



## PERCEPTION OF PATIENT SAFETY AMONG THE HEALTHCARE PROFESSIONALS AT THE KAKAMEGA COUNTY REFERRAL HOSPITAL, KENYA

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### ABSTRACT

*One of the global parameters in measuring healthcare quality is patient safety. Patient safety plays a pivotal role in maintaining and promoting patient safety. The World Health Organization has opined that a weak patient safety culture among healthcare workers predisposes patients to adverse events which subsequently increase hospital stay, healthcare costs, patient morbidity, and mortality. Based on existing literature, the biggest challenge in understanding patient safety is how to assess it. Existing studies assess patient safety using different assessment approaches with most studies assessing patient safety using managerial, staff, or policy perspectives. There is, however, a paucity of studies reviewing the interaction of the three modes of safety assessments. Hence, it was imperative to establish the interaction of the three determinants influencing patient safety. Premised on this, this study sought to establish the determinants of patient safety among critical care clinical teams. Findings from this study posit to help inform patient safety in Kenya and act as a baseline to help trigger further research that could inform policy change. The study was conducted at the Kakamega County Referral Hospital in Kenya and did adopt an analytical cross-sectional design. The study included all healthcare providers working closely with the Critical Care Units (CCUs) since these units are the most critical in-patient safety. A self-administered questionnaire was used to collect data from the study participants. Collected data was coded electronically using the Statistical Package for Social Sciences (SPSS) software version 21 before being subjected to analysis. Using the eight (8) sections of the questionnaire, data was first analyzed and reported descriptively as numbers, percentages, means, and standard deviations. Inferential statistics was then run on selected variables to help answer the research questions. After explaining the scope and rationale of the study, the respondents was required to first consent by signing a consent form before being included in the study. Study findings was communicated digitally and physically in print format and made available to the public through the university library and online through the university website and an accredited peer-reviewed journal.*

**Key Words:** Patient Safety, Healthcare

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## INTRODUCTION

The WHO defines patient safety as “the reduction to an acceptable minimum or complete absence of preventable harm associated with the healthcare process” (WHO, 2011). One of the global parameters in measuring healthcare quality is patient safety (Ammouri, et al., 2015). Patient care is a multi-disciplinary assignment within healthcare facilities globally. Hence, healthcare workers’ patient safety plays a pivotal role in maintaining and promoting patient safety. Provision of safe care has been posited to reduce patient morbidity, mortality, hospital stay, and costs (Abu-El-Noor, et al., 2019).

Based on the patient safety definition, patient safety can be considered as the perceptions, attitudes, and competencies of an individual or group of individuals towards patient safety. Studies have opined that a weak patient safety culture among healthcare workers predisposes patients to adverse events which increases hospitalization costs and stay and might lead to further morbidity or mortality of the patient (Qoronbfleh, 2021).

Studies have demonstrated that adverse events pose a great threat to patient safety. Cohn and colleagues define adverse events as “unintended complications arising during healthcare management that are not related to the patients’ underlying disease”. They further posit that these complications mostly lead to a protracted hospital stay, disability, or death (Abuosi, Akologo, & Anaba, 2019). According to Kapaki & Souliotis, (2018) the prevalence of deaths attributable to adverse events exceeds deaths caused by breast cancer, HIV/AIDS, and motor accidents.

Several studies have confirmed that a strong patient safety can help in reducing events in healthcare institutions. The WHO defines patient safety as “shared values, attitudes, perceptions, beliefs and attitudes” that foster safe, patient management practices among healthcare workers (WHO, 2011). The promotion of patient safety has been posited as a tool that helps increase provider-patient satisfaction (Abuosi, Akologo, & Anaba, 2019).

In Kenya, healthcare stakeholders and researchers have started promoting a patient safety across the continuum of healthcare as a strategy towards the reduction of the occurrence of adverse events (MoH, 2019). The biggest challenge in understanding patient safety however is how to assess patient safety. Different researchers have assessed and discussed patient safety differently. Patient assessment tools have been categorized as either taking a managerial or staff perspective while some combine elements of both. Others still have used tools that focus on policies and practices. There is a paucity of studies that review the interaction of the three components to help understand the determinants of patient safety. Policy-driven studies review patient safety based on existing managerial perspectives on what the management sees occurring against what they need to see occurring in their health facilities. Others review policy based on the existence or absence of standard operating procedures in patient management. Staff perspective studies have employed tools measuring staff knowledge, perceptions and attitude. Instead of reviewing managerial, structural perspectives, these studies focus on the perceptions of what occurs in the daily running of patient care and management.

This study sought to establish some of the issues that influence patient safety among intensive care unit healthcare workers by combining the three determinants of; administrative, individual and policy factors and how their interaction influences patient safety. The study was a staff-based assessment. Staff-based assessments are structured, self-reporting surveys meant to measure respondent perspectives on different healthcare delivery aspects. The study made use of a descriptive statement that could help the researcher measure the various domains of patient safety. This study type has been adopted since it helps the researcher measure all the three broad determinants of patient safety at a point in time using a single set of respondents and this was beneficial in establishing the trend of patient safety among the ICU healthcare workers working within the Kakamega County Referral Hospital.

This study was premised on studies conducted in Kenya which have demonstrated that the Kenyan healthcare system has minimum patient safety standards (Kinuthia, 2018). The intensive care unit is the highest level of healthcare. Hence, it was imperative to establish what influences patient safety among healthcare workers working in the intensive care unit in Kenya. Insights on this can help inform patient safety interventions and act as a baseline to help trigger further research that could inform policy change. To help substantiate this gap, this study sought to identify what influences patient safety among healthcare workers working in the intensive care unit at the Kakamega County Referral Hospital in Kenya.

### **Problem Statement**

According to a World Health Organization report, adverse events due to unsafe care is one of the top 10 leading causes of death and disability globally. The report further posits that developing economies record approximately 134 million cases of adverse events and 2.4 million deaths due to unsafe care (WHO, 2019). Owing to the sensitivity and complexity of care offered in the Intensive Care Units (ICU), several incidents can compromise patient safety (Farzi, et al., 2017). Common adverse events include; nosocomial infections which account for between 10.85% in developed countries (Farzi, et al., 2017) to 40% in some sub-Saharan African countries (Mbim, et al., 2019), pressure ulcers accounting for 10-21%, and medical errors accounting for 80% of all adverse events (Farzi, et al., 2017; Abuosi, et al., 2019). Studies have posited that one of the best strategies in the improvement of the patient safety among healthcare workers.

