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Prevalence, pattern and determinants of medical errors among health workers in suburban, Edo State, Nigeria: A multicenter study

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Abstract

Background: Medical errors are preventable adverse events that significantly impact patient safety, healthcare costs, and public trust. Understanding their prevalence, patterns, and determinants is essential for improving healthcare quality and safety. **Objectives:** This study assessed the prevalence, patterns, and determinants of medical errors among healthcare workers in Edo State, Nigeria. Methods: A cross-sectional study was conducted across a tertiary and a primary healthcare facility using stratified random sampling to recruit 324 healthcare workers. Data was collected using a structured, self-administered questionnaire that covered sociodemographic characteristics, prevalence and types of medical errors, and their determinants. Statistical analysis included descriptive statistics, chi-square tests, and logistic regression to identify significant associations and predictors of errors, with a significance threshold of $p < 0.05$. **Results:** The prevalence of self-reported medical errors was 58.6%, with medication errors (46.3%) being the most common, followed by laboratory errors (31.6%) and wrong communication with patients (30.0%). Among medication errors, dose omissions (60.2%) and wrong dose administration (43.2%) were predominant, while less than one year of experience significantly increased the odds of errors (OR = 3.17, p = 0.009). Fear of consequences (53.7%) and lack of reporting systems (19.1%) were key barriers to error reporting. **Conclusion:** The high prevalence and varied patterns of medical errors underscore the need for systemic interventions, including enhanced training, mentorship programs, and error-reporting systems to improve patient safety and healthcare outcomes.

Keywords: *Determinants, Medical errors, Patient safety, Patterns, Prevalence*

1. Introduction

Medical errors represent a critical concern in healthcare systems worldwide due to their implications for

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patient safety, healthcare costs, and professional practice (Garrouste-Orgeas *et al.*, 2012). These errors, defined as preventable adverse events that may occur due to incorrect actions or omissions in healthcare delivery. They are multifactorial in origin that occur in various clinical settings, ranging from diagnostic, treatment errors to system-related failures, including issues with communication, documentation, and processes (Gupta *et al.*, 2018; Pham *et al.*, 2012).

Globally, the prevalence of medical errors varies depending on the healthcare system, population characteristics, and the reporting mechanisms in place. In the United States alone, medication errors are responsible for at least one death and 1.3 million injuries annually (WHO, 2017). Additionally, medical errors account for as many as 98,000 deaths annually, according to a landmark study by the Institute of Medicine (Ranji, 2016). Medication errors are projected to cost $42 bn per year globally, accounting for over 1% of total global health expenditure, with a cost of $17-$29 bn annually in the United States (WHO, 2017; World Federation of Societies of Anaesthesiologists, 2022). These errors have far-reaching consequences, undermining public trust in medical services and leading to reduced productivity and lower population health levels.

Low- and Middle-Income Countries (LMIC's) have higher rates of medication-related adverse events in comparison to high-income countries. In African hospitals, at least one medication administration error was reported in 56.4% of all observations, with between 4.5% and 20.1% of patients reporting suspected adverse drug events, with a median mortality rate of 0.1% (Mekonnen *et al.*, 2018; Eshetie *et al.*, 2015; Tumwikirize *et al.*, 2011). The financial and social burdens of medical errors in these regions are significant but often underreported due to systemic challenges and resource constraints. Patients in Intensive Care Units (ICUs) are particularly vulnerable due to the complexity of their treatments, the use of parenteral medications, and the need for precise calculations in drug administration (Mohd Said *et al.*, 2016).

In Nigeria, studies have reported prevalence rates of medical errors ranging from 42.8% to 89.8% among healthcare practitioners (Afolalu *et al.*, 2021; Iloh *et al.*, 2017; Ilesanmi *et al.*, 2016; Oshikoya *et al.*, 2013). Medication administration errors were the most commonly reported, though intraoperative errors, transfusion errors, radio-laboratory investigation ordering errors, and physician diagnostic errors were also identified. The rate of error reporting varied between 30% and 84.4%, with fear of punishment, fear of litigation, blame culture, lack of confidentiality, and overwhelming reporting processes being commonly cited reasons for failure to report medical errors (Iloh *et al.*, 2017; Ilesanmi *et al.*, 2016; Oshikoya *et al.*, 2013).

