, who make up the majority of the healthcare staff and interact closely with patients during their hospital stays, are important potential contributors to enhancing patient safety. The medical errors committed by nurses can be attributed to either individual or system-related factors (Lee *et al.*, 2022).

Interrupted communication between nurses during patient handoff has the potential to result in an inadequate or ineffective handoff and most importantly, ineffective handoff increases the risk of committing an error. Consequently, when handoff is interrupted negative patient outcomes can be realized (Rhudy *et al.*, 2019). Thus, to deliver safe, high-quality patient care, educational qualifications, adequate training, and continual professional development are essential. (Raeda and Eyad, 2014; WHO, 2016; Lee *et al.*, 2022).

Education intervention among nurses enhances patient safety and quality of care by ensuring that individuals are well-prepared to perform their required duties, thereby reducing errors due to gaps in knowledge or skills (WHO, 2016). It is essential to train nursing leaders and managers to reorganize health systems and build a larger culture of safety in systems with greater degrees of communication errors and issues with information technology (WHO, 2016).

Besides making sure that professionals are educated to have excellent communication skills with patients, they must also be educated to ensure successful communication between practitioners of the same and other professional specialties. Experts have identified several reasons for making education intervention vital among health care providers when striving to provide safe patient care among which are:

i. Providing education about the core principles of primary care to all healthcare providers creates a foundation of values upon which to develop a positive safety culture.

ii. Having an adequate and well-trained primary care health workforce is essential for providing safe, high-quality care.

iii. Educating the workforce about safety skills has the potential to further improve patient outcomes (WHO, 2016).

The important areas related to patient harm in health care include diagnosis, prescribing, communication, and organizational change (WHO, 2016).

1.8 Problem Statement

Despite the abundance of literature worldwide addressing the assessment and improvement of patient safety culture, along with guidelines from the World Health Organization (WHO) urging intensified efforts in preventing avoidable patient harm (WHO, 2020, 2021a), there is a significant gap in published reports regarding patient safety culture assessment in Nigeria, particularly in the North-Western region (Powell *et al.*, 2011; Benson *et al.*, 2018).

Moreover, the lack of comprehensive data on patient safety in sub-Saharan African countries presents considerable challenges in quantifying the extent of avoidable patient harm (Abuosi *et al.*, 2022). This data deficiency has unfortunately led to persistent preventable morbidity and mortality due to suboptimal healthcare practices and overcrowded healthcare facilities (Ayanore *et al.*, 2017).

Adding to the complexity is the limited research dedicated to addressing issues concerning patient handoff processes and evaluating the effectiveness of educational interventions aimed at promoting behavioural changes among nurses in Nigerian public hospitals. As a result, the transfer of patient information within and between healthcare professional groups remains a significant challenge within the Nigerian healthcare system (Abah, 2022).

The current state of patient safety has attracted the attention of various stakeholders, including governments, agencies, organizations, healthcare managers, and public health professionals. Consequently, there is a growing imperative for healthcare leaders and government authorities to develop a comprehensive understanding of critical patient safety determinants (WHO, 2021a). These determinants encompass aspects such as teamwork within hospitals, communication practices, reporting adverse events, managing medical errors, and preventing and controlling healthcare-associated infections in healthcare facilities. Understanding these determinants is crucial for implementing effective strategies and policies to enhance patient safety standards nationwide (Nnebue *et al.*, 2021).

1.9 Justification of the study

Reducing the incidence of preventable patient harm or injury is the responsibility of everyone in the healthcare setting, and much needs to be learned, done, and shared between healthcare givers, managers, and researchers in this area. Improving patient safety has also been considered a significant element of or determinant of a patient's health outcome worldwide.

The research is expected to demonstrate the current status of patient safety culture among nurses in Katsina State public hospitals, North-Western Nigeria, as this will guide and direct the stakeholders and policymakers in the state toward the areas of patient safety that required more attention for improvement and come up with new ideas that will pave the way to a successful implementation of strategic plans for promoting health quality and safety of their patients. Also, this phase of the study will provide baseline information on patient safety culture among healthcare workers in public hospitals in the region for future research on improving patient safety.

Considering the lack of adequate data on patient safety and its associated factors in Nigeria and the recent call made by the World Health Organization on treating and caring for patients in a safe environment and protecting them from healthcare-related avoidable harm and also making patient safety a national and international priority, this research was conducted base on: baseline assessment of patient safety culture, development and validation of Education Intervention Module and assessment of the effectiveness education intervention on improving nurses' perception on a patient hand-off and safety in Katsina state public secondary facilities.

