Research Article

CORE KNOWLEDGE OF KEY POLICIES IN DRUG FORMULARY AND INTERVENTIONS FOR PRESCRIBING PRACTICE AMONG MEDICAL OFFICERS AND STUDENTS: SRI LANKAN PERSPECTIVE

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ABSTRACT
Awareness for effective use of drug formulary and prescribing practices for medical practitioners and students is essential to maintain an affordable and sustainable health care system for a country. In this study, knowledge and attitude of Medical Practitioners (MPs) and Medical Students (MSs) on key policies of drug formulary and prescribing practices were assessed. Forty two MPs and 120 MSs from hospital and the Faculty of Medicine were given a pretested structured questionnaire on knowledge of drug formulary and prescribing practices, strongest evidence about best drug data resources on interventions for improving prescribing practices, basic drug information in formulary. Filled questionnaire was considered for data analysis. We found that only 81 % of MPs were confident about the knowledge on basic drug information in formulary but students had shown more knowledge (91 %). Knowledge on the intervention for improving prescribing practices showed that 59 % of MPs had selected the correct answer but 89 % of MSs had selected the correct answer. 37 % MPs and 56 % of MSs selected the pharmaceutical industry as the best intervention programme. In contrast both of MPs and MSs (74 % and 72 % respectively) had understood that the randomized control trials are the strongest evidence for drug information and prescribing. But knowledge on scientific evidence for RUM was not correctly understood by both groups. It is concerned that MSs had better knowledge on correct intervention programme than MPs. Therefore it is a great requirement to augment the in service teaching and training programme in practical applications of RUM at timely interval. Both groups need more training on basic drug information about formulary and overall we believe to enhance the cost effectiveness of treatment strategies.
Keywords: Rational use of medicine, Drug formulary, Medical practitioners, Prescribing practices

INTRODUCTION
Practice of medicine has to be evaluated and monitored at timely interval when available medicines are increased. Prescribing of a drug should consider existing clinical condition and relevant therapeutic objectives, drug factors like availability, suitability, affordability and the cost.[1-3] Most hospitals should have their own basic drug hospital formulary to show the working professionals the suitable drug list that offers guidance on safe and cost-effective prescribing. A hospital formulary should consist of a continually updated list of medications and related information and also pharmaceutical care planning judgment of pharmacists, decisions of physicians, and other experts in the diagnosis and treatment of disease and promotion of health.[1] The properly planned and implemented formulary system can encourage rational, clinically appropriate, safe, and cost-effective drug therapy. If a formulary system is not optimally developed, organized and administered that can easily lead to a compromised health care system.[2] It is important to update the medical practitioners in the society about the current developments of formulary systems, new measures in good prescribing practices, importance of keeping the rational health care quality and cost effectiveness to ensure the clinically appropriate, safe, affordable and sustainable health care system for the nation.[4] Considering the current status of

the country and the limited data on the knowledge on drug formularies and basic drug information, we decided to evaluate knowledge on these key policies of Rational use of medicine (RUM). Out of the main key policies of RUM in this study, was the knowledge on drug formularies, intervention programme for improvement of prescribing practices and drug information resources. After the analysis, we hope to use this data for further development of existing drug formularies and the knowledge on data resources for future medical professionals.

SUBJECTS AND METHOD
The study was carried out at the Teaching Hospital, Karapitiya and Faculty of Medicine, University of Ruhuna. Knowledge on drug formulary, drug information resources and prescribing practices were assessed in 42 MPs and 120 MSs. The ethical clearance was granted by the ethics and review committee of the institution. The Knowledge was tested using a pretested structured questionnaire related to contents of drug formulary and prescribing practices in RUM. Questionnaire was sent to all MPs in hospital and Faculty of medicine and only responded data were collected. MSs who participated to this study had finished the pharmacology syllabus in undergraduate curriculum.

Questionnaire is given in Table 1.

