



**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE OF RATIONAL USE OF
MEDICINES AMONG THE POST GRADUATE JUNIOR RESIDENT DOCTORS OF
GOA MEDICAL COLLEGE AND HOSPITAL-A QUESTIONNAIRE BASED STUDY.**

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INTRODUCTION

Medicines are the foremost contributor towards the health and well-being of humans.^[8] They play an important role in the prevention and treatment of disease.^[8] Global spending on medicines reached \$1.2 trillion in 2018 and is set to exceed \$1.5 trillion by 2023.^[3] However, due to the scarce nature of a resource, the availability, the equitable access of essential medicines with affordable price, and their appropriate or rational use is very challenging throughout the world, particularly in low and middle-income countries (LMIC).^[8]

The Conference of Experts on the Rational Use of Drugs, convened by the WHO in Nairobi in 1985, defined rational use as follows.^[1]

“The 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 cost to them and their community.”^[1]

The irrational use of medicines include failure to prescribe, dispense, and use medicines as per guidelines, use too many medicines, inappropriate use of anti-bacterials, overuse where not required, underuse where required, inadequate use for chronic diseases, overuse of injections, self-medication and use of expensive low-efficacy, low safety drugs.^[10] Irrational use results in morbidity, mortality, adverse drugs reactions (ADRs), poor outcome of cure, control, prevention of disease, antimicrobial resistance and financial loss.^[10] Irrational use has resulted in chloroquine-resistant falciparum malaria in 90 per cent countries, 2-40 per cent primary drug-resistant tuberculosis, 10-90 per cent ampicillin sulphamethoxazole / trimethoprim-resistant shigellosis.^[10] This has led to the use of expensive second-line drugs.^[10] Antimicrobial resistance is estimated to cost US\$ 4000-5000 million annually in the USA.^[10] Adverse medicines events are estimated to cost £466 million annually in the UK and up to US\$ 5.6 million per hospital per year in the USA.^[10] Half of the ADRs are preventable with rational use.^[10]

Non-communicable diseases (NCDs) are on the rise, 80 per cent of its burden can be reduced by appropriate use of medicines.^[10] In a study from India, 69.2 per cent of money spent on medicines in private sector and 55.2 per cent in public sector was found to be wasteful.^[10]

Though there are numerous factors that may be responsible for the irrational use of medicine at various phases of the medicine usage cycle, the lack of appropriate knowledge and skills from both providers and patients, unobstructed availability of medicines or procurement and distribution of medicine not based on an essential medicine list (EML), economic incentives from pharmaceutical companies, weak control and regulation over prescriptions, inappropriate promotion of medicines, biased information of medicine, overwork of health personnel, profit motives from selling medicines, and health insurance coverage have been implied to be factors contributing to the irrational medicine use in the literature.^[8]

The most important step of rectifying irrational use of medicines is to measure it.^[8] In order to address the problem of irrational use of medicines, the health policy makers require precise data on the nature of irrationality been carried out in order to choose the appropriate, effective and feasible strategies. Several studies have assessed the perception of RUM among the various participants like; nurses, pharmacy students, pharmacists, prescribers.^[8] Post-graduate students are subjected to various patterns of prescribing during their resident ship.^[3] They are the future physicians and specialists.^[3] This questionnaire on knowledge and attitude towards

good prescribing will help in finding the voids about the RUM among junior resident doctors.^[3] The present study was conducted to assess the knowledge, attitude and practice of postgraduate resident doctors about RUM as there are very few studies conducted among them.^[3]

METHODOLOGY

Study Setting: This Cross-sectional questionnaire based study was conducted in Goa Medical College and Hospital, Bambolim with the objective to assess the knowledge, attitude and practice of rational use of medicines among the Post-graduate medical students between January 2022 and May 2022.

Ethics Approval: Institutional Ethics Committee, Goa Medical College and Hospital granted the approval prior to the initiation of study.

Study Participants: 100 junior resident doctors from the various clinical departments between the age group from 17 to 23, both males and females were included in this study and a written informed consent was obtained from all the participants.

