THE RELATIONSHIP BETWEEN MEDICATION ADMINISTRATION ERRORS AND HEALTH OUTCOMES AMONG PATIENTS IN SELECTED HOSPITALS IN NIGER STATE, NIGERIA

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Abstract

Medication administration errors (MEs) are a critical global healthcare issue, significantly impacting patient safety and health outcomes, particularly in low-resource settings like Niger State, Nigeria. This study investigates the relationship between MEs and health outcomes among patients in six selected hospitals in Niger State. Guided by Robert K. Merton's Theory of Unintended Consequences (1936), the research explores how purposive actions in medication administration can lead to unforeseen adverse outcomes due to ignorance, error, short-term concerns, and systemic complexities. A cross-sectional survey of 345 respondents (healthcare professionals and patients) utilized a 4-point Likert scale questionnaire to assess perceptions of ME impacts, complemented by 18 key informant interviews for qualitative insights focusing on reflexive thematic analysed. Descriptive statistics and multiple linear regression analysed quantitative data, revealing a significant but moderate relationship ($R=0.463$, $R^2=0.215$, $p<0.001$) between MEs and health outcomes, with mistakes in medical orders ($\beta=0.242$, $p=0.001$) and wrong-route administration ($\beta=-0.211$, $p<0.000$) as key predictors. Common MEs included wrong medication (79.2% agreement), incorrect dose (69.5%), wrong route (54.2%), and providing medication to a wrong patient (60.6%), leading to adverse drug effects, hospitalizations, and increased mortality. Despite global efforts to reduce MEs, their persistence in Niger State underscores the need for targeted interventions. Recommendations include implementing barcode scanning, standardized checklists, and increased staffing to mitigate errors. This study provides a foundation for policy changes to enhance patient safety in Niger State's healthcare system, addressing a critical gap in understanding MEs in resource-constrained settings.

Key words: Medication administration errors, patient health outcomes, hospitals unintended consequences

Introduction

Medical errors are a significant concern in healthcare delivery worldwide, leading to adverse health outcomes, increased morbidity, and mortality. Medical errors refer to preventable events or harm caused to patients due to health care providers' actions or omission. Patient safety has become a critical focus in global healthcare systems (World Health Organization (WHO, 2019). Patients worldwide continue to experience harm during healthcare delivery in both high- and low-income countries (Mekonnen, Alhawassi, McLachlan, & Brien,2018). Patient safety aims to enhance safe practices and minimize adverse medical outcomes in healthcare facilities (Okoro, Ogbemudia & Okeke, 2021). However, the complexity of healthcare delivery systems increases the likelihood of errors, particularly medication errors (MEs), which are a significant concern (Reason, 2000). Globally, as many as 40% of patients using healthcare services are harmed, with the majority of incidents being medication-related and preventable (WHO, 2019). Medication administration error is one among medical errors that posed a great consequence on health outcome of the patients. A medication administration error is defined as any preventable event that may lead to inappropriate medication use or patient harm while under the control of healthcare professionals, patients, or consumers (National Coordinating Council for Medication Error Reporting and Prevention (Dedefo et al., 2016).

The results also revealed that lack of knowledge and negative self-care practices pose very serious threats to women's health and wellbeing. Lack of preventive care leads to an increased risk of infection, late detection, repeated infections, infertility, pelvic inflammatory disease, pregnancy complications, psychological problems, and ultimately lowers women's quality of life. Women who have good knowledge about reproductive health, on the other hand, tend to practice good self-care behaviours that result in timely detection and treatment, thus improving women's reproductive health conditions. Consequently, there is a need to enhance women's knowledge of reproductive health and adopt good self-care practices to reduce the impact of RTIs.