Patterns of medical errors are influenced by the nature of healthcare delivery, patient demographics, and the complexity of medical interventions, with errors being commonly categorized into medication errors, surgical errors, diagnostic errors, and administrative lapses (Rodziewicz *et al.*, 2024). The determinants of medical errors are equally diverse, spanning individual, organizational, and systemic factors. At the individual level, factors such as fatigue, lack of adequate training, and cognitive overload among healthcare workers can contribute to errors (Dingley *et al.*, 2008). Organizational factors include poor staffing ratios, inadequate supervision, and lack of effective communication within healthcare teams, while systemic factors, such as fragmented healthcare delivery systems, outdated infrastructure, and limited access to technology, exacerbate the risk of errors (Richter *et al.*, 2016).

The consequences of medical errors are far-reaching, affecting patients, healthcare workers, and the broader healthcare system. For patients, medical errors can lead to prolonged hospital stays, increased healthcare costs, and, in severe cases, loss of life (Ranji, 2016; World Federation of Societies of Anaesthesiologists, 2022; Eshetie *et al.*, 2015; Tumwikirize *et al.*, 2011). Healthcare workers involved in errors may experience emotional distress, professional consequences, and a loss of confidence in their abilities (Afolalu *et al.*, 2021; Iloh *et al.*, 2017; Ilesanmi *et al.*, 2016). At the systemic level, medical errors contribute to inefficiencies, increased expenditure, and a loss of public trust in healthcare institutions (Ahsani-Estahbanati *et al.*, 2022).

Efforts to mitigate medical errors have focused on improving reporting systems, fostering a culture of safety, and implementing evidence-based interventions. Strategies such as simulation-based training, electronic health records, standardized protocols, and team-based approaches to care delivery have shown promise in reducing errors (Ahsani-Estahbanati *et al.*, 2022). Moreover, continuous education and training programs for

healthcare workers aim to address skill gaps and improve decision-making in complex clinical scenarios (Mistri *et al.*, 2023). Research into the prevalence, patterns, and determinants of medical errors will provide insights that will inform interventions and guide policymaking to enhance patient safety and healthcare quality.

2. Methods

2.1. Study setting

The study was conducted in Okada, Edo State, located in southern Nigeria, within the Ovia North-East Local Government Area. The region is home to both primary and tertiary healthcare facilities, which were selected to participate in the study. The tertiary healthcare facility was Igbinedion University Teaching Hospital, while the primary healthcare facility selected was Okada Primary Health Centre. These institutions were chosen as they provide a broad range of healthcare services, including emergency care, maternal and child health services, and outpatient care, making them representative of healthcare delivery in the region.

2.2. Study population

The study population comprised healthcare workers employed at Igbinedion University Teaching Hospital and Okada Primary Health Centre. These workers included doctors, nurses, pharmacists, and medical laboratory scientists. Healthcare workers at these facilities were targeted due to the critical role they play in healthcare delivery and the potential for medical errors in both primary and tertiary healthcare settings. Eligible participants were healthcare workers who were actively employed at the time of data collection and who were willing to participate in the study. Exclusion criteria included healthcare workers who were on leave or unavailable during the data collection period.

2.3. Sampling technique

The sampling method employed a multi-stage approach to select both healthcare facilities and healthcare workers. Initially, simple random sampling was used to select one tertiary and one primary healthcare facility from a list of available institutions in the area. Igbinedion University Teaching Hospital and Okada Primary Health Centre were selected for inclusion in the study.

Once the healthcare facilities were chosen, healthcare workers were selected through a multistage sampling to select the health facilities (from a tertiary and primary healthcare facilities) and stratified sampling technique, categorized by their professional roles: doctors, nurses, pharmacists, and medical laboratory scientists. This stratification ensured representation from each professional group within the healthcare sector. Following the stratification, healthcare workers were randomly selected from each group. To achieve the desired sample size, systematic sampling was then applied, where every n^{th} healthcare worker was chosen from the list of eligible participants within each group. The sample size was calculated based on the total population of healthcare workers at the selected healthcare facilities.