1.10 Research Questions

i. What is the level of patient safety culture among nurses in Katsina State public hospitals?

ii. What are the factors associated with a negative perception of patient safety culture among nurses in Katsina State public hospitals?

iii. Is education intervention effective in improving nurses' perception of patient handoff and safety in Katsina State public hospitals?

1.11 Research Hypothesis

H_1: There are significant associations between the sociodemographic characteristics of nurses and the Patient Safety Culture in Katsina State public hospitals.

H_2: The education intervention is significantly effective in increasing the perception scores of patients' Handoff and safety among nurses in the intervention group.

1.12 Study Objectives

1.12.1 General Objective

- To study the level of Patient Safety Culture and its associated factors as well as to develop and assess the effectiveness of the education intervention module on patient handoffs and safety among nurses in Public Hospitals in Katsina state, North-West Nigeria

1.12.2 Specific Objectives

Phase I of the Research

1. To determine the level of patient safety culture among nurses in Katsina state public hospitals.

2. To determine the sociodemographic and work-related factors associated with negative patient safety culture in Katsina State public hospitals.

Phase II of the Research

3. To develop and validate education intervention modules on Patient Handoffs and Safety.

Phase III of the Research

4. To determine the effectiveness of the education intervention program in improving nurses' perception of patient handoffs and safety in Katsina state public hospitals.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction to the Chapter

The background to patient safety culture and patient safety, as well as the rationale of this study, were discussed in the previous chapter. Whereas, in this chapter previous literature was reviewed and various aspects of patient safety culture, studies on patient safety culture among healthcare workers, the need for assessment for improving patient safety culture, tools for assessment of patient safety culture, factors associated with negative perception of patient safety culture were discoursed. It further reviewed and discussed several literature-related, education interventions, module development and validation and evaluation of the effectiveness of education intervention.

2.2 Patient Safety Culture

Patient safety is the elimination or minimization of any potential for harm or accident throughout providing medical care (Ogaji *et al.*, 2018). The significance of creating a safety culture is being increasingly understood as healthcare companies work to improve (Owonaro *et al.*, 2015).

The concept of safety culture has been defined by experts and researchers differently, an example of which is “the attitudes, beliefs, and perceptions shared by natural groups as defining norms and values (Eeckelaert *et al.*, 2011), which determine how they react concerning reporting, analyzing, and preventing errors which can develop into life-threatening circumstances or outcomes. This is linked to

the concepts of assessing hazards, risk, harm, and identification of errors, events, and incidents (Sorra *et al.*, 2014).

Since a culture of safety is known to be connected to clinical results, evaluating the patient safety culture of a healthcare facility can give insight into the effectiveness and standard of treatment offered by that facility (Ogaji *et al.*, 2018). The complex nature of healthcare facilities and their complexity makes serious actions to promote patient safety culture difficult, even though measuring patient safety is useful and a vital step toward change (Ogaji *et al.*, 2018).

Patient safety culture is determined by multiple factors within a health organization and can support the prevention and reduction of harm to patients. It is the outcome of different factors within a healthcare institution including attitudes, values, skills, and even behaviours to commit to patient safety management (Alswat *et al.*, 2017).

2.3 Patient Safety Culture among Healthcare Workers

A patient safety culture is a product of efforts made by hospital leadership, teamwork, and collaboration of health workers using evidence-based practices, measurement, learning, effective communication, a just culture, systems thinking human factors, and zero tolerance (Burke, 2003; Candace and William, 2011).

In hospitals, clinical and non-clinical healthcare workers were shouldered with the responsibility of ensuring safe patient care for a better patient health outcome (Landstrom, 2015; Pascale et al., 2008). As such, nurses were noted to be a suitable group of healthcare workers to improve patient handoff through continuous monitoring, identification, and application of evidence-based techniques to ensure

optimum compliance with global patient safety standards (Ginsburg et al., 2005; Hughes, 2008).

Ensuring quality and safe patient care is one of the significant Global Public Health concerns in both developed and developing countries. Word Health Organization (WHO) has recently emphasized researching patient safety, and clinical, and organizational issues that can hinder safe patient care through its group of experts under the World Alliance for Patient Safety (WHO, 2008b).

