

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_59_17

Awareness about rational use of medicines among fresh Bachelor of Medicine and Bachelor of Surgery graduates

Vijaya Laxman Chaudhari, Smita N. Mali¹, Amruta V. Dawari², Tushar B. Nishandar³

Abstract:

CONTEXT: Fresh Bachelor of Medicine and Bachelor of Surgery graduates (FMGs) are responsible for the majority of prescription errors and irrational use of medicines. Little research has explored their knowledge on rational prescribing practices.

AIMS: The present study aimed to evaluate the awareness of rational use of medicines (RUMs) among the FMGs.

SETTINGS AND DESIGN: A multicentric, cross-sectional, and questionnaire-based study was conducted among 308 FMGs during the internship orientation program.

SUBJECTS AND METHODS: The structured and prevalidated questionnaire consisted of 35 statements on important aspects of RUM.

STATISTICAL ANALYSIS USED: Data were analyzed using SPSS version 24.0 at 95% level of significance with Fisher's exact test.

RESULTS: Nearly 31% of FMGs did not know that the generic drugs are equally efficacious as branded drugs whereas 53% were in support of pregnant female should not consume any drug. Nearly 58% of FMGs were confused about deciding the dose in children and 18% were in favor of using antibiotics in common cold. Almost 55% of FMGs were disagree for adjusting the dose of antidiabetic drugs by patient depending on the meal taken whereas 12% were not aware of the importance of compliance of antihypertensive drugs and 40% were supporting the safety of fruits in chronic renal disease. The FMG from government colleges answered more correctly than that of the private colleges.

CONCLUSIONS: The awareness of RUM among FMG is not satisfactory, and also there is a gap in its implementation. Thus, they should be supervised during the initial phase of their medical practice.

Keywords:

Antibiotic, diabetes, generic, pregnancy, questionnaire

Introduction

The rational use of medicines (RUMs) means "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] This definition focuses on four important aspects of the RUMs: correct

medication, correct dose, correct duration of treatment, and correct cost.

Irrational use of medicines is a serious public health problem worldwide and can be seen as (a) use of too many medicines per patient; (b) inappropriate use of antimicrobials, often in inadequate dosage and insufficient duration; (c) over use of injections when oral medication would be more appropriate; (d) failure to prescribe in

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Chaudhari VL, Mali SN, Dawari AV, Nishandar TB. Awareness about rational use of medicines among fresh bachelor of medicine and bachelor of surgery graduates. J Edu Health Promot 2017;6:94.

Department of
Pharmacology, SMBT IMS
and RC, Dhamangaon,
¹Department of
Pharmacology,
Lokamanya Tilak
Municipal Medical College,
Mumbai, ²Department
of Pharmacology,
Maharashtra Institute
of Medical Sciences
and Research, Latur,
³Department of
Pharmacology, SRTR
GMC, Ambajogai,
Maharashtra, India

Address for correspondence:

Dr. Vijaya Laxman
Chaudhari,
Shivanand, Bharat Nagar,
Maldad Road, Sangamner,
Ahmednagar - 422 605,
Maharashtra, India.
E-mail: vijugmc@yahoo.
co.in

Received: 02-08-2017

Accepted: 06-08-2017

accordance with clinical guidelines including standard treatment guidelines and prescribing policy; and (e) inappropriate self-medication, often of prescription only medicines.^[2]

It has been estimated by WHO that more than 50% of all medicines are prescribed, dispensed, or sold inappropriately and about 50% of patients do not take them correctly.^[3] Thus, medicines are prescribed when they are not needed; wrong, ineffective, or unsafe medicines are prescribed; effective and available medicines are underused; or they are not used correctly. This scenario underscores the need for educating the prescriber, the dispenser, the retailer, and the public including the patient.^[4,5]

Fresh Bachelor of Medicine and Bachelor of Surgery graduates (FMG) are the doctors who have just finished their medical education and are now ready to implement their medical knowledge through the general practice. Before commencing their practice, it is desired that they should receive training on RUM, thereby preventing the serious problems related to the inappropriate use of medicines by these FMGs during their medical practice. Hence, in most of the institutions, the FMGs have the internship orientation program through which they brush up their knowledge of RUM.^[6,7]

In the past, many studies were conducted to check the awareness of RUM among the consumers, but very few studies reported it among the FMG.^[8-11] Hence, we planned this study with the aim to evaluate the knowledge and awareness about RUM among FMGs and an objective to compare this awareness among the FMG from private and government medical colleges.

