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Perceived Factors Associated with Medication Errors and Nurses' Knowledge, Attitudes, and Practices Regarding Medication Safety at Federal Medical Centre Nguru, Nigeria: A Cross-Sectional Study

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Declaration:
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S.A.M.: Conceptualization, data collection. A.S.T.: Supervision, critical review. A.I.D.: Writing - original draft. Z.M.Y.: Writing - review and editing. A.N.: Proofreading, reference verification. All authors approved the manuscript.
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ABSTRACT

Background: Medication errors pose a significant threat to patient safety, and nurses play a central role in their prevention through medication administration and monitoring. However, evidence regarding perceived contributing factors and medication safety practices in northeastern Nigeria remains limited.

Objective: To assess nurses' perceived factors contributing to medication errors, their knowledge, attitudes, and practices regarding medication safety and error reporting, and their preferred prevention strategies at Federal Medical Centre (FMC) Nguru, Yobe State, Nigeria.

Methods: A descriptive cross-sectional survey was conducted among registered nurses at FMC Nguru, with a target population of 254. A sample size of 97 was calculated using the Taro Yamane formula. Participants were recruited through stratified sampling with convenience selection within strata. Data were collected using a self-administered questionnaire with a four-point Likert scale and analysed descriptively using frequencies and percentages.

Results: Most respondents were male (78.4%), and 40.2% were aged 30–39 years. The most frequently perceived contributors to medication errors were heavy workload (86.6%), inadequate staffing (80.4%), fatigue (80.4%), inadequate supervision (78.4%), and look-alike medication names or packaging (59.8%). Knowledge of the rights of medication administration was high (93.8%); however, 22.7% reported inadequate understanding of the hospital's medication error-reporting procedures. Although 99.0% agreed that medication errors should be reported even when no patient harm occurs, 66.0% identified fear of punishment as a barrier to reporting. All respondents (100%) supported regular in-service training and clear medication administration guidelines, while 96.9% endorsed improved communication, 93.8% adequate staffing, and 87.6% medication administration technologies.

Conclusion: Nurses at FMC Nguru perceived medication errors as predominantly associated with system-level factors, including workload, staffing shortages, fatigue, and inadequate supervision. Strengthening workforce capacity, continuous professional training, institutional guidelines, and non-punitive error-reporting systems may improve medication safety.

Keywords: Medication errors; Medication safety; Nurses; Patient safety; Error reporting; Nigeria.

INTRODUCTION

Medication administration is one of the most important nursing responsibilities and demands precision, knowledge, attentiveness and accountability. Despite advances in healthcare delivery and the introduction of safety protocols, medication errors remain a persistent threat to patient safety and treatment outcomes worldwide. The National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP) defines a medication error as "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer". Such events may be related to professional practice, health care products, procedures and systems, including prescribing, order communication, product labelling, packaging and nomenclature, compounding, dispensing, distribution, administration, education, monitoring and use (NCCMERP, 2022; Aronson, 2009). Errors can arise at any stage of the medication-use process, but nurses, who stand at the final step of that process, are particularly well placed both to commit and to intercept them.

The scale of the problem is considerable. The World Health Organization (WHO) estimates that medication errors cause at least one death every day and injure approximately 1.3 million people annually in the United States alone, and that avoidable medication-related harm costs about US$42 billion a year globally (WHO, 2017; Donaldson et al., 2017). The burden is likely to be heavier in low- and middle-income countries, where staffing is limited, safety systems are weak and monitoring is inconsistent. In a national survey of 2,386 health professionals in ten Nigerian tertiary hospitals (46.3% of them nurses), 47% reported having made a medication error, overwork was the most frequently cited reason for being error-prone (59.2%), and only 35.5% had ever reported an error (Ogunleye et al., 2016). A survey of 300 nurses in Nigeria identified confusion between drugs with similar names and a high patient-to-nurse ratio as the main contributing factors (Ayorinde & Alabi, 2019). Nurses' own perceptions of medication error risk factors have also been explored qualitatively (Savva et al., 2022).

Factors that influence medication errors operate at the individual level (knowledge, experience, stress and fatigue) and at the institutional level (workload, shift patterns, nurse-to-patient ratios, supervision, and the availability of protocols and continuing education). Local evidence is needed to target interventions at the right factors. To our knowledge, no study of nurses' perceptions of medication errors has been published from Federal Medical Centre (FMC) Nguru, the tertiary referral hospital serving Yobe State. The motivation for this study arose from observations made during clinical postings at the centre, where nurses' heavy workloads, staffing challenges and system-related problems were thought to predispose them to medication errors.

Aim and objectives

The aim of this study was to assess perceived factors associated with medication errors among nurses at FMC Nguru. The specific objectives were to:

1. identify the factors nurses perceive to be associated with medication errors;
2. assess nurses' knowledge, attitude and practice regarding medication safety and error reporting; and
3. determine the strategies nurses consider appropriate for preventing medication errors and improving patient safety.