Study Method: A self-developed Semi-structured questionnaire was utilised for the assessment of the study participants. 20 questions were included in the questionnaire in 2 parts – 12 questions on Knowledge, 8

questions on Attitude and Practice. Responses were collected by the offline and online mode. For 8 questions on knowledge, the JRs had to choose yes or no as answer. For the rest of questions assessing their attitude and practices, they had to choose answers between always, sometimes and never. A descriptive analysis of the data was done using SPSS software version 20 and results interpreted.

statistical analysis

At the end of the study, all data was merged and expressed as counts and percentages.

RESULTS

100 respondents were included in this study, of which 43 were men and 57 women with age ranging from 24 to 30 years. Respondents were junior residents pursuing their post graduation after MBBS in any of the clinical disciplines of which 60 participants had joined in the year 2020 and 40 participants had joined in the year 2021 in their respective departments.

Demographic characteristics of the respondents.

Table 1: Demographic characteristics of respondents.

FEMALE	MALE
57	43

Table 2: year of joining of the respondents.

No of Respondents joined in the year 2020	No of Respondents joined in the year 2021
60	40

Table 2: Knowledge about RUM (n= 100)

Questions	Number of respondents	
	Yes	No
1. Are you aware of term Rational use of medicine?	100	0
2. Do you always prescribe rationally ?	97	3
3. Are you aware of term essential medicines	100	0
4. Do you prescribe from essential drug list of india ?	92	8
5. Are you aware of generic medicines?	100	0
6. Do you agree that generic drug is medication that has the same active ingredient as the brand name drug and yield the same therapeutic effect?	100	0
7. Are you aware of the term over the counter (OTC) drugs?	100	0
8. Do you feel that the availability of OTC drugs increases risk of delayed diagnosis, adverse effects and drug interactions?	91%	9%
9. Are newer and costlier medicines more efficacious?	37	63
10. Do you feel that the nutritional supplements are over-used in your department ?	65	35
11. Are you always aware of individual component while prescribing Fixed Dose Combinations (FDC's)?	88	12
12. Did training in clinical pharmacotherapy during the 2 nd MBBS curriculum helped you to prescribe rationally?	84	16

RUM: rational use of medicines; OTC: over the counter drugs; FDCs: fixed dosed combinations.

Table 3 shows majority of the respondents are aware of the term RUM and 97% of the respondents agree of always prescribing rationally. 100% of the respondents are aware of the term essential medicines and 92% of the

participants agree of prescribing from the essential drug list of India.

All participants (100%) are aware of the term generic medicines and also approve that the generic drug is medication that has the same active ingredient as the brand name drug and yields the same therapeutic effect. 100% of the respondents are aware of the term OTC drugs and (91%) of the study participants feel that the availability of OTC drugs increases risk of delayed diagnosis, adverse effects and the drug interactions.

Only 37% participants agree of newer and costlier medications being more efficacious.

65% of the respondents are of the opinion that the nutritional supplements are over-used in their respective departments. (88%) of the participants are always aware of the individual component while prescribing fixed dose combinations.

According to (84%) of the respondents, training in clinical pharmacotherapy during the 2nd MBBS curriculum helped them to prescribe rationally.

Table 3: attitude and practice of RUMs.

Questions	Percentage of responses		
	Always	Sometimes	Never
1. Are you aware of adverse effects, drug interactions and contra-indications of the drugs you prescribe ?	47%	51%	2%
2. Do you write your prescription clearly and concisely ?	93%	7%	0%
3. Do you write drugs in generic name on the prescription slip?	41%	59%	0%
4. Do you completely depend on information about medicines provided by the pharmaceutical industries?	2%	33%	65%
5. Does increase of working hours decrease your efficiency of prescribing rationally?	2%	77%	21%
Questions	Number of respondents		
	Yes	No	
6. Is there a need of inclusion of regular problem based training in pharmacotherapy and rational prescribing of drugs in post- graduate curriculum?	100	0	

Table 3 illustrates attitude and practice about rational use of medicine of the respondents.

(47%) of the respondents are always whereas (51%) are sometimes aware of the adverse effects, drug interactions and contra-indications of the drugs they prescribe.

(93%) of participants are always whereas (7%) of them sometimes agree that they write their prescription concisely and clearly.

(41%) of the participants always whereas (59%) of the respondents sometimes approve of writing the drugs in generic name on the prescription slip.

(33%) of the respondents sometimes, (65%) of the participants never whereas (2%) of the participants always depend completely on the information about medicines provided by the pharmaceutical industries.