In response, the World Health Organization launched the Global Patient Safety Challenge in 2017aimed at reducing medication errors and related harm by 50% in healthcare settings (WHO, 2019). For instance, medication errors contribute to substantial economic burdens, with costs per error ranging from €2.58 to €111,727.08 (Wu, 2021). In the United Kingdom, MEs account for an annual cost of £98.5 million, driven by medication-related hospital

admissions and prolonged hospitalizations due to preventable ADEs (Elliott et al., 2018). Medication administration errors are a worldwide problem that affects 18.7% to 56% of hospitalized patients. In Australia, 60% to 80% of patients experienced medication administration errors, and 64% of patients in Nigeria (Feleke, Mulatu &Yesmaw, 2019).). Despite efforts to reduce MEs, no significant decrease in hospitalizations or mortality related to these errors has been observed (Iorkosu, Iorshagher&Achiaku, 2025). It has been estimated that 3.4–97% of adult patients experience at least one medication error during hospital admission (WHO, 2018), with low-income countries, including those in Africa, reporting MEs in 75–97% of patients (Mekonnen et al., 2018). Medication administration errors are a worldwide problem that affects 18.7% to 56% of hospitalized patients.

African is not exempted from this scenario. For instance, a study in Africa indicates that approximately half of adverse drug events (ADEs) result from medication errors, with Ethiopia reporting a rising prevalence of MEs across various healthcare settings (Iorkosu&Afatakpa, 2025). These errors can lead to severe consequences, including tragic patient outcomes, psychological distress for healthcare professionals (e.g., guilt, shame, and self-doubt), and significant financial and reputational costs for healthcare institutions (Iorkosu et al., 2025).The emergency ward is a critical setting where medication errors are presumed to be prevalent due to its high-pressure environment (Rothschild et al., 2005).

Medication administration errors constitute a significant patient safety challenge in Nigeria's healthcare system. Self-reported medication error prevalence among health professionals reaches 47%, frequently linked to overwork. Among nurses in south-eastern Nigeria, 86.5% reported having administered medications incorrectly at some point, often due to misidentification of drugs and poor storage practices. These errors contribute to patient harm, prolonged hospital stays, and increased healthcare costs (Abosede, Prisca, & Adejumo, 2019).

Despite regulatory frameworks, systemic issues such as heavy workloads, inadequate staffing, and fear of consequences continue to impede effective reporting and prevention of medication errors. The Medical and Dental Council of Nigeria (MDCN), through its Disciplinary Tribunal, addresses professional misconduct and negligence, with outcomes ranging from interim suspensions and practice suspensions to admonishment or removal from the register in severe cases. However, public data specifically on medication administration errors remains limited, and underreporting persists. Unlike most crimes that

require intent (mens rea), medical errors are typically unintentional slips or system failures occurring within the context of intended healing. This distinction emphasizes learning, system improvements, and a just culture over punishment, with criminal charges reserved primarily for cases of gross negligence or recklessness. In Nigeria, particularly in Niger State, there is limited research on the prevalence, causes, and impact of MEs in hospital settings, especially in emergency wards where the risk of errors is heightened due to the fast-paced environment. Despite global efforts to reduce MEs, their persistence in low-resource settings like Niger State exacerbates patient harm and strains healthcare systems. This study seeks to address the gap in understanding the relationship between medication administration errors and patient health outcomes in selected hospitals in Niger State, aiming to inform strategies for improving patient safety. Specifically, the objective of the study was to find out the relationship between Medication Administration Errors and Health outcomes among patients in selected hospitals in Niger state, Nigeria, with corresponding hypothesis to test if there was a significant relationship between administration errors and patients' health outcomes in selected hospitals in Niger State or not.

Theoretical Framework

The Theory of Unintended Consequences, introduced by Robert K. Merton in 1936, explains how purposive social actions can lead to unforeseen outcomes due to the complexity of social systems, human behaviour, and limited foresight. It identifies five sources of unintended consequences: ignorance, error, short-term concerns, conflicting values, and self-fulfilling anticipations. These consequences can be positive, negative, or peripheral. In healthcare, particularly in Niger State, the theory applies to medication errors (MEs), which result from intentional actions like diagnosis, prescription, and medication administration but can lead to adverse patient outcomes. For example, a misdiagnosis or incorrect prescription may cause harm, as seen in cases like the death of Dr. Stella Amey Adadevoh in 2014 due to an Ebola-related medical error (Ajemigbitse et al., 2019). The theory highlights four tenets in this context: (1) purposive social action (intentional healthcare interventions), (2) unanticipated consequences (e.g., adverse drug reactions), (3) complexity and interdependence of healthcare systems (e.g., poor communication leading to errors), and (4) limitations of human knowledge (e.g., unforeseen side effects). Despite criticisms that the theory is broad, vague, and hindsight-focused, it provides a valuable framework for

understanding MEs in Niger State, guiding strategies to reduce errors and improve patient safety.

