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Assessment of the Prescribing Knowledge, Attitude and Skills of Medical Students and Interns in a Large Teaching Hospital of Southern India

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ABSTRACT

There is a world wide concern among health authorities regarding the lack of safe and rational prescribing skills and knowledge among the new medical graduates. This study was undertaken to assess the undergraduate medical students' and interns' attitude and knowledge regarding safe prescribing and to examine their prescribing skills. Fresh interns, 130 in number who had recently graduated and 148 medical undergraduate students were asked to complete an anonymous, selfadministered, structured questionnaire about safe prescribing. As a part of the questionnaire they were also supposed to write a prescription for a patient suffering from common cold and fever. The data so obtained was analysed using simple descriptive statistics. Where relevant Chi-square test was used to determine any significant difference. On final analysis safety and efficacy of a drug were considered to be most important factors deserving consideration. Non official drug formularies (CIMS, IDR & Drug Index) were the most preferred source of information for 88 (75%) interns, while 46 (40%) students preferred textbooks and scientific journals. The average number of medications prescribed per prescription by the students and interns were 2.11 and 2.44 respectively. Antibiotics were unnecessarily prescribed by a large number of students [48(41.73%) versus 13(11.60%) $p<0.001$]. The knowledge and attitudes of the students and interns were satisfactory. The main concern was regarding the students' unnecessary prescribing of antibiotics and their prescription writing skills which calls for our attention.

Key words: Prescribing skill, Medical students, Rational prescribing, Prescribing knowledge, Medical education.

INTRODUCTION

Prescribing is a complex and challenging task that requires a sound knowledge of the drug and the disease combined with an attitude of care and credibility towards the patient and the society as well as sound and convincing, communication and prescription writing skills.

The ever expanding drug formulary, increased incidence of polypharmacy, and an older patient demography, have further increased the complexities and risks of prescribing[1].

Inspite of its complexity and great significance very little importance is given to the learning of prescribing in the medical curriculum. The time devoted to its learning during the undergraduate clinical pharmacology practical exercises is hardly sufficient. The clinical postings teach the students about how to arrive at a diagnosis and what drugs are to be prescribed. How to prescribe receives very little attention.

Deficiencies in undergraduate prescribing education has been closely linked to the high frequency of medication errors, especially by the junior doctors[2] which can result in serious health

risks to the patient and adverse economic outcomes[3].

The causes of prescription errors can be multi-factorial including both individual and organizational factors. The quality of undergraduate therapeutics teaching has been reported as one of the main contributor[1]. Most often prescribing is thought of as a simple act of writing a prescription and failure to perceive the importance of the prescribing task at hand has resulted in prescription errors[3].

Prescribing is a complex and high-risk intervention which has to be based on accurate and objective information and not an automated action, without critical thinking. Safe prescribing must include cognitive and decision-making steps before the prescription is actually written[3,4].

Prescription writing is a vital part of medical practice and patient care and can also have medicolegal repercussion. The importance of writing proper prescription should be emphasized during the students' undergraduate training. The skills, knowledge, and attitudes needed to make good prescribing decisions should be inculcated[5,6].

Contrary to this the undergraduate training at many places including ours makes the task of prescribing to appear as a casual exercise which only requires the students to memorize the names of certain medications. The practical aspects of selecting a drug appropriate to a clinical condition, based on patient characteristics and available evidence is rarely conveyed to the students[7].

We undertook this study in order to assess the knowledge, attitudes and behaviour of medical graduates who are about to begin their internship regarding safe prescribing and compare with third year medical students who have completed their one and half year pharmacology training. Their prescription writing skills were also analysed.

This study was undertaken in a medical college located in the southern part of India, in the state of Kerala which has recently taken various steps to reform its medical curriculum by establishing a single health university, Kerala University of Health Sciences (KUHS). The revised pharmacology curriculum introduced by KUHS gives more emphasis on teaching of clinical pharmacology and rational therapeutics.

The present questionnaire based survey was carried out among the medical students and interns enrolled at the Calicut University, which prescribed the traditional pharmacology curriculum. The present study seeks to verify the ability of the traditional pharmacology curriculum in meeting the desired objectives of rational prescribing. It can also serve as a reference point for the later assessment of the newly introduced pharmacology curriculum of the KUHS.

MATERIALS AND METHODS

This was a cross-sectional, questionnaire-based study. The study was conducted in a private medical college and hospital in Kerala.

The participants included

1) Medical students (n=148) after the end of their one and half year of pharmacology training and
2) New Interns (n=130) who had recently graduated and about to begin their housemanship

Ethical clearance for the study was obtained from the institutional ethics committee. Informed consent was taken and the participants were asked to complete an anonymous, selfadministered, structured questionnaire about safe prescribing. The questionnaire was designed to assess the knowledge, attitudes and behaviour of the study participants regarding safe prescribing. It consisted of Multiple choice questions (MCQs) and five point likert scale based questions whose responses ranged from "strongly agree" to "strongly disagree.

