

**MEDICATION ERRORS, WHAT HEALTHCARE PROVIDERS THINK? A KNOWLEDGE, ATTITUDE AND PRACTICE SURVEY**SWAPNIL C JAYKARE<sup>\*1</sup>, VIJAY M MOTGHARE<sup>2</sup>, SUDHIR L PADWAL<sup>3</sup>, VINOD S DESHMUKH<sup>4</sup>, JYOTI R PATIL<sup>5</sup>, HARSHAL N PISE<sup>6</sup>, ASHA D JADHAV<sup>7</sup>

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Received: 9 July 2013, Revised and Accepted: 27 July 2013

**ABSTRACT**

Objective: Evaluation of knowledge, attitude and practice of healthcare providers about Medication errors.

Method: It was a KAP survey conducted with the help of specially designed and pre-validated questionnaire. Doctors', nurses' and pharmacists' awareness and perception about Medication errors were assessed. The KAP survey questionnaire was analyzed and their question-wise percentage value was calculated. Data was analyzed with One-way ANOVA followed by Dunnett's post-hoc test and descriptive statistics were applied whenever necessary.

Results: Response rate amongst healthcare providers was satisfactory. Doctors' knowledge and practice were significantly higher compared to the nurses and the pharmacists. Their perception when analyzed, revealed that most of the participants consider medication error as an important problem which can be prevented. There is a difference of opinions as regards to the liability for legal punishment to the personnels responsible for such incidences, thus considering it as a crime.

Conclusion: There is awareness regarding Medication errors, yet certain circumstances which significantly contribute in occurrence of these events need to be overcome. Regardless of the availability of few solutions, as this area of practice is least approached, further research is warranted in various interventions to deal with the same.

**Keywords:** Awareness, Doctors, Medication errors, Nurses, Pharmacists.

**INTRODUCTION**

*Medication errors are easy to prevent, Once occurred they are very difficult to defend.*

Medication error are the events related to professional practice, processes involved during prescribing, product labeling, packaging, compounding, dispensing, distribution, and administration of drugs and drug-related products. The National Coordinating Council for Medication error (NCCMER) defines a Medication error as being "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." [1] They may occur at any time, from the prescription to consumption of the medicines by the patient. Medication errors compromise patient confidence in the health-care system and increase health-care costs. The problems and sources of Medication errors are multidisciplinary and multifactorial. Errors occur from lack of knowledge, substandard performances and mental lapses, or defects or failures in systems.[2] Medication errors may be committed by both experienced and inexperienced staff, including physicians, pharmacists, nurses, students, clerical staff, administrators, pharmaceutical manufacturers, patients and their caregivers, and others. An understanding and improvising of these risk factors will enable better patient care in the form of reduced incidence of these events.[3] These events occurs due to lack of knowledge, casual attitude and improper practices by the health-care providers at various stages. Awareness about the knowledge and attitude towards medication errors will definitely improve the quality of provision of health services.[4]

In the present study we have tried to analyze the knowledge, attitude and practices of the health-care providers at our institute which is a rural tertiary care teaching hospital. This valuable

information will highlight the fact that for efficient functioning of the health-care systems, a co-ordination amongst these personnels and the patients is of vital importance.

**Methodology**

Survey method involved the Doctors, Nurses and Pharmacists. It was a prospective Knowledge attitude practice (KAP) questionnaire based study carried out after **approval from the Institutional Ethics Committee**. Informed consent was obtained from each participant. A newly developed and pre-validated KAP questionnaire was used. It consisted of a total number of 20 questions. Among these 7 questions were related to the **Knowledge**, 6 questions were related to **Attitude** and remaining 7 were related to the **Practice** aspects. The initial draft was circulated to the members of the research team and modifications were carried out as per the suggestions. On receiving the responses from healthcare professionals, its reliability was tested by assessing the **Cronbach alpha** value. Every healthcare professional was given 30 minutes to fill the questionnaire. Any clarification needed in understanding the questionnaire was provided.

In order to preclude any potential bias, the disclosure of name of the responder was made optional. Initially Pre-KAP questionnaire was briefed to all participants (doctors, pharmacists and nurses) and informed about the purpose of the study. KAP survey questionnaire was analyzed question-wise and their percentage value calculated. In case of unanswered questions, the participant was excluded from the study.

Data was analyzed with One-way ANOVA followed by Dunnett's post-hoc test using Open Epi Version 2.3 software for statistical analysis and descriptive statistics used whenever required.

**RESULTS**

A total number of 75 healthcare personnels, each of 25 doctors, nurses and pharmacists were interviewed with the help of the specially designed questionnaire. The demographic profile of the healthcare professional is shown in table 1. Majority of the study participants were in the age-group of 31-40 years with less than ten years of work experience.