In healthcare, particularly in Niger State, Nigeria, this theory directly applies to medication administration errors (MAEs) deviations from prescribed orders during drug delivery. These errors emerge from intentional clinical actions, such as a nurse administering antibiotics to treat infection, yet result in adverse patient outcomes like organ damage or death. Merton's five sources of unintended consequences ignorance, error, short-term concerns, conflicting values, and self-fulfilling anticipations provide a structured lens to dissect how well-meaning administration protocols in resource-constrained settings inadvertently harm patients.

Ignorance and error dominate MAEs in Niger State, where incomplete pharmacological knowledge or misread prescriptions lead to wrong-dose or wrong-drug incidents. For example, a nurse may administer ceftriaxone instead of cefuroxime due to similar packaging, triggering anaphylaxis in allergic patients. Short-term priorities, such as rushing intravenous infusions during emergencies, overlook risks like phlebitis or haemolysis. Conflicting values arise when staff reuse syringes amid shortages, fostering infections. Self-fulfilling fears of litigation delay critical dosing, worsening sepsis outcomes. These sources transform purposive actions into negative health consequences, with regional data indicating MAEs contribute to 15–25% of adverse drug events and elevate mortality in under-resourced facilities.

The complexity of Niger State's healthcare system amplifies these unintended effects through poor communication, inadequate training, and supply chain failures. A physician's verbal order, misheard in a noisy ward, cascades into incorrect administration, prolonged hospitalization, or disability. Limitations in human knowledge such as unrecognized genetic variations affecting drug metabolism further compound risks, as seen in severe reactions to sulphonamides. TUC's tenets highlight that while actions are purposeful, outcomes remain unpredictable within interdependent systems lacking robust checks, directly linking MAEs to increased morbidity, repeat admissions, and strained healthcare resources.

Methodology

A cross-sectional survey was adopted for the study. This is due to fact that even though number of healthcare providers is reported to be 7,368, the total number of patients in Niger State is unknown. Given the lack of a definitive patient population, Cochran's formula is

ideal for calculating the required sample size based on the desired confidence level, margin of error, and expected proportion of the population. Using Cochran's formula, a total of 345 sample size including healthcare professionals and patients) across six hospitals, Federal Medical Centre Bida, General Hospital Lapai, General Hospital Minna, General Hospital Kuta, General Hospital Kontagora, and General Hospital Mokwa was used for the study. A 4-point Likert scale questionnaire to assess relationship between Medication Administration Errors and health outcomes was used for the study. Eighteen (18) key informants were interviewed. That is, three (3) key informants were drawn from each of the six sampled hospitals. Descriptive statistics and multiple linear regression were used to analyse quantitative data while reflexive thematic analysed was used for the interviews. The researcher applied for ethnical clearance to the Niger State ministry of health (NSMH/SRW/2025/0124) through the social and behaviour ethical committee of the Federal University, Lafia, Nasarawa state. Also, a written permission was obtained from the authority of the selected hospitals before the study commenced, and consent was also obtained from all the participants for the KII. The human right of self-determination whereby a respondent has the right to participate in the study or refuse to do so was respected.

