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A CROSS-SECTIONAL STUDY OF KNOWLEDGE, ATTITUDE AND PRACTICE OF RATIONAL USE OF DRUGS AMONG YOUNG HEALTH CARE PROFESSIONALS IN A TEACHING HOSPITAL OF NORTH KARNATAKA.

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ABSTRACT **Introduction:** Rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest possible cost to them and their community. Implementation of these principles will ensure safe medication practice among healthcare professionals. This will also help in building a relationship of trust between a patient and a doctor **Aim:** This study aims to assess the knowledge, attitudes, and practices of resident doctors and interns regarding Rational drug use in our hospital. **Materials and Methods:** A cross-sectional, questionnaire-based study was conducted in our hospital in the month of December 2023. Total of 145 interns and 215 resident doctors participated in the study. A questionnaire was administered through google forms which included questions regarding socio-demographic profile, use of Essential Medicines (EM), Rational drug use, concept of Personal drugs (P-drug) and source of drug information. Data were statistically analyzed using the Chi-square test. **Results:** Out of 360 participants, 165 (45.83%) were males and 195 (54.16%) were females. At least 73.02% of resident doctors were aware of the term Essential Drugs as compared to 88.96% of interns. Only 12.41 % of interns and 3.72% of resident doctors were aware of the term Rational Drug Use. Resident doctors had better knowledge regarding the P-drugs concept, prescribed drugs from the Essential Medicines List, were more aware of adverse effects and contraindications of the drugs they prescribed and also informed the patient regarding disease, drug therapy, regular follow-up and monitoring of drug therapy as compared to interns. Resident doctors prescribed new drugs more as compared to interns and this difference in prescribing newer drugs as compared to older drugs was statistically highly significant. **Conclusion:** The present study shows that the knowledge of responders regarding the concepts of rational drug use was not satisfactory which corresponded to their unsatisfactory practice, while the attitude towards safe drug use may be satisfactory but is not good enough in implementing the principles of safe medication practice. This study shows that there is an increasing need for sensitization of young practitioners about the safe use of drugs which will help them in implementing the principles of rational drug use.

KEYWORDS : Rational Drug Use, Essential Medicines List, P-drug, Prescription

INTRODUCTION

Rational drug use is defined according to the World Health Organization as "A drug given to a patient in a way that is "suited to their clinical needs, in doses that satisfy their own specific requirements, for a suitable period of time, and at the lowest cost to them and their community".[1] Accordingly data shows that 50% of all medicines prescribed, dispensed or sold are incorrect, and more than 50% of patients do not take their medications as directed by the physician. Irrational drug use is a serious global issue leading to unsafe medical practices.[2]

Irrational use refers to the use of medications in a manner that is inconsistent with rational use. The various forms of irrational drug use are polypharmacy, inappropriate antibiotic use, excessive injectable usage, noncompliance with clinical prescription recommendations, and inappropriate self-medication, frequently with prescription-only drugs.[3] Expensive drugs are often chosen either by the doctor or patient thinking it to be more beneficial than cheaper drugs which may not be the case many times, whereas drugs are to be prescribed based on efficacy and preferably from an essential list of medicines. Irrational drug use also includes poor dispensing practices which leads to medication errors which in turn leads to adverse drug reactions. It also encompasses failure to adhere to treatment regimens by the patients and inappropriate self-medication.[4]

These problems can be dealt with effectively in hospitals by creating special committees and promoting pharmacovigilance activities. These committees can sensitize healthcare professionals regarding rational drug use and safe medicine practices. Such training programs should also be conducted for undergraduate students and nursing staff. At the level of administration, it should be seen that all the drugs included in the list of essential medicines should be made available to the patients all the time in the hospital pharmacies. These are some of the recommendations made by WHO to encourage Rational drug use.[5] It is notable that a single strategy is unlikely to work and therefore a multistep approach should be taken to solve this problem. These steps could be, training of undergraduate students, interns and nursing staff, sensitization of residents as well as senior doctors towards practicing rational prescription of drugs, setting up of committees to oversee the drug prescribing and drug dispensing system and sufficient supply of essential medicines.