MATERIALS AND METHODS

Study design

A non-experimental, descriptive cross-sectional survey was conducted.

Study setting

The study was conducted at Federal Medical Centre Nguru, Nguru Local Government Area, Yobe State, north-eastern Nigeria. The centre is a tertiary health facility located along Machina Road and was established by the Federal Government of Nigeria in 1998. It is under the Federal Ministry of Health and has 16 departments and 35 wards/units, including male and female medical wards, male and female surgical wards, obstetrics, gynaecology, labour, paediatric and orthopaedic wards, and an intensive care unit.

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Study population
The study population comprised the 254 registered nurses working at FMC Nguru at the time of the study.

Eligibility criteria
Nurses were eligible if they were registered nurses working at FMC Nguru, were directly involved in patient care and medication administration, had worked at the hospital for at least six months, and were available during data collection. Student nurses, intern nurses and nursing assistants were excluded, as were nurses in purely administrative or managerial roles without involvement in medication administration, nurses on leave (annual, sick or maternity) during data collection, and nurses who declined to participate or withdrew consent.

Sample size determination
The minimum sample size was calculated using the Taro Yamane (1967) formula for a finite population:
$n = N / [1 + N(e2)]$
where n is the sample size, N is the population size (254) and e is the margin of error. A margin of error of 0.08 (92% confidence level) was adopted, giving:
$n = 254 / [1 + 254(0.082)] = 254 / 2.6256 = 96.7 \approx 97$
The sample size was therefore 97 nurses, allocated across five strata (Table 1).

Table 1. Planned allocation of the sample by stratum, compared with respondents analysed

S/N	Stratum (unit/ward)	Planned allocation	Respondents analysed
1	Medical ward	26	18
2	Surgical ward	15	15
3	Paediatric ward	15	18
4	Intensive care unit	10	6
5	Other units	31	40
	Total	**97**	**97**

The planned allocation was fixed before data collection; the distribution of respondents actually analysed differed from it in three strata.

Sampling technique
Nurses were grouped into strata by unit (medical ward, surgical ward, paediatric ward, intensive care unit and other units) so that the main clinical areas were represented. Within each stratum, respondents were then selected by convenience, that is, according to availability on duty. Convenience selection is a practical choice in hospital settings where access is limited by duty rosters and workload (Etikan et al., 2016), but it is a non-probability method, and the sample cannot be assumed to be statistically representative of all nurses at the centre.

Data collection instrument
Data were collected using a structured, self-administered questionnaire (Appendix IV). It had four sections: Section A (socio-demographic characteristics: age, sex, highest nursing qualification, years of experience and unit/ward); Section B (factors associated with medication errors); Section C (knowledge, attitude and practice regarding medication safety and error reporting); and Section D (strategies for preventing medication errors and improving patient safety). Items in Sections B to D were statements rated on a four-point Likert scale: strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD).

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Validity
Face and content validity were established by submitting the questionnaire to an expert in the field and to the project supervisor, whose comments were incorporated before administration.

Reliability
A pilot test–retest was carried out with 10 nurses from a comparable health facility in Nguru, outside the study site, to check the clarity of items, the time needed to complete the questionnaire and the stability of responses (Polit & Beck, 2021). [Authors to insert the reliability coefficient obtained, e.g. test–retest correlation or Cronbach's alpha, and the interval between test and retest.]

Data collection procedure
After introducing themselves and obtaining consent, the researchers distributed the questionnaires to nurses on their wards and clarified items when asked. Completed questionnaires were collected after two to five days, and each was checked for completeness. Data were collected between [dates to be inserted] 2026, within the period covered by the ethical approval. [Authors to state the number of questionnaires distributed, the number returned and the response rate].

Data analysis
Data were coded and analysed descriptively using [software and version to be stated]. Categorical variables are presented as frequencies and percentages (Kothari & Garg, 2019). For ease of interpretation, "agreement" was defined as the sum of the "strongly agree" and "agree" responses. No inferential tests were performed.

Ethical considerations
Ethical approval was granted by the Health Research Ethics Committee of Federal Medical Centre Nguru (reference FMC/N/CL.SERV/355/VOL.VII/505, dated 23 April 2026; Appendix III), valid for a maximum of 12 months. An introductory letter from the College of Nursing Sciences, FMC Nguru, was presented to the wards (Appendix II). Participation was voluntary, respondents were informed of the purpose of the study and gave consent, no names or other identifiers were recorded, and respondents were assured that their answers would be treated confidentially and used for research purposes only (Appendix I).

RESULTS

Socio-demographic characteristics of respondents
Ninety-seven nurses were included in the analysis. Most were aged 30–39 years (40.2%) and male (78.4%). About half (52.6%) held a Bachelor of Nursing Science (BNSc) degree and 40.2% held RN/RM qualifications. The largest groups had 11–15 years (32.0%) or fewer than five years (27.8%) of experience. By unit, 41.2% worked in "other" units, 18.6% in the paediatric ward, 18.6% in the medical ward, 15.5% in the surgical ward and 6.2% in the intensive care unit (Table 2). The distribution by unit differed from the planned allocation (Table 1), with fewer respondents than planned from the medical ward (18 vs 26) and the intensive care unit (6 vs 10), and more from the paediatric ward (18 vs 15) and other units (40 vs 31).