Healthcare workers working in the Intensive Care Unit have the critical role of establishing safe and requisite care for patients. They are further mandated with the task of giving care, administering complicated medication, using advanced and sophisticated technology to offer advanced life support. Any error in these processes predisposes the patient to adverse events compromising not only the life and quality of life of the patients but that of their families too. There is a paucity of literature on what determines the patient safety among healthcare workers working in the ICU in Kenya and as of the time of this study, there is no known study that has been conducted within Kakamega County. For this reason, healthcare stakeholders must understand the determinants of patient safety among intensive care unit healthcare workers.

### **Research Objectives**

The broad objective of this study was to assess the perception of patient safety among the health care professionals at the Kakamega county referral hospital, Kenya. The study was guided by the following specific objectives

- To rate the perception of patient safety across the hospital units that work closely with the CCU at the Kakamega County Referral Hospital
- To determine the healthcare professionals' demographic characteristics that affect the patient safety across hospital units that work closely with the CCU at the Kakamega County Referral Hospital.
- To identify organizational factors that impact on the patient safety across hospital units that work closely with the CCU at the Kakamega County Referral Hospital.
- To identify healthcare professionals' perceived factors that impact the patient safety across hospital units that work closely with the CCU at the Kakamega County Referral Hospital.

### **Conceptual Framework**

The study posits that as healthcare workers interact through communication, they enact a mindset reproducing an organizational patient safety that acts as an enabler or disabler of a patient safety. Figure 1 below illustrates the proposed interaction and mentions variables of interest that can be used as probable points of improvement when reviewing patient safety. Applying this conceptual perspective helped the study to discuss the patient safety within the study facility and reveal gaps within the dynamic system of individual and organizational factors influencing patient safety practices. The study chose to focus on physicians, medical officers, clinical

officers, and nurses only since they are the primary caregivers rendering most healthcare services in a health facility.

### Conceptual Framework

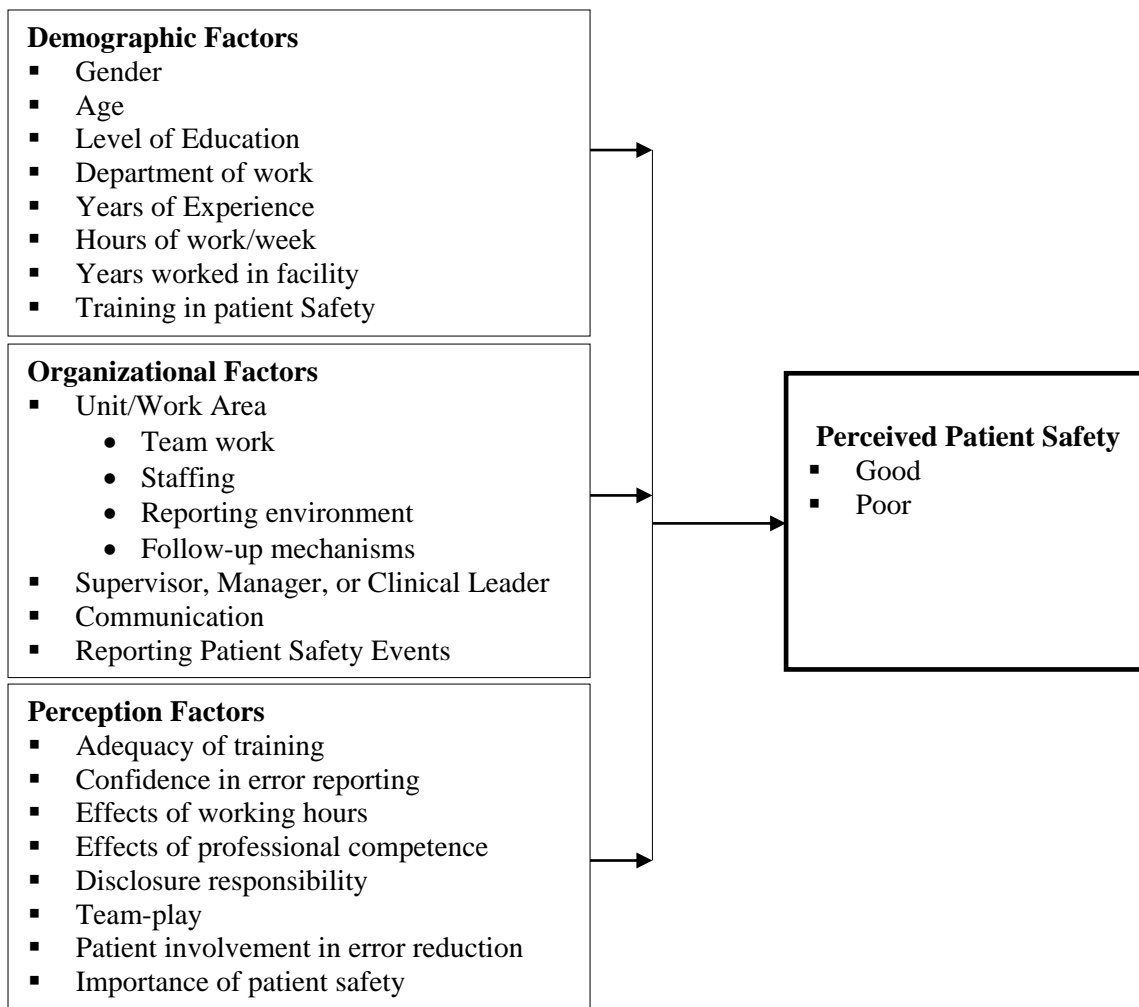


Figure 1: Conceptual Framework- (Source: Author)

### LITERATURE REVIEW

Patients being discharged from health facilities face immense life-threatening outcomes. A study by Groves et al. (2011) established that most patients report adverse outcomes within 3 weeks post-discharge. Studies have further demonstrated that approximately 75% of these adverse outcomes could be prevented (Alsalem et al., 2018). Commonly cited adverse outcomes include; adverse drug events, nosocomial infections, and procedural complications (Abuosi et al., 2019; Davenport et al., 2020). According to Abuosi et al. (2019), the greatest challenge to patient safety is the fact that most patients (40%) are discharged with pending test results. A similar proportion is discharged with a plan to complete care as an outpatient. Unless a comprehensive plan is put in place to manage these patients, these factors pose the greatest challenge to patient safety. According to Gayat et al. (2018), a stressful hospital environment can lead to increased stress and general body weakness a condition commonly referred to as “post-hospital syndrome”. This condition is commonly said to result in adverse events such as falls and infections. Studies have demonstrated that minimizing the post-discharge syndrome can reduce patient adverse outcomes by up to 20% (Shahian et al., 2017).