According to (77%) of the participants, increase of working hours sometimes decrease their efficiency of prescribing rationally while (21%) of the participants agreed that the increase of working hours do not affect the efficiency of prescribing rationally.

(100%) of the respondents are of the opinion of the need of inclusion of regular problem based training in pharmacotherapy and rational prescribing of drugs in the post-graduate curriculum.

DISCUSSION

This study considers the existing knowledge, attitude and practice of the Post-graduate medical students about the several issues concerned about rational usage of drugs.^[9] Evaluating the knowledge, attitude and awareness among the young growing population is an significant phase in the course of creating awareness in the society on rational drug usage.^[9] Hence assessing the knowledge of post-graduate medical students who are a part of the healthcare team would be helpful in promoting the rational use of drugs and improving the awareness of the society.^[9]

Through this study it was observed that all of the respondents had knowledge and were aware of the terms such as rational use of medicines, essential medicines, generic medicines and over the counter drugs. Almost everyone agreed of prescribing rationally and from the essential drug list of India. This result was consistent with the finding of Dakhale et al^[1] who reported 96.5% respondents were aware of the term RUM and 87.5% respondents were aware of the term essential medicines. According to Bajait et al^[2], a similar study done on junior residents and faculty members of a medical institute reported that only 87% of them were aware of the term RUM^[2]. Vagge DS et al^[10] observed that among 39 interns of a college who were included as a group of participants among others, 84% of them were aware of RUM.

The National List of EM (NLEM) includes accessible, affordable, quality medicine at all the primary, secondary, tertiary levels of health care.^[2] The primary purpose of NLEM is to promote RUM considering the three important aspects, i.e., cost, safety, and efficacy.^[2] Further, it promotes prescription by generic names.^[2] Some studies have reported improvement in the quality of health care following use of NLEM and standard treatment guidelines.^[2] Hence, it is essential to adopt measures that will encourage their use.

All the respondents agreed that the generic drug is a medication that has the same active ingredient as the brand name drug and yields the same therapeutic effect. This finding is similar to result of the study by Sontakke *et al*^[6], where majority of the respondents (96.8%) were aware that same generic content of medicines is available under different names. A generic drug is a medication created to be the same as an already marketed brand-name drug in dosage form, safety, strength, route of administration, quality, performance characteristics, and intended use.^[11] These similarities help to demonstrate bioequivalence, which means that a generic medicine works in the same way and provides the same clinical benefit as the brand-name medicine.^[11] Low cost and easy accessibility are some of the benefits of the generic medications.

It was encouraging to know that most of the respondents were aware that the availability of the OTC drugs increases the risk of delayed diagnosis, adverse effects and the drug interactions among the patients. Though the benefits of OTC drugs include fewer visits to the physician, resulting in the decrease of the health care system costs, the use of OTC drugs can result in incorrect diagnosis leading to the serious illnesses, drug to drug interactions and potential for the misuse and abuse of the drugs.

Around 62% of the respondents were of the opinion that the newer and costlier medications are more efficacious.

Majority of the respondents felt that the nutritional supplements are not over used in their departments and is a positive finding.^[12] The primary significance of use of vitamins and minerals as drugs is usually the prevention and treatment of deficiency diseases. Few vitamins in pharmacological doses do have empirical uses.^[12] However vitamins and minerals as class of drugs are highly promoted, over prescribed and overused.^[12]

Combination products, also known as fixed dose drug combinations (FDCs) combinations of two or more active drugs in a single dosage form. Most of the participants were always aware of the individual component while prescribing the FDCs. Knowledge of the individual component while prescribing FDCs is necessary in an effort to make available the maximum benefits of the prescribed drug to the patients.

