

Original Article

ASSESSMENT OF MEDICATION ADMINISTRATION ERRORS AND ITS ASSOCIATION WITH ANXIETY AND DEPRESSION AMONG TERTIARY CARE HOSPITAL NURSES

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Abstract

Objective: This study aimed to assess the frequency and types of medication administration errors, nurse-related non-compliance, and the association of anxiety and depression with MAEs among nurses.

Study Design: A cross-sectional correlational study was conducted.

Place and duration of study: A cross-sectional correlational study was conducted at Saidu Group of Teaching Hospital.

Material and Methods: A cross-sectional correlational study was conducted at Saidu Group of Teaching Hospital. A total of 155 registered nurses were selected through enumerative sampling. Data were collected using a validated self-reported questionnaire and analyzed using SPSS version 22. Ethical approval was obtained from Iqra National University and Saidu Group of Teaching Hospital.

Results: Wrong time was the most frequently reported MAE (29.7%), while wrong route was the least common (3.9%). Nurse-related non-compliance was highest in patient education omission (49.7%) and monitoring drug effects (23.2%). Among psychological factors, anxiety was generally mild, with excessive worry being the most common symptom (25.8%). Depression was more prominent, with fatigue (18.7%) and psychomotor symptoms (16.8%) most frequently reported; 9% of nurses reported suicidal ideation. Correlation analysis showed a significant association between depression and MAEs ($r=0.249, p=0.002$), whereas anxiety had a non-significant association with MAEs ($r=0.154, p=0.055$).

Conclusion: The study revealed a substantial burden of MAEs, non-compliance, and psychological distress among nurses. Depression was significantly associated with MAEs, indicating the need for supportive workplace interventions and a non-punitive environment to improve patient safety and nurses' mental well-being.

Keywords: Medication administration error, medication error, nurses, tertiary care hospital, anxiety, depression.

1. Introduction

Medication administration errors (MAEs) are a critical global threat to patient safety, with nurses as the frontline providers most commonly implicated. MAEs increase morbidity, mortality, and healthcare costs, particularly in elderly patients. While prevalence varies globally—reported as high as 68.1% in Ethiopia and 25–30% in India—data from Pakistan remain limited (5.5–16.9%) and unevenly distributed across provinces. Key contributors to MAEs include workload, staffing shortages, high nurse-to-patient ratios, fatigue, and environmental disruptions during medication administration. In Pakistan, additional

challenges include lack of continuous training on updated guidelines, limited access to medication administration technologies (e.g., barcode and electronic prescription systems), and cultural/institutional barriers such as fear of blame that discourage MAE reporting. A critical gap exists in understanding the psychological dimensions of MAEs. While anxiety and depression among nurses are recognized as potential contributors, substantial evidence linking these psychological stressors to MAE frequency is lacking. Nurses who commit MAEs often experience guilt, burnout, and reduced confidence

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which may further perpetuate error cycles. This study addresses this gap by assessing MAE frequency, nurse-related non-compliance, and the association between anxiety and depression levels among nurses at Saidu Group of Teaching Hospitals, Saidu Sharif, Swat—a rural tertiary care setting that remains understudied. Findings will inform targeted interventions in education, training, and policy reforms, including optimizing nurse-to-patient ratios and reducing interruptions during medication administration.

The primary goal of this study is to assess the frequency, types of medication error, nurse-related non-compliance contributing factors, and to identify the association of anxiety and depression among nurses working at a tertiary care hospital in SGTH, Swat, Pakistan.

2. Materials & Methods

This study employed a quantitative cross-sectional correlational design to assess the frequency and types of medication administration errors (MAEs), nurse-related non-compliance, and the association of anxiety and depression with MAEs among nurses.

The study was conducted at Saidu Group of Teaching Hospital, Saidu Sharif, Swat, a tertiary care hospital serving patients from Swat and surrounding underserved areas of the Malakand division and neighboring districts.

The study population comprised registered nurses working in direct patient care and medication administration roles. A total of 155 nurses were selected using enumerative sampling from an estimated population of 260 eligible nurses. The sample size was calculated using OpenEpi with a 95% confidence level, 5% margin of error, and a population proportion of 54% taken from previous research.

Eligible participants were licensed registered nurses with at least one year of clinical experience and current involvement in inpatient care areas such as medical, surgical, ICU, and pediatrics. Nurses on leave and those working in administrative departments were excluded.

Data were collected using a structured questionnaire consisting of four sections: demographic characteristics, the Medication Administration Questionnaire by Fogarty and McKeon, the GAD-7 for anxiety, and the PHQ-9 for depression. The Medication Administration Questionnaire included items on self-reported MAEs and nurse-related non-compliance. The GAD-7 and PHQ-9 were used to assess anxiety and depression symptoms, respectively.

