

Original Paper

# Barriers and Facilitators of Voluntary Medication Errors Reporting According to the Nursing Staff in India



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**Running Title** Barriers and Facilitators of Voluntary Medication Error Reporting

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## ABSTRACT

**Introduction:** Medication errors (MEs) are common among nursing staff due to the fear or lack of knowledge and time in reporting MEs.

**Objective:** This study aims to identify the barriers and facilitators of voluntary ME reporting according to the nursing staff in India.

**Materials and Methods:** This cross-sectional study was conducted on 398 nurses of a hospital in India, working in three different shifts with various specialties, who were selected by a convenience sampling method. A validated questionnaire was used to collect data which was prepared in Google Forms. The chi-square test was used to determine whether there was any statistical difference among the responses.

**Results:** Results showed that 87% of nurses were female and 13% were male. The majority were at an age range of 31–40 years (44.9%) and had good knowledge of MEs and the reporting system in the hospital (96.2%). Regarding the barriers, 29.9% (P<0.001) were a beginner in using the reporting system, while 70% had prior experience with the system; 85.4% (P=0.024) reported the lack of a relaxing working environment, 54.7% (P=0.031) reported burnout, 27.6% (P=0.0001) reported personnel problems, 21.6% (P<0.001) reported peer pressure and so on. Receiving support and encouragement from the multi-disciplinary team (91.7%), receiving feedback for the reported MEs that focuses on the system and not on the individuals (90.7%), professional encouragement for the reported MEs (90.4%), and developing a “no-blame” culture (86.9%) were the facilitators of the voluntary ME reporting by the nursing staffs (none of them were statistically significant).

**Conclusion:** Although it is impractical to eliminate all MEs, the engagement of nursing staff is essential in ME reduction and prevention.

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## Highlights

- Medication Errors are a serious issue in healthcare.
- Underreporting of medication errors is prevalent among the nurses.
- Reporting medication errors is an important patient safety criterion.

## Plain Language Summary

Medication errors are a serious issue in healthcare. A significant number of these errors are made by nurses. To find the underlying causes of their occurrence and prevent them, voluntary reporting of such errors is crucial. However, a variety of barriers may hinder nurses' willingness to voluntarily report them. Fear of consequences is one of the most frequent barriers. The lack of time is another barrier. Nurses can be encouraged to voluntarily report medication errors by a variety of facilitators. A relaxed environment at work is one of these facilitators. If nurses believe that their supervisors and co-workers support them, they can be more intended to report medication errors. The availability of a simple-to-use reporting system is another facilitator. Finally, educational program can help nurses perceive the importance and the safe and efficient method of medication error reporting.

## Introduction

**T**he National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) has defined the medication error (ME) 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" [1]. MEs have been estimated to cost 42 billion USD per year accounting for nearly 1% of total global health costs [2]. A study conducted in Australia found that 16.6% of all hospital admissions were associated with an avoidable adverse event, with nearly 5% of cases involving an iatrogenic injury leading to death. An 11% adverse event rate was reported by a retrospective study conducted in the United Kingdom (UK). Studies conducted in other countries have revealed comparable incidences of adverse events; one in New Zealand reported a rate of 10.7%, while another in Denmark reported a rate of 9% [3]. In a study conducted on hospitalized patients in Uttarakhand, India, the prevalence of MEs was reported to be 25.7% [4]. MEs can occur during prescribing, transcribing, dispensing, procurement, administration, and/or monitoring of a drug [5]. These errors can cause considerable negative outcomes, which not only affect the patients' health but

also cause unnecessary hospital re-admissions and prolongation of hospital stay. This drastically affects patient satisfaction and reduces their confidence in the health-care system [6, 7].

Any member of the healthcare team can make MEs. Healthcare specialists in general and nurses in particular are responsible for reporting MEs. The MEs by nurses are most common, mainly because all prescribed medications are given by the nurses and they spend most of the time administering drugs to patients. Consequently, they should administer medications cautiously and prevent any incidence of medication errors [8-11]. Thus, medication errors can hinder nursing care and cause a preventable harm to patients. Despite the rise in ME prevalence, most of them are often under-reported within the healthcare settings. The ME reporting should be a voluntary action to help reduce or prevent future mistakes that can cause patient damage. It can also reduce the associated financial and personal costs. Since ME reporting is an important patient safety criterion, identifying its facilitators and barriers is critical for patient safety investigation. This study aims to investigate the barriers and facilitators of voluntarily ME reporting among the nursing staff in India.