It has been studied from previously conducted research that, the majority of hospitalized patients are at risk of suffering an adverse event (Yenet *et al.*, 2023), and patients who are undergoing treatments may likely have a high risk of medication errors and adverse reactions (Sivanandy, *et al.*, 2016)

2.4 Patient Safety Culture among Nurses

In a healthcare organization, nurses make up the majority of employees, and they influence changing the organizational culture to a culture of patient safety (Alquwez *et al.*, 2018; Tereanu *et al.*, 2018)

Nurses, who make up the majority of the healthcare profession, provide care for a wide range of patients with varying requirements. The demands of providing patient care are mostly focused on the job of nurses and they strive to provide safe care, but they need the skills and resources to identify risks and reduce harm (WHO, 2016).

Nurses bear a large portion of the blame when treatment is subpar, whether as a result of inadequate resource allocation (such as staffing shortages and a lack of

necessary medical equipment) or ineffective rules and regulations (Singh *et al.*, 2024). Reduced adverse occurrences of medical events and patient injuries, such as pressure ulcers, falls, etc., are made possible largely by nursing (Macedo *et al.*, 2016). Additionally, they can significantly affect how some patient groups suffer, especially when it comes to minimizing not just negative outcomes but also the lingering consequences of illnesses and symptoms (Singh *et al.*, 2024).

Nurse managers specifically strive to improve workplace safety by conducting thorough assessments of the safety culture and providing direction to those who work directly under them (Macedo *et al.*, 2016; Xie *et al.*, 2017)

Nurses were chosen as the subjects of the study because of their more substantial proportion in the health workforce (Pascale and Ayse, 2008, 2018) and the high demands of patient care centred on them, which enables them to apply their vast knowledge, the pool of skills, and understanding to care for changing the needs of patients (Landstrom, 2015). Despite the proportion, nurses have the most frequent contact with patients, and this makes them capable of coordinating and incorporating different aspects of patient safety in healthcare facilities for a better quality of care (Singh *et al.*, 2024).

Reviewed literature (Aiken *et al.*, 2001; Brennan *et al.*, 2004) showed that most of the nurses in U.S. and Canadian hospitals reported that the number of patients assigned to them has raised during the last year, which subsequently increased patient acuity and levels of medical errors in both countries. Moreover, another piece of literature (Page, 2008) indicates that the level of nurse staffing, their knowledge skill, and the degree of their collaboration in sharing their knowledge and skills also influence the level of patients' health outcomes and safety.

2.5 Need Assessment for Improving Patient Safety Culture

Patient safety has been frequently regarded as a prerequisite for the provision of high-quality health and a critical component of patient care. Among the critical challenges facing the provision of quality and safe patient care are the adverse events due to medical care, which can consequently result in injuries, disabilities, or even death besides the extra cost of medical services (WHO, 2008b).

Healthcare management and authorities may learn more about the hospital patient safety culture to help them boost standards and reduce mistakes. Also, they will all benefit from greater quality, better patient outcomes, minimal errors, and a more cost-effective healthcare system by improving patient safety culture (Alswat *et al.*, 2017).

Improving patient safety has become one of the areas of concern for hospital managers and healthcare providers in both developed and developing countries for the last two decades globally (Carlton and Blegen, 2006). However, ensuring patient safety in a healthcare facility is the responsibility of all the stakeholders including the Physicians, Pharmacists, and Nurses, Midwives, Laboratory workers, and other community members as everyone has a specific role to play in achieving a culture of safety a patient, (Carlton and Blegen, 2006; Nordin, 2015). To focus on improving patient safety, we needed to identify hazards, measure the intensity of the burden, and identify solutions that would minimize patient harm (Desmedt *et al.*, 2021).

2.6 Assessment of Patient Safety Culture

In Healthcare facilities, assessment of safety culture can be achieved through the evaluation of individual and group values, attitudes, discernment, capabilities, and

motive of behaviour that determine the level of commitment and proficiency of a facility's health and safety management. Moreover, the application of this concept follows the American Agency for Healthcare Research and Quality (AHRQ) definition of "Patient Safety Culture" (Henriksen, *et al.,* 2008).

Previous studies (Yenet *et al.,* 2023) reported that data from healthcare professionals, managers, healthcare organizations, governments (worldwide), and consumers had used the benefits of this knowledge, for the development of patient safety improvement strategies. Landstrom, 2015 has mentioned that "to create healthcare organizations that are safe and reliable for quality patient care, it is vital to consider redesigning the processes, changing the organizational culture, and workers' behaviour." (Landstrom, 2015). Therefore, to accomplish the goals of patient safety culture, there is a need to understand the norms, beliefs, and values about what is relevant to healthcare facilities and what attitudes.