After obtaining ethical and administrative approval, informed consent was secured from all participants. Participation was voluntary, anonymity was maintained by assigning codes to questionnaires, and confidentiality was strictly protected. Data were collected between March and June 2025 according to the approved study timeline. Data were analysed using SPSS version 22.

Descriptive statistics: for demographic categorical variables such as gender, qualification, shift pattern, and working unit were reported as frequencies and percentages. Continuous variables such as age and year of experience were reported as mean, median, standard deviation, and median. Prevalence and non-compliance scale were labelled as the Likert Scale, and the variables were coded as Never = 1, Once or twice = 2, Three or Four = 3, and More often = 4. In the same way, variables on the non-compliance scale were also similarly coded as Likert scale items. Frequencies,

percentages, mean, and SD were calculated for MAEs and non-compliance.

The items on the GAD-7 and PHQ-9 Scale, rated as an ordinal rating scale from 0 to 3, were analysed descriptively by frequency distribution.

Pearson correlation was used to assess the association between the frequency of medication errors (MAEs) and anxiety/depression.

Ethical approval for this study was obtained from the Department of Nursing Sciences, IQRA National University, Peshawar. Study participants were informed that their anonymity would be protected throughout the study. Confidentiality was ensured by keeping all paper and pen data in a locked drawer and all digital data in password-protected files on the computer.

3. Results

This chapter presents the study findings. The study aimed to assess the frequency of medication administration errors (MAEs), nurse-related non-compliance, anxiety and depression, and the association of anxiety and depression with MAEs among 155 nurses working at SGTH.

Table 1: Demographic characteristics of the study participants

Table 1 shows the demographic characteristics of the study participants. Among the 155 nurses, 88 (56.8%) were male and 67 (43.2%) were female. Regarding qualification, 26 (16.8%) had General Nursing, 67 (43.2%) had BSN, 50 (32.2%) had Post RN BSN, and 12 (7.7%) had MSN. In terms of shift pattern, 78 (50.3%) worked day shift, 17 (11%) worked night shift, and 60 (38.7%) worked rotating shifts. For working unit, 45 (29%) were from Medical and Allied, 37 (23.9%) from Surgical and Allied, 13 (8.4%) from Cardiology,

16 (10.3%) from Gynaecology, 31 (20%) from Paediatrics, and 13 (8.4%) from ICUs.

The following graphs represent the above-given variable

Gender distribution of the sample consisted of 56.8% male and 43.2% female. The sample consisted of a relatively greater number of males not usually found in other hospitals of the province. This distribution also highlights the increasing number of male nurses in the profession, as opposed to the past, where females dominated the nursing field.

Figure 3: Qualification

Regarding qualification, most of the nurses were bachelor's degree holders, particularly BSN and Post RN BSN; among them, general nursing diploma holders were 26.8%, BSN 43.2%, Post RN BSN 32.2%, and MSN 7.7%. Most of the nurses were bachelor's degree holders, showing growing progress in nursing education and training. The number of advanced, educated nurses, i.e., Master's in Nursing, was remarkably low, notably, only 12 participants possessed a Master's degree in Nursing and were working at the bedside, which highlights the rarity of advanced degree holders in direct patient care roles.

Figure 4: Shift Pattern

Shift Pattern distribution: day shift 50.3%, night shift 11%, and rotating shift 38.7%. The day shift was dominant among the shift patterns, this may be due increased number of staff needed for peak hours. Rotating shift was also common, reflecting flexible scheduling in healthcare. Low ratio during the night shift typically aligns with the hospital staff ratio.

Figure 5: Working Unit

Working unit distribution was roughly equal for medical and surgical units and constituted the majority of study participants. Among these were Medical and Allied 29%, surgical and Allied 23.9%, cardiology 8.4%, gynaecology 10.3%, paediatrics 20%, and ICUs 8.4%.

Table 2: Demographic Characteristics of Participants (Age and Experience)

Table 2 shows that the mean age of participants was 35.43 years (SD = 6.708; median = 35), and the mean years of experience in the current unit were 7.08 years (SD = 5.502; median = 5). Figure 6: Age distribution

Age and years of experience in the current working unit as continuous variables were analysed for mean, median, and standard deviation. The age category had a mean of 35.43, a median of 35 and a standard deviation of 6.708. The mean age of study participants was 35.43 years, the median age was 35 years, standard deviation in age was (SD)6.708. The mean and median ages were nearly identical, suggesting a normal distribution without significant skewness. The SD of 6.708 indicates that most participants' ages cluster within ± 6.7 years of the mean, i.e., ~28.7 to 42.1 years. The sample represents a relatively young to middle-aged workforce, typical in many healthcare or organizational settings. The narrow SD suggests low variability, meaning most participants were close in age.