Table 1: Questionnaire on assessment of knowledge on rational use of medicine of health personnel

Question details	Responses given for the question
1. My knowledge on (Good / fair / don't know)	a. Standard treatment guidelines/Essential drug list b. National formulary/Hospital formulary c. Drug and therapeutic committees d. Reliable drug information sources
2. Essential drugs list is (Mark as True/ false)	a. List of life saving drugs b. List of drugs by generic names c. List of drugs required for common ailments d. List of drugs required for majority of ailments and people e. List of drugs required for priority needs of the population
3. Core policies to promote more rational use of drugs include (Mark as True/ false)	a. Essential drug list b. Standard treatment guidelines c. Restricting prescribing d. Cross sectional supervision, audits and feedback e. Sufficient government money
4. Regarding standard treatment guidelines (Mark as True/ false)	a. It consists of clinical features of the illness b. It is not necessary to update the STG c. Include common treatment practices but not the best practice d. Provide guidance to orient new prescribers e. It is prepared according the personnel experience
5. Criteria for selection of essential drugs are (Mark as True/ false)	a. Pattern of prevalent diseases b. The training and experience of available personnel c. Treatment facilities d. Relative efficacy cost and suitability e. Latest drug in the market
6. Which of the following is the most effective intervention to improve prescribing practices (Mark as True/ false)	a. Drug bulletin/newsletter b. Seminar c. Face to face education d. Pre service training of the doctors e. Drug information from pharmaceutical industry
7. Strongest evidence comes from the following	a. Randomized Controlled comparative trials b. Review articles c. Meta analysis d. Clinical experience e. Text books
8. Basic drug information in formulary is / are	a. Dose b. Dosing interval c. Brand name d. Generic name e. Clinical indications
9. How frequently should Essential Medicines List be revised?	a. Every quarter b. Every two years c. Every five years d. No revision required e. Every Year

Statistical Analysis

Analysis was done using microcal origin 06 and SPSS version 07 statistical packages. Data was distributed normally and therefore the parametric measures were used to find out the mean and SD or SEM in necessary situations.

RESULTS

Percentage of Knowledge on Key Policies of RUM

The level of knowledge of MPs on key policies of RUM was analyzed as the initial phase. Figure 1 shows of percentage of MPs knowledge on standard treatment guideline (STG) 26.83 % (A), Essential Drug List (EDL) 29.27 % (B), national formulary/hospital formulary (NF/HF) 24.39 % (C), drugs and therapeutic committees (DTC) 9.76 % (D) and reliable drug information resources (RDIR) 29.27 % (E).
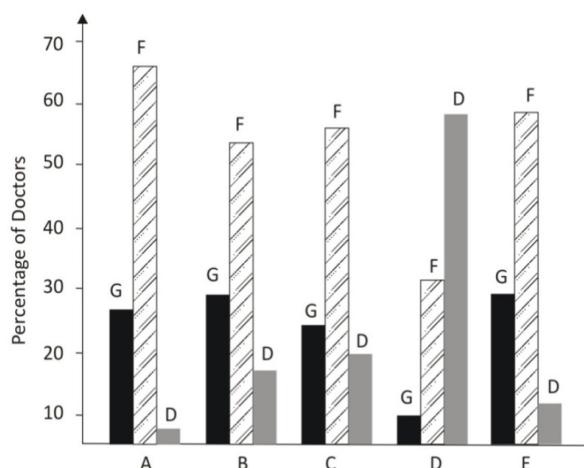

Figure 01: Level of knowladge in key policies on RUM of 42 MPs

Figure 1: The level of knowledge in key policies on RUM of 42 MPs was assessed. The percentages of MPs who were confident on their knowledge were 26.83 %, 29.27 %, 24.39 %, 9.76 % and 29.27 % on STG, EDL, NF/HF, DTC and RDIS respectively. Some of MPs were convinced or not at all aware of STG in 7.32 %, EDL in 17 %, NF/HF in 19.51 %, DTC in 58.54 % and RDIR in 12.2 %. In this graph G indicates good, F stand for fair and D stand for does not know of the answers.