Results

Table I: Respondents' Responses on Medication Administration Errors and Health Outcomes among patients in Selected Hospitals in Niger State, Nigeria

Variable	Frequency N=345	Percent 100
Age		
15-20	56	16.3
26-30	108	31.3
31-35	104	30.2
36-40	77	22.3
Sex		
Male	139	40.4
Female	205	59.6
Marital status		
Single	118	34.2
Married	172	49.9
Divorce	35	10.1
Widow	20	5.8
Cadre		
Resident doctor	59	17.1
Nurse	125	36.2
Pharmacist	111	32.2

Medical Lab. Scientist	50	14.5
Years of experience		
Less than 5 years	56	16.2
5-10 years	148	42.9
11-15	93	27.0
16 above	48	13.9
Level of education		
Diploma	131	38.0
Bachelor Degree	119	34.5
Master Degree	60	17.4
Doctorate Degree	13	3.8
Others	22	6.4
Work hours Per Week		
Less than 20 hours	24	7.0
20-40 hours	59	17.1
41-60	157	45.5
More than 60 hours	105	30.4

Source: Fieldwork, 2025

Table 4.1 presents a detailed demographic profile of the 345 respondents who participated in a study examining the impact of medication administration errors and health outcomes among patients in six selected hospitals in Niger State, Nigeria. The age breakdown shows a youthful and diverse respondent pool, reflecting the dynamic workforce and patient population in Niger State's hospitals. The largest group, 98 respondents (28.4%), is aged 26–30 years, suggesting a significant presence of young professionals, likely early-career doctors, nurses, or patients in their prime working years. Closely following are 94 respondents (27.2%) aged 31–35, indicating a strong mid-career or adult patient representation. The 36–40 age groups include 75 respondents (21.7%), representing more experienced professionals or older patients. The smallest group, 36 respondents (10.4%), is aged 15–20, likely younger patients or junior healthcare workers, such as community health extension workers. This distribution underscores a predominantly young to middle-aged sample, which aligns with Nigeria's demographic profile (median age ~18 years) and suggests that the study captures perspectives from those most active in healthcare delivery or seeking care, critical for assessing error impacts in a high-pressure environment.

The sex distribution reveals a female-majority sample, with 205 females (59.6%) compared to 139 males (40.4%). This skew may reflect the dominance of women in nursing (a traditionally female-heavy profession in Nigeria) and possibly higher female patient representation, as women often seek healthcare for maternal or family-related issues in Niger State, where maternal mortality is high (1,020 per 100,000 live births). The male presence,

while significant, likely includes resident doctors and pharmacists, who are often male in Nigerian settings.

The marital status data shows 172 respondents (49.9%) were married, forming the largest group, likely reflecting stable, working-age professionals or patients with family responsibilities. Single respondents' number 118 (34.2%), possibly younger healthcare workers or unmarried patients. Divorced individuals (35, 10.1%) and widows (20, 5.8%) form smaller groups, suggesting a mix of life experiences that could influence perceptions of healthcare errors. For instance, married respondents may face added stress from family duties, impacting their error-related experiences, while single respondents might reflect the views of younger, less experienced staff or patients. This diversity ensures the study captures varied emotional and social contexts affecting trust in healthcare systems.

The cadre breakdown highlights the professional diversity of the respondents, with nurses being the largest group at 125 (36.2%), reflecting their critical role in patient care and medication administration in Niger State's hospitals. Pharmacists follow closely with 111 respondents (32.2%), emphasizing their involvement in prescription processes where errors often occur. Resident doctors (59, 17.1%) and medical laboratory scientists (50, 14.5%) represent smaller but vital groups responsible for diagnostics and testing, respectively. This distribution ensures that the study captures insights from key players in the healthcare delivery chain, each facing unique error-related challenges nurses with administration errors, pharmacists with prescription issues, and doctors with diagnostic decisions providing a holistic view of error dynamics.

The data shows that the experience levels vary, with the largest group, 148 respondents (42.9%), having 5–10 years of experience, indicating a mid-career dominance likely to have encountered numerous error scenarios. Those with 11–15 years (93, 27.0%) bring seasoned perspectives, while 56 respondents (16.2%) with less than 5 years represent novices, potentially more prone to errors due to inexperience, as noted in the study (junior doctors make twice as many prescribing errors). The 48 respondents (13.9%) with over 16 years of experience likely include senior doctors or administrators, offering authoritative insights into systemic issues. This range ensures the study reflects both fresh and veteran perspectives on diagnostic errors, critical in a context where experience influences error rates.