Subjects and Methods

The present study is a multicentric, cross-sectional, questionnaire-based study conducted during February 2016 to May 2016. The study population was 308 FMGs from the following centres: private colleges - (a) Terna Medical College, Navi Mumbai and (b) Maharashtra Institute of Medical Sciences and Research, Latur; Government Colleges - (a) Lokamanya Tilak Municipal Medical College, Sion and (b) SRTR, Government Medical College, Ambajogai. The inclusion criteria were FMG from the mentioned centers that passed their final Bachelor of Medicine and Bachelor of Surgery (MBBS) examination in January 2016 and are willing for participation.

Study plan

During the internship orientation program, the eligible participants were provided an explanation about the study purpose, the questionnaire, and their responsibility.

A consent form followed by the study questionnaire was administered to them. The FMGs were asked to select the most correct response for that statement based on their knowledge, attitude, and practices. The responses are of Likert type with three response options as "agree," "do not know," and "disagree." The incomplete questionnaires were excluded from the study.

Preparation of questionnaire

A questionnaire was prepared, pretested, and amended as per the language expert. The validity of the final version of questionnaire was checked by calculating Cronbach's alpha value (Cronbach's alpha coefficient = 0.92). The final version of questionnaire consisted of 35 statements related to the following domains of the RUM: generic medicine (1-4), drug use in pregnancy and lactation (5-10), drug use in pediatrics (11-13), antibiotic use (14-20), management of hypertension (21-26), diabetes mellitus (27-32), and chronic renal/hepatic disease (33-35). Among total 35 statements, 15 statements (2, 6, 8, 10, 11, 13, 15, 16, 17, 18, 19, 22, 25, 33, and 34) were negatively framed.

The data collection was started only after the approval of the study by the Institutional Ethics Committee at the respective center. The identity of all the participants was kept confidential. The questionnaire was framed in very simple words to avoid any mental burden on the participant. The voluntariness of the participant was respected by the principal investigator.

All responses received were cross tabulated. The responses were converted to correct and wrong response for each statement. The interpretation of "do not know" was considered as wrong response. The extent of awareness for each statement was mentioned in percentage. Data were analyzed using the statistical package SPSS version 24 (IBM Corporation, Armonk, New York, USA). Fisher's exact test was applied to compare the extent of awareness about RUM among FMGs from private and government medical colleges. The significance level was set at $P < 0.05$.

Results

A total of 308 FMGs completed the present study. Figures 1-7 shows responses to the statements of various domains of RUM. In generic medicines, about 31% of FMGs did not know that the quality of generic is equal as brand name drugs whereas 33% of FMGs were disagree to this statement. In drug use during pregnancy and lactation, more than 50% of FMGs were in support of female should not consume any drug during her pregnancy, whereas 15% participants were disagree with the statement "most of the drugs are not safe in pregnancy." Similarly, 22% of FMGs did not know that

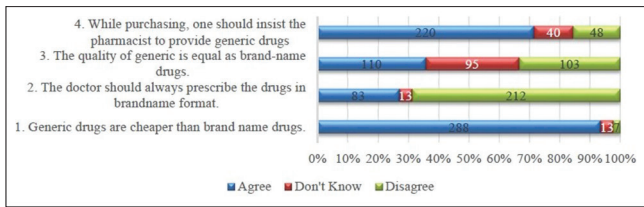


Figure 1: Responses of interns on the statements of generic medicines (n = 308)

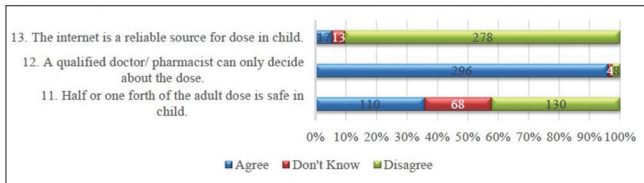


Figure 3: Responses of interns on the statements of pediatric drug use (n = 308)