Moreover, behaviour related to patient safety is supported, rewarded, and expected (Simsekler *et al.,* 2019), and this may be required to improve policies, education, workforce, and health care financing, organization, and delivery, (Snyder, 2012). Studying patient safety culture makes it possible to identify the weak areas that require improvement, and hence, a suitable intervention can be developed (Singh *et al.,* 2024). Healthcare workers, such as nurses, are at the frontline to observe any unsafe practices and the conditions that might lead to an increase or decrease in poor patient safety practices (Hughes, 2008; Australian Comission, 2022).

2.7 Tools for Assessment of Patient Safety Culture

Commitments to determining the level of safety culture, other related dimensions to organizational performance, and clinical quality have resulted in the development of several instruments (Owonaro *et al.*, 2015). For patient safety culture assessment in hospitals, the European Network for Patient Safety gathered a total of 19 instruments through literature reviews out of which they recommended three validated questionnaires (Eeckelaert, *et al.*, 2011; Soo-Hoon *et al.*, 2016; Danielsson, 2018; Waterson *et al.*, 2019) for use in healthcare facilities on the bases of their suitability of use in hospitals and other settings than hospitals, and they are recommended for use in at least ward/unit/team level, administrability on paper and electronic base, having a well-documented user manual, history of usage in assessing the utility and lastly their Number of dimensions assessed (EUNetPaS, 2010).

The three most recommended instruments are (1) the Hospital Survey on Patient Safety Culture (HSOPSC), developed by the Agency for Healthcare Research and Quality (AHRQ) in the USA, (2) the Manchester Patient Safety Assessment Framework (MaPSaF), developed by the University of Manchester in the UK, and (3) Safety Attitudes Questionnaire (SAQ), developed by the University of Texas and Johns Hopkins University in the USA.

The Hospital Survey on Patient Safety Culture was selected for this study because of its recognized effectiveness and appropriateness in assessing the patient safety culture within hospital settings. Also, it has a well-documented history of validity and reliability, making it a robust tool for assessing patient safety culture in healthcare settings. Its validity ensures that it measures what it intends to, while its

reliability ensures consistent results over time and across different populations (Shu *et al.*, 2015; Kapaki and Souliotis, 2018; Gheed *et al.*, 2019).

Additionally, the survey comprehensively covers various aspects of patient safety culture, including teamwork, communication, error reporting, and overall perceptions. It provides a holistic view of the organizational culture as perceived by healthcare professionals. Moreover, it is widely recognized and commonly used in healthcare research globally and this made it easy for comparisons across various healthcare institutions, countries and regions.

Many healthcare organizations and researchers worldwide have utilized this survey, resulting in a substantial body of literature and data for reference and comparison (EUNetPaS, 2010; Hogden *et al.*, 2017; Kapaki and Souliotis, 2018). Furthermore, several literatures indicated its applicability in different parts of the world (Smits *et al.*, 2008; Chen and Li, 2010; El-Jardali *et al.*, 2010, 2014; Arabloo *et al.*, 2012; Robida, 2013; Achakzai, 2014; Nordin, 2015; Suliman, 2015; Mascherek and Schwappach, 2017; Alswat *et al.*, 2017; El-Shabrawy *et al.*, 2017; Ali *et al.*, 2018; Alquwez *et al.*, 2018; Fassarella *et al.*, 2018).

2.7.1 Hospital Survey on Patient Safety Culture (HSOPSC)

The Hospital Survey on Patient Safety Culture (HSOPSC) is the most widely used instrument for measuring different patient safety culture issues among all professional groups (who have direct or indirect contact with patients) working in different healthcare facilities worldwide (Bondevik *et al.*, 2017; Ali *et al.*, 2018). It was primarily developed to assess the views of hospital workers about some patient safety issues such as medical errors, and event reporting among others in hospitals (EUNetPaS, 2010), but now it has been adapted and translated into many languages

such as Arabic, Dutch, French, Farsi, and Spanish measuring safety culture in community pharmacy, ambulatory surgery, nursing homes, and outpatient medical offices, including primary care globally (Hogden *et al.*, 2017).