Table 2. Socio-demographic characteristics of respondents (n = 97)

Characteristic	Frequency (n)	Percentage (%)
Age group (years)		
20–29	21	21.6
30–39	39	40.2
40–49	27	27.8
≥ 50	10	10.3

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Characteristic	Frequency (n)	Percentage (%)
Sex		
Male	76	78.4
Female	21	21.6
Highest nursing qualification		
RN/RM	39	40.2
BNSc	51	52.6
MNSc	3	3.1
Other	4	4.1
Years of nursing experience		
< 5	27	27.8
5–10	18	18.6
11–15	31	32.0
> 15	21	21.6
Unit/ward		
Medical	18	18.6
Surgical	15	15.5
Paediatric	18	18.6
Intensive care unit	6	6.2
Other units	40	41.2
Total	**97**	**100.0**

Perceived factors associated with medication errors

Heavy workload was the most frequently endorsed contributor to medication errors (86.6% agreed; 43.3% strongly), followed by inadequate staffing and fatigue or long working hours (80.4% each) and lack of adequate supervision (78.4%). Similar drug names and packaging were the least endorsed, but still by a majority (59.8%), while 40.2% disagreed (Table 3).

Table 3. Respondents' perceptions of factors associated with medication errors (n = 97)

Statement	SA n (%)	A n (%)	D n (%)	SD n (%)	Agree (SA + A) n (%)
Heavy workload contributes to errors	42 (43.3)	42 (43.3)	6 (6.2)	7 (7.2)	84 (86.6)
Inadequate staffing increases errors	45 (46.4)	33 (34.0)	3 (3.1)	16 (16.5)	78 (80.4)
Fatigue/long hours contribute to errors	45 (46.4)	33 (34.0)	3 (3.1)	16 (16.5)	78 (80.4)
Inadequate supervision contributes to errors	24 (24.7)	52 (53.6)	3 (3.1)	18 (18.6)	76 (78.4)
Similar drug names/packaging contribute to errors	15 (15.5)	43 (44.3)	12 (12.4)	27 (27.8)	58 (59.8)

SA, strongly agree; A, agree; D, disagree; SD, strongly disagree. Percentages are calculated on n = 97.

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Knowledge, attitude and practice regarding medication safety and error reporting

Knowledge. Nearly all respondents (93.8%) reported being knowledgeable about the rights of medication administration, and 78.4% agreed that errors can occur at any stage of administration. However, 77.3% understood the procedure for reporting errors at FMC Nguru, which means that 22.7% (22 nurses), almost all of whom strongly disagreed, did not (Table 4).

Attitude. Most respondents (90.7%) agreed that reporting errors improves patient safety, and almost all (99.0%) agreed that errors should be reported even when no harm results. Nevertheless, two-thirds (66.0%) agreed that fear of punishment discourages nurses from reporting errors.

Practice. Most respondents (90.7%) agreed that they double-check medications before administration; 9.3% did not (Table 4).

Table 4. Nurses' knowledge, attitude and practice regarding medication safety and error reporting (n = 97)

Statement	SA n (%)	A n (%)	D n (%)	SD n (%)	Agree (SA + A) n (%)
Knowledgeable about the rights of medication administration	48 (49.5)	43 (44.3)	6 (6.2)	0 (0.0)	91 (93.8)
Understand error-reporting procedures at FMC Nguru	15 (15.5)	60 (61.9)	1 (1.0)	21 (21.6)	75 (77.3)
Errors can occur at any stage of administration	24 (24.7)	52 (53.6)	18 (18.6)	3 (3.1)	76 (78.4)
Reporting errors improves patient safety	60 (61.9)	28 (28.9)	3 (3.1)	6 (6.2)	88 (90.7)
Errors should be reported even if no harm occurred	57 (58.8)	39 (40.2)	0 (0.0)	1 (1.0)	96 (99.0)
Fear of punishment discourages reporting	24 (24.7)	40 (41.2)	9 (9.3)	24 (24.7)	64 (66.0)
I double-check medications before administration	52 (53.6)	36 (37.1)	3 (3.1)	6 (6.2)	88 (90.7)

The first three statements assess knowledge, the next three attitude and the last practice. SA, strongly agree; A, agree; D, disagree; SD, strongly disagree.

Strategies for preventing medication errors

All respondents (100%) agreed that regular in-service training and the use of clear medication guidelines and protocols can reduce medication errors. Improved communication among healthcare workers (96.9%), adequate staffing (93.8%) and the availability of medication-administration technologies (87.6%) were also widely endorsed (Table 5). Figure 1 summarises the level of agreement across all items.