2.4. Data collection

Data for the study were gathered using a structured, self-administered questionnaire that had been pre-tested to ensure its reliability and validity. The questionnaire was adapted from the WHO model used to assess patient safety awareness among healthcare workers, with modifications made to focus specifically on medical errors (World Health Organization, 2011).

The first section collected sociodemographic data from respondents, including information on their age, gender, professional designation, years of service, and educational background. This information helped to provide context for the analysis of medical errors across different demographic groups.

The second section focused on the prevalence and patterns of medical errors. Respondents were asked whether they had ever made a medical error and, if so, to describe the type of error, such as medication errors, diagnostic mistakes, or surgical complications. The questionnaire also inquired whether respondents had

observed medical errors made by colleagues. These questions allowed for the collection of data on personal experiences of respondents and their observations of errors within the workplace.

The third section aimed to identify the determinants of medical errors. Respondents were asked to indicate potential causes of medical errors, such as heavy workloads, inadequate training, poor communication, or stress. Additionally, respondents were asked about barriers to reporting medical errors, with questions designed to identify factors that might discourage healthcare workers from disclosing errors, such as fear of punishment or lack of institutional support.

Data collection was carried out at the healthcare facilities, with participants completing the questionnaires in a private and confidential setting to ensure that their responses were candid and unaffected by external factors. The researchers ensured that the respondents understood the questions, and assistance was provided if necessary to clarify any ambiguities.

2.5. Ethical considerations

Ethical approval for the study was obtained from the Ethics and Research Committee of Igbinedion University Okada, and permission was granted by the hospital management of both Igbinedion University Teaching Hospital and the selected Primary Health Centres. Informed consent was obtained from all participants after they were fully informed of the study's purpose, the voluntary nature of their participation, and the confidentiality of their responses. Respondents were assured that their participation would not affect their professional standing or relationship with their employer in any way. They were also informed that they could withdraw from the study at any time without any repercussions. All responses were kept confidential, and data were securely stored for the duration of the study.

2.6. Data analysis

Data collected from the questionnaires were checked for completeness and consistency before being entered into the Statistical Package for Social Sciences (SPSS) version 25.0 for analysis. Descriptive statistics were used to summarize the responses, with categorical data presented as frequencies and proportions, while continuous data were reported as means and standard deviations. Bivariate analysis was conducted to assess the relationships between categorical variables, such as the association between profession and the prevalence of medical errors. Chi-square tests and Fisher's exact tests were used to test for statistical significance, with a p-value of less than 0.05 considered statistically significant. Logistic regression analysis was employed to identify factors that significantly contributed to the likelihood of healthcare workers experiencing or observing medical errors. The model was used to assess the relationship between sociodemographic variables, professional roles, work conditions, and the prevalence of medical errors. A p-value of less than 0.05 was used to determine statistical significance for the logistic regression analysis.

The results were presented in frequency tables, pie charts, and prose to provide a clear and comprehensive overview of the study's findings.

3. Results

3.1. Socio-demographic characteristics of respondents

The study sample consisted of 324 individuals, with a mean age of 29.0 ± 7.4 years. The age distribution was as follows: 112 (34.6%) participants were aged 21-25 years, 135 (41.7%) were aged 26-30 years, 51 (15.7%) were aged 31-40 years, and 26 (8.0%) were aged 41 years and above. Regarding sex, 157 (48.5%) were male, while 167 (51.5%) were female. Regarding marital status, 232 (70.7%) were single, 86 (27.5%) were married, 3 (0.9%) were cohabiting, and another 3 (0.9%) were separated or divorced. The religious affiliation of participants was predominantly Christian, with 272 (84.0%) identifying as such, followed by 42 (13.0%) who were Muslim, and 10 (3.1%) who adhered to traditional religions. The distribution of participants by job title was as follows: 130 (40.1%) were doctors (physicians or surgeons), 70 (21.6%) were nurses, 63 (19.4%) were pharmacists, and 61 (18.8%) were medical laboratory scientists. The years of practice among the participants varied, with 63 (19.4%) having practiced for less than one year, 69 (21.3%) for 1-5 years, 110 (34.0%) for 6-10 years, and 82 (25.3%) for more than 10 years. Regarding average income, 37 (11.4%) earned less than ₦ 100,000, 125 (38.6%)

earned between ₦ 100,000 and ₦ 199,000, 134 (41.4%) earned between ₦ 200,000 and ₦ 299,000, and 28 (8.6%) earned ₦ 300,000 or more (Table 1).