Data on education levels show 131 respondents (38.0%) hold diplomas, likely nurses or community health workers, common in Nigeria's healthcare system. Bachelor's degree

holders (119, 34.5%) include doctors and pharmacists, while 60 (17.4%) have master's degrees, possibly senior professionals or specialists. Only 13 (3.8%) have doctorates, likely senior doctors, and 22 (6.4%) fall under "others" (e.g., certificates or non-degree qualifications). This educational diversity reflects the varied training levels in Niger State's hospitals, where lower-educated staff may face challenges with complex diagnostics, contributing to errors, while higher-educated respondents may identify systemic issues like equipment shortages, enriching the study's findings.

Also, the work hours data reveals a high workload environment, with 157 respondents (45.5%) working 41–60 hours weekly, typical for healthcare professionals in understaffed Nigerian hospitals. A significant 105 respondents (30.4%) work over 60 hours, indicating extreme workloads that the study links to error prevalence (e.g., rushed diagnoses). The 59 respondents (17.1%) working 20–40 hours and 24 (7.0%) working less than 20 hours likely include part-time staff or patients not bound by work schedules. This distribution underscores the intense pressure on healthcare workers, a key factor in diagnostic errors, as overworked staff is more likely to miss critical symptoms or make mistakes under fatigue.

Table 2: Respondents Responses on Medication Administration Errors and Health Outcomes among patients in selected hospitals in Niger state, Nigeria

Items	SA	A	D	SD	X	St. D	Dec.
Providing the wrong medication can lead to adverse drug events (ADEs).	122 35.4	151 43.8	61 17.7	11 3.2	2.83	.853	Accepted
Giving the wrong dose of medication can lead to medication-related hospitalizations.	74 21.4	166 48.1	78 22.6	27 7.8	2.91	.974	Accepted
Dispensing the wrong dose of medication can result in adverse drug reactions (ADRs).	114 33.0	121 35.1	75 21.7	35 10.1	2.72	.974	Accepted
Delivering medication at the wrong time can disrupt the therapeutic effect.	79 22.9	121 35.1	114 33.0	31 9.0	2.54	.859	Accepted
Administering medication via the wrong route can lead to medication-related hospitalizations.	49 14.2	138 40.0	123 35.7	35 10.1	2.78	.954	Accepted
Providing medication to the wrong patient can lead to increased mortality rates.	96 27.8	113 32.8	104 30.1	32 9.3	2.65	.845	Accepted
Total					**2.73**	**0.91**	**Accepted**

Source: Field work, 2025

This table covers six statements on administration errors (e.g., wrong dose or route). All items were accepted, with a grand mean of 2.73, indicating agreement on their adverse effects. The data on providingthe wrong medication can lead to adverse drug events (ADEs) shows that 79.2% agreement (35.4% strongly agree, 43.8% agree) and 20.9% disagreement (17.7% disagree, 3.2% strongly disagree), the mean score is 2.83 and standard deviation is 0.853, leading to acceptance of the statement. Data on giving the wrong dose of medication can lead to medication-related hospitalizations shows 69.5% agreement (21.4% strongly agree, 48.1% agree) and 30.4% disagreement (22.6% disagree, 7.8% strongly disagree), the mean score is 2.91 and standard deviation is 0.974, leading to acceptance of the statement. Also, dispensing the wrong dose of medication can result in adverse drug reactions (ADRs) shows that68.1% agreement (33.0% strongly agree, 35.1% agree) and 31.8% disagreement (21.7% disagree, 10.1% strongly disagree), the mean score is 2.72 and standard deviation is 0.974, leading to acceptance of the statement. Data on delivering medication at the wrong time can disrupt the therapeutic effect shows that 58.0% agreement (22.9% strongly agree, 35.1% agree) and 42.0% disagreement (33.0% disagree, 9.0% strongly disagree), the mean score is 2.54 and standard deviation is 0.859, leading to acceptance of the statement. The data on administering medication via the wrong route can lead to medication-related hospitalizations shows that54.2% agreement (14.2% strongly agree, 40.0% agree) and 45.8% disagreement (35.7% disagree, 10.1% strongly disagree), the mean score is 2.78 and standard deviation is 0.954, leading to acceptance of the statement. Data onproviding medication to the wrong patient can lead to increased mortality rates indicates that60.6% agreement (27.8% strongly agree, 32.8% agree) and 39.4% disagreement (30.1% disagree, 9.3% strongly disagree), the mean score is 2.65 and standard deviation is 0.845, leading to acceptance of the statement. The above data entails that all items were accepted, with a grand mean of 2.73, indicating agreement on their adverse effects. Average St. D of 0.91 shows consistent responses. Agreement ranged from 58.0% to 79.2%, with means from 2.54 to 2.91. This table reinforces Medication Administration as a high-risk phase, potentially due to human factors in busy hospitals.

