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ASSESSMENT OF KNOWLEDGE REGARDING NEAR MISS DRUG ERROR REPORTING FROM NURSES PESPECTIVE: A TERTIARY CARE HOSPITAL SURVEY

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Abstract

Background: *Nurses' knowledge is critical in recognizing and reporting near-miss medication errors—incidents that could harm patients but are intercepted in time. Limited knowledge may lead to underreporting, threatening patient safety. Assessing nurses' knowledge is therefore vital for identifying gaps and improving outcomes.*

Objective: *This study assessed bedside nurses' knowledge of near-miss medication error reporting and explored barriers influencing their reporting practices in a tertiary care hospital.*

Methods: *A descriptive cross-sectional study was conducted at Ittefaq Hospital, Lahore, including 100 bedside nurses selected through convenience sampling. Data were collected using a validated 27-item questionnaire (Cronbach Alpha = 0.947).*

Results: *While 92% of nurses acknowledged the significance of reporting, 57% lacked formal training, and misconceptions prevailed—such as assuming non-harm errors need not be reported. Moreover, 90% feared disciplinary action, discouraging open reporting.*

Conclusion: *Findings reveal gaps in nurses' knowledge and reporting culture. Targeted education and supportive, non-punitive systems are essential to strengthen reporting practices and enhance patient safety.*

INTRODUCTION

Near-miss medication errors, often defined as incidents that could have harmed patients but were prevented before reaching them, play a pivotal role in identifying system vulnerabilities. According to the WHO, near misses are errors with the potential to trigger adverse events that fail to cause harm due to chance interceptors (Bifftu, Dachew, Tiruneh, & Beshah, 2016). Similarly, the Institute of Medicine describes them as unsafe acts or omissions that could have injured patients but were prevented or mitigated by random events or interventions (Ntlanganiso, 2022). Experts, however, differ on whether near misses involve intercepted errors before reaching patients or errors that reach patients without causing harm (Packendorff, Magnusson, Wibring, Axelsson, & Hagiwara, 2024). Despite such

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conceptual differences, near-miss reporting remains central to advancing patient safety.

Nurses, as frontline providers, are vital in recognizing and documenting near-miss medication errors. Yet, underreporting remains a persistent issue due to misconceptions, fear of punishment, workload pressures, and insufficient training (Nallathambi et al., 2023; Geiselman, Opsahl, & Townsend, 2024). Research emphasizes that effective reporting is obstructed by barriers across individual, organizational, and cultural levels. Furthermore, opaque reporting statistics in complex healthcare environments undermine system learning. Evaluating near-miss events as distinct from no-harm incidents enables deeper insights into safety threats, even when interception is attributed to chance or intervention (Bowman, Hinchcliff, Jayalath, Dharmagunawardene, & Dharmaratne, 2024).

Building a supportive reporting culture is essential for patient safety. Studies highlight that non-punitive policies, transparent communication, leadership support, and practical training strengthen nurses' confidence to report errors (Falcone, Van Stee, Tokac, & Fish, 2022; Gleeson, Dalton, O'Mahony, & Byrne, 2020). Near-miss reporting systems that prioritize user-friendly tools and continuous education foster more consistent reporting behaviors. However, evidence from tertiary care hospitals—where patient acuity and risks are higher—remains limited. This study therefore aims to assess bedside nurses' knowledge of near-miss medication error reporting and explore barriers influencing their practices, thereby providing evidence-based insights to strengthen patient safety initiatives (Jones, 2021).

1. Materials and Methods

This study employed a descriptive cross-sectional design and was conducted at Ittefaq Hospital, Lahore, over a duration of six months following the approval of the final synopsis. The sample size was calculated using the formula $n = N / 1 + N(e)^2$, with a population size of 157 and a 6% margin of error, yielding a final sample of 100 nurses. A convenience sampling technique was used for participant selection.

The study included registered bedside nurses aged 22–30 years, with more than one year of experience and holding either a diploma or degree in nursing. Exclusion criteria were student nurses, interns, newly hired staff, head nurses, nursing supervisors, and those who had previously attended near-miss drug error workshops.

Data were collected using a structured questionnaire comprising 27 items divided into two sections: Section I (17 items) and Section II (10 items). The tool was adopted from prior research, validated, and demonstrated high reliability (Cronbach's Alpha = 0.947). Questionnaires were distributed across morning, afternoon, and night shifts, with participants given three days to complete them. On average, completion required 20–25 minutes. Prior permission was obtained from hospital authorities, and the study purpose was explained to ward supervisors and participants. Written informed consent was secured, and confidentiality was assured.