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (n = 324)	Percent (%)
Age (years)		
21-25	112	34.6
26-30	135	41.7
31-40	51	15.7
41 and above	26	8.0
Mean (±S.D)	**29.0 ± 7.4**	
Sex		
Male	157	48.5
Female	167	51.5
Marital status		
Single	232	70.7
Married	86	27.5
Cohabiting	3	0.9
Separated/Divorced	3	0.9
Religion		
Christian	272	84.0
Muslim	42	13.0
Traditional Religion	10	3.1
Position/Job title		
Doctor (Physician/Surgeon)	130	40.1
Nurse	70	21.6
Pharmacist	63	19.4
Medical Laboratory Scientist	61	18.8
Years of practice		
< 1	63	19.4
1-5	69	21.3
6-10	110	34.0
>10	82	25.3
Average income (₦)		
<100,000	37	11.4
100,000-199,000	125	38.6
200,000-299,000	134	41.4
≥300,000	28	8.6

3.2. Prevalence of medical errors

Among the 324 participants, 190 (58.6%) reported having made a medical error, while 134 (41.4%) had not. Of those who had made an error, the most common type was medication errors, with 88 (46.3%) participants reporting such mistakes. Other types of errors included laboratory errors, which 60 (31.6%) participants

reported, wrong communication with patients by 57 (30.0%), and wrong diagnoses by 47 (24.7%). Equipment or system failures were cited by 42 (22.1%), surgical errors by 29 (15.3%), and hospital infections by 18 (9.5%). When asked about errors made by co-workers, 95 (29.7%) participants noticed such errors, while 229 (70.3%) did not. Among those who observed errors, all 95 (100.0%) reported noticing medication errors and wrong lab results for a patient. Additionally, 86 (90.5%) reported witnessing wrong diagnoses, 47 (49.5%) wrong communication with patients, and 45 (47.4%) surgical errors. Equipment or system-related errors were noted by 32 (33.7%), and hospital infections by 18 (19.0%) (Table 2).

Table 2: Prevalence of medical errors among health workers

Variable	Frequency (n = 324)	Percent (%)
Ever made a medical error		
Yes	190	58.6
No	134	41.4
Type of medical error made (n = 190) *		
Medication errors	88	46.3
Laboratory errors	60	31.6
Wrong communication with patients	57	30.0
Wrong diagnoses	47	24.7
Equipment/system failures	42	22.1
Surgical errors	29	15.3
Hospital infections	18	9.5
Noticed errors made by co-worker		
Yes	95	29.7
No	229	70.3
Type of error made by co-worker (n = 95) *		
Medication error	95	100.0
Wrong lab results for a patient	95	100.0
Wrong diagnosis	86	90.5
Wrong communication with patients	47	49.5
Surgical error	45	47.4
Equipment/system-related errors	32	33.7
Hospital infections	18	19.0

Note: * Multiple choice question.

3.3. Patterns of medical errors

Among the 88 medication errors reported, the most common type was omitting a dose, which accounted for 53 (60.2%) of the errors. Wrong dose administration was the second most common, reported by 38 (43.2%), followed by giving the wrong patient a drug, which occurred in 15 (17.0%) cases, and prescribing or administering at the wrong time, reported in 12 (13.6%) cases.

Regarding surgical errors, 29 cases were identified, with the majority being wrong procedures, which accounted for 22 (75.9%) of the errors. Mislabelled instruments were reported in 5 (17.2%) cases, while wrong site errors were noted in 2 (6.9%). In the case of laboratory errors, 60 were reported, with wrong interpretation being the most frequent, accounting for 35 (58.3%) of the errors. Wrong results were reported in 12 (20.0%) cases, wrong patient in 8 (13.3%), and wrong specimen in 5 (8.4%) (20.0%) (Table 3).