Table 5. Respondents' views on strategies for preventing medication errors (n = 97)

Statement	SA n (%)	A n (%)	D n (%)	SD n (%)	Agree (SA + A) n (%)
Regular in-service training reduces errors	60 (61.9)	37 (38.1)	0 (0.0)	0 (0.0)	97 (100.0)
Adequate staffing helps prevent errors	57 (58.8)	34 (35.1)	3 (3.1)	3 (3.1)	91 (93.8)

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Statement	SA n (%)	A n (%)	D n (%)	SD n (%)	Agree (SA + A) n (%)
Clear guidelines and protocols reduce errors	37 (38.1)	60 (61.9)	0 (0.0)	0 (0.0)	97 (100.0)
Medication administration technology reduces errors	37 (38.1)	48 (49.5)	0 (0.0)	12 (12.4)	85 (87.6)
Improved communication prevents errors	39 (40.2)	55 (56.7)	0 (0.0)	3 (3.1)	94 (96.9)

SA, strongly agree; A, agree; D, disagree; SD, strongly disagree.

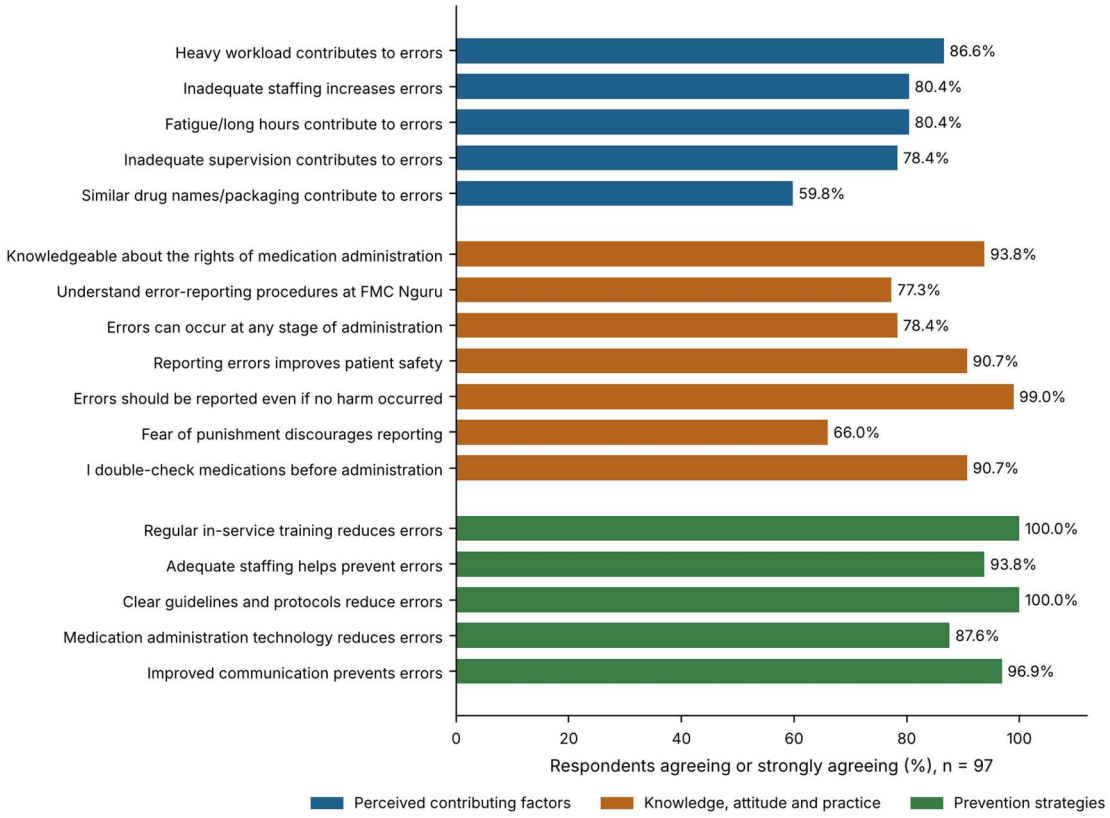


Figure 1. Proportion of respondents agreeing or strongly agreeing with each statement (n = 97).

DISCUSSION

This study examined nurses' perceptions of the factors associated with medication errors at a tertiary hospital in north-eastern Nigeria, together with their knowledge, attitude and practice regarding medication safety and their views on prevention. Because the study recorded perceptions and not observed errors, the findings describe what nurses believe about errors and cannot show how often errors occur or which factors actually cause them.

Perceived factors associated with medication errors

Workload-related factors were rated highest: heavy workload (86.6%), inadequate staffing (80.4%) and fatigue or long working hours (80.4%), followed by inadequate supervision (78.4%). This agrees with the Nigerian national survey, in which overwork was the most common reason given for being error-prone (Ogunleye et al., 2016), and with the finding of Ayorinde and Alabi (2019) that a high patient-to-nurse ratio was among the main contributors in Nigeria. A recent meta-analysis of studies of Iranian nurses likewise listed workload, fatigue and nursing shortages as leading factors (Fathizadeh et al., 2024). Taken together, these findings suggest that nurses locate the origin of errors mainly

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in the work system, and not in individual carelessness. That view is consistent with the systems approach to patient safety promoted by the WHO's Medication Without Harm challenge and its Global Patient Safety Action Plan (WHO, 2017; WHO, 2021).