Essential medications, which are a cornerstone of the Rational use of Medicines, are those drugs that meet the bulk of a population's medical needs. According to the WHO, essential Medicines are "those drugs that satisfy the healthcare needs of the majority of the population; they should therefore always be available in sufficient amounts and in appropriate dosage forms, at a price the community can afford".[6]

Another important aspect of the rational use of medicines is P-drugs. These are those drugs that a physician has decided to frequently prescribe and that are familiar to them. The P-drug idea consists of the dosage form, dosing schedule, and length of therapy in addition to the name of a pharmacological agent. This P-drug for a particular disease or diagnosis differs from physician to physician or from country to country because of differences in drug availability and cost, national formularies and essential drug lists, medical cultures, and individual interpretation of information.[7]

To emphasize the importance of rational drug use National Medical Commission (NMC) has incorporated this concept in its latest Competence-Based Medical Education (CBME) program.[8] This step by NMC would ensure that all future

Health care professionals will have adequate knowledge about rational drug use, and by proper training and sensitization, they develop the right attitude towards it and will also implement the same during their medical practice.[9]

This study was undertaken to know the level of Knowledge, attitude and practices of the young healthcare professionals particularly the resident doctors and interns about the rational use of medicines and find out the gaps in the same which will help the administration in formulating policies to improve the patient outcome.

MATERIALS AND METHODS

A cross-sectional study was conducted in Khaja Bandanawaz Teaching and General Hospital over 1 week. The study was approved by the Institutional Ethics Committee. The study tool i.e. the questionnaire was validated before the commencement of the study by introducing it to six physicians and their responses were analyzed. A few questions were corrected for their syntax and a few of them were rewritten to improve the comprehensibility of the questions. After standardizing the questionnaire, a Google form was prepared for the prospective participants. This Google form contained the agreement for informed consent and the study questionnaire. All the questions were marked compulsory including the informed consent part. A total of 360 participants responded to the questionnaire out of which 215 were resident doctors and 145 were interns

Study Procedure

All the participants were sent the questionnaire via a link that navigated them through the Google form on their respective mobiles or laptops. A timely reminder was sent to fill out the form. The questionnaire in the present study was based on the questionnaire used in the previous study by Dakhale G et al. and was validated by the panel of subject experts in the institution.[10] The questionnaire consisted of questions related to socio-demographic profile, use of Essential Medicines, Rational drug Use, concept of P-drugs and source of drug information.

Total of 18 questions were prepared. Out of the 18 questions, 9 questions were related to knowledge, 2 questions were about the attitude, 2 questions were for the practice of rational drug use and the rest of the 5 questions were regarding consent and basic demographic data of the study participant. Knowledge questions had binary options in the form of 'yes' or 'no'. For the options for attitude and practice-related questions, participants were given a choice to answer by selecting always, frequently and occasionally. Data for the answers were presented as frequency and percentage. For type of drug prescribed-old drug, new drug or both was asked.

Statistical Analysis

Data was entered in a Microsoft Excel sheet and was analyzed using the Statistical Package for Social Sciences version 25.0. Descriptive statistics was used to describe the data and the Chi-square test was used to analyze the difference between male and female participants, resident doctors(junior and senior) and interns for prescribing essential medicines and following principles of rational use of drugs. A p-value <0.05 was considered to be significant.

RESULTS

A total of 392 participants were considered for the study out of which 165 were interns and 227 were resident doctors (junior and senior). Out of these 145 interns and 215 resident doctors responded to the questionnaire. So, a total of 360 participants responded to the study. Out of 360, males were 165 (45.83%) and 195 (54.16%) were females. The majority of interns belonged to 23 to 26 years of age group and resident doctors ranged from 30 years to 45 years of age. The mean age of interns was 24.55 ± 1.74 years while that of resident doctors was 37.55 ± 1.27 years.

Out of all the resident doctors who participated 73.02% of them were aware of the term essential drugs as compared to 88.96% of interns. Regarding having the National Model Essential Drug List in their place and knowing about the number of drugs included in the Essential Medicines List (EML), the expected positive response from both groups was not satisfactory and the difference among both groups was also not significant in this aspect. Regarding the term Rational drug use, 12.41 % of interns said that they were aware as compared to 3.72% of resident doctors. While knowledge regarding the term P-drugs was more in resident doctors as compared to interns, Resident doctors informed the patient about disease, drug therapy, regular follow-up and monitoring of drug therapy more as compared to interns and this difference between both the groups was statistically significant. (Table 1)

