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Medication error reporting – An insight among final-year MBBS students and interns

Praneeth Reddy Onteddu[1], Shravya Edavaluru[2], Bhuvaneshwari Edavaluru[3], Mary Rohini Pentareddy[4], Chaitanya Kandula[5]

[1,5]Final Year Postgraduate Resident, [3]Professor and Head,[4]Assistant Professor, Department of Pharmacology, Gandhi Medical College, Musheerabad, [2]Intern, Kamineni Academy of Medical Sciences and Research Center, Hyderabad, Telangana, India

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ABSTRACT

Background: Medication errors can be defined as avoidable errors that can occur while prescribing, transcribing, dispensing, or administering a drug to a patient. Medication errors lead to mortality and morbidity of varying severities in patients. They also impose a heavy financial burden on the health-care sector. This study was conducted to compare three aspects of medication errors – Awareness, Outlook, and reporting, between two demographic groups, namely, interns and final-year MBBS students. **Aims and Objectives:** The objectives of this study were to evaluate the level of awareness about medication errors, the outlook toward medication errors and the medication errors reporting among MBBS students and Interns. **Materials and Methods:** A questionnaire was handed out to 500 people and it had questions related to awareness, outlook, and reporting of medication errors. Out of these 500 people, the number of respondents was 425 and they were grouped into various sub-categories based on their responses. **Results:** 30.6% of the respondents had sufficient awareness, 44.9% of the respondents had a good outlook, and 27.5% were reporting medication errors. The results also depicted that the Interns have better awareness and better practice of reporting when compared to final-year MBBS students. On the other hand, final-year MBBS students had a better outlook toward medication errors than Interns. **Conclusion:** It can be concluded from this study that more education and training in medication error reporting is essential right from the undergraduate level. There should also be well-established reporting systems in hospitals.

Key words: Awareness; Outlook; Reporting; Medication errors; Interns; Final-year MBBS students

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INTRODUCTION

Medication errors are conventionally defined as any preventable event that may result in an inappropriate medication usage which has the potential to harm patients.[1]

Rational prescribing (i.e., effectively, safely, and at low cost) is a challenging task for every medical doctor as it involves a mixture of awareness, skills, and outlooks integrated into the complex social context of the clinical workplace.[2] Across the world, medication errors are increasing the burden on health-care sector as they lead to significant mortality and morbidity. The cost of medication errors in the national health service of the United Kingdom reaches £1.1 bn annually.[3]

In India, the incidence of medication errors was recorded in states such as Karnataka and Uttarakhand, which was 14% and 26%, respectively.[4,5] Similarly, the British Medical Journal quoted that India, like any other developing country, is recording a lot of medical errors. The reason behind this is that we have not trained doctors and nurses to measure the clinical outcomes. According to Jha et al., there are at least 43 million adverse events each year due to medical care, and nearly 23 million DALYs are lost as a consequence.[6]

The literature available on medication errors in India is scarce. Moreover, there are not many studies conducted on Interns and medical students. A study conducted on final-

Address for Correspondence:
Dr. Mary Rohini Pentareddy, Assistant Professor, Department of Pharmacology, Gandhi Medical College, Musheerabad - 500 003, Telangana, India. **Mobile:** +91-9908521401. **E-mail:** drmaryrohini@yahoo.co.in

year medical students from European countries showed that their prescribing competencies were inadequate.[7] Hence, this study has been initiated to compare the awareness, outlook and reporting of medication errors reporting between interns and final-year MBBS students.

Aims and objectives

Aims

To assess the level of perception, outlook and reporting of medication errors among final-year MBBS students and interns in a tertiary care teaching hospital.

Objectives

1. To determine the level of perception about medication errors among final-year MBBS students and Interns
2. To determine the outlook toward medication errors among final-year MBBS students and Interns
3. To evaluate the reporting of medication errors among final-year MBBS students and Interns.