### **Demographic Factors Affecting Patient safety**

Several studies have investigated the influence of healthcare workers' socio-demographic characteristics against their perception of patient safety. Findings reported by these studies vary significantly. An early study by Mwachofi, et al., (2011) demonstrated that sociodemographic factors did not significantly predict the perception of patient safety. They posited that this could be attributed to the fact that demographic factors change in an organization with staff turnover. A study by Khoshakhlagh and colleagues established that there was no significant difference between patient safety and age, work experience, gender, and deployment station (Khoshakhlagh, et al., 2019). Whereas these studies posit no significant relationship between socio-demographic factors and patient safety, palliative care studies have demonstrated that sociodemographic factors have an impact on the quality of care delivered by medics. These studies have demonstrated demographic factors such as age, gender, and work experience have a significant impact on the quality of care delivered (Alsalem, et al., 2018; Lasater, et al., 2016).

Several studies have demonstrated that burnout due to long working hours have a significant impact on patient safety. A study by Khoshakhlagh, et al., (2019) demonstrated that, even in work-shift cases, burn-out was positively associated with a poor patient safety. They however noted that age, experience, gender, and place of service were not positively correlated with the burnout score. Meaning, irrespective of their socio-demographic characteristics, healthcare workers can get burnout and this was attributed to the nature of their work.

Alsalem et al. (2018) demonstrated that the hospital type and shift of work had a significant association with the patient safety of an organization. In this study, they established that weekend lower scores of the patient safety dimensions compared to weekdays. They further established that whereas communication openness scored significantly higher, the non-punitive response to errors scored poorly. A study by Lasater, et al., 2016 demonstrated that private health facilities had poor patient safety scores compared to public facilities. In their study, they determined that the average score for public facilities was 65.5 while private had 58.3%.

### **Factors Impacting Patient safety**

Positive safety culture is critical as it shapes healthcare providers' behavior in such a way that patient safety becomes a priority within the organization. Studies have demonstrated that elements such as; organizational learning, open communication, teamwork, policies, non-punitive response to errors, timely feedback, and shared cultural perceptions towards safety are critical in organizational safety and that organizations need to work towards fostering them into their culture (Khoshakhlagh et al., 2019).

#### ***Non-punitive response to errors***

Studies assessing the influence of non-punitive response to errors on patient safety have gained prominence in the past decade. A study by El-Jardali, et al., (2011) established that a non-punitive response to errors helps healthcare institutions to conduct a self-assessment of their safety and obtain a clear view on best practices that will ensure patient safety aspects that need more attention. More recent studies have demonstrated that a non-punitive response to medical errors allows for more objective reviews of the gaps of care and enhances the delivery of healthcare services. A study by Basson, et al., (2018) observes that a positive patient safety environment allows healthcare providers to analyze their errors with the aim of improving patient safety. Boston and colleagues further suggest that to develop a positive safety culture, healthcare institutions need to first assess their response to nursing care errors. In their conclusion, they recommend the inclusion of a non-punitive response to errors as the top-most strategy towards strengthening institutional capacity (Basson, et al., 2018). Khoshakhlagh, et al., (2019) reiterates these sentiments by stating that hospitals need to develop a strong patient safety before implementing structural interventions. They posit those hospitals with good infrastructure and a poor patient safety predispose their patients to adverse outcomes. They conclude that; a system in which the facility can learn from their medical mistakes is more sustainable than a facility focused on infrastructural development (Khoshakhlagh, et al., 2019). Their study recommends developing a strong

patient safety founded on a non-punitive response to errors as this helps healthcare workers at the facility to learn from their medical errors and enhance patient outcomes. Whereas the value of non-punitive response to errors has been underscored by most researchers, studies have continued to record significantly low scores from healthcare workers. An Iranian comparative study by Khoshakhlagh, et al., (2019) sought to analyze factors affecting patient safety in public and private hospitals in Iran established those non-punitive responses scored the least in the two facilities. Similar findings are recorded by Abu-El-Noor, et al., (2019).

### ***Policy factors***

Medical error occurrence is highly considered by health policy-makers and stakeholders as a policy breach (Asem, et al., 2019). Generally, studies posit that when people work in areas where there is a lack of proper structures, their induced sense of self-efficacy, and competence are impaired leading to diversity in patient management approaches, unpleasant work environments, occupational burnout, and mental discomfort which translates into a poor patient safety environment (Titlestad, et al., 2018; Chegini, et al., 2019; Asem, et al., 2019).

A study by Hall et al (2016) demonstrated that lack of or poor policy structures increased chances of emotional exhaustion, depression, and poor sense of personal accomplishment, these, they say can trigger poor patient outcomes. They later concluded that proper policy structures can help in the appropriate planning and control and can lead to a better patient safety (Hall, et al., 2016). Wisetborisut et al (2020) expounded this concept by explaining that policies are critical since they allocate and explain caregiver expectations and actions promoting patient safety. Policy feedback then helps measure the frequency of adverse patient outcomes (Wisetborisut, et al., 2020).

Through the directorate of health standards and quality assurance, Kenya implemented the Kenya Health Policy 2014-2030 which sought to ensure Safe and Quality care provision. This is a set of protocols that are limited in their efficacy as they are a health facility inspection checklist meant to sustain the upscaling and sustainability of fundamental patient safety standards (MoH, 2019). Owing to the broad perspective of patient safety, the existing national policies cannot comprehensively cover the patient safety needs (Kinuthia, 2018). There is, therefore, a need for studies to be conducted to help understand some of the policy factors that influence patient safety and develop a policy document guiding healthcare givers on what needs to be done to ensure patient safety. Since County level 5 hospitals handle the bulk of the national healthcare issues, they provide the best places for assessing patient safety, existing policy guidelines, and their implementation levels.

### ***Working environment***

Kolmar (2021), defines the work environment as the actual space where work is performed. They elaborate that the work environment includes the physical space, facilities, working conditions, and company culture. A study by Olds et al (2018) seeking to assess the association between work environment and patient safety established that; respondents who reported to be working in facilities with a poor work environment also reported poor patient safety and had a higher rate of patient readmissions. They further determined that caregivers' perception of patient safety influenced the patient's chances of readmission (Olds, et al., 2018). In yet another study, Lasater & Mchugh (2016) sought to understand how staffing and work environment influenced patient safety and how these influenced readmissions among adult elective hip and knee replacement patients. They concluded that readmission of patients was positively associated with poor patient safety. The poor patient safety was attributed to low staffing and a poor work environment. They recommended that institutions should pay attention to the patient safety and have a holistic look at the factors that influence this culture among healthcare workers to reduce readmission rates among postoperative medical care populations (Lasater, et al., 2016).

The WHO posits that millions of people suffer and die each year because of unsafe healthcare (WHO, 2019). The WHO cites 9 core causes of death that can be attributed to a poor patient safety; diagnostic errors, healthcare-associated infections, medication errors, radiation errors, sepsis, unsafe injections practices, unsafe

surgical care procedures, unsafe transfusion practices, and venous thromboembolism (blood clots). Whereas some studies established no significant association between patient safety and morbidity (Shahian, et al., 2017), some found a strong positive correlation (Kumbi, et al., 2020).