Table 1: Knowledge About Rational Drug Use

Questions	Resident doctors (n=215)		Interns (n=145)		P valve	X2
	Yes n (%)	No n (%)	Yes n (%)	No n (%)		
1. Are you aware of the term essential drugs?	157 (73.02)	58 (26.27)	129 (88.96)	16 (11.03)	0.0008	11.10
2. Do you have the National Model Essential Drug List at your work place?	12 (5.58)	203 (94.44)	15 (10.34)	130 (89.65)	0.09	2.82
3. Do you know the number of drugs included in Indian EML?	5 (2.32)	210 (97.67)	5 (3.44)	140 (96.55)	0.60	0.26
4. Are you aware of the term "Rational drug use"?	8 (3.72)	207 (95.27)	18 (12.41)	127 (87.58)	0.007	7.24
5. Can you name the parts of a prescription?	198 (92.09)	17 (7.90)	139 (95.86)	6 (4.13)	0.19	1.67
6. Are you aware of the term P-drugs?	78 (36.32)	137 (63.72)	33 (22.75)	112 (77.24)	<0.0001	130.39
7. Are you aware of the STEP criteria for selection of P-drug?	47 (21.86)	168 (78.13)	27 (18.62)	118 (81.37)	0.37	0.78
8. Do you inform the patient regarding the disease, drug therapy, regular follow-up and monitoring of drug therapy?	207 (96.27)	8 (3.72)	128 (88.27)	17 (11.72)	0.006*	7.32

A p-value <0.05 was considered to be significant, EML: Essential Medicines list, P-drug: Personal drug, STEP: Safety, tolerability, efficacy, price

Resident doctors prescribed drugs from the Essential Medicines List more as compared to interns. They were also more aware of the adverse effects and contraindications of the drugs they prescribed as compared to interns. Both interns and residents preferred to write generic names and there was

no significant difference between them (p-value=0.15). Lastly, resident doctors prescribed new drugs more as compared to interns but both the groups preferred to prescribe older drugs more often than the newer drugs and this difference in prescribing newer drugs as compared to older drugs was statistically highly significant [Table 2].
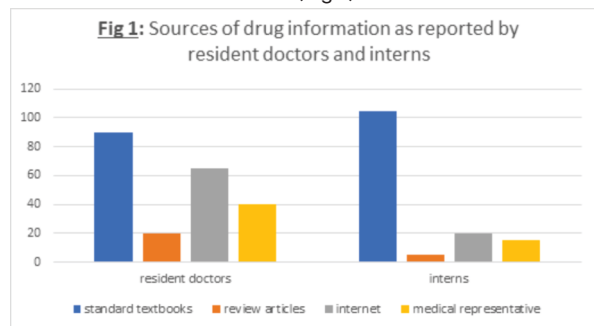
Table 2: Attitude And Practice Of Resident Doctors And Interns About Different Aspects Of Rational Drug Use.

Questions	Response	Residents n (%)	Interns n (%)	p-value	χ2 value
1. How often do you prescribe Essential Medicines (EM)?	Always	183 (85.11)	89 (61.37)	0.00001	25.45
	Frequently	22 (10.23)	38 (26.20)		
	Occasionally	10(4.65)	18 (12.41)		
2. Are you aware of the adverse effects, interactions and contraindications of the drugs you prescribe?	Always	128 (59.53)	11 (7.58)	0.00001	152.30
	Frequently	75 (34.88)	43 (29.65)		
	Occasionally	12 (5.58)	91 (62.75)		
3. What do you prefer to write on a prescription slip?	Generic name	188 (87.44)	130 (89.65)	0.15	3.73
	Trade name	18 (8.37)	14 (9.65)		
	Both	9 (4.18)	1 (0.68)		
4. What do you prefer to prescribe a new or old drug?	New drug	27(12.55)	4 (2.75)	0.00001	68.91
	Old drug	124 (57.67)	137 (94.48)		
	Both	64 (29.76)	3 (2.06)		

A p-value <0.05 was considered to be significant; Resident doctors n=215; Interns n=145

A statistically significant difference (p<0.05) was observed in prescribing drugs from the essential medicines list and practice based on principles of rational use of drugs between both the cadre of practitioners i.e. interns and resident doctors.

Regarding the source of drug information, multiple answers were allowed by the respondents. Both interns and residents reported standard textbooks like Katzung, Sharma and Sharma and KD Tripathi as major sources of drug information. Review articles were the least preferred source of information. In internet various drug applications and new treatment guidelines of various national and international forums and associations were considered (Fig 1)

Fig 1: Sources of drug information as reported by resident doctors and interns

■ standard textbooks ■ review articles ■ internet ■ medical representative

DISCUSSION

In the present study, 45.83% were males and 54.16% were females while in the previous study conducted by Mahajan R et al., there were 55.6% males and 44.4% female participants.[11] While the male: female ratio in Adeola K et al., was 1.6:1.[12]

In this study, the majority of participants i.e. 73.02% of resident doctors and 88.96%, of interns seem to be aware of the concept of Essential Medicines, despite not having a National Model Essential Drug List at their workplace. Notably, only 2.32% of Resident doctors and 3.44% of interns knew the exact number of drugs in the Indian EML. These observations are similar to the previous study conducted by Mahajan R et al.[11] This is an alarm for the administration of hospitals and medical colleges to train healthcare professionals in rational drug use practices which will in turn improve the quality of healthcare provided to the patients.

