Knowledge, Attitude and Practice of Rational Use of Medicine among Interns and Resident Doctors in Tertiary Care Teaching Hospital of Western City of Gujarat: A Cross-sectional Study

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ABSTRACT

Introduction: According to the definition of Rational Use of Medicine (RUM), patients must receive pharmaceuticals that are "suitable to their clinical needs, in doses that fit their own specific requirements, for an adequate period of time, and at the lowest cost to them and their community". By prescribing the proper medications in the proper dosages, doctors can influence the health and well-being of their patients.

Aim: To evaluate the knowledge, attitudes, and practices of interns and resident doctors towards RUM in tertiary care center, Jamnagar, Gujarat.

Materials and Methods: A cross-sectional, questionnaire-based study was conducted in August 2022 in Guru Gobind Singh Government Hospital, Jamnagar, Gujarat. Total 149 first year postgraduate students (residents doctors) from different specialties and 205 intern students of a tertiary care teaching hospital were included in the study. A questionnaire was administered, which included the questions regarding socio-demographic profile, use of Essential Medicines (EM), RUM, concept of Personal drugs (P-drug) and source of drug information. Data were statistically analysed using Chi-square test.

Results: Mean age of Resident Doctors was 24.55±1.74 years while of interns was 22.86±1.27 years. Eighteen (12.08%) residents and 9 (4.39%) interns knew what the phrase RUM meant. At their place of employment, the National Model Essential Drug List was accessible to 12 (5.6%) interns and 16 (10.73%) residents. Out of total, 190 (92.68%) interns and 143 (95.97%) residents were able to identify the components of the prescription slip accurately. The word P-drug was known to roughly 74 (36.09%) interns and 34 (22.81%) residents, of which 45 (21.95%) interns and 27 (18.12%) residents were aware of the Safety, Tolerability, Efficacy, Price (STEP) criteria for P-drug selection.

Conclusion: Majority of the responders seem to be aware of the concept of EM and RUM, while the word P-drug seems to be quite unknown to the responders. However, majority of responders prescribed EM which are old drugs. Since, the awareness of RUM among interns and residents was found to be inadequate it has critical importance to hold educational activities with the cooperation of physicians, health organisations, universities to avoid negative consequences of irrational drug use.

INTRODUCTION

According to a World Health Organisation (WHO), 50% of all medicine prescriptions, sales, or dispensing are incorrect, and 50% of patients do not take their medications as directed [1]. For a medication to be used rationally, it must be 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." Globally, a serious issue is the unwise use of medications [2].

Irrational use refers to the use of medications in a manner that is inconsistent with rational use and is frequently described in terms of polypharmacy, inappropriate antibiotic use, excessive injectable usage, non compliance with clinical prescription recommendations, and inappropriate self-medication, frequently with prescription-only drugs [3]. The most frequent issues with irrational medication use include choosing medications without taking cost-effectiveness and efficacy into account, inefficiently purchasing unnecessarily expensive medications, failing to prescribe medications in accordance with standard treatment protocols, poor dispensing practices leading to medication errors, improper patient adherence to dosing schedules and treatment regimens, and inappropriate self-medication [4].

The creation of special committees to oversee and enhance the use of medications, teaching students about pharmacotherapy and drug prescription, removing financial incentives for prescribers, and the establishment of standards for moral drug promotion are some of the recommendations made by the WHO to encourage the rational use of therapies [5]. Because a single strategy won't work in poor nations, the best approach is to combine patient education, staff training and monitoring, and a sufficient supply of the necessary medications [5].

Essential medications, a cornerstone of RUM, are those that meet the bulk of a population's medical needs. The WHO have conceptualised this idea in 1975 as a significant step in advancing RUM. According to the WHO, essential pharmaceuticals 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 dose forms, at a price the community can afford" [6].

P-drugs are medications that a person has decided to frequently prescribe and that are familiar to them. The P-drug idea comprises the dosage form, dosing schedule, and length of therapy in addition to the name of a pharmacological agent. Because of differences in drug availability and cost, national formularies and essential drug lists,

medical cultures, and individual interpreters of information, P-drugs will vary from country to country and between clinicians [7].