A study conducted in Ethiopia by Shahian et al. (2017) established that a poor patient safety score (46%) the number of working hours, level of staffing, teamwork, having participated in a patient safety program, and a safe environment for reporting patient adverse outcomes are some of the patient safety that positively correlated with patient morbidity and mortality. Contrary findings are recorded by Davenport (2020). Their study conducted in the USA on 6,083 healthcare workers drawn from 52 sites established that working conditions, job satisfaction, teamwork, safety climate, and burnout did not correlate with morbidity and mortality (Davenport, et al., 2020).

Ko and Yu (2017) cite administrative factors like cost-cutting measures, poor policies, poor standard operating procedures, rigidity, and fault finding as some of the factors passively correlating to adverse patient outcomes (Ko, et al., 2017). Chegini and colleagues posit that a leaders' attitude is pivotal in the reporting and management of medical errors. They further support the administrative component by concluding that the use of proper care pathways in managing and reporting medication errors can significantly influence the quality of care delivered to patients and hence their safety (Chegini et al., 2019).

### **Healthcare Worker Perceptions of Patient safety**

Studies have reported varying knowledge levels among healthcare workers. Different studies have reviewed knowledge differently. Studies researching on patient safety from a specific target population have measured caregiver knowledge using the abilities of the caregiver to deliver specific healthcare services, for instance, Titlestad and colleagues established that health caregiver knowledge and expertise in diabetes and familiarity with the national clinical recommendations on diabetes care were key influencers of patient safety and reduced adverse outcomes (Titlestad, et al., 2018).

Nurses are the primary caregivers authorized to administer medication and care to patients and hence, they need the requisite knowledge and experience to securely execute care on their patients (Abu-El-Noor, et al., 2019; Chegini, et al., 2020). Research has demonstrated that there is a relationship between patient safety and health caregivers' knowledge. These studies posit that higher knowledge of patient safety is associated with patient outcomes (Titlestad, et al., 2018). Further studies have associated health providers' knowledge and expertise to better patient treatment and care within a clinical field. Proponents of caregiver knowledge posit that varied knowledge levels explain the varying levels of patient safety recorded in most studies (Titlestad, et al., 2018).

A study by Castle et al (2016) and Asem et al (2019) opines that insufficient knowledge and familiarity of patient safety among healthcare workers can impede a positive patient safety. hence, this study explored possible associations between nurses' knowledge and patient safety.

Studies attribute occupational burnout to several factors. A study by Khoshakhlagh, et al., (2019) posits that "occupational burnout is a product of long-term stress in the workplace." Rotenstein, et al., (2018) posits that occupational stress often arises due to physical, emotional, or psychological stress. Burnout has been credited to increase emotional exhaustion, decrease working energies, and increase an individual's susceptibility to bad attitudes (Khammar, et al., 2017). Khammar and colleagues further posit that burnout symptoms are manifested whenever an individual lacks the requisite skill to meet the job demands. Burnout isolates an individual psychologically from their work environment leading to poor service delivery and compromising patient safety. Several studies have assessed the impact of Burnout on patient safety. Abuosi et al (2019) attributed burnout to medical staff exposure to stressors such as "patient mortality, high workload, exposure to a high number of patients per working shift, interpersonal problems, emergency decision making due to inadequate information/poor communication, threats at the workplace and punitive measures arising from

medical errors. A study by Hayashi et al., (2020) sought to establish the relationship between patient safety and other factors like; the number of employees' working hours, the number of days an employee takes off duty, and the number of night-shifts. The study established that working time, number of shifts and number of rest days were significantly associated with low patient safety. Whereas several studies have demonstrated the impact of burnout on healthcare worker output, little has been documented in Kenya and more so in Kakamega on the extent of the impact of burnout on patient safety within health facilities.

### **Patient Safety Outcome Factors**

Whereas studies posit a strong positive relationship between patient safety and positive patient outcomes, healthcare research needs to disintegrate and review how specific components of patient safety influences individual patient outcomes such as; patient readmission, length of stay, patient mortality, and any other adverse outcomes (Olds, et al., 2018). Several studies have examined the relationship between a hospital's patient safety and patient readmission rates. Whereas different studies have reported conflicting findings on the relationship and its significance, most studies have demonstrated that hospitals with a positive patient safety have fewer readmission rates (AHRQ, 2010; Groves, et al., 2011; Khoshakhlagh, et al., 2019).

Studies have demonstrated that the provision of safe care, helps in the reduction of morbidity, mortality, length of hospital stay, and medical costs (Abu-El-Noor, et al., 2019). Length of patient stay at a hospital is however an output of several determinants. Empirical literature posits that patient safety is associated with length of health facility stay while others associate patient safety to the healthcare workers' perceptions of facility management (Lasater, et al., 2016; Abu-El-Noor, et al., 2019).

Studies spanning more than a decade have demonstrated that medication errors are a leading cause of patient injury and avoidable medical care harm within a healthcare system (Aitken, et al., 2012; WHO, 2011; WHO, 2019). The WHO (2019) posits that the annual global cost associated with medication errors is approximately 42 billion USDs. Several researchers have dichotomized the factors associated with medical errors into individual and administrative. Common individual factors influencing medication errors include; fear of victimization, lack of adequate supportive supervision (Ali, et al., 2018; Chegini, et al., 2020).

### **METHODOLOGY**

This study adopted an analytical cross-sectional study design. The study was conducted at the Kakamega Level 5 Hospital. The study included all healthcare providers working closely with the Critical Care Units (CCUs). The study population did include all nurses, clinical officers, and medical officers working in the CCUs, accident and emergency units, theatre(s), and the acute rooms in the wards. The target population included 150 healthcare providers in Kakamega Level 5 Hospital. Owing to the small number of staff working in the CCUs, this study used the census method on the population. Using this approach, the study collected data from all the 100 healthcare workers working in the ward acute rooms and all the 50 ICU clinical staff (N=150).

This study used a self-administered questionnaire to collect data from the study population on the determinants of patient safety among critical care clinical teams working at the Kakamega County Referral Hospital. The questionnaire was the primary research tool for this study. The study tool was pre-tested to ensure the researcher was familiar with the tool and that the tools measure well what the study sought to measure. Computer software was used to re-code the physical data collection tool into an electronic one using the Statistical Package for Social Sciences (SPSS) software version 21. Electronic data was then subjected to analysis.

### **RESULTS**

This study aimed at identifying the factors associated with patient safety in Kakamega County Referral hospital. The data analysis process started with descriptive statistics of the study population. Numerical



variables were presented in terms of means and standard deviation while categorical variables were presented in terms of frequencies and percentages. Chi square was used to determine the relationship between variables. Further, multivariate logistic regression was used to determine the predictors of patient safety.