The qualitative data collected was in tandem with the qualitative data presented above. The two methods of data indicated that medication administration errors are common in the selected hospitals and such errors have detrimental effect on the health outcome of the patients. For instance, in key informant interview the respondents were asked to acknowledge that medication administration errors occur in hospitals or not and whether any

medical personnel have experienced medication administration errors in their practice or not. Data elicited on medication administration error via key informant Interview from a Nurse, Age 45, General Hospital Kuta said that**:**

Frequent administration errors, such as giving the wrong medication due to similar packaging or incorrect doses during rushed shifts can lead to medication administration errors. I recall a case where a wrong dose of antihypertensive medication caused a patient to collapse, requiring intensive care.

Also, a Pharmacist, Age 37, at Federal Medical Centre Bida opined that:

> Wrong-route errors are common here, like giving oral medications intravenously because of inadequate training and unclear labelling. I remember a case where an oral drug was pushed through IV and caused severe tissue damage; the patient needed prolonged hospitalization. Most errors go unreported because staff fear blame, so we never know the true scale.

Similarly, a Chief Medical Director, Age 52, at General Hospital Kontagora highlighted that:

> Wrong patient errors are a severe problem. I recall a case where chemotherapy intended for one patient was given to another—it was fatal. This happens because of understaffing and no proper patient identification protocols. Rural hospitals like ours suffer the most.

H1: There is no significant relationship between administration errors and patients' health outcomes in selected hospitals in Niger State.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.463[a]	.215	.194	.722

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	47.807	9	5.312	10.181	.000[b]
	Residual	174.785	335	.522		
	Total	222.591	344			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.403	.431		7.887	.000
	Giving the wrong medication for a condition can cause complications.	-.032	.067	-.032	-.478	.633

Mistakes in medical orders can delay recovery and worsen the patient's condition	.219	.068	.242	3.202	.001
Errors in determining the correct frequency of medication intake can lead to ineffective treatment	-.047	.051	-.057	-.921	.358
Incorrect or incomplete medication instructions can lead to non-compliance and worsen health outcomes.	-.008	.047	-.010	-.175	.861
Giving the wrong dose of medication can lead to medication-related hospitalizations.	-.080	.053	-.085	-1.495	.136
Dispensing the wrong dose of medication can result in adverse drug reactions (ADRs).	.069	.054	.084	1.273	.204
Delivering medication at the wrong time can disrupt the therapeutic effect.	.045	.049	.052	.922	.357
Administering medication via the wrong route can lead to medication-related hospitalizations.	-.198	.050	-.211	-3.939	.000
Providing medication to the wrong	-.107	.055	-.127	-1.927	.055