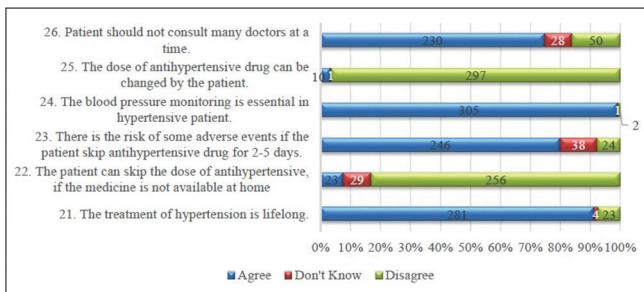


Figure 5: Responses of interns on the statements of hypertension (n = 308)

half or one-fourth of the adult dose is safe in child and 36% interns were in favor of the statement. Most of the FMGs had correct knowledge about the antibiotic use; however, 18% of them were in favor of using antibiotics in common cold and 11% did not know whether to stop or continue the further dose of antibiotics if the illness is not responding to the antibiotics. About the management of hypertension, 12% of FMGs did not know that skipping antihypertensive drugs for 2–5 days may lead to adverse effects in patients. Likewise, 55% of FMGs were disagree to the statement “the dose of insulin or other antidiabetic drugs can be adjusted by the patient depending on the meal taken” and 40% were agree for the statement “fruits are safe in patients of renal dysfunction.”

Table 1 summarizes the comparison of correct responses among FMG from private (n = 177) and government (n = 131) medical colleges. Among the total 35 statements, there was a significant difference in ten statements (4, 5, 8, 9, 11, 16, 17, 20, 23, and 34). Out of these ten statements, the FMGs from government colleges answered more correctly in six statements as compared to the private colleges.

Discussion

According to WHO^[1] and Ambwani and Mathur,^[12] there is the need for educating the prescriber and lack of proper



Figure 2: Responses of interns on the statements of pregnancy and lactation (n = 308)

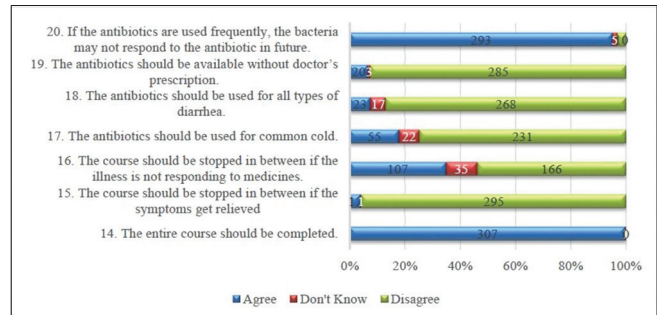


Figure 4: Responses of interns on the statements of antibiotics use (n = 308)

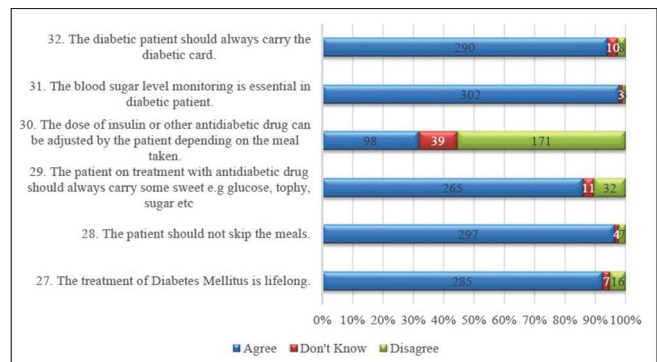


Figure 6: Responses of interns on the statements of diabetes mellitus (n = 308)

training to the FMGs leads to increase in the irrational use of medicines. Many other studies^[9-11] also revealed that the theoretical rational therapeutic teaching transfers knowledge to undergraduates (UGs); however, it is not retained in interns and does not adequately prepare FMG to prescribe safe and rational drugs. Likewise, the FMG should be assessed periodically on prescribing knowledge and skills during their training to minimize prescribing and clinical errors. In view of the above, this cross-sectional study was conducted among FMGs who have learned clinical pharmacology and rational therapeutics in 2nd year of MBBS. The objective of this study was to evaluate the knowledge and awareness about RUM among FMGs. We have conducted this study over four different centers with the intention of increasing the sample size and also comparing this awareness among the private and government medical colleges.

