

A prospective study to evaluate awareness about medication errors amongst health-care personnel representing North, East, West Regions of India

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ABSTRACT

Background: Medication errors are prevalent in the hospital settings. To ensure the patient safety and provide better health services, medication errors should be curbed. India is still lacking the regulatory system for the control of medication errors. Therefore, a stringent regulatory set up should be established to reduce medication errors. Awareness among the health-care professionals regarding medication errors may be the major factor in the establishment of successful regulatory system. In Indian context, no study has been reported about the awareness of medication errors. Therefore, this study assessed the awareness of the health-care professionals representing North, East and West regions of India about medication errors. These health-care professionals also included the students who were in the final phase of professional courses related to health management. **Materials and Methods:** A questionnaire comprising of 17 questions pertaining to different aspects of medication errors was prepared. Questionnaire was distributed to 456 health-care professionals of various institutes of North, East and West India. Respondents of the questionnaire were restricted to one sitting for answering the entire questionnaire and they were not allowed to consult with anyone for the purpose of answering the questions. Data was compiled and analyzed. **Results:** It has been found that 18.45%, 39.48%, 14.16%, 27.9% of respondents were having excellent, good, average, poor knowledge respectively regarding the fundamentals of medication error. Knowledge regarding reporting medication errors was excellent in 56.65%, good in 22.53%, average in 09.23% and poor in 11.59% of respondents. **Conclusion:** The outcome of this study may be of great help in drafting the regulatory policies to curb the problem of medication errors.

Key words: Awareness, health-care professionals, medication errors

INTRODUCTION

Institute of Medicine issued a report on the prevalence of medication errors in the United States in which at least 1.5 million Americans are injured every year by medication errors. Every patient in the hospital is probably subjected to

at least one medication error every day. Though, many of these errors do not cause harm, but there may be as many as 7000 people who die every year from medication errors. The huge costs incurred for treating the consequences of medication errors are estimated to be over 3 billion US dollars annually. This alarming figure does not include lost wages and workers productivity.^[1]

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It is therefore a challenging issue for the health-care settings as these errors pose a great threat to the safety of patient. Medication errors are defined 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."^[2] Such events may be related to professional practice, health-care products, procedures and systems including prescribing; order communication; product labeling, packaging and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use."^[3]

Access this article online	
Quick Response Code:	Website: www.ijabmr.org
	DOI: 10.4103/2229-516X.125694

There are different types of medication errors for example prescription errors, dispensing errors, administration errors, monitoring errors, potential errors, compliance errors and clerical errors.^[4] Prescription errors are the biggest contributors with a staggering figure of 70% of total medication errors.^[5] The leading causes behind other types of medication errors comprise of clogging of health-care professionals with enormous patients because of alarming shortage of health-care professionals, especially in developing countries like India, miscommunication amongst the health-care team. Confusing or misleading drug-labeling, packaging, nomenclature of medicines, lack of knowledge about drug therapy also causes medication errors. Misinterpretation of verbal orders, conservative approach of health-care professionals in taking patient history for example ignorance of taking the allergy history of the patient are few other causes of occurrence of medication errors.^[6]

This issue should be dealt more seriously to ensure safe medication use. Therefore, every stakeholder should be aware about the different aspects of medication errors.^[7] Such studies may pivot the pathway to begin the reporting system for medication errors and draw the attention of drug regulatory bodies of India.^[8]

This study was conducted to assess the awareness amongst various health-care professionals/students regarding medication errors. The awareness was assessed in different groups including the doctors, nursing staff and students, pharmacists and pharmacy students, dentists and dental students.

MATERIALS AND METHODS

The present study is an observational prospective study to assess the awareness of medication error amongst health-care professionals. A questionnaire comprising of 17 questions pertaining to medication errors and their management was prepared. Questionnaire was administered by making the groups of the doctors, medical students, dentists, dental students, pharmacists, nurses and nursing students in the working hours with prior permission of the institution. Institutions were selected from different states of India.