Similar drug names and packaging were endorsed by a smaller majority (59.8%) than the work-system factors, and 40.2% disagreed. In the study of Ayorinde and Alabi (2019), confusion between drugs with different names was a leading factor, so the lower ranking here may reflect differences in the drugs stocked, in labelling practices or in how the item was understood; this deserves further exploration, for example through a review of the pharmacy's look-alike, sound-alike drug list.

Knowledge, attitude and practice

Self-reported knowledge of the rights of medication administration was high (93.8%) and most respondents (90.7%) reported double-checking medications. These are self-reports and may overstate actual practice, and the questionnaire did not test knowledge directly. The most important finding in this section is the gap between attitude and reporting culture. Almost all respondents (99.0%) agreed that errors should be reported even when no harm occurs, yet 22.7% did not understand the reporting procedure and two-thirds (66.0%) agreed that fear of punishment discourages reporting. Under-reporting has been documented elsewhere in Nigeria, where only 35.5% of health professionals who responded to a national survey had ever reported an error (Ogunleye et al., 2016), and an earlier survey of Nigerian nurses recommended that supervisors encourage error reporting aimed at prevention and not punishment (Ayorinde & Alabi, 2019). Errors that are not reported cannot be analysed, so the hospital loses the information it needs to prevent recurrence. The study did not ask respondents whether they had themselves reported an error, which would have been a more direct measure of practice.

Strategies for prevention

Respondents were near-unanimous in endorsing in-service training and clear guidelines (100% each), improved communication (96.9%), adequate staffing (93.8%) and technology (87.6%). The strong support for training and guidelines suggests that nurses would welcome such interventions. The somewhat lower support for technology (12.4% strongly disagreed) may reflect limited familiarity with electronic medication systems at the centre, an interpretation that the present data cannot confirm. Support for these measures indicates acceptability and not effectiveness; evidence of effect should come from evaluation of interventions that are implemented. The pattern of responses is also consistent with nurses viewing improvements in staffing, supervision and reporting culture as the most direct route to safer practice.

LIMITATIONS

- The design was cross-sectional and recorded self-reported perceptions. Neither the incidence nor the types of medication errors, nor any causal relationship between the factors examined and errors, could be assessed. Hence the study should be read as describing perceived and not demonstrated associations.
- Respondents were selected by convenience within strata, which introduces selection bias, and the realised distribution by unit differed from the planned allocation (Table 1). Findings come from a single centre and cannot be generalised beyond it without caution.
- All statements were worded in one direction and rated on a four-point scale with no neutral option, which can encourage acquiescence. In support of this, the proportion disagreeing that inadequate staffing increases errors (19.6%) was higher than the proportion disagreeing that adequate staffing prevents them (6.2%) (Tables 3 and 5). Social desirability may also have inflated reported knowledge and double-checking.
- Only descriptive statistics were used, so differences by experience, qualification, sex or ward could not be tested. The questionnaire items on reference materials and on respondents' own error reporting, and the question on communication as a cause of errors, are not reported here.
- The reliability coefficient of the instrument is not reported.

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CONCLUSION

Nurses at FMC Nguru perceive medication errors as multifactorial and largely preventable, with heavy workload, inadequate staffing, fatigue and inadequate supervision the most frequently endorsed contributors. Their self-reported knowledge of safe administration is high, but a substantial minority do not know the reporting procedure and two-thirds believe that fear of punishment discourages reporting. Nurses overwhelmingly support in-service training, clear guidelines, improved communication, adequate staffing and technology as preventive strategies.

RECOMMENDATIONS

Based on these findings we recommend that:

1. Hospital management should review nurse staffing and nurse-to-patient ratios and should schedule shifts and rest periods so as to reduce workload and fatigue, especially in high-demand wards.
2. Nursing services should strengthen supervision of medication rounds, particularly on night shifts and in units with high workload.
3. The hospital should adopt a clear, non-punitive error-reporting system, ensure that every nurse knows the reporting procedure (for example, through orientation and ward-level reminders), and give regular feedback on reported incidents.
4. Regular in-service training on safe medication practice, including the rights of medication administration, high-alert and look-alike, sound-alike medicines, and the use of any medication-administration technology introduced, should be institutionalised.
5. Standardised medication guidelines and protocols should be made available in every ward, and structured handover and communication practices should be encouraged.
6. Future studies should measure the actual incidence and types of medication errors (for example, by incident reports or direct observation), use multi-centre probability sampling, apply inferential analysis to test associations with nurse and ward characteristics, and evaluate the effect of interventions over time.

