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Original Research Article

Expert opinion survey on medication error awareness, reporting and its challenges among nursing leaders in India

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ABSTRACT

Background: Medication errors (MEs) remain a significant concern in healthcare settings globally, particularly in India, where Nurses play a vital role in preventing MEs. This expert opinion survey explored the experience of nursing leaders in handling and reporting of MEs.
Methods: This expert opinion study was based on a descriptive survey conducted among 51 nursing leaders from top corporate hospitals in India. The survey consisted of 15 questions covering four key areas: (1) frequency and types of errors, (2) barriers to error reporting, (3) department-related factors, and (4) training/education. Responses were collected through an online self-administered questionnaire between June and November 2024.
Results: Most of the nursing leaders (96%) reported encountering MEs. Among them, 39.2% of respondents observed MEs weekly, while 19.6% encountered these errors daily. The common types of errors included prescribing errors (71%), dispensing errors (69%), wrong dosages (63%), and wrong timing (61%). Notably, 37% of nursing leaders perceived underreporting of MEs. Identified barriers to MEs reporting included extra time for documentation (47%), fear of blame (45%), lack of knowledge (47%), absence of anonymous reporting systems (33%), and inadequate information for reporting errors (31%). A significant proportion of respondents (86%) emphasized the need for more comprehensive training to improve ME reporting practices.
Conclusions: This survey highlighted the need for transformative changes in ME awareness and reporting in hospitals. Establishing blame-free, anonymous reporting systems and enhancing training are essential. Additionally, advanced technological solutions should be utilized to support nursing staff in improving patient safety via prevention of MEs.

Keywords: Healthcare management, Medication errors, Medication error reporting, Nurses, Patient safety

INTRODUCTION

Patient safety has emerged as a serious concern in healthcare, with medication errors being a major focus due to their profound implications.[1] The World Health Organization (WHO) 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". These errors can occur at various stages, including prescribing, dispensing, administration, and monitoring.[2]

India faces significant challenges in ensuring patient safety, with an estimated 5.2 million injuries occurring annually due to medical errors.[3] Medication errors are a leading cause of adverse events, with studies reporting error rates as high as 15.34% and 25.7% among hospitalized patients in India.[4] These errors can lead to

adverse drug reactions, drug-drug interactions, and poor patient outcomes, resulting in significant health and economic consequences.[2,5] The causes of medication errors are complex and multifaceted, and increase with the coexistence of factors.[6-10]

Rapid changes in healthcare have raised ethical concerns for medical professionals, particularly nurses, who play a crucial role in patient care, medication management, and clinical interactions. Despite the shared responsibility among healthcare professionals, nurses are more prone to medication errors due to their pivotal role in drug administration. MEs can compromise nursing care and lead to preventable harm to patients.[1]

MEs are often underreported in healthcare settings, particularly in developing countries like India.[11] Voluntary ME reporting is crucial for enhancing patient safety by identifying and mitigating potential risks. By fostering a culture of transparency and accountability, ME reporting can help reduce adverse events, financial burdens, and personal costs. Given its significance in promoting patient safety, understanding the facilitators and barriers to ME reporting is essential.[1,3,11]

Previous research has identified several factors contributing to the underreporting of medication errors, including fear of repercussions, lack of a non-blame culture, inadequate training and feedback, and a stressful work environment.[10,12-14] Despite extensive research on medication errors, the problem persists, and various barriers to reporting and managing MEs remain in Indian healthcare settings. Given these circumstances, it is crucial to understand the perspectives and practices of nursing leaders, who play a vital role in shaping medication error reporting culture and practices. Therefore, this expert opinion survey aimed to explore nursing leaders' perceptions, awareness, and challenges to reporting medication errors in India.

METHODS

A descriptive study was conducted between June and November 2024, involving 51 senior nursing leaders selected randomly from corporate hospitals in India. The inclusion criteria of the study were participants who were nursing leaders with over 10 years of work experience, employed in corporate hospitals, and actively involved in handling of medication error reporting practices. The exclusion criteria of the study were nursing staff with less than 10 years of experience and those not affiliated with corporate hospitals. Study excluded surveys with more than 10% invalid or blank responses to ensure data quality and completeness.

Table 1: List of categorical questions for medication errors assessment.