Table 3: Pattern of medical errors among respondents		
Variable	**Frequency**	**Percent (%)**
Type of medication error made (n=88)*		
Omitting a dose	53	60.2
Wrong dose administration	38	43.2
Giving a wrong patient a drug	15	17.0
Prescribing/administering at the wrong time	12	13.6
Type of surgical error made (n=29)*		
Wrong procedure	22	75.9
Mislabelled instruments	13	44.8
Wrong site	7	24.1
Type of laboratory error made (n=60)*		
Wrong interpretation	35	58.3
Wrong results	24	40.0
Wrong patient	14	23.3
Wrong specimen	12	20.0
Note: * Multiple response question.		

3.4. Self-reported causes of medical errors

The study found that the most commonly reported causes of medical errors were heavy workload, cited by 279 (86.1%), and communication problems, reported by 197 (60.8%). Other significant causes included lack of knowledge, which was identified by 176 (54.3%), and multiple jobs, reported by 145 (44.8%). Poor management was noted by 132 (40.7%), while night shifts or extra shifts were mentioned by 104 (32.1%) (Table 4).

Table 4: Self-reported causes of medical errors and underreporting		
Variable	**Frequency (n = 324)**	**Percent (%)**
Causes of medical errors*		
Heavy workload	279	86.1
Communication problems	197	60.8
Multiple jobs	145	44.8
Lack of knowledge	176	54.3
Night shifts/Extra shifts	104	32.1
Poor management	132	40.7
Reason for underreporting of medical errors*		
Fear of consequences	174	53.7
Time-consuming	27	8.3
No reporting system exists	62	19.1
Management does not take any proper action after reporting	45	13.9
There is no need to report errors	16	4.9
Note: * Multiple response question.		

3.5. Determinants of medical errors

A heavy workload was associated with a higher prevalence of medical errors, as 75 (77.3%) of those with a

heavy workload reported errors, compared to 22 (22.7%) who did not, with a χ^2 value of 19.914 and a p-value <0.001. Similarly, bad management was significantly associated with medical errors, with 22 (25.0%) of those experiencing bad management reporting errors, compared to 66 (75.0%) who did not, yielding a χ^2 value of 56.378 and a p-value <0.001.

Age was positively associated with the likelihood of making a medical error, with an odds ratio (OR) of 1.065 (95% CI: 1.011-1.122, p = 0.017), suggesting that older participants were more likely to report errors. Respondents who were single had an increased likelihood of making errors, with an OR of 2.540 (95% CI: 1.201-5.373, p = 0.015) compared to those who were married. Regarding job title, doctors (physicians/surgeons) had a lower likelihood of making medical errors, with an OR of 0.221 (95% CI: 0.085-0.572, p = 0.002). Similarly, nurses and pharmacists had lower odds of making errors, with ORs of 0.391 (95% CI: 0.172-0.889, p = 0.025) and 0.373 (95% CI: 0.160-0.868, p = 0.022), respectively, compared to medical laboratory scientists.

Years of practice also influenced the likelihood of medical errors. Respondents with less than 1 year of experience had a significantly higher odds of making errors, with an OR of 3.170 (95% CI: 1.341-7.491, p = 0.009) compared to those with over 10 years of experience. Income level was also a significant determinant, with respondents earning between ₦ 100,000 and ₦ 199,000 having an OR of 5.490 (95% CI: 1.283-23.489, p = 0.022), and those earning between ₦ 200,000 and ₦ 299,000 having an OR of 8.504 (95% CI: 2.132-33.924,