Almost everyone agreed that the training in clinical pharmacotherapy helped them to prescribe rationally, they also emphasized the need of inclusion of regular problem based training in pharmacotherapy and rational prescribing of drugs in the post graduate curriculum. National Rural Health Mission along with WHO proposes that Rational drug use should be included in under graduate medical curriculum.^[6] Teaching in Rational use of medicines will be further more efficacious if it considers students' current knowledge, viewpoint and expertise and is directed towards the prescribing prerequisites in future.^[6] Such intervention requires to have an awareness of the students' understanding on several concerns with RUM. This being their learning stage, they are susceptible of getting influenced by several factors which can change their perception either positively or otherwise.^[6]

Attitude and practice of RUM

Similarly, awareness of the adverse effects, interactions and contraindications of the prescribed drugs was seen in majority of the respondents. DAKHALE *et al* in his study reported similar findings in which 86% of interns and resident doctors were frequently aware of the adverse effects, interactions and contraindications of the drugs they prescribed. Lack of knowledge regarding adverse effects and interactions can lead to iatrogenic diseases causing more hospital admission and loss of resources.^[1]

It was encouraging to see that almost all respondents agreed of always writing their prescription clearly and concisely. Illegible writing of the drug is a matter of great concern, because badly handwritten drug orders can lead to mistakes.^[14] Illegible specific medication on the medication order could be misread by the nurse or the pharmacist, which can delay the treatment or can lead to administration of the incorrect medicine, that can worsen the patient's medical condition.^[1] It is necessary that the medication orders are written precisely and systematically, to make sure the patients are getting the best promising treatment.^[14] The WHO highlights the need of the legibility and clarity of prescriptions as the legal duty of the doctor.^[14]

Majority of the respondents agreed of sometimes writing the drugs in generic name on the prescription slip. Prescribing medicines by brand name has become a regular practice according to the various studies that have been conducted.^[3] lately, Medical Council of India has notified that prescribing drugs should be with generic names and also confirm that there is rational prescribing.^[3] Prescribing by generic name will help to promote RUM.^[3]

In this study almost 65% of the respondents appeared to be never dependent on information about medicines provided by Pharmaceutical companies. Although this is a positive finding it is actually very challenging to assess how many of these respondents would really follow this

in their future practice as the measures adopted by the Pharmaceutical industry to allure prescribers are so pleasing that it is often very difficult for them to resist and so they easily can be victims to such tricks.^[6] This problem which is one of the main contributor to irrational drug use can be settled only if the prescriber is self-motivated and dedicated towards the cause of patient care.^[6] Repeatedly reminding the medical students about this by way of appropriate inclusions in the postgraduate medical curriculum can be helpful to a certain extent.^[6]

Around 77% of the respondents agree of increase in working hours sometimes decreases their efficiency of prescribing rationally. When changes to doctors' working hours are considered and implemented there is a need for an evidence based approach to evaluating their impact on both educational and clinical outcomes.^[15]

Almost everyone agreed that the training in clinical pharmacotherapy helped them to prescribe rationally, they also emphasized the need of inclusion of regular problem based training in pharmacotherapy and rational prescribing of drugs in the post graduate curriculum. National Rural Health Mission along with WHO proposes that Rational drug use should be included in under graduate medical curriculum.^[6] Teaching in Rational use of medicines will be further more efficacious if it considers students' current knowledge, viewpoint and expertise and is directed towards the prescribing prerequisites in future.^[6] Such intervention requires to have an awareness of the students' understanding on several concerns with RUM. This being their learning stage, they are susceptible of getting influenced by several factors which can change their perception either positively or otherwise.^[6]

Teaching hospitals should consider of promoting the RUM through their teaching staff who can most efficiently imbibe this concept into the minds of future clinicians.^[4] While the medical students are at the phase of learning where their understanding and outlook are subject to change, any new concept to which they are exposed is more likely to be accepted and retained.^[4] This study provides an insight into the perception of various aspects of RUM in future doctors which would be helpful in planning an intervention targeting this group which can be considered one of the major stakeholders in rational drug use.^[4]

CONCLUSION

Majority of the post-graduate students were knowledgeable of the various terminology associated with RUM and also the issues concerned with it. Since the respondents are future prescribers, unawareness in the particular areas of RUM is a matter of concern that requires to be addressed. While the concept of RUM is included in undergraduate curriculum in most of the medical colleges and universities, further vigorous teaching concerning RUM is necessary to intensify the mechanisms for the on going professional growth of the

post-graduate junior resident doctors, to update their knowledge and skills to prescribe rationally. The major limitation of this study is that the sample size was small. In order to fill the lacunae in knowledge, attitude and practice of RUM, Similar studies should be done at various medical colleges and health care centres, so that corrective actions can be taken to help in improving the quality of health care.

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