N	Category	Questions
Q1	Frequency and types of errors	Have you ever reported a medication error?
Q2		If yes, how often do you encounter medication errors in your facility?
Q3		What types of medication errors have you encountered?
Q4		In which therapy area do you think medication errors are most common?
Q5		How likely do you think medication errors are underreported in your facility?
Q6	Barriers to medication error reporting	The extra time required to document a medication error is one of the barriers to medication error reporting
Q7		Fear of being blamed or facing disciplinary action is one of the barriers to medication error reporting
Q8		Lack of knowledge about which medication errors should be reported is one of the barriers to medication error reporting
Q9		Lack of an anonymous medication error reporting system is one of the barriers to medication error reporting?
Q10		Lack of information on how to report a medication error is one of the barriers to medication error reporting?
Q11	Department related factors	How effective do you find the current reporting protocol of medication error?
Q12		Which of the following factors related to nursing management contribute to medication errors in your department?
Q13	Training, education and awareness	Is there any training on medication error reporting in your hospital
Q14		How frequently does your hospital provide training on medication error reporting to nursing staff?
Q15		Do you feel there is more training and education session required for medication error reporting

Data was collected using a two-part questionnaire. The first part focused on demographic characteristics, collecting data on age, gender, and work experience. The second part evaluated medication errors through 15 items categorized into four key areas: (1) frequency and types of errors (five items), (2) barriers to reporting (five items), (3)

department-related factors (two items), and (4) training, education, and awareness (three items). The survey included both categorical and Likert scale responses, with most items scored on a five-point Likert scale ranging from "extremely likely" or "very effective" (score 5) to "extremely unlikely" or "very ineffective" (score 1) (Table 1).

The questionnaire was adapted from a previously validated instrument developed by Ravi et al in Indian healthcare settings, with a Cronbach's alpha value of 0.85.[15] To ensure the relevance and accuracy of the adapted questionnaire, preliminary discussions were conducted with nursing leaders and experts in India, incorporating their feedback before finalizing the survey. The adapted questionnaire demonstrated good internal consistency reliability, with a Cronbach's alpha value of 0.82 from a pilot test conducted among Indian nursing leaders.

Participants were informed about the voluntary nature of their participation through an introductory statement in the questionnaire as "kindly confirm that you have understood the description of this survey, and your participation is voluntary. Study may use the responses provided by you in any manner with the understanding that the same shall be used for study, analysis, and publication." Data collection was conducted via an online self-administered questionnaire.

A total of 70 questionnaires were distributed, with 59 responses received, yielding a response rate of 84.3%. After excluding eight surveys with more than 10% invalid or blank responses, 51 completed surveys were included in the final analysis. Data were analyzed using Microsoft Excel.

RESULTS

Among the 51 nursing leaders, the majority were aged between 40 and 59 years. Most of them (78%) had more than 20 years of experience. Demographic data of study participants are summarized in Table 2.

Table 2: Demographic characteristics of nursing leaders.

Characteristics	
Total participants	
Age (years), mean (SD)	46.20 (5.81)
Female, %	92.16
Work experience (years), mean (SD)	20.73 (5.36)

Frequency and types of medication errors

The survey assessed the frequency and types of medication errors encountered by respondents. A majority (96%) of the 51 respondents reported experiencing medication errors, with 19.6% encountering them daily, 39.2% weekly, 17.6% monthly, and 21.6% rarely.

The survey identified multiple types of medication errors, with respondents selecting more than one type. The most common types of errors were prescribing errors (71%), dispensing errors (68.6%), wrong dosage (62.8%), wrong time (60.8%), omission errors (51%), and wrong frequency (51%) (Figure 1).

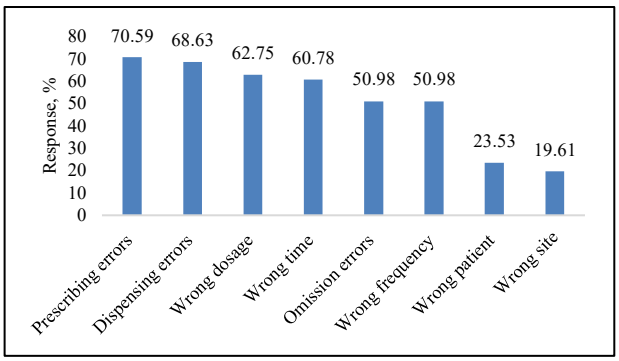

Figure 1: Type of medication errors.

Medication errors are likely being under-reported within healthcare facilities, as a significant proportion of respondents (37.2%) believed under-reporting was likely. Among them, 29.4% considered it "somewhat likely", and 7.8% stated it was "extremely likely". Conversely, 49% of respondents thought underreporting was unlikely, while 13.7% remained neutral on the issue.