The Hospital Survey on Patient Safety Culture has a total of 42 items which were grouped into 12 composite measures or composites (Chen and Li, 2010), and it was designed to measure the following parameters (EUNetPaS, 2010):

(A) Seven unit-level aspects of safety culture

i. Supervisor/manager expectations and actions promoting safety (4 items)

ii. Organizational learning-continuous improvement (3 items)

iii. Teamwork within units (4 items)

iv. Communication openness (3 items)

v. Feedback and communication about errors (3 items)

vi. Nonpunitive response to error (3 items)

vii. Staffing (4 items)

(B) Three hospital-level aspects of safety culture

i. Hospital management support for patient safety (3 items)

ii. Teamwork across hospital units (4 items)

iii. Hospital handoffs and transitions (4 items)

(C) Four outcome variables

i. Overall perceptions of safety (4 items)

ii. Frequency of event reporting (3 items)

iii. Patient Safety Grade (of the Hospital Unit) (1 item)

iv. Number of Events Reported (1 item).

2.7.2 Safety Attitude Questionnaire (SAQ)

Sexton and colleagues developed the Safety Attitudes Questionnaire (SAQ) at the University of Texas in the United States (US) more than two decades ago (Cui *et al.*, 2017). Six factors are included in the questionnaire: Teamwork Climate, Safety Climate, Stress Recognition, Job Satisfaction, Unit Management Perceptions, Hospital Management Perceptions, and Working Conditions (EUNetPaS, 2010). It is one of the most commonly used and rigorously assessed methods for assessing safety culture in health care. The whole questionnaire contains 60 items, 30 of which are standard and identical across all contexts. The SAQ has been modified for use in a variety of settings, such as intensive care units, operating rooms, general inpatient settings, and outpatient clinics (Singla *et al.*, 2006). All of the survey items were graded on a five-point Likert scale ranging from 'Disagree Strongly' to 'Agree Strongly' (EUNetPaS, 2010; Hogden *et al.*, 2017).

The SAQ survey has been translated into many languages such as Arabic, Chinese, Norwegian, Swedish, Portuguese, Dutch, German, and Turkish. It can be completed within 10 to 15 minutes (Cui *et al.*, 2017). Moreover, it can be employed to assess the attitudes of different sorts of employees and to track changes over time with recurrent deployment. Furthermore, it is thought to be the sole technique that provides

evidence of a direct relationship with patient outcomes. The survey can be accessed at: https://med.uth.edu/chqs/surveys/safety-attitudes-and-safety-climate-questionnaire/ (EUNetPaS, 2010; Hogden *et al.*, 2017).

2.7.3 Manchester Patient Safety Framework (MaPSaF)

The Manchester Patient Safety Framework (MaPSaF) is a tool that was created after extensive analyses of healthcare literature and consultations with healthcare professionals (Mayeng and Wolvaardt, 2015) at the University of Manchester (UK) to assist healthcare organizations in assessing employee opinions on safety culture through facilitated anticipation and discussions (Hogden *et al.*, 2017).

The MaPSaF helps healthcare teams and organizations understand the concept of a "safety culture." The MaPSaF was created for use in general medical practices and primary care settings, but it has now been updated for use in various healthcare settings (Mayeng and Wolvaardt, 2015).

The MaPSaF is a qualitative assessment instrument used in workshops delivered by a healthcare organization's facilitator at the organizational or team level. (EUNetPaS, 2010; Eeckelaert *et al.*, 2011). It employs crucial dimensions of patient safety and offers five levels of growing maturity in organizational safety culture as listed in *Table 2.1* below (Parker, 2009).

Table 2.1 Levels of organizational safety culture

Level of organizational safety culture	Characterization
Level 1: Pathological	Why do we need to waste our time on risk management and safety issues?
Level 2: Reactive	We take risks seriously and do something every time we have an incident
Level 3: Calculative	We have systems in place to manage all likely risks
Level 4: Proactive	We are always on the alert, thinking of risks that might emerge
Level 5: Generative	Risk management is an integral part of everything we do

Adapted from (Parker, 2009)

Despite the slight discrepancies across the versions of MaPSaF when it comes to the dimensions of safety culture addressed and the wording of the descriptions, they are fairly similar (Parker, 2009). The nine elements that make up safety culture are included in the version for usage in primary care settings: Overall commitment to quality, Priority given to patient safety, Personnel management and safety issues, Investigating patient safety incidents, Organizational learning following a patient safety incident, Perceptions of the causes of patient safety incidents and their identification, Communication about safety issues, Staff education and training about safety issues and Team working around safety issues (Mayeng and Wolvaardt, 2015).

The factors related to areas where attitudes, values, and behaviour associated with patient safety are anticipated to be reflected in the organization's working process. (Eeckelaert *et al.*, 2011; Mayeng and Wolvaardt, 2015).

The framework has the penitential of being used in a variety of ways, including facilitating reflection on patient safety culture, stimulating discussion about the patient safety culture's strengths and weaknesses, revealing any disparities in