### Demographic characteristics of the study participants

Out of 150 participants, 57.3% were females while 41.3% were males. With regard to highest attained education level, 61.3% had attained diploma while 38.7% had attained degree. While 9.3% worked in the maternity department, 16% worked in the medical unit, 40% worked in the special unit, 17.3% worked in the surgical unit and 17.3% worked in other departments. Regarding the specialization of the study participants, 17.7% were Clinical officers, 11.8% were Consultants/Physicians, 17.7% were medical officers while 52.9% were nurses. 45.7% had previous training of patient safety (Table 1). In addition, the average years of experience was 8.36 years, the average number of years spent in the facility were 2.64 years while the average period of service in Kakamega was 5.76 years. With regard to respondent's designation, majority (49.3%) were KRCHN followed by Clinical Officers (23.3%) while Post-graduate Nurses (1.4%), Consultants/Physicians (1.4%) and Clinical Area in charge (1.4%) comprised the minority.

**Table 1: Demographic characteristics of study participants**

Variables	n	%
<b>Sex</b>		
Males	62	41.3
Females	86	57.3
<b>Education level</b>		
≤Diploma	92	61.3
≥Degree	54	38.7
<b>Designation</b>		
Post-Graduate Nurse	2	1.4
BSc Nurse	20	13.7
KRCHN	72	49.3
Clinical Officer	34	23.3
Medical Officer	14	9.6
Consultant/Physician	2	1.4
Clinical area in charge	2	1.4
<b>Department of work</b>		
Maternity	14	9.3
Medical	24	16
special Unit	60	40
Surgical	26	17.3
Others	26	17.3
<b>Specialization</b>		
Clinical Officers	12	17.7
Consultants/Physicians	8	11.8
Medical Officers	12	17.7
Nurses	36	52.9
<b>Trained on patient safety</b>		
Yes	64	45.7
No	76	54.3
	<b>Mean</b>	<b>Std. Deviation</b>
Years of experience	8.36	8.77
Years worked in ward	2.64	2.11
Period of service in Kakamega (yrs)	5.76	7.29

## Organizational Factors affecting Patient safety

### *Institutional factors*

Fourteen items were used to evaluate the institutional factors on patient safety. The items were measured as follows: Disagree (mean<3) and Agree (mean>3). Higher values indicated more agreement with the institutional factors in question. There was generally a strong agreement that at the institution, teamwork was embraced (Mean 4.48±0.80), helping each other during busy times (Mean 4.31±0.93), focusing on learning rather than blaming others whenever errors were made (Mean 3.99±1.08). On the other hand, participants disagreed with the fact that there were disrespectful behaviors by those they worked with (Mean 2.10±1.00), the number of staff employed in their unit was enough to handle the workload (Mean 2.34±1.12) and there was rushed workspace (Mean 2.28±1.25). Therefore, in Kakamega County Referral hospital, it stands out that teamwork is embraced, staffs focus on learning, there were no instances of disrespectful behaviors among staffs, there was not enough staff to handle the workload and the work space was not rushed. The mean and standard deviations of the individual items and the mean and standard deviation of the combined items are presented in table 2.

**Table 2: Institutional factors**

	Mean	Std. Dev
Embrace teamwork	4.48	0.80
In this unit, we have enough staff to handle the workload	2.34	1.12
Staff in this unit work longer hours than is best for patient care	3.81	1.10
This unit regularly reviews work processes to determine if changes are needed to improve patient safety	3.58	1.23
This unit relies too much on temporary, float, or PRN staff	3.04	1.43
In this unit, staff feel like their mistakes are held against them	2.59	1.20
When an event is reported in this unit, it feels like the person is being written up, not the problem	2.64	1.32
During busy times, staff in this unit help each other	4.31	0.93
There is a problem with disrespectful behavior by those working in this unit	2.10	1.00
When staff make errors, this unit focuses on learning rather than blaming individuals	3.99	1.08
The work pace in this unit is so rushed that it negatively affects patient safety	2.28	1.25
In this unit, changes to improve patient safety are evaluated to see how well they worked	3.58	1.32
In this unit, there is a lack of support for staff involved in patient safety errors	2.54	1.26
This unit lets the same patient safety problems keep happening	2.31	1.27

### *Administrative factors (immediate in-charge, manager, or unit in charges)*

Three items were used to evaluate the prevailing administrative factors in Kakamega County Referral Hospital. The items were measured as follows: Disagree (mean<3) and Agree (mean>3). Higher values indicated more agreement with the administrative condition in question. There was generally a strong agreement that the in-charges: took action to address patient safety concerns brought to their attention (Mean 4.07±1.03) and seriously considered staff suggestions for improving patient safety (Mean 3.92±1.02). On the other hand, participants disagreed with the fact that the in-charges wanted them to work faster during busy times even if it meant taking shortcuts (Mean 1.85±0.95). Therefore, in Kakamega County Referral hospital, it stands out that in-charges readily take action to address patient safety concerns brought to their attention, take staffs' suggestions for improving patient safety seriously and don't advocate for shortcuts. The mean and standard deviations of the individual items and the mean and standard deviation of the combined items are presented in table 3.

**Table 3: Administrative factors affecting patient safety**

	Mean	Std. Dev
My supervisor, manager, or clinical leader seriously considers staff suggestions for improving patient safety	3.92	1.02
My supervisor, manager, or clinical leader wants us to work faster during busy times, even if it means taking shortcuts	1.85	0.91
My supervisor, manager, or clinical leader takes action to address patient safety concerns that are brought to their attention	4.07	1.03

***Communication factors (level of agreement or disagreement at unit/work area)***

Communication factors affecting patient safety were evaluated using seven items. The items were measured as follows: Disagree (mean<3) and Agree (mean>3). Higher values indicated more agreement with the communication factor in question. There was generally a strong agreement that: staffs were free to speak up whenever they see something that could negatively affect patient care (Mean 4.31±0.93), staffs were diligent to prevent errors from recurring (Mean 4.05±1.07) and those in more authority were open to patient safety concerns raised by the staffs (Mean 4.01±1.03). On the other hand, staffs disagreed with the fact that they were afraid to ask questions whenever something was wrong (Mean 2.29±1.23). Therefore, in Kakamega County Referral hospital, it stands out that staffs readily speak up whenever they see something that could negatively impact patient safety, staffs are careful to prevent errors from recurring and those in more authority were open to patient safety concerns raised by their staffs. The mean and standard deviations of the individual items and the mean and standard deviation of the combined items are presented in table 4 below.