MATERIALS AND METHODS

This is a questionnaire-based cross-sectional study wherein convenience sampling was done. The study period was from June 2022 to July 2022. After taking approval from Institutional Ethics Committee (Reg.No. IEC/GMC/2022/06/11) and after obtaining consent from the participants, a pre-validated questionnaire was handed out to the final-year MBBS students in the college and to the interns working in the hospital. All Students from the final year of MBBS who have given informed consent and all interns who have given informed consent were included in the study. Students from the 1st, 2nd, and 3rd year of MBBS degree and Students who have not consented to the survey were excluded from the study.

Questionnaires were handed out to 500 people. Out of them, 425 participants had filled the questionnaire. After receiving the questionnaire, 75 out of 500 participants cited personal reasons for being unable to fill the responses. The identity of all participants was kept confidential. All 425 participants answered all the questions in the questionnaire. The questionnaire was handed out to final-year MBBS students when they had assembled for a theory class in a lecture hall. A few questionnaires were handed out to students to be given to their batchmates who were absent at the time of its distribution. They were collected back after 1 h.

For interns, the questionnaires were kept available at the place where they marked their daily attendance. Before this a message was circulated in their group regarding this study, requesting them to fill out the questionnaire and to place it back in the same place. For interns posted in the Emergency and Intensive Care Units, the questionnaire was personally handed over and collected back. The interns in other departments were requested to place the questionnaires in the attendance room within 2 h.

Table 1 shows the 23 questions included in the three sections of the questionnaire.

Table 1 shows the questions included in the three sections of the questionnaire.

There were eight questions regarding the perception of medication errors. There were two types of responses – "Yes" and "No". Each "Yes" response was given 1 point. If "No" was chosen, no point was awarded. If a participant scored 8 points, he/she was categorized as "Aware." A score of 7 or less than 7 was labeled as "scope for education."

The questionnaire had 12 questions regarding outlook toward medication errors. The responses to these questions were graded as per the Likert scale, wherein there were 5 responses. The responses and their scoring were as follows:

- Strongly Disagree=1 point
- Disagree=2 points
- Neutral=3 points
- Agree=4 points
- Strongly Agree=5 points.

Participants who scored between 40 and 60 points were tagged as "Good outlook." Those who scored below 40 were categorized as "Outlook must improve."

Reporting of medication errors was assessed with three questions. The responses were either a "Yes" or "No." A response as "Yes" was given 10 points. If "No" was chosen, no points were awarded. Participants with a score of 30 were included in the "Satisfactory practice" group. Those who scored below 30 were included in the "Scope for improvement" group.

Statistical analysis

The collected data were uploaded into Microsoft Excel sheets and wereanalyzed. The results were expressed in percentages. t-Test and Fischer Exact Test were the statistical tools employed to calculate the p-values in this study.

RESULTS

Although the questionnaire was handed out to around 500 individuals, only 425 had submitted their responses. Out of them, 204 were interns, while 221 were final-year MBBS students.

Perception

Figure 1 depicts that out of 425 respondents, 30.6% (130) of them could be categorized as "Aware." On the

Table 1: List of questions included in the questionnaire

Q. No.	Question
Q1	Have you ever heard about medication errors?
Q2	Do you understand the relevance of the term medication errors?
Q3	Are you aware of the categories of medication errors?
Q4	Are you aware of the proceedings once you encounter a medication error?
Q5	Once you encountered medication errors have you informed anyone, or have you reported them
Q6	Do you think after noticing medication errors, we must intervene to rectify them –
Q7	Do you think more sensitization/awareness should be created about identifying and reporting medication errors to increase patient safety and professional practice –
Q8	Do you think medication error reporting can make a difference in patient safety monitoring –
Q9	Do you think medication error is a non-serious issue –
Q10	Is it the sole responsibility of the doctor to detect and report medication errors?
Q11	Do you think medication error should be considered as an accident –
Q12	Do you think there should be a system to report and monitor medication errors –
Q13	Do you think it is the responsibility of every health-care professional to identify and report medication errors –
Q14	Do you think if one comes across medication errors in future practice, one must preferably report it -
Q15	Have you ever made a conscious attempt to identify medication errors?
Q16	Have you used an Online reporting form or a paper-based reporting form or a telephone-based reporting or a mobile app to report medication errors?
Q17	Have you ever seen a medication error form?
Q18	Can medication errors happen at wards, OPDs, dispensaries and pharmacies?
Q19	Do you think medication error reporting is a costly affair and a burdensome process –
Q20	Are medication errors preventable?
Q21	Do you think prevention of medication errors is beneficial to the health-care system –
Q22	Do you think medication errors are an extremely important issue –
Q23	Do you think it is not your responsibility to identify and report a medication error made by someone else -

other hand, 69.4% (295) were grouped as "Scope for education."