DECLARATIONS

Ethical Approval: Ethical approval was granted by the Health Research Ethics Committee, Federal Medical Centre Nguru, Yobe State, Nigeria (see Methods and Appendix III).

Conflict of Interest: The authors declare no conflicts of interest regarding the conduct or publication of this study.

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Author Contributions (CRediT):
- Saje Aminu Mohammed: Conceptualization and data collection.
- Ahmed Shuaibu Tsafi: Supervision and critical review of the manuscript.
- Abdullahi Ibrahim Doma: Writing - original draft.
- Zubaina Mahmud Yarima: Writing - review and editing.
- Alfa Ndakotsu: Proofreading and reference verification.

Data Availability: The dataset supporting the findings of this study is available from the corresponding author upon reasonable request, subject to applicable ethical and institutional requirements.

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REFERENCES

Aronson, J. K. (2009). Medication errors: definitions and classification. British Journal of Clinical Pharmacology, 67(6), 599–604. https://doi.org/10.1111/j.1365-2125.2009.03415.x

Ayorinde, M. O., & Alabi, P. I. (2019). Perception and contributing factors to medication administration errors among nurses in Nigeria. International Journal of Africa Nursing Sciences, 11, 100153. https://doi.org/10.1016/j.ijans.2019.100153

Donaldson, L. J., Kelley, E. T., Dhingra-Kumar, N., Kieny, M.-P., & Sheikh, A. (2017). Medication without harm: WHO's third global patient safety challenge. The Lancet, 389(10080), 1680–1681.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. American Journal of Theoretical and Applied Statistics, 5(1), 1–4.

Fathizadeh, H. [authors to be confirmed from the published article]. (2024). Prevalence of medication errors and its related factors in Iranian nurses: an updated systematic review and meta-analysis. BMC Nursing, 23. https://doi.org/10.1186/s12912-024-01836-w

Kothari, C. R., & Garg, G. (2019). Research methodology: Methods and techniques (4th ed.). New Age International.

National Coordinating Council for Medication Error Reporting and Prevention. (2022). About medication errors. https://www.nccmerp.org/about-medication-errors

Ogunleye, O. O., Oreagba, I. A., Falade, C., Isah, A., Enwere, O., Olayemi, S., Ogundele, S. O., Obiako, R., Odesanya, R., Bassi, P., Obodo, J., Kilani, J., & Ekoja, M. (2016). Medication errors among health professionals in Nigeria: a national survey. International Journal of Risk & Safety in Medicine, 28(2), 77–91. https://doi.org/10.3233/JRS-160721

Polit, D. F., & Beck, C. T. (2021). Nursing research: Generating and assessing evidence for nursing practice (11th ed.). Wolters Kluwer.

Savva, G., Papastavrou, E., Charalambous, A., Vryonides, S., & Merkouris, A. (2022). Exploring nurses' perceptions of medication error risk factors: findings from a sequential qualitative study. Global Qualitative Nursing Research, 9. https://doi.org/10.1177/23333936221094857

World Health Organization. (2017). Medication without harm: Global patient safety challenge on medication safety. World Health Organization.

World Health Organization. (2021). Global patient safety action plan 2021–2030: Towards eliminating avoidable harm in health care. World Health Organization.

Yamane, T. (1967). Statistics: An introductory analysis (2nd ed.). Harper & Row.

APPENDIX I: LETTER TO RESPONDENTS

College of Nursing Sciences,
Federal Medical Centre Nguru, Yobe State.
P.M.B. 02.

Dear Respondent,

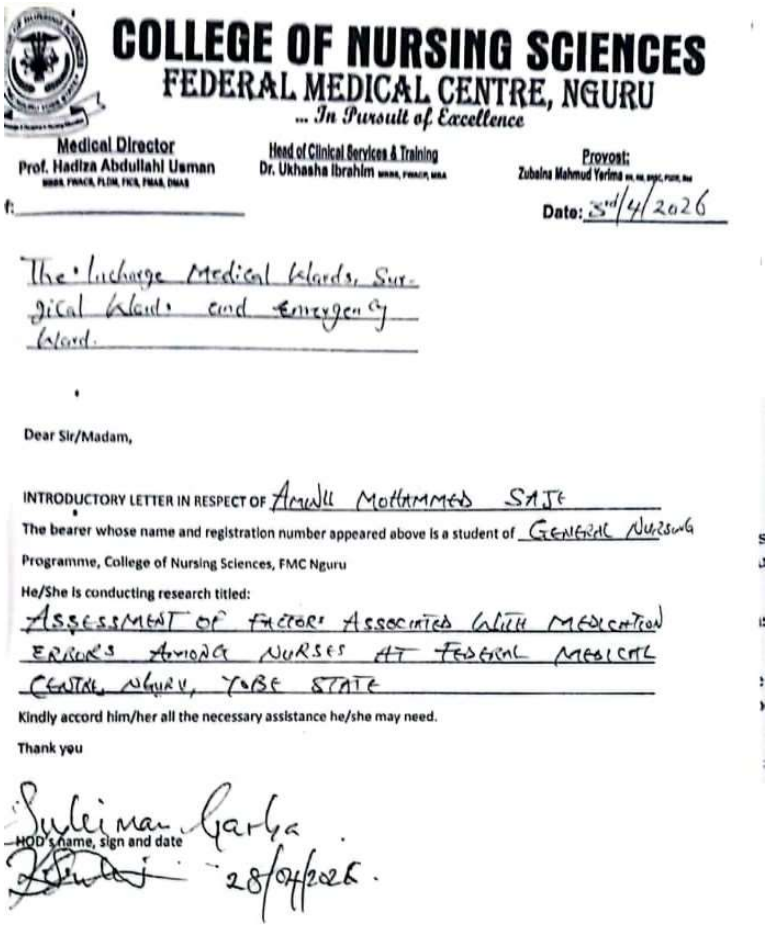
I am a final-year student of the above-named college undertaking a research study titled "Assessment of factors associated with medication errors among nurses at Federal Medical Centre Nguru". The questionnaire is strictly for research purposes and has nothing to do with your personality or job performance. Participation is voluntary, and all information gathered will be treated confidentially and anonymously.