**Table 4: Communication factors**

	Mean	Std. Dev
We are informed about errors that happen in this unit	3.81	0.98
When errors happen in this unit, we discuss ways to prevent them from happening again	4.05	1.07
In this unit, we are informed about changes that are made based on event reports	3.84	0.97
In this unit, staff speak up if they see something that may negatively affect patient care	4.31	0.93
When staff in this unit see someone with more authority doing something unsafe for patients, they speak up	3.69	1.33
When staff in this unit speak up, those with more authority are open to their patient safety concerns	4.01	1.03
In this unit, staff are afraid to ask questions when something does not seem right	2.29	1.23

***Reporting patient safety events (Reporting safety)***

Three items were used to evaluate the Safety reporting factors possibly associated with patient safety. The items were measured as follows: Disagree (mean<3) and Agree (mean>3). Higher values indicated more agreement with the reporting safety factor in question. Participants agreed that reporting was only done sometimes whenever a mistake is caught and corrected before reaching the patient (Mean 3.24±1.33) and whenever a mistake reached the patient and could have harmed the patient but did not (Mean 3.31±1.30). Moreover, on average each staff had only reported one or two safety events (Mean 2.10±1.15) at the time of data collection. Therefore, in Kakamega County Referral hospital, it stands out that safety reporting needs to be improved. The mean and standard deviations of the individual items and the mean and standard deviation of the combined items are presented in table 5.

**Table 5: Safety reporting factors (frequency of reporting)**

	Mean	Std. Dev
When a mistake is caught and corrected before reaching the patient, how often is this reported?	3.24	1.33
When a mistake reaches the patient and could have harmed the patient, but did not, how often is this reported?	3.31	1.30
In the past 12 months, how many safety events have you reported?	2.10	1.15

### Hospital perceived factors affecting Patient safety

#### *Hospital perception factors associated with patient safety*

Six items were used to evaluate the Hospital perception factors possibly associated with patient safety. The items were measured as follows: Disagree (mean<3) and Agree (mean>3). Higher values indicated more agreement with the communication factor in question. There was relatively a strong agreement that: important patient care information would often be left out during shift changes (Mean 3.91±1.00) and when transferring patients from one unit to another (Mean 3.77±1.11) although there was always enough time to exchange all key patient care information (Mean 3.75±1.12). However, participants neither agreed/disagreed as to whether management did provide adequate resources to improve patient safety (Mean 2.96±1.07) and whether management were only interested in patient safety after an adverse event occurred (Mean 3.12±1.06). Therefore, in Kakamega County Referral hospital, it stands out that although there was always sufficient time to exchange patient care information, some information was always omitted during shift changes and when transferring a patient from one unit to another. The mean and standard deviations of the individual items and the mean and standard deviation of the combined items are presented in table 6.

**Table 6: Hospital perception factors affecting patient safety**

	Mean	Std. Dev
The actions of hospital management show that patient safety is a top priority	3.49	1.22
Hospital management provides adequate resources to improve patient safety	2.96	1.05
Hospital management seems interested in patient safety only after an adverse event happens	3.12	1.06
When transferring patients from one unit to another, important information is often left out	3.77	1.11
During shift changes, important patient care information is often left out	3.91	1.00
During shift changes, there is adequate time to exchange all key patient care information	3.75	1.12

#### *Health worker attitude towards patient safety*

Thirty items were used to score the attitude of the health worker with regards to patient safety. The items were measured as follows: Disagree (mean<3) and Agree (mean>3). Higher values indicated more agreement with the attitude factor in question. The participants generally agreed that they liked their job (Mean 4.53±0.58); that their training had prepared them to understand the causes of medical errors (Mean 4.39±0.66); that personal input about patient care was well received at their work place (Mean 4.19±0.86); that better multidisciplinary teamwork (Mean 2.96±1.07), paying more attention at work (Mean 4.08±1.03) and teaching teamwork skills (Mean 4.13±0.90) would lead to less medical errors being committed. On the other hand, participants didn't agree that a true professional would not make mistakes/errors (Mean 1.86±0.95) and that learning patient safety issues was not as important as learning other more skill-based aspects of being a doctor/nurse (Mean 1.82±1.01). The mean and standard deviations of the individual items and the mean and standard deviation of the combined items are presented in table 7.

**Table 7: Attitude towards patient safety**

	<b>Mean</b>	<b>Std. Dev</b>
My training has prepared me to understand the causes of medical errors	4.39	0.66
I like my job	4.53	0.58
Personal input about patient care is well received at my workplace	4.19	0.86
Most medical errors result from careless nurses	2.07	1.06
Medical errors are handled appropriately my workplace	3.81	0.82
I would feel comfortable reporting any errors I had made no matter how serious the outcome had been for the patient	3.57	1.01
I don't think I make errors	2.19	0.86
I feel confident I could report an error I had made without feeling I would be blamed	3.55	1.1
The number of hours doctors / nurses work increases the likelihood of making medical errors	3.51	1.38
I would feel comfortable reporting any errors other people had made, no matter how serious the outcome had been for the patient	3.36	1.12
I am confident I could talk openly to my supervisor about an error I had made if it had resulted in potential or actual harm to my patient	3.82	0.92
A true professional does not make mistakes or errors	1.86	0.95
Shorter shifts will reduce medical errors	3.69	1.04
By not taking regular breaks during shifts doctors / nurses are at an increased risk of making errors	3.68	1.19
Doctors / nurses have a responsibility to disclose errors to patients only if they result in patient harm	2.52	1.32
Patient safety issues cannot be taught and can only be learned by clinical experience when qualified	2.35	1.35
Even the most experienced and competent clinical caregiver make errors	3.85	1.11
Better multi-disciplinary teamwork will reduce medical errors	4.08	1.03
Patients have an important role in preventing medical errors	3.59	1.2
Medical errors are a sign of incompetence	2.11	1.1
Learning about patient safety issues is not as important as learning other more skill-based aspects of being a doctor / a nurse	1.82	1.01
All medical errors should be reported	3.96	1.03
Teaching teamwork skills will reduce medical errors	4.13	0.9
If people paid more attention at work, medical errors would be avoided	4.03	0.85
Encouraging patients to be more involved in their care can help to reduce the risk of medical errors occurring	3.78	1.22
It is not necessary to report errors which do not result in adverse outcomes for the patient	1.99	1.05
It is the responsibility of all health care professionals to formally report all medical errors which occur	3.79	1.14
Most medical errors result from careless doctors	2.21	1.19
Learning about patient safety issues before I qualify will enable me to become a more effective doctor / nurse	4.01	1.03
Even the most experienced and competent nurses make errors	3.92	1.07

## Patient safety

### *Patient safety score*

Patient safety was measured using seven items. The items were measured as follows: Disagree (mean<3) and Agree (mean>3). Higher values indicated more agreement with the patient safety aspect in question. Participants agreed that medical misdiagnosis (Mean 3.07±1.20), conflicting instructions by providers (Mean 3.29±1.19), infections post treatment/hospitalization (Mean 3.22±1.19) did occur within the facility. However, they disagreed that wrong instructions were issued on follow-up care (Mean 2.51±1.09), errors were made on medication dosage (Mean 2.59±1.07), unnecessary treatments were done (Mean 2.67±1.20), wrong medications were issued (Mean 2.51±1.24). Therefore, in Kakamega County Referral hospital, it stands out that there is uncertainty as to whether medical misdiagnosis, instances of conflicting instructions by providers, infections post treatment/hospitalization occur. The mean and standard deviations of the individual items and the mean and standard deviation of the combined items are presented in table 8.