Knowledge of Mps on Basic Drug Information in a Hospital Drug Formulary (BDIF)

Detailed knowledge of MPs on Basic drug information in national / hospital drug formulary and on the evidences of reliable drug information sources was assessed. Figure 2 shows that the level of knowledge of MPs on different factors in basic drug information in a hospital formulary. All of MPs selected dose (A), 95 % selected the dosing interval (B) as the necessary contents in drug formulary while 70 % of MPs selected brand name (C), 92 % of them noted the generic name (D) as the inclusion criteria in a formulary. 95 % of MPs selected clinical indication (E) to be included criteria in a drug formulary.   .
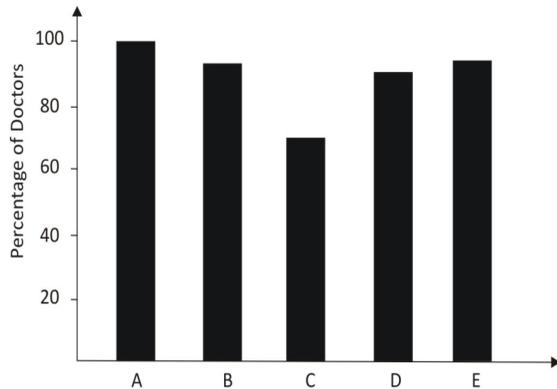

Figure 02: Knowledge of MPs on basic drug information in a drug formulary

Figure 2: The percentages of knowledge of MPs on BDIF

Were 100 % in dose (A), 95 % in dosing interval (B), 70 % in brand name (C), 92 % in generic name (D), 95 % in clinical indication (E).

Difference in the Knowledge of Basic Drug Information Resources in Mps by their Self Assessment and Questionnaire Based Evaluation

There were two questions in the questionnaire to assess the self evaluation of MPs about their knowledge on national and hospital formulary and reliability of drug information resources. First questions showed that 81 % of MPs were confident on their knowledge on National and hospital formulary and 87 % of them said that they know the reliable drug information resources. But According to current evaluation by question 8, 91 % of MPs had shown that they have the correct knowledge on BDIF. The Figure 3 shows this gap analysis of the current knowledge and the true knowledge about BDIF in MPs.
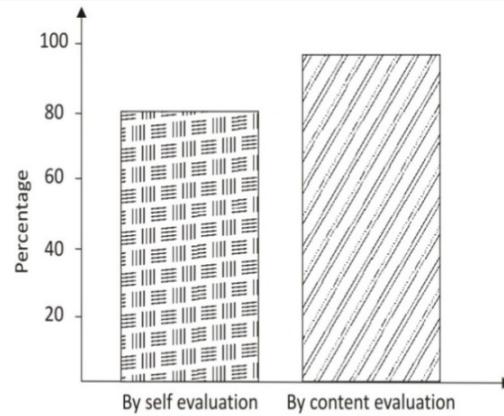

Figure 03: Gap analysis in the knowledge on formulary of MPs between their assessment and our analysis

Figure 3: It shows significant difference in knowledge about basic drug information in a formulary in MPs by self evaluation and questionnaire based content evaluation

Knowledge of MSs and MPs on Selection of the Strongest Evidence for Best Drug Data Resources (BDDR)

We further analyzed the knowledge on selection of strongest evidence on best drug data resources on both MPS and MSs by this questionnaire. Five best drug data resources were considered in our questionnaire; the randomized control trials (A), the review articles (B), meta analysis (C), clinical experience (D) and text books (E) are the responses selected for our analysis.