## Materials and Methods

This cross-sectional study was carried out for 6 months from May to October 2022. Out of 800 nurses, 511 nurses who were involved in ward round activities and were working in three work shifts from various speciali-

ties participated (286 nurses including interns, practical nurses, and nursing managers were excluded). Using a convenience sampling method, 398 nurses from among 511 nurses were included in the study (116 nurses did not enter in study as they did not respond to the questionnaire).

After a literature review, a questionnaire measuring the facilitators and barriers to reporting MEs was designed. It was a 39-items tool with four sections (demographic information, knowledge, barriers, and facilitators). The questionnaire was validated based on the opinions of 11 healthcare professionals (4 physicians, one chief nurse, and 6 charge nurses) by measuring the item-content validity index (I-CVI) and scale-content validity index (S-CVI). The overall I-CVI was 0.92. Since it was more than 80%, none of the items needed further change or removal. An average S-CVI score of 94.6% for Relevance, 93.2% for clarity, 94.2% for ambiguity, and 96.4% for simplicity were obtained. The Cronbach's  $\alpha$  value was obtained as 0.86, 0.88 and 0.87 for the knowledge, barriers, and facilitators subscales, respectively. The first section surveys the demographic characteristics of nurses (such as age, gender, working department, years of experience, and educational level). The second section consists of seven items measuring the knowledge of MEs and the reporting system; six items are answered by Yes (1 point) and No (0 points), and one item (assessing the number of MEs reported) is answered by "0 reports", "1-5 reports", and "more than 5 reports". The third section with 27 items uses a Likert scale as 1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree to surveys the barriers to voluntary reporting of MEs. The last section with 5 items rated on a Likert scale as 1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree, surveys the facilitators of voluntary ME reporting

The questionnaire was prepared using the [Google Form](#) and the link was sent to the nursing staffs and their responses were collected. Chi-square test was used to determine if there is any significant difference among the nurse's responses to each items of the subscales facilitators and barriers to determine their willingness to engage in voluntary ME reporting. All collected data were entered and analyzed in SPSS software, version 18. The variables such as age, gender, and educational level were described using the statistics of frequency and percentage.

## Results

Of 511 nurses, 398 completed the questionnaires (response rate=77.9%), of whom 87% were female and 13% were male. The majority were at an age range of 31–40 years (44.9%). For more information, see [Table 1](#). The majority (85.67%) had a diploma, followed by 12.56% with a bachelor's degree in nursing, and 1.75% with a master's degree in nursing.

The results related to the knowledge of MEs, their impacts, and the reporting system showed that 96.2% had good knowledge, whereas 3.85% were unaware of the existence of a ME reporting system in the hospital and chi square test showed only 'awareness of the existence of a medication error reporting system in the hospital was significant ( $P=0.004$ ).

Based on [Table 2](#) information, the results related to the barriers to voluntary ME reporting showed that 30% were novice in using the ME reporting; 67.9% reported that they had too many ward activities to focus on reporting; 54.3% reported that patients were too demanding to handle; 27.6% reported personnel problems, and 26.1% reported financial/economic problems. These were statistically significant ( $P<0.05$ ). Other significant barriers to reporting MEs are reported in [Table 3](#).

The results related to the facilitators of the voluntary ME reporting showed that professional encouragement (90.4%), receiving a feedback for the reported errors that focuses on the system and not on any individuals (90.7%), a "no-blame" culture (86.9%), the belief in the significant contribution of ME reporting to professional practice, organization, and patient safety (94.2%), and support and encouragement from the multi-disciplinary team (91.7%) were the facilitating; however, none of them were statistically significant ([Table 4](#)).

## Discussion

The occurrence of MEs is a threat to patient safety. The goal of medication therapy is to achieve the best therapeutic outcome while enhancing the patient's quality of life [12]. Well-qualified practical nurses can accept many roles for resolving patient care challenges and being an integral part of the healthcare team [13]. In the current study, the researchers aimed to investigate the different barriers and facilitators of voluntary ME reporting according to nurses in India. The majority of the nurses had 5-10 years of nursing experience. With increasing experience, nurses learn more about the various types of MEs and the factors contributed to these errors. With

**Table 1.** Demographic characteristics of the study participants

Variables	Gender Distribution (n=398)		
	Females (n=346)	Males (n=52)	
Age (y)	<20	5(1.4)	0
	21-30	91(26.3)	9(17.3)
	31-40	147(42.5)	32(61.5)
	41-50	96(27.7)	10(19.2)
	≥50	7(2)	1(1.9)
Work experience (y)	<1	25(7.2)	4(7.7)
	1-5	50(14.4)	4(7.7)
	6-10	105(30.3)	13(25)
	≥11	166(48)	31(59.6)
Total	346(100)	52(100)	