The respondents were asked to fill the questionnaire according to their individual view and were not allowed to consult their group members for opinions on any question. Respondents were instructed to answer the questions of the questionnaire in one sitting, but no time constraint was kept for this purpose. All the completed questionnaires were collected for analysis. The highlights of the questionnaire are as follows:

- Every question in the questionnaire was followed by three alternative objective answers viz. “Yes,” “No,” “No comments”
- Questions in the questionnaire were segregated into three classes for evaluation of awareness in different spheres of concept of medication error. First class was designated as “A” class which comprised of seven questions. Questions numbered 1-6 and 10 of the questionnaire belong to this class and pertain to the fundamental knowledge regarding medication errors and interventions used in prevention and management of medication errors. Every “Yes” response was given a score of one and every “No” or “No comments” was scored as zero and cumulative score was calculated for the whole class of questions
- Class “B” comprised of questions concerned with the reporting system for medication errors. Question no. 7-9 and 14 were categorized into this class. Every “No” response for the question no 7-9 was scored as one and every “No comments” or “Yes” was scored as zero. “Yes” response for the question no. 14 was scored as one followed by calculation of cumulative score of the class B
- Similarly, class C was categorized by making a set of questions related to the capability to give an opinion or recommendations over the escalation of the system for medication errors. Question no 11-13 and 15-17 constituted the Class C, for which every “Yes” response was scored as one whereas every “No” or “No comments” was scored as zero.

A grading scale to assess the awareness was designed as shown in Table I.

Questionnaire

- Do you know about medication error?
- Do you understand the relevance of the term medication error?
- Are you aware of the various categories of medication errors?
- Do you know that there exist various interventions to prevent medication error?
- Are you aware of the various interventions to prevent medication errors?
- Are you aware how to proceed if medication errors occur?
- If you noticed a medication error, did you not inform due to fear of any legal consequences?

Table I: Grading scale

Class	Total no. of questions	Grading scale			
		Excellent	Good	Average	Poor
A	7	7	5 or 6	4	≤3
B	4	4	3	2	≤1
C	6	6	5	4	≤3

- After noticing the medication error, did you not inform as you were too busy?
- After noticing the medication error, did you not inform as you did not know whom to inform?
- After noticing a medication error did you intervene to rectify by using suitable measures?
- Should awareness quantification of medication error particularly to pediatric population be recommended as dosing error are particularly more common in their age group?
- Should there be an improved system in hospitals regarding administration for drug dispensing?
- Do you recommend integrated approach toward training and education about the medication error in medical institute and the general public?
- Are you aware of reporting system and how to report?
- Do you recommend standardized implementation of proper maintenance of data?
- Do you think our institute should form an independent body for reporting medication errors?
- Should proper recommendations to be instituted in the areas of organization, legislation, regulation and resources to improve surveillance and safe use of drugs?.

Screening of respondents

Four hundred and fifty-six respondents were taken from the health-care profession. All of the respondents were either established health-care professionals or were in the final phase of their learning of professional skills. The respondents were approached in their respective institutes after seeking permission from the head of the institute.

RESULTS

The graphical representation of the responses from the health-care professionals to the questionnaire is shown in Figure 1. It shows the relative distribution of percentage of every response i.e., “Yes,” “No,” “No comments” in relation to each question of questionnaire.

It has been evaluated that the knowledge of fundamentals of medication error in the health-care professionals was found to be excellent in 18.45%, good in 39.48%, average in 14.16% and poor in 27.9% of the total respondents. Among the 27.9% of respondents having poor knowledge of medication error, 4.72% of respondents were found to have no basic knowledge and scored zero in group A of questions pertaining to the basic knowledge of medication errors.

The knowledge about the reporting system of medication errors was excellent in 40.13%, good in 40.13%, average in 14.16% and poor in 5.57% of respondents. Among the

professionals with poor knowledge, 0.21% of respondents has no knowledge of reporting system of medication errors and earned a score of zero in group B of questions which are pertaining to the reporting system of medication error.

Among the health-care professionals, 56.65% were able to recommend or opine about the betterment of the system for reporting medication errors and this response was termed as excellent. The response was good for 22.53%, average for 9.23% and poor for 11.59% of respondents. Out of 11.59% of respondents having poor knowledge, 3.65% of respondents were found to be incapable of giving any recommendation or opinion over the betterment system of medication errors and fetched a score of zero in group C of questions pertaining to the capability to give an opinion or recommendations over the escalation of the system of medication error. The complete scores are tabulated in the Table 2.