Percentage of Mps Having Knowledge on BDDR

Figure 4 shows the percentage of MPs who selected different type of drug data resources. 25 % of them selected randomized control trials (A), 62 % of them selected the review articles (B), 21 % decided it as meta analysis (C), 51 % of them thought it as clinical experience (D) and 71 % of them decided it as a text books (E).
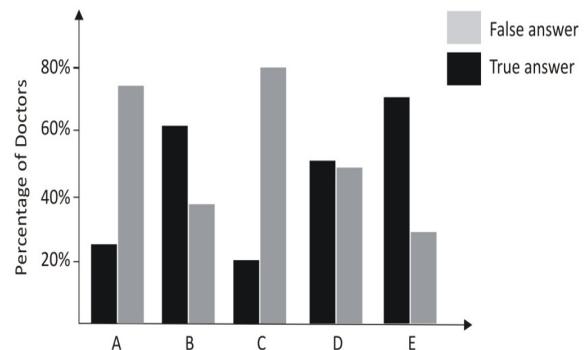

Figure 04 a : Knowledge of MPs on the best data resources for drug formulary

Figure 4a : it shows the percentage of MPs who submitted the answers for BDDR.25% of them selected randomized control trials (A), 62% of them review articles (B), 21% them selected it as meta analysis (C), 51 % of them thought it as clinical experience (D) and 71% of MPs selected BDDR as text books (E).

Percentage of Mss Having Knowledge on BDDR
We further analyzed the knowledge of medical students and the analysis of knowledge shows 27 % of them had selected randomized control trials (A), 59 % of them selected it as review articles (B), 36 % of MSs decided it as meta analysis (C), 78 % of them selected it BDDR as clinical experience (D) and text books (E) were selected by 75 % of them as the reliable drug information source.
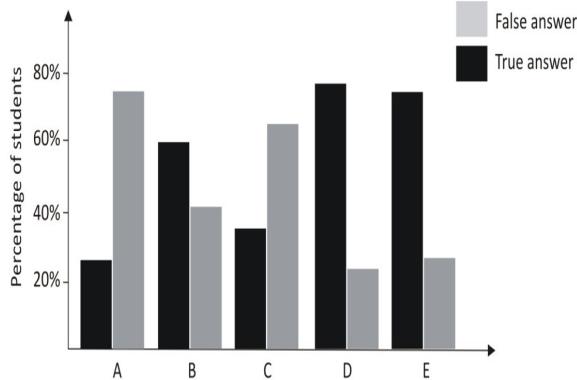

Figure 04 b : Knowledge of MSs on the best data resources for drug formulary

Figure 4b: It shows the percentage of medical students who submitted the answers for BDDR. 27% of them were correct in Randomized control trials (A), 59% decided it as review articles (B), 36% thought it as meta analysis (C), 78 % of them in the decision of it as clinical experience (D) and 75% them selected the SEBDDR is text books (E).

Comparison of Knowledge on BDDR between Mps and Mss
We compared the level of knowledge of MPs and MSs on selecting correct criteria as the strongest evidence of best drug data resources and it showed as 46 % and 55 % respectively.
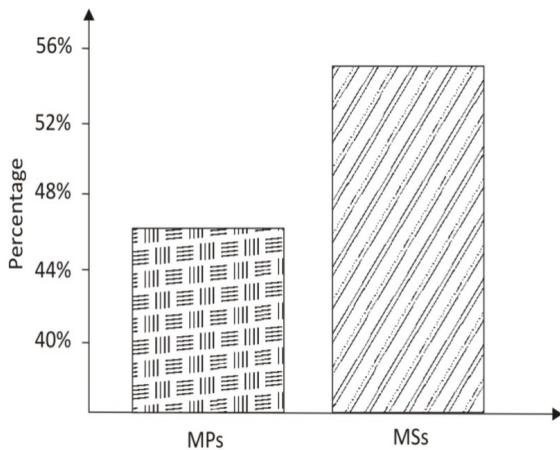

Figure 04 c: Comparison of knowledge on the best data resources for the drug formulary between MPs and MSs

Figure 4c: It shows the level of knowledge of MPs and MSs on the data resources of the formulary and it was 46 % and 55 % respectively