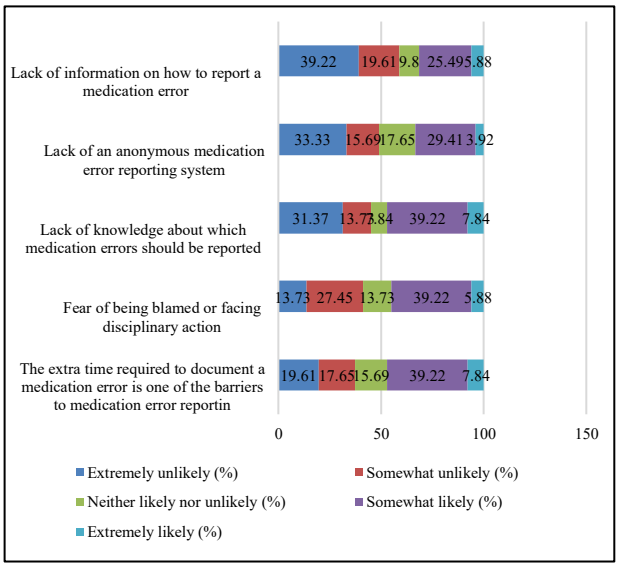

Figure 2: Details of category-wise responses regarding barriers to ME reporting.

Barriers to medication error reporting

The main barriers to reporting medication errors include the extra time required to document errors (47% somewhat or extremely likely), fear of being blamed (45% somewhat or extremely likely), and lack of knowledge on reporting medication errors (47% somewhat or extremely likely). Additionally, the absence of an anonymous reporting

system (33% somewhat or extremely likely) and lack of information on how to report medication errors (31% somewhat or extremely likely) were also identified as barriers. Figure 2 provides detailed responses on perceived barriers to medication error reporting among nursing leaders.

Department-related factors

Respondents also evaluated the effectiveness of the current medication error reporting system, with 41.2% finding it very effective, 39.2% considering it effective, 15.7% remaining neutral, and 3.9% judging it ineffective.

Various department-related factors contributing to medication errors were identified. The most frequently cited factor was the drug prescription method (67%), followed by physicians' illegible handwriting (62%). Figure 3 provides the details of other factors.

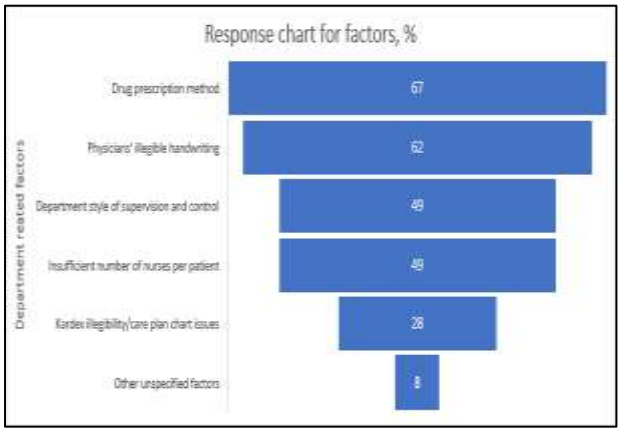

Figure 3: Funnel chart of department-related factors contributing to medication errors

Training, education, and awareness

All respondents confirmed that their hospitals provided training on medication error reporting. The frequency of training varied, with 15.7% receiving daily training, 37.3% weekly, and 43% monthly. However, a small proportion (3.92%) reported receiving training only rarely.

When asked about the need for additional training, a majority (86.3%) agreed, while 13.7% did not see the necessity for further sessions.

DISCUSSION

This expert opinion survey provides a distinctive insight into medication errors from the perspectives and experiences of senior nursing leaders in India. The participation of nursing leaders with over 15-20 years of experience in the present survey provided valuable insights into the complexities of medication error reporting in India into four key areas.

Frequency and types of medication errors

Medication errors remain a significant concern in healthcare settings, as confirmed by our survey findings, where 96% of nursing leaders reported experiencing medication errors and nearly 20% experiencing them daily. The most common types of medication errors, including prescribing (71%), dispensing (68.6%), and incorrect dosage of administration (62.8%), align with findings from previous Indian studies.[3,7,9,10,13,16-20]

Nurses, being primarily responsible for medication administration, bear the greatest responsibility for preventing administration errors, which can have severe consequences for patients.[1] Administration errors, such as wrong dosage (62.8%) and wrong time (60.8%), experienced in present survey are in line with previous Indian studies as 86% administration error reported in a tertiary care private hospital in eastern India and 76% administration error reported in a neonatal ICU of a tertiary care hospital in South India.[20,21] These errors are commonly linked to workload pressures, interruptions, and miscommunication, reinforcing the need for standardized administration protocols and advanced smart solutions for automated administration technologies.[20]