In most of the institutions, there is one year compulsory rotatory internship through which interns can brush up their knowledge of RUM [8]. Although the concept of RUM was covered in the old Medical curriculum the recently developed Competence-Based Medical Education (CBME) programme by Medical Council of India (MCI) has given it more emphasis [9]. If this programme is correctly implemented, it would undoubtedly open the road for rational prescribing. Despite the fact that the majority of resident doctors understand the value of RUM, most of them have not been able to frequently apply their knowledge in their day-to-day clinical work [9]. In this study, only interns and first year residents were taken because these participants have suffered from more lack of knowledge regarding RUM than other experienced doctors. On thorough literature search, we couldn't find the similar study from Gujarat.

Hence, present study was carried out among interns and first year residents to detect the knowledge, attitude and practices about RUM among them.

MATERIALS AND METHODS
The present cross-sectional, questionnaire-based study was carried out in Guru Gobind Singh Government Hospital, Jamnagar, Gujarat, for the duration of 1 month in August 2022. The study approval was taken prior to the study started from the Institutional Ethical Committee (Approval number:152/03/2022) and written informed consent was obtained from all the study participants.

Inclusion criteria: All the interns and first year residents were included in the study.

Exclusion criteria: Those who didn't give informed consent and were not willing to participate in the study were excluded.

Sample size: Total list of interns and first year residents was obtained from administrative department. There was total 168 first year residents and 224 interns from the main batch during study period. A total of 149 residents and 205 interns responded to the questionnaire and were enrolled in the study.

Procedure
All the participants were sent the questionnaire in the form of google document in their respective WhatsApp group and timely reminder was sent for the form filling. Questionnaire in present study was based on the questionnaire used in the previous study by Dakhale G et al., and was validated by the panel of the subjects expert in the institution [10]. The questionnaire consisted of questions related to socio-demographic profile, use of EM, RUM, concept of P-drugs and source of drug information. For socio-economic classification, modified Kuppuswamy Classification was used [11].

Total 18 questions were asked. Out of those 18 questions, 9 questions were regarding knowledge, 2 questions were regarding attitude, 2 questions were for the practice of RUM and remaining 5 questions were regarding consent and sociodemographic details of the participant. Questions regarding knowledge had two options to answer yes and no, while for attitude and practice regarding questions participants can answers 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 Microsoft Excel and was analysed using the same along with Statistical Package for Social Sciences version 25.0. Descriptive statistics is used to describe the data and Chi-square test is used to analyse difference between male and female and interns and residents for prescribing EM and RUM. A p-value <0.05 was considered to be significant.

RESULTS
A total of 392 participants were considered for the study out of which 168 were first year residents and 224 were interns. Out of them 149 residents and 205 interns responded for the study. So, total 354 participants responded for the study. Out of 354, 217 (61.29%) were females and 137 (38.71%) were males. Majority of residents belonged to 24 to 26 years of age group and interns belonged to 22 to 24 years of age group. Mean age of resident doctors was 24.55 ± 1.74 years while of Interns was 22.86 ± 1.27 years. Majority of residents 125 (83.89%) belonged to upper and upper middle class according to modified Kuppuswamy classification [Table/Fig-1].

Variables	Residents	Interns	p-value	χ^2 value
Gender n (%)				
Male	61 (40.93)	76 (37.07)	0.46	0.54
Female	88 (59.07)	129 (62.93)		
Age group (in years)				
22 to 24	41 (27.52)	161 (78.54)	<0.00001	92.50
>24 to 26	72 (48.33)	32 (15.61)		
>26 to 28	23 (15.43)	9 (4.39)		
>28	13 (8.72)	3 (1.46)		
Marital status				
Single	137 (91.95)	194 (94.63)	0.31	1.02
Married	12 (8.05)	11 (5.36)		
Socio-economic status				
Upper	23 (15.43)	35 (17.07)	0.26	3.97
Upper middle	102 (68.45)	123 (60.00)		
Lower middle	13 (8.72)	31 (15.12)		
Upper lower	11 (7.38)	16 (7.80)		

[Table/Fig-1]: Socio-demographic characteristics of study participants.
A p-value <0.05 was considered to be significant

Resident doctors 129 (86.57%) were more aware of the term essential drugs as compared to interns 147 (71.71%). Regarding having National Model Essential Drug List at your work place and knowing about the number of drugs included in Essential Medicines List (EML), residents responded more positively as compared to interns. Resident doctors 18 (12.08%) were more aware of the term RUM as compare to interns 9 (4.39%). While knowledge regarding the term P-drugs and STEP criteria for selection of P-drug was more in interns as compared to resident doctors respectively. Resident doctors informed the patient regarding disease, drug therapy, regular follow-up and monitoring of drug therapy more as compared to interns [Table/Fig-2].