Knowledge on Interventions for Improving Prescribing Practice
One of the key policies in rational use of medicine is the usage of intervention programme to improve the correct

prescribing practice. Analysis of the knowledge of MPs and MSs on five intervention programme was tested among them. Drug bulletin and news letter (A), seminar (B), face to face education (C), pre service training of the doctors (D) and drug information from pharmaceutical industry (E) were given as selective responses in the questionnaire. Figure 5a shows the percentage of MPs selected the type of intervention programme tested by the questionnaire. 41 % of them selected the best programme as drug bulletin and news letter (A), 48 % decided it as seminar (B), 59 % of MPs selected it as face to face education (C), 43 % selected it as pre-service training of the doctors (D) and 63 % of MPs decided the IFIPP as drug information from pharmaceutical industry (E).
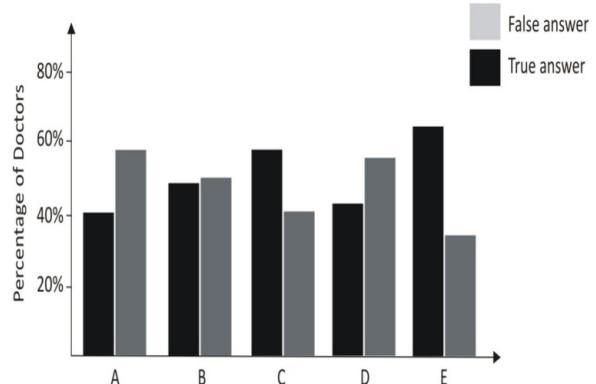

Figure 05 a: Knowledge of MPs on having best resources on drug information to improve prescribing practices.

Figure 5a: It shows the percentage of MPs selecting the IFIPP from the questionnaire. 41% of them selected the IFIPP as drug bulletin and news letter (A), 48% of thought it as the seminar (B), 59% thought it is the face to face education (C), 43 % the and 63% of thought that best IFIPP is the pre service training of the doctors (D), and the drug information from pharmaceutical industry (E) respectively.
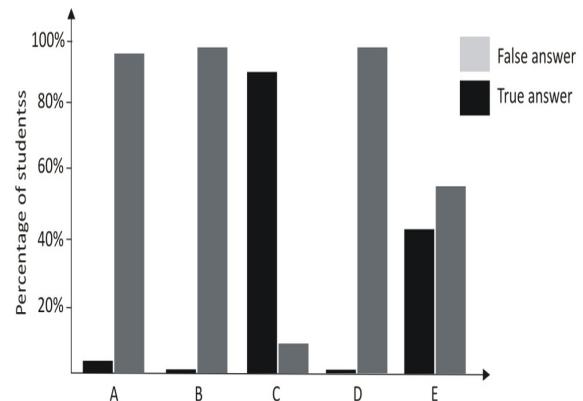

Figure 05 b: Knowledge of MSs on having best resources on drug information to improve prescribing practices.

Figure 5b : It shows the percentage of MSs Selections for IFIPP type. 3% of them selected best IFIPP as drug bulletin and news letter (A), 1% of them selected it as seminar (B), 88% decided it as face to face education (C), 1% of them marked it as pre service training of the doctors (D) and 44% of MSs had marked the best IFIPP as the drug information from pharmaceutical industry (E).

Comparison of knowledge on IFIPP
Considering above data we compared the level of overall knowledge on interventions for improving prescribing practices of both MPs and MSs. We calculated the average

percentage of giving correct answer for this question both in MPs and MSs and found out that 51 % of MPs had selected the correct answer while MSs had 27.5 % of knowledge.
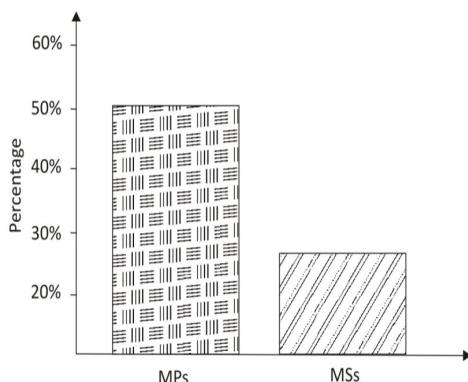