The observation that 37% of respondents believed medication errors are underreported is consistent with previous Indian research highlighting significant underreporting of such incidents.[10,17,20]

Barriers to medication error reporting

A considerable proportion of respondents believed that the extra time required to document errors and the fear of being blamed were barriers to reporting. Lack of knowledge about medication errors and lack of an anonymous reporting system were also identified as potential barriers. These findings are consistent with previous research.[10,12-14,22,23] Specifically, a previous Indian study highlighted that being afraid of the possible consequences and the time-consuming process of reporting medication errors are significant barriers to reporting ($p=0.0001$).[15] Additionally, one study reported that inadequate knowledge in recognizing medication errors was a significant barrier ($p=0.003$).[12]

Nearly half of the respondents identified fear of blame as a barrier, highlighting the need for a culture shift within healthcare organizations. The latest WHO report on MEs mentioned that MEs are often not reported in LMICs due to blame culture and fear of litigation, so an anonymous and blame-free reporting system is essential.[2] In India, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) created a Medication Error Reporting Form, which provides a structured and blame-free framework for reporting errors, facilitating the identification of systemic issues and opportunities for quality improvement.[24]

To promote patient safety and improve quality of care, healthcare organizations can implement strategies such as simplifying reporting systems, providing regular feedback, educating staff on error reporting, promoting open communication, and investigating errors constructively.[20,22,23,25]

Department-related factors

Departmental factors play a critical role in medication safety. Our study identified the drug prescription method and illegible handwriting by physicians as key contributors to medication errors. These findings are consistent with previous research on systemic causes of medication errors.[26,27] To address these challenges, hospitals can adopt several strategies. Firstly, implementing electronic prescribing and clinical decision support systems can reduce errors related to prescription methods. Regular audits of medication safety practices can also help identify and address systemic issues.[9]

Medicolegal factors

From a hospital's perspective, medication errors can have serious medicolegal implications. Medical negligence, including medication errors, can pose significant risks to patient safety and give rise to criminal and financial liabilities.[28] In India, for instance, over 1000 criminal cases were registered against doctors for causing death due to alleged negligence between 2017 and 2022.[29] Hospitals can mitigate these risks by prioritizing medication safety, implementing robust reporting systems, and ensuring that healthcare professionals are adequately trained and supported.[30]

Training, education, and awareness

The survey's findings on training, education, and awareness are encouraging. All respondents confirmed that their hospitals provided training on medication error reporting, and a majority agreed that additional training was necessary. Raising awareness about preventable medication-related harm among healthcare providers is crucial for improving medication safety.[2]

Nurses are particularly vulnerable to medication errors due to their frequent interactions with patients and doctors.[31] To prevent medication errors, nurses can adhere to the "five rights" of medication administration, double-check high-alert medications, conduct medication reconciliation, and clarify uncertainties with pharmacists or prescribers.[32-34]

Table 3: List of challenges and solutions for medication errors assessment.

Challenges	Solutions
Lack of transparency and accountability	Foster a culture of transparency and accountability, encouraging healthcare professionals to report errors without fear of reprisal. Implement blame-free and anonymous reporting systems
Limited awareness about medication errors	Raise awareness about preventable medication-related harm among healthcare providers
Lack of training	Provide comprehensive and regular training programs
Ineffective reporting systems	Implement electronic reporting systems and regular audits
Systemic issues	Implement electronic prescribing systems and standardized administration protocols
Human factors	Implement strategies to reduce workload pressures and promote effective communication
Dispensing errors	Implement barcode scanning systems and automated dispensing cabinets
Medication administration errors	Implement smart infusion pumps and automated administration systems
Insufficient staffing and resources	Provide adequate staffing and resources to support medication safety initiatives

Regular training and education programs can significantly reduce medication errors.[7,35] Hospitals should prioritize these programs to equip healthcare professionals with the necessary knowledge and skills. Effective interventions like smart infusion pumps can also improve patient safety and economic efficiency (Table 3).[36]

This study has several limitations. The sample size was relatively small, and the respondents were limited to nursing leaders from corporate hospitals. Future studies should aim to include a larger and more diverse sample. Another limitation is that the exclusion of 8 responses due to more than 10% invalid or blank answers may introduce selection bias, as the omitted data could differ systematically from the included responses, potentially affecting the generalizability of the findings.

CONCLUSION

This survey underscores the urgent need for transformative changes in medication error awareness and reporting practices among nurses in Indian hospitals. To enhance patient safety, hospitals must prioritize key strategies, including addressing perceived barriers among nurses,

implementing blame-free and anonymous reporting systems, providing comprehensive and regular training, and leveraging advanced technological solutions to minimize medication errors.

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