Table 5: Determinants of medical errors among respondents

Factors	β (Regression co-efficient)	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age group (years)	0.063	1.065	1.011	1.122	0.017#
Sex					
Male	-0.194	0.823	0.467	1.450	0.501
Female*		1			
Marital status					
Single	0.932	2.540	1.201	5.373	0.015#
Ever married*		1			
Position/Job title					
Doctor (physician/surgeon)	-1.510	0.221	0.085	0.572	0.002#
Nurse	-0.938	0.391	0.172	0.889	0.025#
Pharmacist	-0.986	0.373	0.160	0.868	0.022#
Medical Laboratory Scientist*		1			
Years of experience/practice					
<1	1.154	3.170	1.341	7.491	0.009#
1-5	-0.553	0.575	0.260	1.273	0.172
6-10	-0.502	0.606	0.301	1.217	0.159
>10*		1			
Average income					
Less than ₦100,000	1.223	3.398	0.672	17.176	0.139
₦100,000-199,000	1.703	5.490	1.283	23.489	0.022#
₦200,000-299,000	2.141	8.504	2.132	33.924	0.002#
₦300,000 and above*		1			

Note: * Reference category; # Statistically significant.

p = 0.002), both indicating a higher likelihood of reporting medical errors compared to those earning ₦ 300,000 or more (Table 5).

4. Discussion

The study on medical errors among healthcare workers in Edo State, Nigeria, highlighted significant findings regarding the prevalence, patterns, and determinants of medical errors. Regarding prevalence, the study found that 58.6% of healthcare workers reported having made a medical error, with medication errors being the most frequent, affecting 46.3% of participants. This finding was comparable to findings from Abia state, Nigeria in 2017 (Iloh *et al.*, 2017), where 42.8% of medical practitioners were noted to have made medical errors. The high prevalence observed in this study was attributed to systemic issues such as heavy workloads and communication breakdowns, which were reported by 86.1% and 60.8% of participants, respectively. These systemic challenges, compounded by a culture of underreporting, often limit the ability to mitigate errors effectively. The public health implications of this finding are profound, as medical errors contribute to adverse patient outcomes, increased healthcare costs, and diminished public trust in healthcare institutions. To address this issue, comprehensive hospital-wide error-reporting systems that ensure anonymity and foster a culture of transparency and learning should be put in place.

Furthermore, the study revealed that only 29.7% of participants reported observing medical errors made by colleagues, with medication and laboratory errors being the most frequently observed. This low rate of observation contrasts with findings in a similar study conducted in Iran (Mahdaviazad *et al.*, 2020), where almost all respondents had witnessed medical errors made by colleagues, with 74.9% of physicians and 92.2% of nurses, although formal reporting rates were much lower, ranging from 12.9% to 59.2%. In our study, the reluctance to report observed errors was linked to fears of punishment, lack of confidentiality, and insufficient institutional support, as cited by 53.7% of respondents. The implications of underreporting are significant, as low reporting levels provides limited opportunities to address systemic flaws and improve healthcare delivery.

Regarding patterns of medical errors, the study identified that omitting a dose was the most common medication error, accounting for 60.2% of reported cases, followed by administering the wrong dose, which accounted for 43.2%. These findings aligned with global trends, particularly in intensive care settings, where complex treatment regimens increased the likelihood of dosing errors (Laher *et al.*, 2021; Farzi *et al.*, 2017). The prevalence of these errors was attributed to staff fatigue, multitasking, and inadequate knowledge or training. The public health significance of medication errors was substantial, as they could lead to preventable adverse drug reactions, prolonged hospital stays, and compromised patient recovery. To address this issue, electronic prescribing systems and barcoding technologies can be implemented to minimize such errors.

Surgical errors were also prominent, with wrong procedures being the most common, constituting 75.9% of all reported surgical errors. These findings differed from findings in a study conducted in California, USA in 2021 (Cohen *et al.*, 2021), which showed that retained foreign objects in patients were the most common surgical error, reported in 66.2% of cases, followed by wrong site of surgery and surgery being performed on the wrong patient. The errors observed were often linked to poor teamwork and inadequate use of preoperative checklists. The consequences of such errors can be grave, as they could result in increased morbidity, mortality, and additional costs for corrective surgeries. To mitigate these errors, standardized surgical safety checklists should be used, fostering regular team briefings to enhance communication and coordination.