Completed questionnaires were reviewed for completeness, coded, and entered into SPSS version 25.0 for analysis. Descriptive statistics were applied: mean and standard deviation for quantitative variables, and frequency and percentages for categorical variables. Barriers to near-miss medication error reporting were ranked according to importance and categorized as very important, moderately important, or slightly important.

Ethical principles were strictly observed. Participants' anonymity and confidentiality were maintained, and they were informed of their right to withdraw at any time without penalty. No hospital regulations were violated, and data were securely stored under lock and key.

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Results

Table 1: Demographic Characteristics of Nurses (N = 100)

Category	Count	Percent (%)
Age (in years)		
22–23	34	34.0
24–25	62	62.0
26–27	4	4.0
Gender		
Male	3	3.0
Female	97	97.0
Marital Status		
Single	64	64.0
Married	36	36.0
Work Status		
Part-time	15	15.0
Full-time	85	85.0
Educational Qualification		
Diploma	51	51.0
BSN	34	34.0
Specialization	14	14.0
MSN	1	1.0
Years of Experience		
1–2 years	26	26.0
3–5 years	51	51.0
6–10 years	14	14.0
11+ years	9	9.0

The study included 100 bedside nurses. The majority were aged 24–25 years (62%), followed by 22–23 years (34%), while only 4% were in the 26–27 years category. Most participants were female (97%), with only 3% males. Regarding marital status, 64% were single and 36% married. In terms of work status, the majority were employed full-time (85%), while 15% worked part-time. Educational qualifications showed that 51% held a nursing diploma, 34% a BSN degree, 14% a specialization, and only 1% an MSN degree.

Work experience varied, with over half (51%) having 3–5 years, followed by 26% with 1–2 years, 14% with 6–10 years, and 9% with more than 10 years of experience.

Table 2: Perceptions of Factors Contributing to Medication Errors (N = 100)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Hostile environment contributes to medication error	32 (32.0%)	52 (52.0%)	10 (10.0%)	4 (4.0%)	2 (2.0%)
Interruption during medicine administration leads to error	28 (28.0%)	58 (58.0%)	9 (9.0%)	2 (2.0%)	3 (3.0%)
Distraction from patient due to overcrowding	36 (36.0%)	47 (47.0%)	9 (9.0%)	5 (5.0%)	3 (3.0%)
Shortage of staff nurses contributes to error	33 (33.0%)	50 (50.0%)	3 (3.0%)	10 (10.0%)	4 (4.0%)

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Working >12 hours in one shift increases errors	33 (33.0%)	48 (48.0%)	13 (13.0%)	6 (6.0%)	0 (0.0%)
Tiredness and exertion lead to error	27 (27.0%)	58 (58.0%)	6 (6.0%)	8 (8.0%)	1 (1.0%)
High patient ratio leads to error	35 (35.0%)	49 (49.0%)	9 (9.0%)	5 (5.0%)	2 (2.0%)
Difficulty in reading handwritten orders	21 (21.0%)	46 (46.0%)	22 (22.0%)	8 (8.0%)	3 (3.0%)
Use of abbreviations	21 (21.0%)	41 (41.0%)	18 (18.0%)	16 (16.0%)	4 (4.0%)
Reporting near-miss errors helps identify vulnerabilities	21 (21.0%)	63 (63.0%)	6 (6.0%)	10 (10.0%)	0 (0.0%)
Hectic and stressful environment contributes to error	33 (33.0%)	55 (55.0%)	9 (9.0%)	2 (2.0%)	1 (1.0%)
Poor communication with patients	28 (28.0%)	48 (48.0%)	15 (15.0%)	9 (9.0%)	0 (0.0%)
Confusion with patients of similar names	18 (18.0%)	51 (51.0%)	21 (21.0%)	8 (8.0%)	2 (2.0%)
Diverse patients, unfamiliar settings, time pressure	30 (30.0%)	48 (48.0%)	13 (13.0%)	8 (8.0%)	1 (1.0%)
Increased patient-to-nurse ratio	34 (34.0%)	51 (51.0%)	11 (11.0%)	1 (1.0%)	3 (3.0%)
Adequate organizational support prevents error	33 (33.0%)	55 (55.0%)	10 (10.0%)	1 (1.0%)	1 (1.0%)
Faulty dose checking contributes to error	40 (40.0%)	41 (41.0%)	13 (13.0%)	6 (6.0%)	0 (0.0%)