In the present study, interns who had recently cleared their MBBS final year exam were comparatively more aware of the concept of Rational Drug Use than the resident doctors (12.41% Vs 3.72%). Both groups were able to name the parts of the prescription correctly. Similar studies conducted by Sajad SH et al. showed that 16.98% of residents were aware of the term Rational Drug Use and 43.39% were able to name the parts of the prescription.[9] Awareness of term P-drug among resident doctors and interns was 36.32% and 22.75% respectively whereas Kanthi GR and Prayaga UK, Tanuja V et al., and Bajait CS et al. showed that 42%, 63.2% and 35% were aware about the term P-drug respectively.[13-15]

In the present study, 21.86% of resident doctors and 18.62% of interns were aware of the STEP criteria for choosing P-drug while in Kanthi GR and Prayaga UK study, 27.50% of clinicians and postgraduates were aware of it [13]

In our study resident doctors more often informed the patients regarding disease, drug therapy, regular follow-up, and monitoring of drug therapy than the interns. This emphasizes the fact that the interns need to be trained in communication skills for better patient care. In the current study, 85.11% of resident doctors and 61.37% of interns always prescribed drugs from EML while in Tanuja V et al., 17.6% of junior residents always prescribed EM and Tekulapally K showed that 23% of interns always prescribed EM.[14,16]

This study revealed that resident doctors are more often aware about the adverse effects, interactions and contraindications of the drugs they prescribe as compared to interns who mostly occasionally knew about the drugs they prescribed (59.53% vs. 7.58%).

In our study, 89.65% of resident doctors and 87.44% of interns preferred to write generic drugs in prescription whereas Tanuja V et al. reported that 36% of junior residents prescribed generic drugs in a prescription slip and Tekulapally K showed that 49% of interns preferred to write generic drugs in prescription slip. [14,16]

In our study, 94.48% of interns considered writing old drugs and only 2.75% of interns preferred to write new drugs in prescription whereas resident doctors chose new drugs more frequently than interns. Previous studies conducted by Tanuja V et al., showed that 19.7 % of junior residents preferred to write new drugs on prescription slip and Tekulapally K reported that 47% of interns preferred to write old drugs and 45% preferred to write new drugs in prescription slip.[14,16]

In our study, the main source of drug information was standard textbooks followed by internet sources and medical representatives. The last source is review articles in both groups. Whereas in a study conducted by Adeola K et al., it was found that drug information was sourced from colleagues (98.8%), reference books (96.9%), pharmaceutical sales representatives (93.2%), promotion materials (92.6%), scientific papers/journals/internet (91.4%), and drug promotion forum/ product launches (88.3%) and as per Mamas T et al., the list of main sources of information for physicians includes: peer-reviewed medical journals, medical

textbooks, proceedings of conferences and pharmaceutical sales representatives.[12,17]

Limitation

Our study was mainly focused on young practitioners. We did not include the faculty of higher cadre such as Assistant/ Associate professors, Professors and above them. The study was also limited to our hospital and we could not take responses from physicians practicing outside our hospital.

CONCLUSION

The present study shows that the knowledge of participants regarding the concepts of rational drug use was not satisfactory which corresponded to their unsatisfactory practice, while the attitude towards safe drug use may be satisfactory but is not good enough in implementing the principles of safe medication practice. This study shows that there is an increasing need for sensitization of young practitioners about the safe use of drugs which will help them in implementing the principles of rational drug use. This in turn will go a long way in patient safety. Such studies should be increasingly done, so that the gaps in knowledge, attitude and practice of rational drug use among physicians can be identified and appropriate corrective measures can be taken which will help in improving the quality of healthcare. Doctors should know all the aspects of rational drug use and its understanding. The concepts of rational drug use are taught in MBBS phase II and it is reinforced from time to time so that students learn and implement them in their clinical postings. Despite that in the real world young practitioners are not seen to be implanting these principles in their daily clinical practice which should be a cause of concern. Studies like these can help in mitigating these problems to some extent by helping the hospital administration formulate policies towards patient safety.

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Conflict of Interest: None declared

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