**Table 8: Patient safety score**

	<b>Mean</b>	<b>Std. Deviation</b>
Medical Misdiagnosis	3.07	1.20
Issued wrong instructions on follow-up care	2.51	1.09
Errors in medication dosage	2.59	1.07
Unnecessary treatment	2.67	1.20
Different instructions issued by different providers	3.29	1.19
Infection post-treatment/hospitalization	3.22	1.19
Issuance of wrong medication	2.51	1.24

### *Patient safety Rating*

Participants were asked how they would rate their unit/work area on patient safety on a five-point likert scale (Poor, Fair, Good, Very Good and Excellent). While 8 people indicated poor, 16 indicated fair, 120 indicated good, 6 indicated very good and none indicated excellent. Poor and Fair categories were combined into Poor while Good, Very Good and Excellent were also combined into Good category. Hence, to rate patient safety at Kakamega Referral hospital, the categories were either poor or good. The result indicated that 84% (n=126) of respondents rated patient safety as good, while 16% (n=24) rated patient safety as poor (Table 9).

**Table 9: Patient safety Rating**

	<b>Frequency (n)</b>	<b>Percent (%)</b>
Poor	24	16
Good	126	84
<b>Total</b>	<b>150</b>	<b>100</b>

## Bivariate Analysis

### *Association between demographic characteristics and patient safety*

A chi-square test of association was performed to determine whether there was a relationship between demographic characteristics and patient safety. Variables with a p value <0.05 were considered significant. Findings indicated a statistically significant relationship between education level ( $\chi^2= 6.632$ ,  $p=0.036$ ), age ( $\chi^2= 6.494$ ,  $p=0.024$ ), training on patient safety ( $\chi^2= 16.31$ ,  $p=0.000$ ), and patient safety. Results are presented in Table 10.

**Table 10: Association between demographic characteristics and patient safety**

Variable	Patient Safety Rating		$\chi^2$ value	p value
	Poor	Good		
<b>Gender</b>				
Male	8	54	0.862	0.243
Female	16	70		
<b>Education</b>				
≤Diploma	10	82	6.632	0.036
≥Degree	14	38		
<b>Age</b>				
Below 30	16	60	6.494	0.024
31-40	8	32		
41-50	0	14		
Above 50	0	12		
<b>Experience</b>				
Below 10 years	18	86	3.6	0.165
10-20 years	6	20		
21 years and above	0	14		
<b>Training on patient safety</b>				
No	2	62	16.31	0.000
Yes	22	54		

**Association between organizational factors and patient safety**

A chi-square test of association was performed to establish whether there was a relationship between organizational factors and patient safety. Variables with a p value <0.05 were considered significant. Findings showed a statistically significant relationship between administrative factors ( $\chi^2= 12.646$ ,  $p=0.001$ ), communication ( $\chi^2= 25.783$ ,  $p=0.000$ ), reporting safety ( $\chi^2= 8.278$ ,  $p=0.004$ ), and patient safety. Results are presented in Table 11.

**Table 11: Association between organizational factors and patient safety**

Variable	Patient Safety Rating		$\chi^2$ value	p value
	Poor	Good		
<b>Institutional factors</b>				
Disagree	6	36	0.606	0.31
Agree	8	75		
<b>Administrative factors</b>				
Disagree	14	28	12.646	0.001
Agree	10	96		
<b>Communication</b>				
Disagree	10	8	25.783	0.000
Agree	12	114		
<b>Reporting safety</b>				
Disagree	16	50	8.278	0.004
Agree	6	76		

**Association between hospital perceived factors and patient safety**

A chi-square test of association was performed to establish whether there was a relationship between hospital perceived factors and patient safety. Variables with a p value <0.05 were considered significant. Findings showed a statistically insignificant relationship between hospital perceptions ( $p >0.05$ ), health worker attitude towards patient safety ( $p >0.05$ ) and patient safety. Results are presented in Table 12.

**Table 12: Association between hospital perceived factors and patient safety**

Variable	Patient Safety Rating		$\chi^2$ value	p value
	Poor	Good		
<b>Hospital perceptions</b>				
Disagree	18	78	1.291	0.184
Agree	6	46		
<b>Health worker attitude towards patient safety</b>				
Disagree	4	20	0.084	0.497
Agree	12	72		

**Multivariate Logistic Regression; Predictors of Patient Safety**

This section describes the multivariate logistic regression analysis of the patient safety and the predictor variables. Patient safety was categorized into poor and good. P value of <0.05 was considered a significant factor. Findings showed that healthcare providers who disagreed with items on administrative factors were less likely to ensure patient safety (OR =0.076; p = 0.000) compared to those who agreed with items on administrative factors. Results further showed that healthcare providers aged below 30 and 31-40 years respectively were more likely to ensure patient safety (OR =3.00E-10; 2.397E-10; p = 0.001) compared to those aged above 50 years.

**Table 13: Multivariate logistic regression results: Predictors of patient safety**

	Adj. OR	95% CI	Sig.
<b>Education</b>			
≤Diploma	0.694	0.156-3.076	0.630
≥Degree	ref		
<b>Age</b>			
		[6.27E-11-1.44E-09]	<b>0.000</b>
Below 30	3.00E-10		
31-40	2.397E-10	[2.4E-10-2.4E-10]	
41-50	0.467	[0.467-0.467]	
Above 50	ref		
<b>Training on patient safety</b>			
No	859241468.1	0.000	0.997
Yes	ref		
<b>Administrative factors</b>			
Disagree	0.076	[0.016-0.361]	<b>0.001</b>
Agree	ref		
<b>Communication</b>			
Disagree	0.336	[0.065-1.746]	0.195
Agree	ref		
<b>Reporting safety</b>			
Disagree	0.458	[0.093-2.253]	0.337
Agree	ref		



## **SUMMARY**

The study's first objective was to rate the patient safety across the hospital units that work closely with the CCU at the Kakamega County Referral Hospital. The study established that majority of the respondents rated patient safety as good. This suggested that most of the healthcare providers were satisfied with the nature of patient safety at the Kakamega County Referral Hospital. The findings disagree with a study by Lasater et al. (2016) who demonstrated that private health facilities had poor patient safety scores compared to public facilities.