In this data, R=0.463 shows a weaker moderate correlation. Explains 21.5% variance (R^2=0.215), adjusted to 19.4%, the least among models. Std. Error=0.722 indicates good precision. The ANOVA shows a Significant ($F(9, 335)=10.181$, $p<0.001$), regression (47.807) vs. residual (174.785). This statistically means that the Null hypothesis is rejected; administration errors explain 21.5% variance. Significant predictors are order mistakes (positive) and wrong route (negative), emphasizing training on administration protocols to mitigate risks, as in studies showing 73.2% witnessed errors. This means that there **is** a relationship, though weaker, consistent with administration errors (e.g., 49.4% nurse-reported) affecting outcomes. The coefficients provided multiple linear regression (MLR) model examines how nine predictors related to medication administration errors individually contribute to predicting patients' health outcomes, holding other predictors constant. The model uses data from 345 respondents in selected hospitals in Niger State, Nigeria, with health outcomes likely measured as a continuous score where higher values indicate poorer outcomes (e.g., increased complications, hospitalizations, or mortality risk), inferred from the context of medical errors.

Discussion of Findings

The study found that medication administration errors significantly affect health outcomes, with agreement that administering wrong medications, incorrect doses, wrong routes, or giving medications to the wrong patient cause adverse drug events (ADEs), hospitalizations,

and disrupted therapeutic effects. The strongest consensus was on wrong medication and incorrect doses leading to ADEs and hospitalizations, respectively. The regression analysis confirmed a relationship, though less robust than for other error types, with mistakes in medical orders and wrong route administration significantly predicting poorer outcomes, and wrong patient errors nearly significant. Other errors, such as wrong dose or timing, were not independently predictive, possibly due to overlapping effects among predictors. It can be inferred that the administration errors in Niger State, such as a nurse administering chemotherapy to the wrong patient or injecting an oral medication intravenously, can lead to catastrophic outcomes like organ damage, death, or prolonged hospitalizations, imposing significant emotional and financial strain on families. The weaker predictive power of these errors suggests they play a less dominant role compared to diagnostic or prescription errors, possibly because they occur later in the care process. The findings are strongly supported by Mekonnen et al. (2021), who conducted a meta-analysis in African hospitals and reported a 3–8% incidence of medication administration errors, with wrong medication and dose errors being primary causes of ADEs and hospitalizations, aligning with the study's strong agreement on these issues. Adeyemi et al. (2022) found that 49.4% of Nigerian nurses reported errors in medical orders due to miscommunication, particularly in high-pressure environments, corroborating the regression's emphasis on medical orders as a significant predictor. Mekonnen et al. (2021) also noted that wrong-route errors, particularly intravenous administration mistakes, account for a significant portion of hospitalizations in African settings, which contrasts with the study's unexpected negative coefficient for wrong route, potentially explained by multicollinearity as described by Bates et al. (2018). The near-significant wrong patient error aligns with global studies by Leape et al. (2017), who linked such errors to increased mortality risks, such as in cases of chemotherapy mix-ups, highlighting their severity. Okoro et al. (2021) emphasized low error-reporting rates (29.8%) in Nigeria, which may explain the non-significance of predictors like wrong dose or timing, despite their documented harm, suggesting underreporting or overlap in the model. Keers et al. (2018) demonstrated that barcode scanning and standardized checklists can reduce administration errors by up to 25% in resource-limited settings, offering a viable solution for Niger State's challenges. These studies underscore the systemic issues of understaffing and lack of technological aids in Nigeria, reinforcing the need for targeted interventions to address administration errors.

Conclusion

The study concludes that administration pose significant threats to patient health outcomes in Niger State's hospitals, leading to complications, readmissions, prolonged hospitalizations, and non-compliance. Administration errors, though less predictive, result in catastrophic consequences like wrong patient errors or wrong-route hospitalizations, worsened by understaffing and lack of verification protocols. These findings highlight the urgent need for systemic interventions to address Nigeria's healthcare challenges, where limited resources and high error rates undermine patient safety.

Recommendations

Consequent to the findings, the study recommended as follow:

a. The barcode scanning and wristband systems should be implemented for medication administration so as to avoid errors for improve healthcare delivery.
b. There is need to enhance staff training on administration routes and patient identification, so as to reduce ADEs and hospitalizations.
c. The hospital management should increase staff level to reduce nurse to patient's ratio to alleviate work load pressure

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