Table 2 shows that of the 130 participants grouped as "Aware" 92 (70.8%) were interns, and the remaining 38 (29.2%) were final-year MBBS students.

In the subcategory "Scope for education" 112 members out of 295 were Interns. The remaining 183 members were final-year MBBS students. The percentages were 38% and 62%, respectively.

Table 2 - in the sub-category "Aware," 92 (70.8%) out of 130 respondents were Interns, 38 (29.2%) were Final Year MBBS students. In the sub-category "Scope for education," 112 (38%) out of 295 were interns, while 183 (62%) were Final Year MBBS students.

Outlook

Figure 1 depicts that out of 425 respondents, 191 (44.9%) respondents could be included in the group "Good Outlook." The remaining 234 (55.1%) respondents had to be included in the group "Outlook must improve."

Table 3 shows that out of 191 respondents who had a "Good Outlook" 39.3% were Interns, which is 75 members. The remaining 116 members, which is 60.7%, were Final Year MBBS students.

The total number of participants grouped as "Outlook must improve" was 234. Among them, 129 (55.1%)

Table 2: Number of interns and final-year MBBS students in each sub-category of "perception"

Sub-Category	Interns (%)	Final-year MBBS students (%)
Aware (n=130)	92 (70.8%)	38 (29.2%)
Scope for education (n=295)	112 (38%)	183 (62%)
P<0.0000001		

P-value was calculated using Fisher's exact test

Table 3: Number of interns and final year MBBS students in each sub-category of "outlook"

Sub-Category	Interns (%)	Final year MBBS students (%)
Good outlook (n=191)	75 (39.3%)	116 (60.7%)
Outlook must improve (n=234)	129 (55.1%)	105 (44.9%)
P=0.0007749		

P-value was calculated using Fisher's exact test

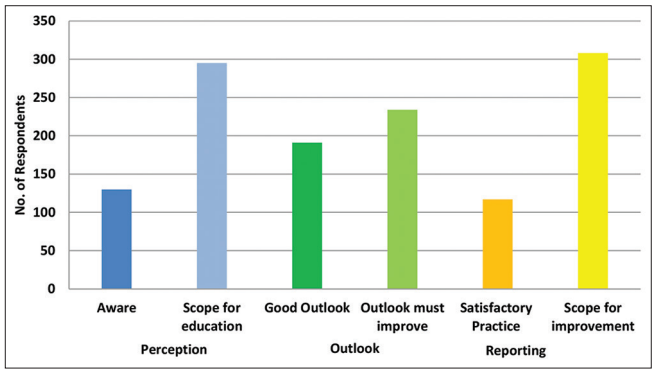

Figure 1: Number of respondents in each category (perception, outlook, reporting) and sub-category

were Interns, while 105 (44.9%) were final-year MBBS students.

Table 3 - in the sub-category "Good Outlook," 75 (39.3%) out of 191 respondents were Interns, 116 (60.7%) were final-year MBBS students. In the sub-category "Outlook must improve," 129 (55.1%) out of 234 were interns. 105 (44.9%) were final-year MBBS students.

Table 4 shows the number of responses for individual questions in the Outlook section. It also shows the number of Interns and the number of Final Year MBBS students who had chosen each response. The P-values show that, when individual questions were considered, there was no significant difference between the interns and final year MBBS students. Figure 2 shows the number of responses to each option for the twelve questions in the outlook section.

Table 4 shows the number of participants (Interns and Final-year MBBS students) who had chosen each response in the twelve questions about outlook.

Reporting

Figure 1 depicts that out of 425 respondents, 117 (27.5%) could be tagged as "Satisfactory practice." The remaining 308 (72.5%) participants were tagged as "Scope for improvement" based on the options they had chosen in the questionnaire.