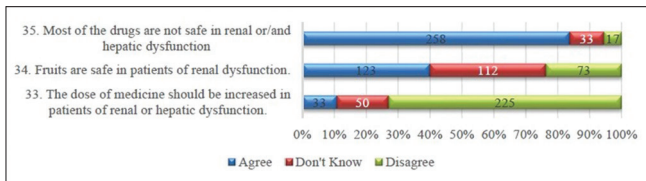


Figure 7: Responses of interns on the statements of chronic hepatic/renal disease (n = 308)

Most of the textbooks of Pharmacology,^[13-15] which are recommended by our medical university, mention that the generic drugs are equally efficacious as branded drugs. Thus, the drug regulatory body is constantly pressurizing the prescribers to prescribe generic drugs; however, it is disappointing that, in the present study, one-third of FMGs did not know the quality of generic is equal as branded drugs and they consider them inferior to the branded drugs. Furthermore, one-fourth of them think that doctor should always prescribe drugs in branded form. This can be due to blindly following the role models under whom the FMGs were posted during their clinical posting in UG tenure and also thoughtlessly listening to the false promotion by the medical representatives. Similar findings were noted by Alfa and Adigwe.^[11]

Pregnancy and lactation are the common phases of life faced by the general public. Hence, awareness about the appropriate use of drug during these phases should be created among the FMGs. In spite of teaching the UGs about the indication of iron and folic acid supplements in pregnancy, more than half of the interns supported that pregnant female should not consume any drug. Likewise, two-third of interns were seemed to be confused about deciding the correct dose for pediatric patient. These judgments indicated their absence of mind or wrong interpretation of the question or difficulty in prescribing the drugs in special situations such as pregnancy, lactation, and in children. Similar findings were reported by Baldwin et al.^[16]

There is a higher incidence of communicable diseases in India, and most of the population is already exposed to antibiotics leading to rise in the development of antibiotic resistance. Hence, the appropriate use of antibiotics should be known to the young prescribers. All the FMGs were supported to complete the entire course of antibiotics; however, about one-third of them think that the course should be stopped in between if the illness is not responding to the antibiotics. One-fifth of FMGs supported the use of antibiotics for the common cold. This indicated that they needed to be supervised while prescribing the antibiotics and also to be reeducated for the rational use of antibiotics. Similar results were recorded by Alfa and Adigwe.^[11]

Table 1: Comparison of correct responses among fresh graduates from private and government medical colleges