The study also explored the determinants of medical errors, revealing that heavy workloads were significantly associated with higher error rates. Among participants experiencing heavy workloads, 77.3% reported errors, with statistical analysis confirming a strong association ($p < 0.001$). This finding was consistent with findings in Indonesia in 2021 (Ratanto *et al.*, 2021), which identified excessive workload as the most critical determinant of errors, reporting up to five times more errors among healthcare workers with excessive workload. The implications of this finding were notable, as heavy workloads not only compromised patient safety but also contributed to burnout among healthcare workers. To alleviate this burden, increasing staffing levels and optimizing work schedules to distribute workloads more evenly can reduce stress and subsequently improve medical care.

In addition to workload, the study identified years of practice as a significant determinant of medical errors. Participants with less than one year of experience demonstrated the highest odds of making errors, with an odds ratio of 3.17 ($p = 0.009$). This finding echoed findings in Abia state in 2017 (Iloh *et al.*, 2017), which showed that doctors with shorter years of practice were more likely to make medical errors. The increased likelihood of errors among less experienced staff may be due to lack of practical skills, confidence, and familiarity with complex clinical scenarios.

5. Conclusion

The study revealed a high prevalence of medical errors among healthcare workers in Edo State, Nigeria, with medication errors being the most frequent. Patterns of errors indicated a predominance of dose omissions and wrong procedures in medication and surgical errors, respectively. Determinants such as heavy workload and limited years of experience were significant contributors to these errors. These findings accentuate the critical need for systemic interventions, including workload redistribution, structured mentorship, and robust reporting systems. Addressing these issues is essential to improving patient safety, reducing healthcare costs, and restoring public trust in healthcare services.

References

Afolalu, O.O., Jordan, S., Kyriacos, U. (2021). Medical error reporting among doctors and nurses in a Nigerian hospital: A cross-sectional survey. *J Nurs Manag*., 29(5): 1007-1015. doi: 10.1111/jonm.13238.

Ahsani-Estahbanati, E., Doshmangir, L., Najafi, B. *et al.* (2022). Incidence rate and financial burden of medical errors and policy interventions to address them: A multi-method study protocol. *Health Serv Outcomes Res Method.,* 22(3): 244-252. doi: 10.1007/s10742-021-00261-9.

Cohen, A.J., Lui, H., Zheng, M. *et al.* (2021). Rates of serious surgical errors in California and plans to prevent recurrence. *JAMA Netw Open*., 4(5): e217058. doi: 10.1001/jamanetworkopen.2021.7058.

Dingley, C., Daugherty, K., Derieg, M.K. *et al.* (2008). Improving patient safety through provider communication strategy enhancements. in: Henriksen, K., Battles, J.B., Keyes, M.A. *et al.* (Editors), *Advances in Patient Safety: New Directions and Alternative Approaches,* 3: August (Performance and tools), Agency for Healthcare Research and Quality (US), Rockville (MD). Available from: https://www.ncbi.nlm.nih.gov/books/NBK43663/

Eshetie, T.C., Hailemeskel, B., Mekonnen, N., Paulos, G., Mekonnen, A.B. and Girma, T. (2015). Adverse drug events in hospitalized children at Ethiopian University Hospital: A prospective observational study. *BMC Pediatr*., 15: 83.

Farzi, S., Irajpour, A., Saghaei, M. and Ravaghi, H. (2017). Causes of medication errors in intensive care units from the perspective of healthcare professionals. *J Res Pharm Pract*., 6(3): 158-165. doi: 10.4103/jrpp.JRPP_17_47.

Garrouste-Orgeas, M., Philippart, F., Bruel, C., Max, A., Lau, N. and Misset, B. (2012). Overview of medical errors and adverse events. *Annals of Intensive Care*, 2: 1-9.

Gupta, A., Harrod, M., Quinn, M., Manojlovich, M., Fowler, K.E., Singh, H., Saint, S. and Chopra, V. (2018). Mind the overlap: How system problems contribute to cognitive failure and diagnostic errors. *Diagnosis*., 5(3): 151-156.

Ilesanmi, R.E., Okojie, E.O. and Ojerinde, A.C. (2016). Methods of voluntary reporting medication administration errors among nurses in the University College Hospital, Ibadan, Nigeria. *Afr J Med Med Sci*., 45(2): 197-206.