Figure 05 c: Comparison of knowledge on the best resources on drug information to improve prescribing practices between MPs and MSs

Figure 5c: Difference in the level of knowledge IFIPP on MPs (51 %) and MSs (51 %) is shown in Figure 5c

DISCUSSION

Many of the research studies had already shown that it is possible to introduce good prescribing policies into general medical practice in government hospitals but it need strong compliance and active involvement of the prescriber concerned.[6,8] In addition to that some other studies had shown the regular feedback and assessment of prescriber and their practice do help to practice the principles of rational use of medicine leading to low budget allocation for the health of a the country.[9-15] As most of the pharmacologist aware, the rational use of medicine cannot be defined without a method of measurement and a references standard, we stepped in to assess the knowledge of the prescriber as an output measure of interventions. Our previously published results shows that MPs had low knowledge in contents of EDL was higher in MSs than MPs.[16] Further to that MPs did not aware about that EDL preparing criteria; inclusion of generic names, common ailment, majority ailments of the people knowledge on essential drug list.[16] This results related to the drug formulary further confirmed the low level of knowledge of MPs on STG, EDL, NF/HF, DTC and drug information resources. In addition to that, knowledge of MPs on BDIF about national / hospital drug formulary and on the evidences of reliable drug information sources were high in the same group. MPs had shown by the results of our gap analysis, that they are not aware about the true core policies for the evaluation. This may be due to the lack of the correct knowledge in these new areas to the medical field. Most of the countries include STG, EDL and DTC recently to the many curricula and the training field in pharmacology in the world. Therefore we would like to reiterate about the repetitive educational activities in relation to those field to medical officers. We further found that the knowledge on scientific evidence for RUM was not correctly understood by both groups. We further found that the knowledge on strongest evidence on best drug data resources (BDDR) such as randomized control trials, the review articles, meta analysis, clinical experience and text books were lower specially in MPs than MSs. This is another evidence to show the need of in service educational programme in relation to the drug data resources and drug research. MSs are getting exposed with the current inclusions of the subcomponents of RUM to undergraduate curriculum.

These results are similar to the study conducted by Orme *et al* regarding the contents in the core curriculum in clinical pharmacology.[17] In contrast to that the knowledge on intervention programme for improving prescribing practice (IFIPP) such as drug bulletin and news letter, seminars, face to face education, pre service training of the doctors and drug information from pharmaceutical industry was higher in MPs than MSs. This further shows that MPs were aware about the improving methods for the good prescribing practices but not the core policies of RUM and drug formularies. Another study related to the knowledge on rational use of medicine shows that there is a significant impact on prescriptions by the knowledge on drug bulletins.[18] We found that this is a very important phenomenon regarding the knowledge in MPs. This data can be used to plan properly to improve the deficits of knowledge components such as core policies of RUM and drug formularies. Finally we suggest the need of in service teaching and training programme to improve the knowledge of RUM and practical applications of IFIPP at timely interval. Both groups need more training on BDIF to improve the efficacy of RUM and the national health cost effectiveness. We found here the bid difference in knowledge in some components in key policies used in drug formularies, intervention programme and best drug information sources. According to our stud results, we suggest that almost all graduate pharmacy and pharmacology curriculum in our country should be ensured of the current needs of these lacked components. Many curriculum used in our country does not address much attention to rational use of medicine and the sustainability of its practice in health sector. We strongly believe that students should be educated and more hand-skilled on practicing core policies of RUM including standard treatment guidelines, essential drug list of a country and also the core policies of drug formulary. The implementation of skill development practical sessions on proper drug information resources and handling, familiarity sessions in components in drug formulary and are greatly recommended. We also suggest that the internship training period of medical apprenticeship under the supervision of a consultant is the best time for the reiteration.

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