Statement number	Total correct response (n=308), n (%)	Private colleges (n=177), n (%)	Government colleges (n=131), n (%)	P
1	288 (93.5)	167 (94.4)	121 (92.4)	0.4932
2	212 (68.8)	114 (64.4)	98 (74.8)	0.0619
3	110 (35.7)	70 (39.5)	40 (30.5)	0.1182
4	220 (71.4)	135 (76.3)	85 (64.9)	0.0309*
5	255 (82.8)	154 (87.0)	101 (77.1)	0.0319*
6	292 (94.8)	167 (94.4)	125 (95.4)	0.7978
7	298 (96.8)	169 (95.5)	129 (98.5)	0.1985
8	135 (43.8)	110 (62.1)	25 (19.1)	<0.0001***
9	296 (96.1)	166 (93.8)	130 (99.2)	0.0157*
10	287 (93.2)	165 (93.2)	122 (93.1)	1
11	130 (42.2)	66 (37.3)	64 (48.9)	0.0476*
12	296 (96.1)	169 (95.5)	127 (96.9)	0.5672
13	278 (90.3)	159 (89.8)	119 (90.8)	0.8472
14	307 (99.7)	176 (99.4)	131 (100.0)	1
15	295 (95.8)	168 (94.9)	127 (96.9)	0.5682
16	166 (53.9)	83 (46.9)	83 (63.4)	0.0054**
17	231 (75.0)	121 (68.4)	110 (84.0)	0.0021***
18	268 (87.0)	152 (85.9)	116 (88.5)	0.6075
19	285 (92.5)	164 (92.7)	121 (92.4)	1
20	293 (95.1)	163 (92.1)	130 (99.2)	0.0029***
21	281 (91.2)	162 (91.5)	119 (90.8)	0.8412
22	256 (83.1)	141 (79.7)	115 (87.8)	0.0659
23	246 (79.9)	149 (84.2)	97 (74.0)	0.0316*
24	305 (99.0)	174 (98.3)	131 (100.0)	0.2643
25	297 (96.4)	168 (94.9)	129 (98.5)	0.125
26	230 (74.7)	133 (75.1)	97 (74.0)	0.8947
27	285 (92.5)	160 (90.4)	125 (95.4)	0.1252
28	297 (96.4)	169 (95.5)	128 (97.7)	0.3647
29	265 (86.0)	151 (85.3)	114 (87.0)	0.7407
30	98 (31.8)	62 (35.0)	36 (27.5)	0.1748
31	302 (98.1)	171 (96.6)	131 (100.0)	0.1403
32	290 (94.2)	165 (93.2)	125 (95.4)	0.4704
33	225 (73.1)	127 (71.8)	98 (74.8)	0.6042
34	73 (23.7)	31 (17.5)	42 (32.1)	0.003***
35	258 (83.8)	151 (85.3)	107 (81.7)	0.4359

Fisher's exact test applied, statistical significant difference with *P<0.05, **P<0.01, and ***P<0.005

The prevalence of chronic diseases such as diabetes mellitus, hypertension, and renal or hepatic disease is higher and rising in elderly age group. Hence, the education on the management of these chronic diseases is a need of this genre. About hypertension management, 12% of FMGs did not know that by skipping the dose of antihypertensive for 2-5 days led the risk of precipitating an acute attack of myocardial infarction or stroke or transient ischemic attack. This fact indicated that unawareness about this mentioned risk in FMGs will keep them away from the proper counseling of their patients about the compliance of the antihypertensive medicines. Likewise in the management of diabetes, 13% of interns did not

know that the patient can adjust the dose of insulin or antidiabetic drug depending on his meal. Three-fourth of the interns did not know that the fruits are not safe in the patient of chronic renal dysfunction. All these findings once again emphasized that the FMG would face difficulty in managing the patients of chronic diseases and there is a need to supervise and teach them practically by case studies. Similar results were observed by Baldwin *et al.*^[16]

Similar types of studies were conducted by Vagge *et al.*,^[8] Tesfaye *et al.*,^[17] and Bajait *et al.*^[18] to check the knowledge regarding RUM among the FMG; however, in all the studies, the questions asked to participants were not as case-based study, where as in the present study, each statement was framed in such a manner that, in a single line, the participants were knowing the diagnosis or case history of the patient and we checked the response of participants, how he/she deals with the situation. This approach is more practical and helpful to accomplish our study aim. According to the Medical Council of India,^[19] the medical graduate must know the management of most common diseases or conditions at the primary setup. Thus, in the present study, we have selected the common conditions such as drug used in pregnancy, lactation, and children and more prevalent diseases such as diabetes, hypertension, and renal/hepatic dysfunction. The questions in our study appear very simple, but they are extremely important for the general practice. Failure to answer such simple questionnaire in our study indicated that we should not assume that every FMG will be aware of the correct response to every simple situation during their future medical practice. The role models or the experienced doctor should supervise these young prescribers to prescribe drugs rationally so as to avoid significant medical errors.

The comparison of correct responses among fresh graduates from private and government medical colleges showed that the graduates from government colleges answered more correctly than that of the private colleges. This indicated that the graduates from government colleges were more exposed to deal the common medical situations. The graduates and the teachers from the private medical colleges should adopt a better technique to improve and to teach the RUM, respectively.

Conclusions

The awareness of RUM among FMG is not satisfactory, and there is a gap in its implementation. Incorporation of these basic concepts in the medical training of FMGs at internship may improve the awareness about RUM and its implementation in the future.