Table 5 shows that in the sub-category "Satisfactory Practice" 80 (68.4%) members were Interns. On the other

Table 4: Number of interns and final-year MBBS students who have chosen each option in "outlook"-related questions

Q. No	Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	P-value
Q6	After noticing medication errors we must intervene to rectify them -	76 (I 38, F 38)	113 (I 57, F 56)	116 (I 54, F 62)	74 (I 29, F 45)	46 (I 26, F 20)	0.7351
Q7	More sensitization/ awareness should be created about identifying and reporting medication errors to increase patient safety and professional practice -	97 (I 46, F 51)	92 (I 32, F 60)	63 (I 35, F 28)	92 (I 42, F 50)	81(I 48, F 33)	0.5883
Q8	Medication error reporting can make a difference in patient safety monitoring -	83 (I 41, F 50)	106 (I 51, F 55)	35 (I 23, F 14)	132 (I 58, F 66)	69 (I 31, F 36)	0.7650
Q9	Medication error is a non-serious issue -	86 (I 48, F 38)	103 (I 48, F 55)	112 (I 51, F 61)	57 (I 25, F 32)	67 (I 32, F 35)	0.6730
Q11	Medication error should be considered as an accident -	88 (I 44, F 44	101 (I 54, F 47)	65 (I 30, F 35)	102 (I 47, F 55)	69 (I 29, F 40)	0.5828
Q12	There should be a system to report and monitor medication errors -	77 (I 34, F 43)	112 (I 39, F 73)	97 (I 51, F 46)	31 (I 15, F 16)	108 (I 63, F 45)	0.7380
Q13	It is the responsibility of every healthcare professional to identify and report medication errors -	107 (I 51, F 56)	82 (I 40, F 42)	88 (I 38, F 50)	117 (I 56, F 61)	31 (I 19, F 12)	0.7601
Q14	If one comes across medication errors in future practice one must preferably report it -	93 (I 37, F 56)	96 (I 38, F 58)	76 (I 34, F 42)	93 (I 58, F 35)	67 (I 38, F 29)	0.6858
Q19	Medication error reporting is a costly affair and a burdensome process -	84 (I 48, F 36)	105 (I 50, F 55)	109 (I 46, F 63)	77 (I 37, F 40)	50 (I 23, F 27)	0.6894
Q21	Prevention of medication errors is beneficial to the healthcare system -	65 (I 32, F 33)	124 (I 63, F 61)	56 (I 25, F 31)	61 (I 34, F 27)	119 (I 50, F 69)	0.7662
Q22	Medication errors is an extremely important issue -	79 (I 26, F 53)	110 (I 45, F 65)	62 (I 28, F 34)	71 (I 43, F 28)	103 (I 62, F 41)	0.7250
Q23	It is not your responsibility to identify and report a medication error made by someone else -	78 (I 32, F 46)	111 (I 59, F 52)	39 (I 12, F 27)	106 (I 73, F 33)	91 (I 28, F 63)	0.7973

I: Interns, F: Final-year MBBS

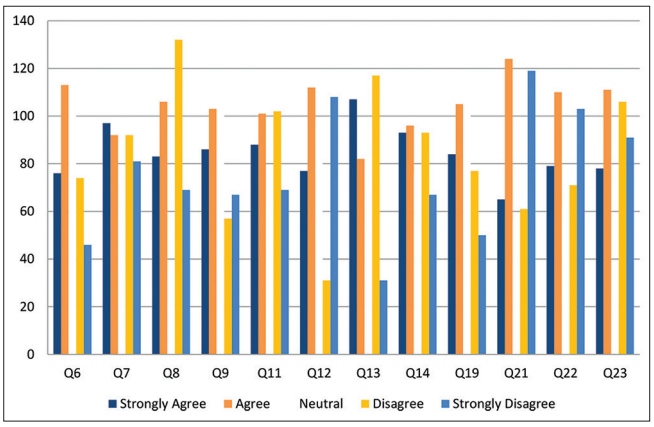

Figure 2: Number of participants who have chosen each option in "outlook" related questions

Table 5: Number of interns and final-year MBBS students in each sub-category of "reporting"

Sub-Category	Interns (%)	Final year MBBS students (%)
Satisfactory practice (n=117)	80 (68.4%)	37 (31.6%)
Scope for improvement (n=308)	124 (40.3%)	184 (59.7%)
P=0.000000162		

P-value was calculated using Fisher's exact test

hand, 37 (31.6%) were final-year MBBS students. The total number of people was 117.