Questions	Interns Yes n (%)	Interns No n (%)	Residents Yes n (%)	Residents No n (%)	p-value	χ^2 value
1. Are you aware of the term essential drugs?	147 (71.71)	58 (28.29)	129 (86.57)	20 (13.43)	0.0008	11.10
2. Do you have the National Model Essential Drug List at your work place?	12 (5.85)	193 (94.15)	16 (10.73)	133 (89.27)	0.09	2.82
3. Do you know the number of drugs included in Indian EML?	5 (2.43)	200 (97.57)	5 (3.35)	144 (96.65)	0.60	0.26
4. Are you aware of the term RUM?	9 (4.39)	196 (95.61)	18 (12.08)	131 (87.92)	0.007	7.24
5. Can you name the parts of a prescription?	190 (92.68)	15 (7.32)	143 (95.97)	6 (4.03)	0.19	1.67
6. Are you aware of the term P-drugs?	74 (36.09)	131 (63.91)	34 (22.81)	115 (77.19)	<0.0001	130.39

7. Are you aware of STEP criteria for selection of P-drug?	45 (21.95)	160 (78.05)	27 (18.12)	122 (81.88)	0.37	0.78
8. Do you inform the patient regarding disease, drug therapy, regular follow-up and monitoring of drug therapy?	182 (88.78)	23 (11.22)	144 (96.64)	5 (3.36)	0.006*	7.32

[Table/Fig-2]: Knowledge about Rational Use of Medicine (RUM).
A p-value <0.05 was considered to be significant; RUM: Rational use of medicine,
P-drug: Personal drug, STEP: Safety, Tolerability, Efficacy, Price

Residents prescribed EM more as compared to interns and residents were also more aware of adverse effects and contraindications of the drugs they prescribe as compared to interns. Both interns and residents prefer to write generic name as there is no significant difference between them (p-value=0.15). Lastly, residents prescribe new drugs more as compared to interns [Table/Fig-3].

Questions	Response	Interns n (%)	Residents n (%)	p-value	χ^2 value
1. How often do you prescribe Essential Medicines (EM)?	Always	126 (61.46)	128 (85.91)	0.00001	25.45
	Frequently	55 (26.83)	15 (10.06)		
	Occasionally	24 (11.71)	6 (4.03)		
2. Are you aware of the adverse effects, interactions and contraindications of the drugs you prescribe?	Always	16 (7.81)	89 (59.74)	0.00001	152.30
	Frequently	61 (29.76)	52 (34.89)		
	Occasionally	128 (62.43)	8 (5.37)		
3. What do you prefer to write in a prescription slip?	Generic name	184 (89.75)	131 (87.92)	0.15	3.73
	Trade name	19 (9.27)	12 (8.05)		
	Both	2 (0.98)	6 (4.03)		
4. What do you prefer to prescribe a new or old drug?	New drug	5 (2.44)	19 (12.75)	0.00001	68.91
	Old drug	193 (91.14)	86 (57.72)		
	Both	7 (3.42)	44 (29.53)		

[Table/Fig-3]: Attitude and practice of interns and residents about different aspects of RUM.
A p-value <0.05 was considered to be significant; Residents N=149; Interns N=205

There was no significant difference between male and female (combined for interns and residents) in prescribing EM and practicing RUM. But there was significant difference in prescribing EM and practicing RUM when considered for different qualification (interns and residents) [Table/Fig-4].