Thank you.

Yours sincerely,
Mohammed Aminu Saje

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APPENDIX II: INTRODUCTORY LETTER



COLLEGE OF NURSING SCIENCES
FEDERAL MEDICAL CENTRE, NGURU
... In Pursuit of Excellence

Medical Director
Prof. Hadiza Abdullahi Usman

Head of Clinical Services & Training
Dr. Ukhasha Ibrahim

Provost:
Zubaina Mahmud Yarima

Date: 3rd/4/2026

The Incharge Medical Wards, Surgical Wards and Emergency Ward.

Dear Sir/Madam,

INTRODUCTORY LETTER IN RESPECT OF Aminu Mohammed Saje

The bearer whose name and registration number appeared above is a student of General Nursing Programme, College of Nursing Sciences, FMC Nguru

He/She is conducting research titled:

Assessment of Factors Associated with Medication Errors Among Nurses at Federal Medical Centre, Nguru, Yobe State

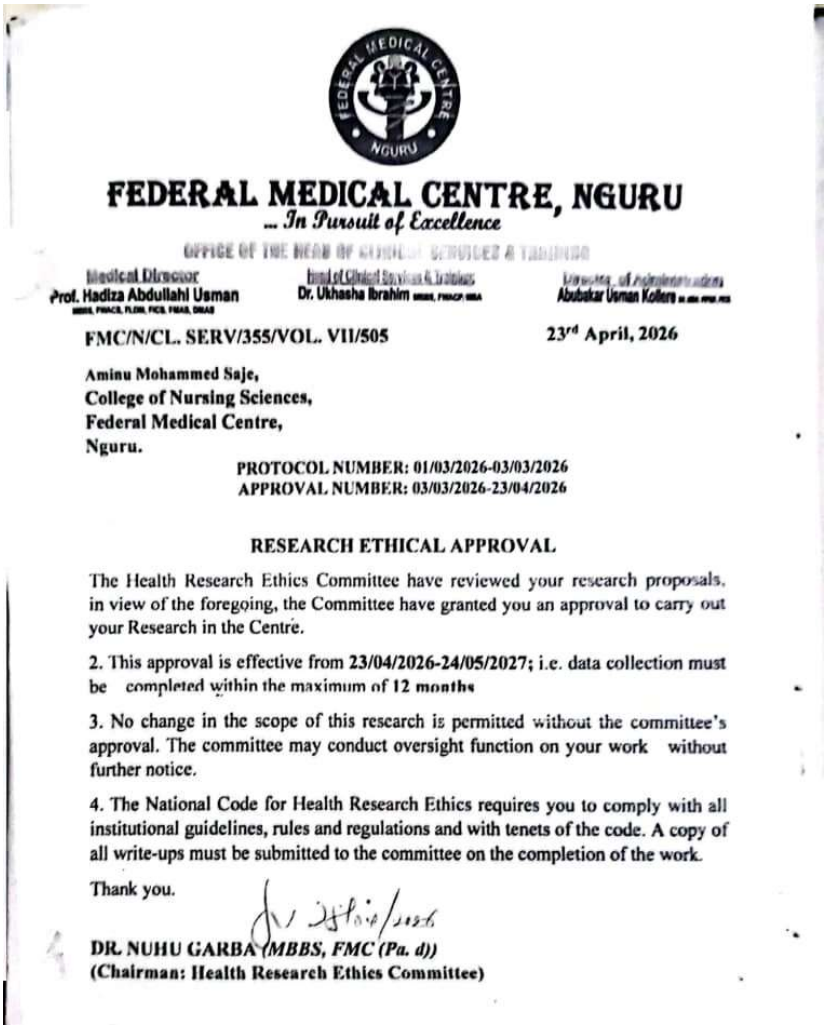
Kindly accord him/her all the necessary assistance he/she may need.