Out of the 308 participants included in the sub-category "Scope for improvement" 124 (40.3%) were interns and the rest, 184 (59.7%), were Final Year MBBS students.

Table 5 - in the sub-category "Satisfactory Practice," 80 (68.4%) out of 117 respondents were Interns, 37 (31.6%) were Final Year MBBS students. In the sub-category "Scope for improvement," 124 (40.3%) out of 308 were interns. 184 (59.7%) were final-year MBBS students.

DISCUSSION

Good awareness and outlook toward medication errors ensure favorable clinical outcomes with high quality of life and low risk to the patient.[8] Monitoring of adverse drug reactions is gaining popularity in the last few years, all over the world, for but medication errors are still striving.[9] In India, the National Pharmacovigilance Program of India is already incepted with the full operation, but there is no reporting or controlling system for medication errors.[10]

From the present study, it can be inferred that the Interns had better awareness of medication errors (P<0.0000001), and final-year MBBS students had a significant scope for education. However, this result is opposite to that of the earlier studies performed on junior doctors/interns.[11-13] The results of our study are similar to those of a study conducted by Alsulami et al. In their study, participants reported a sufficient amount of awareness regarding reporting procedures.[14]

As far as the outlook was concerned, final-year MBBS students had a far better outlook (P=0.0007749) than the interns. This difference was also statistically significant. This result is similar to that of the study conducted by Carandang et al., Their study showed that a higher percentage of the total respondents possessed unfavorable outlook toward medication error reporting despite the results which showed that most of them are practicing medication error reporting.[15]

Regarding reporting of medication errors i.e. Practice, the interns were clearly outnumbering the Final Year MBBS students. This difference between the two groups was also statistically very significant (P=0.000000162). The study conducted by Carandang et al., showed that health practitioners are practicing medication error reporting. However, they possessed unfavorable outlook toward medication error reporting.[15]

The better perception and better practice among interns are probably because their exposure to the clinical environment is greater than that of Final Year MBBS students. The interns are directly involved in patient care. Hence, they get more opportunities to practically notice medication errors and can easily report them. Despite this, the poor outlook of interns toward medication errors is likely due to their work burden and stress.

Limitations of the study

The following limitations have been observed while conducting the study:

1. Participants unable to recall incidents regarding reporting of medication errors
2. A tendency of participants to discuss with their peers and to choose more desirable options in the questionnaire
3. Health-care professionals such as consultants, nurses, and pharmacists who are directly involved in prescribing, administering, and dispensing drugs were not included in the study.

CONCLUSION

This study shows that, in general, there is a significant scope for education, scope for a better outlook, and improvement in reporting of medication errors. On closer observation of data, the interns had relatively better awareness and greater reporting of medication errors. The final-year

MBBS students had a more positive outlook toward medication errors.

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Authors' Contributions:
PRO- Definition of intellectual content, literature survey, prepared the first draft of manuscript, implementation of the study protocol, data collection, data analysis, manuscript preparation and submission of the article; **SE**- Concept, design, clinical protocol, manuscript preparation, editing, and manuscript revision; **BE**- Design of study, statistical analysis, and interpretation; **MRP** - Literature survey and preparation of figures; **CK**- Co-ordination and manuscript revision.

Work attributed to:
Gandhi Medical College, Musheerabad, Secunderabad - 500 003, Telangana, India.

Orcid ID:
Praneeth Reddy Onteddu - https://orcid.org/0009-0004-6620-6332
Shravya Edavaluru - https://orcid.org/0009-0009-2118-2513
Bhuvaneshwari Edavaluru - https://orcid.org/0000-0002-2052-5301
Mary Rohini Pentareddy - https://orcid.org/0000-0001-8593-1637
Chaitanya Kandula - https://orcid.org/0009-0008-3713-2249

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