Acknowledgment

The authors are thankful to the Deans of the respective medical colleges for their constant support and encouragement.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization. Promoting rational use of medicines: Core components. WHO Policy Perspectives on Medicine. Geneva: WHO; 2002.
2. World Health Organization. The Role of Education in the Rational Use of Medicines. SEARO Technical Publication Series No. 45. October, 2006. WHO-SEARO; 2006. Available from: <http://www.apps.who.int/medicinedocs/documents/s16792e/s16792e.pdf>. [Last accessed on 2015 Jul 09].
3. World Health Organization. The Rational Use of Drugs, Report on the Conference of Experts. Nairobi: WHO; 1985.
4. World Health Organization. Medicines: Rational use of medicines. Fact Sheet No. 338. WHO Media Centre: World Health Organization; 2010.
5. le Grand A, Hogerzeil HV, Haaijer-Ruskamp FM. Intervention research in rational use of drugs: A review. *Health Policy Plan* 1999;14:89-102.
6. Kamat SK, Marathe PA, Patel TC, Shetty YC, Rege NN. Introduction of case based teaching to impart rational pharmacotherapy skills in undergraduate medical students. *Indian J Pharmacol* 2012;44:634-8.
7. Oshikoya KA, Senbanjo IO, Amole OO. Interns' knowledge of clinical pharmacology and therapeutics after undergraduate and on-going internship training in Nigeria: A pilot study. *BMC Med Educ* 2009;9:50.
8. Vagge DS, Muraraiah S, Jayanthi CR, Rohatgi V. A questionnaire study to evaluate the awareness and knowledge about rational use of medicines among trainee medical graduates in a tertiary care centre. *Int J Pharm Phytopharmacol Res* 2013;3:231-3.
9. Desai MK, Panchal Jr., Shah S, Iyer G. Evaluation of impact of teaching clinical pharmacology and rational therapeutics to medical undergraduates and interns. *Int J Appl Basic Med Res* 2016;6:205-10.
10. Upadhyaya P, Seth V, Sharma M, Ahmed M, Moghe VV, Khan ZY, *et al.* Prescribing knowledge in the light of undergraduate clinical pharmacology and therapeutics teaching in India: views of first-year postgraduate students. *Adv Med Educ Pract* 2012;3:47-53.
11. Alfa J, Adigwe OP. Rational use of medicines in Nigeria: A critical review. *J Biol Agric Healthc* 2014;4:89-99.
12. Ambwani S, Mathur AK. Rational drug use. *Health Adm.* 2006;19:5-7.
13. Tripathi KD. Antimicrobial drugs: General considerations. In: *Essentials of Medical Pharmacology*. 6th ed. New Delhi: Jayapee Brothers; 2008. p. 667-81.
14. Satoskar RS, Bhandarkar SD, Ainapure SS. General principles of chemotherapy of infections. In: Satoskar RR, editor. *Pharmacology and Pharmacotherapeutics*. 19th ed. Mumbai: Popular Prakashan; 1999. p. 703-14.
15. Lampiris HW, Maddix DS. Clinical use of antimicrobial agents. In: Katzung BG, editor. *Basic and Clinical Pharmacology*. 11th ed. Singapore: McGraw-Hill; 2007. p. 885-98.

16. Baldwin MJ, Abouyannis M, Butt TF. Essential therapeutics skills required of junior doctors. *Perspect Med Educ* 2012;1:225-36.
17. Tesfaye H, Berry D, Prokesova V, Allegaert K. Implementation of clinical pharmacology course in the curriculum for pregraduate medical students and its vital importance. *Recent Res Med Med Chem* 2014;1:99-105.
18. Bajait CS, Pimpalkhute SA, Sontakke SD, Dakhale GN, Jaiswal KM, Urade CS. Evaluation of knowledge, attitude and practice of rational use of medicines among clinicians in a tertiary care teaching hospital. *Int J Nutr Pharmacol Neurol Dis* 2014;4:153-7.
19. Medical Council of India Regulations on Graduate Medical Education; 1997. Available from: http://www.mciindia.org/Rules-and-Regulation/GME_REGULATIONS.pdf. [Last accessed on 2017 Mar 10].