	Prescribing EM (n=324)		Practicing RUM (n=218)	
	Yes	No	Yes	No
Gender				
Male	123	14	77	60
Female	201	16	141	76
χ^2, p-value	0.87, 0.34		2.73, 0.09	
Qualification	Yes	No	Yes	No
Intern	181	24	77	128
Resident	143	6	141	8
χ^2, p-value	6.56, 0.01		118.78, 0.00001	

[Table/Fig-4]: Relationship between variables and practice of Rational Use of Medicine (RUM).
A p-value <0.05 was considered to be significant; EM: Essential medicine; RUM: Rational use of medicines

Regarding source of drug information multiple answers were allowed by the respondents. Both interns and residents reported standard textbooks like Katzung, Goodman and Gillman and KD Tripathi as major source of drug information. Review articles were the least preferred source of information. In internet various drug applications and new treatment guidelines were considered [Table/Fig-5].
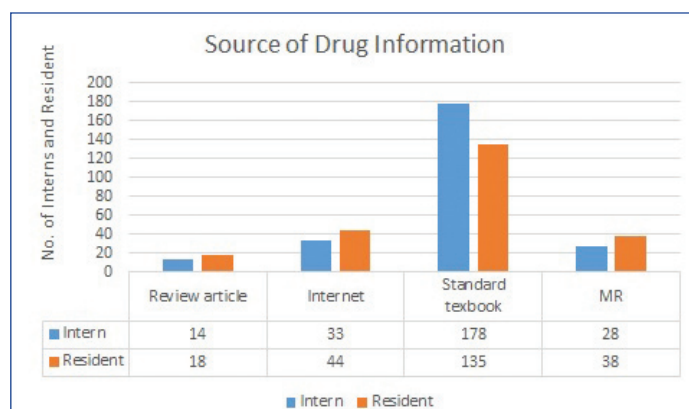
[Table/Fig-5]: Sources of drug information preferred by intern and resident doctors.

DISCUSSION

In present study, 38.71% were males and 61.29% were females while in the previous study conducted by Mahajan R et al., he showed that 55.6% were males and 44.4% were females participants [12]. While the male: female ratio in Adeola K et al., was 1.6:1 [13].

In this study, majority of respondent, 71.71% interns and 86.57% resident doctors, seems to be aware of the concept of EM despite not having National Model Essential Drug List at their workplace. Ironically, only 5 (2.43%) interns and 5 (3.35%) resident doctors of the respondents knew the exact number of drugs in the Indian EML. The findings are similar to the previous study conducted by Mahajan R et al., [12]. This clearly indicates lack of measures to update professional knowledge. Regarding EM, not only selection but also its appropriate use is necessary for upgrading quality of healthcare.

In present study, 12.08% of residents were aware about the term RUM and 95.97% were able to name the parts of prescription whereas Sajad SH et al., showed that 16.98% of residents were aware about the term RUM and 43.39% were able to name the parts of prescription [9]. Awareness about term P-drug among interns and resident doctors was 21.95% and 18.12% 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 [14-16].

In the present study, 21.95% interns and 18.12% resident doctors were aware about the STEP criteria of choosing P-drug while in Kanthi GR and Prayaga UK study, 27.50% clinicians and postgraduates were aware about it [14].

In current study, 61.46% of interns and 85.91% of residents always prescribed EM while in Tanuja V et al., 17.6% of junior residents always prescribed EM and Tekulapally K showed that 23% of interns always prescribe EM [15,17]. In our study, 89.75% interns and 87.92% of resident doctors 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 [15,17].

In our study, 91.14% interns considered to write old drugs and 2.44% preferred to write new drugs in prescription while Tanuja V et al., showed that 19.7 % of junior residents preferred to write new drugs in prescription slip and Tekulapally K reported that 47% of interns were preferred to write old drugs and 45% preferred to write new drugs in prescription slip [15,17].

In our study, main source of information was standard textbooks followed by Medical Representative, internet and last source being review articles. 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

representative (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 [13,18].

Limitation(s)

The major limitation of this study is that the study participants included were limited to interns and first year postgraduate residents in a single tertiary care teaching hospital in a western city of Gujarat.

CONCLUSION(S)

The present study shows that responders had a good knowledge, attitude and practice about EM and RUM. However, it was quite less regarding term "P-drug", new drug and existence of EML. Resident doctors were more aware of the term essential drugs as compared to interns. There was no significant difference between male and female in prescribing EM and practicing RUM. Similar studies should be done, so that the lacunae in knowledge, attitude and practice of RUM can be identified and appropriate corrective measures taken which will help in improving the quality of healthcare. Doctors should have knowledge about all areas regarding RUM and its understanding as they are going to practice medicine in future. Although the notion of RUM is covered in undergraduate coursework, more intensive RUM training is necessary to reinforce the mechanism for clinicians continued professional growth and to keep up with changes in knowledge and abilities.

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