Iloh, G.U., Chuku, A. and Amadi, A.N. (2017). Medical errors in Nigeria: A cross-sectional study of medical practitioners in Abia State. *Arch Med Health Sci*., 5(1): 44-49. doi: 10.4103/amhs.amhs_1_17.

Laher, A.E., Enyuma, C.O., Gerber, L., Buchanan, S., Adam, A. and Richards, G.A. (2021). Medication errors at a tertiary hospital intensive care unit. *Cureus*., 13(12): e20374. doi: 10.7759/cureus.20374

Mahdaviazad, H., Askarian, M. and Kardeh, B. (2020). Medical error reporting: Status quo and perceived barriers in an orthopedic center in Iran. *Int j prev med*., 11: 14. doi: 10.4103/ijpvm.IJPVM_235_18.

Mekonnen, A.B., Alhawassi, T.M., McLachlan, A.J. and Brien, J.A.E. (2018). Adverse drug events and medication errors in African hospitals: A systematic review. *Drugs Real World Outcomes*, 5(1): 1-24.

Mistri, I.U., Badge, A. and Shahu, S. (2023). Enhancing patient safety culture in hospitals. *Cureus.*, 15(12): e51159. doi: 10.7759/cureus.51159.

Mohd Said, M., Tan, S., Rahman, R. and Taha, N. (2016). An investigation of errors: The preparation and administration of parenteral medications in an intensive care unit of a tertiary teaching hospital in Malaysia. *J Pharm Pract res.*, 8(2): 55-7.

Oshikoya, K.A., Oreagba, I.A., Ogunleye, O.O., Senbanjo, I.O., MacEbong, G.L. and Olayemi, S.O. (2013). Medication administration errors among paediatric nurses in Lagos public hospitals: an opinion survey. *Int J Risk Saf Med.*, 25(2): 67-78. doi: 10.3233/JRS-130585.

Pham, J.C., Aswani, M.S., Rosen, M., Lee, H., Huddle, M., Weeks, K. and Pronovost, P.J. (2012). Reducing medical errors and adverse events. *Annual Review of Medicine*, 63(1): 447-63.

Ranji, S. (2016). Measuring and responding to deaths from medical errors. *Agency for Healthcare Research and Quality: Patient Safety Network*, March 22. Available online: https://psnet.ahrq.gov/perspective/measuring-and-responding-deaths-medical-errors

Ratanto Hariyati, T.S., Mediawati, A.S. and Eryando, T. (2021). Workload as the most important influencing factor of medication errors by nurses. *Open Nurs J.*, 15: 204. doi: 10.2174/1874434602115010204.

Richter, J.P., McAlearney, A.S. and Pennell, M.L. (2016). The influence of organizational factors on patient safety: Examining successful handoffs in health care. *Health Care Manage Rev.*, 41(1): 32-41. doi: 10.1097/HMR.0000000000000033.

Rodziewicz, T.L., Houseman, B., Vaqar, S. *et al.* (2024). Medical error reduction and prevention. [Updated 2024 Feb 12], in: *StatPearls* [Internet], StatPearls Publishing, Treasure Island (FL). Available from: https://www.ncbi.nlm.nih.gov/books/NBK499956/

Tumwikirize, W.A., Ogwal-Okeng, J.W., Vernby, A., Anokbonggo, W.W., Gustafsson, L.L. and Lundborg, S.C. (2011). Adverse drug reactions in patients admitted on internal medicine wards in district and regional hospitals in Uganda. *Afr Health Sci.*, 11: 72-8.

World Federation of Societies of Anaesthesiologists. (2022). World patient safety day: Medication without harm. https://wfsahq.org/world-patient-safety-day-medication-without-harm

WHO. (2011). Patient safety curriculum guide: Topic 1A questionnaire before. [Internet]. Available from: https://cdn.who.int/media/docs/default-source/patient-safety/curriculum-guide/ps-curr-2011/questionnaire/topic1a_questionnaire-before.pdf?sfvrsn=71f01738_9

WHO. (2017). WHO launches global effort to halve medication-related errors in 5 years. Available online: https://www.who.int/news/item/29-03-2017-who-launches-global-effort-to-halve-medication-related-errors-in-5-years

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