The majority of nurses agreed or strongly agreed that workplace factors such as hostile environments (84%), interruptions (86%), overcrowding (83%), shortage of staff (83%), and extended shifts (81%) significantly contribute to medication errors. Fatigue (85%) and high patient ratios (84%) were also recognized as major contributors. Documentation issues were notable, with 67% citing handwritten orders and 62% abbreviations as error sources. Importantly, 84% acknowledged that reporting near-miss errors helps identify system vulnerabilities. Organizational support was also emphasized, with 88% believing adequate support prevents errors. Overall, findings highlight workload, environment, communication gaps, and system issues as primary factors influencing medication errors.

Table 3: Nurses' Knowledge and Perceptions on Near-Miss Medication Error Reporting (N = 100)

Question	Yes	No
If there is no harm to patient, an incident involving a medication does not need to be reported.	57 (57.0%)	43 (43.0%)
Education and training regarding medication error can prevent near-miss errors.	88 (88.0%)	12 (12.0%)
Do you know how to access the hospital's event reporting system?	72 (72.0%)	28 (28.0%)
Reporting a near-miss medication error is fast and easy.	68 (68.0%)	32 (32.0%)

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Reporting a near-miss medication error will result in disciplinary action.	90 (90.0%)	10 (10.0%)
All adverse events should be reported via the hospital reporting system.	92 (92.0%)	8 (8.0%)
Verbal orders can lead to near-miss medication errors.	89 (89.0%)	11 (11.0%)
Look-alike and sound-alike medicines can lead to near-miss medication errors.	86 (86.0%)	14 (14.0%)
Have you received training on near-miss medication error reporting?	57 (57.0%)	43 (43.0%)
Reporting near-miss medication errors is important for patient safety.	92 (92.0%)	8 (8.0%)

Findings reveal that while 92% of nurses recognized the importance of reporting near-miss errors for patient safety, and 88% agreed that training can prevent errors, 57% mistakenly believed incidents without patient harm do not need reporting. Awareness of the reporting system was relatively high (72%), and most found reporting fast and easy (68%). However, 90% feared disciplinary action, highlighting a strong barrier to open reporting. Regarding error sources, the majority identified verbal orders (89%) and look-alike/sound-alike medicines (86%) as major contributors. Notably, only had received formal training on near-miss reporting.

2. Discussion

This study shows that most nurses were young (Mean age = 23.96, SD = 1.06), and consistent with previous studies, younger and less experienced nurses are more vulnerable to near-miss errors due to workload and limited clinical exposure (Beck, 2024; Johnson & Lee, 2020; Baini, 2023). Educational qualification also influenced error reporting, as diploma-holding nurses were more prone to near misses compared to BSN graduates, reflecting differences in critical thinking and training depth (Beck, 2024; Atkinson, 2024).

Knowledge gaps were evident, with many nurses unaware of hospital definitions and policies on medication errors, despite access to reporting systems. Similar studies show that while nurses recognize reporting as useful for identifying vulnerabilities, consistent practice remains limited (Chandra, Kusumapradja, & Erni, 2024). Barriers such as fear of punishment and non-punitive culture deficits were also noted, aligning with prior research highlighting staffing shortages, high patient ratios, and workload pressures as major contributors (Rambo Grimm Toledo et al., 2021).

Although most participants acknowledged the importance of education, confidence in error identification and reporting was low, underscoring the need for continuous training and organizational support (Ali Shami et al., 2024). Usability of reporting systems was another challenge, as many nurses found the process complex or time-consuming, echoing findings that streamlined systems and timely feedback improve compliance (Sepp & Tint, 2017).

Comparisons with other studies further reveal that while this study emphasizes staffing and structural interventions, others stress communication failures, cultural barriers, and hierarchical issues in preventing near misses (Pascual et al., 2024; Santa, Borrero, Ferrer, & Gherissi, 2018). Collectively, the evidence indicates that effective reporting requires not only education and training, but also a supportive culture, adequate staffing, and simplified reporting systems to strengthen patient safety.

3.Conclusion

Based on the findings, this study concludes that strengthening nurses' education, continuous training, and policy awareness is essential to improve recognition and reporting of near-miss medication errors. Creating a supportive, non-punitive culture with streamlined reporting

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systems and adequate staffing will enhance reporting practices and ultimately promote patient safety.

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