**Table 2.** Awareness about medication error and its reporting system

Response	Total (n=398)	P*	
Are you aware of the term “medication error”? if so, describe it	Yes	395	0.539
	No	3	
Are you sure about the early detection of medication errors?	Yes	386	0.609
	No	12	
Are you aware of the importance of reporting medication errors?	Yes	394	0.449
	No	4	
Are you aware of the difference between a medication error and an adverse drug event?	Yes	395	0.334
	No	3	
Are you aware of the existence of a medication error reporting system in the hospital?	Yes	383	0.004
	No	15	
Have you ever reported a medication error before?	Yes	176	0.172
	No	222	
How many medication errors have you reported in the past 2-3 months?	None reported	356	0.495
	1-5 reported	33	
	≥5 reported	9	

\*Chi-square test.

**Table 3.** Barriers for voluntary reporting of medication errors

Response		Total	P**
I am a beginner in using the medication error reporting system	Yes	119	0.0001
	No	279	
I think that there is a lack of supervision on handling medicines by inexperienced nursing staff	1	34	0.045
	2	138	
	3	193	
	4	33	
I emphasized on patient safety and reporting medication errors during internship	1	61	0.027
	2	255	
	3	71	
	4	11	
There are too many ward activities to focus on reporting a medication error	1	37	0.0001
	2	232	
	3	118	
	4	11	
A relaxed workplace helps me to be more focused, which in turn can reduce the occurrence of medication errors	1	66	0.024
	2	274	
	3	56	
	4	2	
I believe that distraction or distress in the workplace can affect the workflow	1	45	0.695
	2	241	
	3	109	
	4	3	
Sometime patients can be very demanding to handle, leading to medication errors	1	27	0.005
	2	189	
	3	174	
	4	8	
Sound-alike/look-alike medicines can cause confusion and lead to medication errors	1	40	0.116
	2	238	
	3	104	
	4	16	

Response		Total	P**
Sometimes, uneven work-related communication may result in medication errors	1	34	0.010
	2	239	
	3	115	
	4	10	
Doctor's illegible handwriting in patients' medical files confuses me and may result in medication errors	1	31	0.808
	2	197	
	3	152	
	4	18	
Job burnout can lead to committing a medication error	1	25	0.031
	2	193	
	3	162	
	4	18	
I believe that personal problems sometimes can affect my decision-making ability	1	17	0.0001
	2	93	
	3	247	
	4	41	
I believe financial/economic problems sometimes can affect the work quality	1	20	0.0001
	2	84	
	3	234	
	4	60	
I think that there are insufficient personnel in the hospital	1	21	0.046
	2	143	
	3	220	
	4	14	
I always believe that night shifts are more challenging and can result in frequent medication errors	1	24	0.009
	2	109	
	3	227	
	4	38	
Sometimes, I feel unmotivated to report medication errors	1	16	0.0001
	2	77	
	3	278	
	4	27	

Response		Total	P**
I do not report any medication error due to peer pressure	1	11	0.0001
	2	75	
	3	268	
	4	44	
I feel uncomfortable to report a medication error made by others	1	19	0.0001
	2	88	
	3	259	
	4	32	
I am concerned about the patient confidentiality by having to include the patient's name on a medication error report	1	41	0.002
	2	232	
	3	110	
	4	15	
I have not reported a medication error, because I was afraid of the possible consequences	1	14	0.0001
	2	64	
	3	275	
	4	45	
I have not reported a medication error, because I have not seen others that report an error	1	13	0.0001
	2	74	
	3	284	
	4	27	
I have not reported a medication error due to the lack of information on how to report	1	14	0.0001
	2	66	
	3	280	
	4	38	
I have not reported a medication error because of the lack of trust in the reporting system	1	10	0.0001
	2	57	
	3	287	
	4	44	
I have not reported a medication error, because I do not know the importance of reporting	1	10	0.0001
	2	58	
	3	272	
	4	58	

Response		Total	P**
I have not reported a medication error, because the process of reporting is time consuming	1	10	0.0001
	2	66	
	3	269	
	4	53	
I have not reported a medication error, because I find it as an indicator of our inability to handle the task	1	12	0.0001
	2	73	
	3	275	
	4	38	
I prioritise reporting a medication error, because I think it is serious	1	45	0.352
	2	241	
	3	102	
	4	10	

1: Strongly agree; 2: Agree; 3: Disagree; 4: Strongly disagree. \*Chi-square test.

this experience, they can lower the chance of ME by being more vigilant and taking preventative measures.