**Table 1: Demographic details of healthcare workers**

Parameters	Doctors (n= 25)	Pharmacists (n= 25)	Nurses (n= 25)
Age(In years)			
21-30	17	5	7
31-40	8	15	14
41-50	-	1	3
>51	-	4	1
Gender:			
Male	15	24	22
Female	10	1	3
Years of experience:			
<10 years	23	17	15
11-20	2	5	10
21-30	-	3	-

The mean KAP scores of the respondents were classified based on their profession. Table 2 shows the mean score of knowledge and practice of the health care personnels. Statistical analysis showed that the score of knowledge of the doctors was significantly higher than that of the nurses and the pharmacists. The analysis of the score of practice of the doctors was also significantly higher compared to the nurses and the pharmacists.

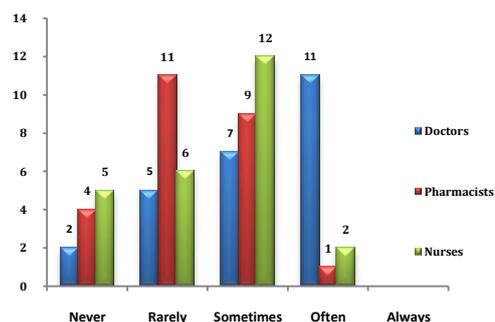
**Table 2: Mean KAP Score of responders**

Professional Status	Mean ± SD	
	Knowledge	Practice
Doctors (n= 25)	7.32 ± 0.8020**	6.72 ± 0.9363**
Nurses (n= 25)	6.36 ± 0.9183	5.88 ± 1.4525
Pharmacists (n= 25)	6.48 ± 1.4106	5.44 ± 1.0832

\*\*\*p < 0.001, \*\*p < 0.01, \*p < 0.05,

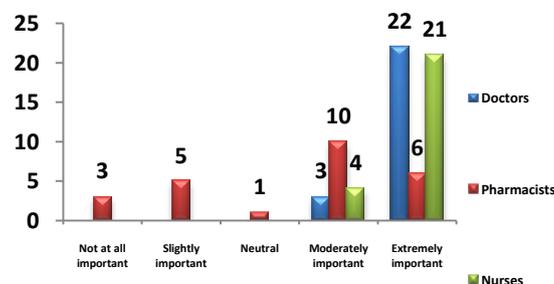
when compared between the groups

When the participants were assessed regarding the knowledge about Medication error, (Figure 1) we observed that most (28) of the healthcare providers have heard the term, "Medication error" at-least "sometimes" in their practice. On the contrary, 11 participants had "never" heard about it.



**Fig. 1: How often have you heard the term "Medication Error"?**

The importance of Medication errors was analyzed (Figure 2) and it was noticed that 65% of the participants considers it as an "extremely important" problem to deal with. Only three healthcare providers think that it is "not at all an important problem"; all being pharmacists.



**Fig. 2: How important a problem do you think is "Medication Error"?**

The following table (Table 3) displays the attitude of the healthcare providers. Majority (86.67) of the participants either agree or strongly agree that the Medication errors are preventable and almost all of them think that its prevention is beneficial to our healthcare system. Interestingly, it was observed that there is a difference of opinions as regards to the liability for legal punishment to the personnels responsible for such incidences, thus considering it as a crime. Most (70.67%) of the participants thought that Medication errors can be considered as an accidental event.

**Table 3: Attitude of participants towards Medication Errors**

Perception	Strongly Disagree: number (%)	Disagree: number (%)	Neutral: number (%)	Agree: number (%)	Strongly Agree: number (%)
Medication errors are preventable.	3(4%)	4(5.34%)	3(4%)	32(42.66%)	33(44%)
Medication errors commonly occur in inpatients.	12(16%)	29(38.67%)	13(17.33%)	19(25.33%)	2(2.67%)
Prevention of Medication errors is beneficial to our healthcare system.	1(1.33%)	-	1(1.33%)	30(40%)	43(57.34%)
Medication error is an important problem.	-	-	1(1.33%)	37(49.33%)	37(49.33%)
Persons responsible for Medication errors are liable for legal punishment.	14 (18.67%)	17(22.67%)	15(20%)	21(28%)	8(10.66%)
A Medication error can be considered as an accident.	2(2.67%)	6(8%)	14(18.67%)	38(50.66%)	15(20%)
There should be a system to report Medication errors.	-	1(1.33%)	-	33(44%)	41(54.67%)
It is a responsibility of every healthcare personnel to report Medication errors.	-	2(2.67%)	2(2.67%)	24(32%)	47(62.66%)