The second objective of the study was to determine demographic characteristics that affect the patient safety across hospital units that work closely with the CCU at the Kakamega County Referral Hospital. The study established that female healthcare providers were more compared to their male counterparts. This could be explained by the tendency of having more women as healthcare providers. Nonetheless, there was fair representation of both women and men implying that the study responses were not biased. The findings further indicated that males were associated with better patient safety compared to females. The findings agree with the work of Alsalem et al. (2018) who concluded that gender has a significant impact on the quality of care delivered.

The study established that all the healthcare providers had attained a minimum of diploma education, with a good number of them having attained higher diploma, bachelor's degree and masters' degree. The study found that healthcare providers worked in different departments including special unit, surgical unit, and maternity department. This indicated that the study information was obtained from different departments and units, thus validating its quality and comprehension in explaining the subject matter. The findings further showed that healthcare providers who work within the special unit were associated with poor patient safety practice when compared to those who work in the Maternity Department.

The study established that the healthcare providers had different specializations including training on patient safety, nurses, medical officers, Consultants/Physicians and Clinical officers. This showed that the study information was obtained from different specialists, therefore, validating its quality and comprehension in explaining the subject matter.

The study found that the average years of experience was 8.36 years, the average number of years spent in the facility were 2.64 years, while the average period of service in Kakamega was 5.76 years. This indicated that most of the healthcare providers had adequate experience working in the health facilities and therefore were familiar with the patient safety. The findings agree with the work of Lasater et al. (2016) who observed that work experience has a significant impact on the quality of care delivered.

The results further indicated that education level, age and training on patient safety were significantly associated with patient safety. The findings are consistent with the work of Titlestad et al. (2018) who associated higher education with patient safety.

The study's third objective was to identify organizational factors that impact the patient safety across hospital units that work closely with the CCU at the Kakamega County Referral Hospital. The study established that in Kakamega County Referral hospital, teamwork is embraced, staffs focus on learning, there were no instances of disrespectful behaviors among staffs, there was not enough staff to handle the workload and the work space was not rushed. The findings mirror those of Shahian et al. (2017) who associated good patient safety score to teamwork, training programs, and a safe environment for reporting patient adverse outcomes.

The study also revealed that in the institution, in-charges readily take action to address patient safety concerns brought to their attention, take staffs' suggestions for improving patient safety seriously and don't advocate

for shortcuts. The findings concur with those of Lasater, et al. (2016) and Abu-El-Noor, et al. (2019) who associated patient safety to the facility management.

The study established that in the institution, staffs readily speak up whenever they see something that could negatively impact patient safety, staffs are careful to prevent errors from recurring and those in more authority were open to patient safety concerns raised by their staffs. The results concur with the findings by Chegini, et al. (2019) who revealed that reporting medication errors can significantly influence the quality of care delivered to patients and hence their safety.

The findings further revealed a statistically significant relationship between administrative factors, communication, reporting safety, and patient safety. The findings concur with those of Lasater, et al. (2016) and Abu-El-Noor, et al. (2019) who associated patient safety to the facility management. The results concur with the findings by Chegini, et al. (2019) who revealed that reporting medication errors can significantly influence the quality of care delivered to patients and hence their safety.

The study's fourth objective was to identify hospital perception factors that impact the patient safety across hospital units that work closely with the CCU at the Kakamega County Referral Hospital. The findings indicated that in Kakamega County Referral hospital, although there was always sufficient time to exchange patient care information, some information was always omitted during shift changes and when transferring a patient from one unit to another. The findings are similar to the work of Abuosi et al. (2019) who attributed inadequate information/poor communication to poor patient safety.

The findings also showed that healthcare providers liked their job, training had prepared them to understand the causes of medical errors, personal input about patient care was well learning received at their work place, better multidisciplinary teamwork, paying more attention at work and teaching teamwork skills would lead to less medical errors being committed. The findings further indicated that true professional still make mistakes/errors, and learning patient safety issues was as important as learning other more skill-based aspects of being a doctor/nurse. The findings are consistent with the work of Shahian et al. (2017) who established that patient safety was associated with having participated in a patient safety program, and a safe environment for reporting patient adverse outcomes.

## **CONCLUSION**

The study concludes that male healthcare providers were associated with better patient safety compared to females. Healthcare providers with at least Bachelor's degree were associated with poor patient safety practice when compared to those who had Diploma. Healthcare providers who work within the special unit were associated with poor patient safety practice when compared to those who work in the Maternity Department. The study concludes that a higher percentage of healthcare providers were satisfied with the nature of patient safety at the Kakamega County Referral Hospital.

The study concludes that there is teamwork, staffs focus on learning, and there is respectful behaviors among staffs in the institution. The staff expressed concern over inadequate personnel in various units. The management readily takes action to address patient safety concerns and listen to staffs' suggestions for improving patient safety. The staffs readily speak up whenever they see something that could negatively impact patient safety, staffs are careful to prevent errors from recurring.

The study concludes that some patient care information is omitted during shift changes and when transferring a patient from one unit to another. Healthcare providers are satisfied with their job, training prepared staffs to understand the causes of medical errors, and personal input about patient care. Professionals also make mistakes/errors, and learning patient safety issues is as important as learning other more skill-based aspects of being a doctor/nurse.

## RECOMMENDATIONS

The study presented recommendations on research findings, implications on policy and practice.

### *Recommendations on Research Findings*

- The institution management should promote teamwork through creation of recreational programs and activities such as retreats and team building sessions.
- The institution management should encourage acquiring more skills through organization of workshops and seminars on patient safety.
- The institution management should incorporate staffs' suggestions for improving patient safety
- The institution management should develop efficient information systems to safeguard patient care information.

### *Implications on Policy and Practice*

The study findings are critical in informing policy and practice on patient safety in health institutions. In terms of policy implications, the study informs key policymakers especially the national and county governments. The outcomes inform the need to relook at policies on patient safety in health institutions. Based on the findings, policy makers should particularly focus on organizational and perceived factors affecting patient safety. On practice, the research informs the management of Kakamega County Referral Hospital on how best to improve patient safety. Improvement can be realized by adjusting the organizational and perceived factors.

### **Suggestion for Further Research**

The study assessed the patient safety at the Kakamega county referral hospital, Kenya. The focus was on demographic characteristics, organizational and perceived factors. The researcher relied on data from medical staff only in conducting the study. Future studies could consider also collecting data from the patients to get their views on the safety issue. Future studies could also compare patient safety between private and public health facilities.

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