Although low ME is considered a success for healthcare professionals, the gap between the ME occurrence and the voluntary ME reporting rate is an important indicator of patient safety. As a result, it is important to develop an effective ME reporting system to identify and reduce the contributing factors and barriers to reporting MEs [14]. Mirghafourvand et al. reported the various barriers and facilitators of ME reporting and emphasised the importance of the need to develop a ME reporting system [15].

The probability of reporting ME in the healthcare professionals may increase if most of them become aware of the importance of ME reporting. Healthcare professionals are more liable to report ME when they are aware of the potential benefits and advantages of ME reporting. Nurses are often hesitant to report mistakes/errors committed by a colleague at work. A variety of reasons play behind this hesitancy such as lack of knowledge about how to report, peer pressure, a lack of trust in the reporting system, potential consequences after reporting, and so on. Thus, removing these barriers to reporting MEs can encourage nursing staff to report their errors voluntarily, since the increase in the number of barriers, can reduce the ME reports [16].

The most significant barriers identified in the current study according to nurses were being a novice in using the ME reporting system, having too many ward activities to focus on, patients being too demanding to handle, personnel problems, financial/economic problems, having night shifts, lack of motivation, and peer pressure. In a study conducted by Travaglia et al., some of the above-mentioned barriers were also identified, such as the time-consuming process of ME reporting and job-related threats [17]. The likelihood of reporting ME can be reduced by the barriers such as fear of retaliation or worries about confidentiality. Healthcare professionals may choose not to report MEs that they notice or commit if they believe that it can affect handling the tasks assigned to them.

A number of facilitators are required for voluntary ME reporting process. Nurses in our study reported many facilitators. In a study conducted by Bakry, 62.6% of nursing staff reported a “no-blame” culture as the major facilitator of ME reporting [18]. To address and reduce the ME reporting barriers, facilitators need to be found. Healthcare professionals are more likely to feel confident and empowered to report MEs when organizations implement policies and procedures that support reporting of MEs.

ME are also a significant fear for patients. In a study conducted by Maxwell, it was reported that ME occurrence is a multi-factorial problem; when a ME occurs,



**Table 4.** Facilitators for reporting medication errors

Response		Total (n=398)	P*
I receive enough support and encouragement from my multidisciplinary team, seniors, peers and organization to report any medication errors	1	93	0.2
	2	272	
	3	30	
	4	3	
I am confident that, when I submit a medication error report, I will receive feedback from the hospital that focuses on the system and not on the individual	1	59	0.13
	2	302	
	3	30	
	4	7	
I get professional encouragement for each medication error report that I submit	1	53	0.26
	2	307	
	3	35	
	4	3	
If there is a 'no-blame' culture in the hospital in relation to the medication errors that I was submitted, I will feel more confident in reporting again	1	55	0.922
	2	291	
	3	49	
	4	3	
I believe that each medication error report that I submit can make a significant contribution to my work, hospital, and patient safety	1	114	0.308
	2	261	
	3	20	
	4	3	

1: Strongly agree; 2: Agree; 3: Disagree; 4: Strongly disagree. \*Chi-square test

healthcare professionals should look for all potential responsible factors [19]. In a study conducted by Dyab et al [20], various barriers to ME reporting in nursing practise were surveyed, and they suggested that identifying and resolving them is needed. Personnel neglect, unfamiliarity with the medication, insufficient training, heavy workload, new staff [21], low work experience [22], tiredness, exhaustion, burnout [23] illegible prescriptions, distractions/interruptions, and confusion between two similar drugs names [24] are some of the most prominent barriers to ME reporting.

There are few limitations in conducting this study. While maximum effort was taken to reduce the response bias, a neglected bias may exist in responses. Also, the duration of the study was short; the number

of participants could be higher with an increase in the study period. The nurses' works in three different shifts made it difficult to survey their responses.

The engagement of nursing staff in ME reduction and prevention is essential. As a result, there is a need to create an environment in which nurses feel free to report MEs without fear of repercussions and the regard for whether the occurred error was serious or not. It is also essential to design a reporting system by which nurses can feel secure and confident in reporting MEs and prevent future incidences of errors.

## Ethical Considerations

### Compliance with ethical guidelines

The ethical approval was obtained from the Institutional Ethics Committee of [JSS Medical College](#) prior to the study (Code: JSSMC/IEC/17112021/37NCT/2021-22).

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### Authors' contributions

Study design, methodology, data collection, data analysis and drafting the manuscript: Ravina Ravi, Sri Harsha Chalasani, and Praveen Kulkarni; Review and editing: Sri Harsha Chalasani, Praveen Kulkarni, Madhan Ramesh, and Janet Mathias; Final approval: All authors.

### Conflict of interest

The authors declared no conflict of interest.

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