## DISCUSSION

The ultimate goal of our study was to assess the knowledge, attitude and practices of the chief healthcare providers of our country i.e. doctors, nurses and pharmacists about Medication errors. When knowledge and practice of the nursing staff was assessed and compared with that of the doctors, there was significant scope for improving the nurses' knowledge and practice about medication errors. On the contrary, the difference between these two parameters was not significant amongst the pharmacists. A study conducted by Bailey CG *et al* [5] assessing the nurses' education and their work experience in relation to Medication errors, concluded that these (education and work experience) go hand-in-hand in order to reduce the incidence of such events and improve the overall healthcare services. Similarly, the knowledge and practices of pharmacists' showed significant differences when compared with that of the doctors. We have come across few studies which also showed similar findings. Rickles NM *et al* [6], in their study, observed that there is need to develop educational interventions and training of pharmacists to improve their knowledge and practise in terms of Medication errors.

Frequently, Medication errors go unnoticed and left unreported. Hence we enquired whether our healthcare personnels consider it to be an important issue. The results were satisfactory as majority of them considered it as an "extremely" or "moderately" important issue. A survey conducted by the European Union [7] demonstrated that majority of the respondents in Italy, Poland and Lithuania perceive Medication errors as an important problem. They also observed that in Finland the respondents not considering Medication error as a problem outnumber those considering it to be an important problem. However in our study only a few pharmacists considered it as a trivial issue.

Majority (86.67%) of the healthcare personnels thought that Medication errors are preventable, while 38.67% respondents think that a person responsible for Medication error is liable for legal punishment as it is not an excusable event. Many (70.67%) respondents also thought that Medication errors can be considered as an accident, whereas only 41.33% respondents think that the person involved in such events is not liable for legal punishment. A few respondents however, chose to remain neutral on this. In spite of the controversies, it has been observed that Medication errors occur also due to patients' faults such as not following proper instructions, discontinuation of medicines at their own will, consuming medicines as per their own assumptions etc. In such circumstances, legal punishments are not acceptable. Hence even though they are preventable events, yet they should be considered as accidents.

Irrespective of the liability, it is necessary to understand causality and preventability of such events. This will help to design and implement interventions and modifications in present clinical practice to avoid Medication errors. In our study, we observed that there were many avoidable instances which had potential for causing Medication errors. The commonest cause of Medication errors, as highlighted in our study, was the appalling hand-writing of the doctors making it difficult to understand the prescription, which in turn was attributed to the heavy workload they bear. In such instances, use of novel technologies such as computerized physician order entry (CPOE) and electronic prescription will keep a check over such events considerably.[8] Adopting simple methods of writing the prescriptions, especially the drug details in block letters, can also eliminate the errors due to improper hand-writing, beyond doubt.

The other causes for such events, we came across during our survey, were confusing brand names of the drugs (Sound Alike Look Alike: SALA), similar appearance of the dosage forms and when drugs are stored at a site which is reserved for some other drugs. The concept of SALA is very common in day-to-day practice; few examples being capsule Moclox and capsule Macox, tablet Rockin and tablet Roxin, and tablet Diamox and capsule Amox. Administration of drugs with these confusing brand names may lead to many untoward effects thereby causing Medication errors. This can be prevented merely by mentioning the generic name of the drug along-with the brand name,

e.g. tablet Calpol (paracetamol). Confirming and reconfirming the correct drug with its dose before administration of the same will minimize the errors due to similar appearance of the dosage forms and storing the drugs at the same sites. Reporting of such events is also very important, as more and more data can be generated so as to create awareness about the same. The participants in the present study also unanimously supported this, as almost all of them agreed upon the need of developing a system for reporting such events.

Medication errors, even though, appears to be a grave problem, can be prevented certainly by undertaking various simple measures. A vigilant and responsible attitude goes a long way even amidst a busy and hectic schedule. The efficient functioning of the healthcare system is a result of the harmonious working of its three pillars i.e. doctors, nurses and pharmacists. A cautious attitude on the part of the patients also cannot be overemphasized.

## CONCLUSION

Medication errors are a major hindrance in the efficient functioning of our healthcare system which cannot be solely attributed to doctors or other healthcare providers. Every level of this system, from doctors to patients, is equally responsible for its occurrence. In the present study, we have tried to assess the awareness of the problem in terms of knowledge, attitude and practices amongst the healthcare providers. This survey suggested that though there is awareness regarding Medication errors, the circumstances mentioned above which significantly contribute in occurrence of these events need to be overcome. Though we have suggested few solutions, yet, as this area of practice is least approached, further research is warranted in various interventions to deal with the same.

**Conflict of Interest:** Nil

## ACKNOWLEDGMENT

Authors sincerely wish to acknowledge all the healthcare providers who participated in the study.

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