Figure 7: Years of Experience in the current unit

4. Discussion

This chapter interprets the study findings in relation to the research objectives and existing literature. The discussion focuses on the frequency of medication administration errors (MAEs), nurse-related non-compliance, nurses' psychological status, and the association of anxiety and depression with MAEs.

Frequency of Medication Administration Errors

The study found that wrong-time administration was the most frequently reported MAE among nurses at SGTH. This finding is consistent with previous studies showing that timing-related errors are among the most common medication errors in hospital settings, particularly where workload, interruptions, and time pressure are high. Similar patterns have been reported in Pakistan and other low- and middle-income countries, suggesting that medication timing remains a persistent patient safety concern in resource-constrained environments.

The high frequency of wrong-time administration may reflect staffing shortages, heavy patient loads, and the fast-paced nature of tertiary care settings. In such contexts, nurses may find it difficult to administer medications exactly as scheduled, increasing the risk of timing-related errors. These findings emphasize the need for workflow support, adequate staffing, and stronger medication administration systems.

Nurse-Related Non-Compliance

The study also revealed important non-compliance in areas related to patient education and monitoring of drug effects. This suggests that medication administration is not limited to giving the drug but also includes communication, observation, and follow-up, which may be compromised when nurses are under time pressure. Prior studies have similarly linked medication errors to workload, distractions, lack of training, and weak safety culture.

These findings indicate that non-compliance may reflect both individual practice gaps and organizational constraints. In busy emergency and tertiary care environments, nurses may prioritize immediate clinical tasks over patient teaching and post-administration monitoring, which can weaken safe medication practice. Strengthening supervision, refresher training, and accountability mechanisms may help address these gaps .

Anxiety and Depression Among Nurses

The psychological assessment showed that nurses at SGTH experienced symptoms of both anxiety and depression. Anxiety was most commonly reflected by excessive worry and irritability, while depression was marked mainly by fatigue and psychomotor symptoms. These findings are important because psychological distress can reduce concentration, slow decision-making, and impair medication safety .

The presence of depressive symptoms, including suicidal ideation in a small proportion of participants, is particularly concerning and points to the need for mental health screening and workplace support . Similar research has shown that nurses working in high-stress settings are at increased risk of depression, fatigue, and emotional exhaustion, all of which can affect performance and patient safety .

Association of Anxiety and Depression with MAEs

The study found a weak, non-significant association between anxiety and MAEs, but a significant positive association between depression and MAEs. This suggests that depression may have a stronger effect on medication administration performance than anxiety. Nurses experiencing depressive symptoms may be more vulnerable to fatigue, poor concentration, and reduced vigilance, which can increase the likelihood of errors .

These findings are consistent with earlier studies showing that depressive symptoms and fatigue are linked with increased medication errors among nurses . The results also suggest that psychological distress and

medication errors may reinforce each other, creating a cycle that affects both nurse well-being and patient safety .

Overall Interpretation

Overall, the study highlights that MAEs, non-compliance, and psychological distress are interrelated problems in the nursing workforce at SGTH. Workload pressure, missed communication steps, and depressive symptoms appear to contribute to medication-related mistakes. The findings support the need for supportive workplace policies, staffing improvements, mental health screening, and regular training to reduce MAEs and strengthen nursing practice .

Conclusion

This study at Saidu Group of Teaching Hospital (SGTH) found a notable frequency of medication administration errors among nurses, with wrong-time administration reported most often. It also identified nurse-related non-compliance, particularly in patient education and monitoring/reporting of drug effects. In addition, the study found a significant association between depression and medication administration errors, while anxiety showed a weak and non-significant association.

Overall, the findings indicate that medication errors, non-compliance, and psychological distress are present among nurses working at SGTH. These results address the study objectives and highlight the need for further attention to safe medication practices and nurses' mental health within the hospital setting.

Limitations

This study uses a Cross-sectional design, which may limit causal inferences. Self-reported data may be subject to social desirability and recall biases. This study was conducted in a single hospital, which may limit the generalizability of the findings.

Future Recommendations

Future studies should include a larger and more diverse sample to improve the validity and

generalizability of the findings. Extending the duration of the research would allow better observation of long-term trends and outcomes related to plantar fasciitis. Additionally, ensuring balanced gender representation among participants would provide more accurate and representative results.

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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