DISCUSSION

The prevalence of medication error is high even in countries like USA which is evident from the fact that United States Food and Drug Administration has received approximately 1 lakh reports of medication errors since year 2000.^[9] Developing countries are still lacking good health-care systems and are falling short of adequate number of health-care personnel

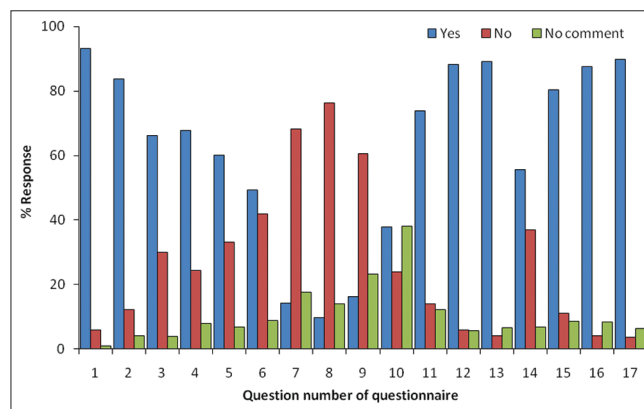


Figure 1: Representation of the relative distribution of percentage of responses

Table 2: Scores earned by respondents in different classes of questions

Score earned	No of respondents from Class A earning score (%)	No of respondents from Class B earning score (%)	No of respondents from Class C earning score (%)
7	86 (18.45)	-	-
6	96 (20.60)	-	264 (56.65)
5	88 (18.88)	-	105 (22.53)
4	66 (14.16)	187 (40.13)	43 (9.23)
3	54 (11.59)	187 (40.13)	18 (3.86)
2	39 (8.37)	66 (14.16)	15 (3.22)
1	15 (3.21)	25 (5.36)	4 (0.86)
0	22 (4.72)	1 (0.21)	17 (3.65)

after each patient. Therefore, there are high probabilities of occurrence of medication errors across the entire spectrum of prescribing, dispensing and administering. Medication errors are not individual generated rather they are system generated. Also, reporting “near misses” may contribute a lot for the future corrective measures to safeguard the patients.^[10] As there is no reporting system so far in India for medication errors,^[11] “No” or “No comments” response of the Class B questions implies that the respondents earning good score in the class B questions are not biased in the study and they are producing the actual results. That was the reason why questions with negative answers were incorporated in the questionnaire.

Monitoring of adverse drug reactions is gaining the popularity since last few years all over the world for which medication errors are still striving.^[12] In India, National Pharmacovigilance Program of India is already incepted with full operation but there is no reporting or controlling system for medication errors.^[13]

The present study reveals that 72% respondents are having average or above average basic knowledge regarding medication errors whereas 94.43% respondents are having knowledge regarding non-existence of reporting system for medication error in India. These figures suggest that health-care professionals in India are aware about the medication error and therefore establishment of reporting system in India may help in combating the problem of medication errors.

Establishment of medication error reporting system does not meet the objective of reducing the medication error. There is a challenge of eliminating the under reporting of errors even after the establishment of reporting system.^[14] There are numerous factors responsible for the under reporting of medication errors which include fear of adverse consequences, tarnishing of reputation, overburden of work.^[15,16]

There are numerous factors which can increase error reporting, e.g., all health-care team committed to patient safety; encouraging reporting of near misses; providing timely feedback and follow up actions and improvements to avert future errors; and having a multidisciplinary approach to reporting etc.^[17,18] More recent approaches are focusing on increasing and simplifying error reporting and automating the detection of errors, including creating web-based forms or adapted standard spreadsheets to reveal patterns of errors.

Conclusively, unbiased assessment of awareness amongst health-care professionals may pivot the pathway to the establishment of a system which will help in monitoring and controlling the occurrence of medication error.

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How to cite this article: Sewal RK, Singh PK, Prakash A, Kumar B, Medhi B. A prospective study to evaluate awareness about medication errors amongst health-care personnel representing North, East, West Regions of India. *Int J App Basic Med Res* 2014;4:43-6.
Source of Support: Nil. **Conflict of Interest:** None declared.