Thank you

Suleiman Garba
HOD's name, sign and date 28/04/2026.

APPENDIX III: ETHICAL APPROVAL

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FEDERAL MEDICAL CENTRE, NGURU
... In Pursuit of Excellence

OFFICE OF THE HEAD OF [illegible]

Medical Director
Prof. Hadiza Abdullahi Usman

Head of Clinical Services & Training
Dr. Ukhasha Ibrahim

Director of Administration
Abubakar Usman Kollere

FMC/N/CL. SERV/355/VOL. VII/505 — 23rd April, 2026

Aminu Mohammed Saje,
College of Nursing Sciences,
Federal Medical Centre,
Nguru.

PROTOCOL NUMBER: 01/03/2026-03/03/2026
APPROVAL NUMBER: 03/03/2026-23/04/2026

RESEARCH ETHICAL APPROVAL

The Health Research Ethics Committee have reviewed your research proposals, in view of the foregoing, the Committee have granted you an approval to carry out your Research in the Centre.

2. This approval is effective from **23/04/2026-24/05/2027**; i.e. data collection must be completed within the maximum of **12 months**

3. No change in the scope of this research is permitted without the committee's approval. The committee may conduct oversight function on your work without further notice.

4. The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with tenets of the code. A copy of all write-ups must be submitted to the committee on the completion of the work.

Thank you.

DR. NUHU GARBA *(MBBS, FMC (Pa. d))*
(Chairman: Health Research Ethics Committee)

APPENDIX IV: QUESTIONNAIRE

Dear respondent, this questionnaire is for research purposes only. Your participation is voluntary, and your responses are anonymous and confidential. Please tick (☐) the option that applies to you.

Section A: Socio-demographic characteristics
Age:
☐ 20–29 years
☐ 30–39 years
☐ 40–49 years
☐ 50 years and above
Sex:
☐ Male
☐ Female
Highest nursing qualification:
☐ RN/RM
☐ BNSc
☐ MNSc
☐ Other (specify): _____
Years of nursing experience:
☐ Less than 5 years

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☐ 5–10 years
☐ 11–15 years
☐ Above 15 years
Unit/ward currently working in:
☐ Medical
☐ Surgical
☐ Paediatric
☐ ICU
☐ Other (specify): _____
Section B: Factors associated with medication errors
Please indicate your level of agreement (SA = strongly agree, A = agree, D = disagree, SD = strongly disagree).
Heavy workload contributes to medication errors.
☐ SA ☐ A ☐ D ☐ SD
Inadequate staffing increases the likelihood of medication errors.
☐ SA ☐ A ☐ D ☐ SD
Fatigue and long working hours contribute to medication errors.
☐ SA ☐ A ☐ D ☐ SD
Poor communication among healthcare professionals leads to medication errors.
☐ SA ☐ A ☐ D ☐ SD
Lack of adequate supervision contributes to medication errors.
☐ SA ☐ A ☐ D ☐ SD
Similar drug names and packaging contribute to medication errors.
☐ SA ☐ A ☐ D ☐ SD
Inadequate availability of drug reference materials contributes to medication errors.
☐ SA ☐ A ☐ D ☐ SD
Section C: Nurses' knowledge, attitude and practice on medication safety and error reporting
Knowledge
I am knowledgeable about the "rights" of medication administration.
☐ SA ☐ A ☐ D ☐ SD
I understand the procedures for reporting medication errors in FMC Nguru.
☐ SA ☐ A ☐ D ☐ SD
Medication errors can occur at any stage of medication administration.
☐ SA ☐ A ☐ D ☐ SD
Attitude
Reporting medication errors helps to improve patient safety.
☐ SA ☐ A ☐ D ☐ SD
Nurses should report medication errors even if no harm occurred.
☐ SA ☐ A ☐ D ☐ SD
Fear of punishment discourages nurses from reporting medication errors.
☐ SA ☐ A ☐ D ☐ SD
Practice
I always follow the medication administration guidelines strictly.
☐ SA ☐ A ☐ D ☐ SD
I double-check medications before administration.
☐ SA ☐ A ☐ D ☐ SD
I have reported a medication error when it occurred.
☐ SA ☐ A ☐ D ☐ SD
Section D: Strategies for preventing medication errors and improving patient safety
Regular in-service training can reduce medication errors.
☐ SA ☐ A ☐ D ☐ SD
Adequate staffing can help prevent medication errors.

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☐ SA ☐ A ☐ D ☐ SD
Use of clear medication guidelines and protocols can reduce errors.
☐ SA ☐ A ☐ D ☐ SD
Encouraging a non-punitive error-reporting system will improve patient safety.
☐ SA ☐ A ☐ D ☐ SD
Availability of medication administration technologies (e.g. electronic systems) can reduce errors.
☐ SA ☐ A ☐ D ☐ SD
Improved communication among healthcare workers can prevent medication errors.
☐ SA ☐ A ☐ D ☐ SD
Thank you for your time.

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