As a part of the questionnaire they were also supposed to write a prescription for a patient suffering from common cold and fever for which a blank space was provided in the questionnaire. The prescription was analysed for its rationality and content. The data so obtained was analysed using simple descriptive statistics. Where relevant Chi-

square test was used to determine any significant difference and a p value of < 0.05 was considered as significant.

RESULTS

The response rate for our questionnaire based survey was 90% (117/130) among interns while among the students the response rate was 78% (116/148).

The number of students (31/116) and interns (31/117) who prefer using a only generic name while prescribing were around 30%. Trade/ brand name alone was preferred by 40% of the students when compared to 20% of the interns. More number of interns preferred to use both generic and trade names while prescribing a drug when compared to the students [70(59.8%) versus 44(37.9%) p<0.001].

Among the drug related factors, safety and efficacy of a drug were considered to be more important elements deserving consideration when compared to the cost and convenience by 87% of the interns and 91.3% students.

Table 1: Opinion of the students and interns regarding package inserts

S.No	Characteristic	Students n (%)	Interns n (%)
1.	Reliable	30 (25.8%)	24 (20.5%)
2.	Unbaised	12 (10.6%)	02 (1.7%)
3.	Educational to the doctor as well as the patient	86 (74.1%)	88 (75.2%)
4.	Based on substantial scientific evidence	58 (50.1%)	52 (44.4%)

Table 2: Beliefs of the students and interns regarding certain aspects of prescribing

		Agree	Unsure	Disagree
1.	New Drugs entering the market are always superior to older ones			
	Students n(%)	39(33.6%)	38(32.7%)	35(30%)
	Interns n (%)	17(14.5%)	61(52.1%)	41(35%)
2.	A good prescription usually contains more than 3-5 drugs			
	Students n(%)	08(6.8%)	11(9.4%)	97(83.6%)
	Interns n(%)	03(2.5%)	06(5.1%)	108(92.3%)
3.	Providing instructions to the patient regarding the prescribed drug is entirely the duty of the pharmacist			
	Students n(%)	17(14.6%)	06(5.1%)	91(78.4%)
	Interns n(%)	10(8.5%)	02(1.7%)	101(86.3%)

Table 3: Parameters which were included in the prescriptions of the participants

S. No	Parameters included in the Prescription	Students n (%)	Interns n (%)
1.	Date of Prescription	21 (18.3%)	25 (22.3%)
2.	Strength of Medication	53 (46.0%)	78 (69.6%)**
3.	Duration of Use	56 (48.7%)	57 (51.0%)
4.	Frequency of Use	70 (60.8%)	90 (80.3%)*
5.	Directions for Use	02 (01.7%)	03 (02.6%)
6.	Non Drug Measures	08 (06.9%)	26 (23.2%)**
7.	Prescriber's Name, Signature and Number	27 (23.4%)	44(39.3%)*

mp <0.05, mm p <0.001

The patient related factors which deserve more consideration were personal preferences of the patient and history of drug allergy according to 68(58.6%) students, and 89(76%) interns. Presence of other concomitant diseases and use of other medications by the patient were considered important by 31(26.7%) students and 27(23%) interns.

On coming across an adverse drug reaction (ADR) in any patient around 25% of the interns and 21% students would report it to the concerned staff in the hospital. While a majority of both the students and interns (80%) would try to ascertain the cause by obtaining a detailed medication history.

Table 4: Participants' preference of the name while prescribing

S. No	Preferred Name	Students n (%)	Interns n (%)
1.	Generic name only	86 (74.8%)m	66 (58.9%)
2.	Brand/Trade name only	04 (03.5%)	13 (11.6%)
3.	Both Generic and Brand name	18 (15.6%)	33 (29.6%)*

*p <0.05

Table 5: Medications included in the participants' written prescriptions

S. No	Medications Prescribed	Students n (%)	Interns n (%)
1.	Antibiotics	48 (41.7%)	13 (11.6%)
2.	Analgesics and Antipyretics	96 (83.5%)	112 (100%)
3.	Antihistaminics	55 (47.8%)	86 (76.8%)
4.	Anti peptic ulcer drugs	08 (06.9%)	11 (09.8%)
5.	Other medications (Decongestants etc)	14 (12.2%)	08 (07.1%)

Non official drug formularies (CIMS, IDR, Drug Index) were the most preferred source of information among interns which is highly significant when compared to students who preferred the same [88(75.2%) versus 33(28.4%) p<0.001]. Students would mostly prefer textbooks and scientific journals [46(40%) versus 19(22.23%) p<0.001]. The internet was the preferred source for 31(26.7%) students while among the interns only 12(10%) preferred the World Wide Web (p<0.05). About 80% of both students and interns were aware of the unreliability of the drug information and product promotional literature supplied by the pharmaceutical companies and agreed that it requires critical appraisal and assessment before consideration.

Out of the 117 interns and 116 students who returned the questionnaires only 112 interns and 115 students had attempted the prescription exercise where they were supposed to prescribe for a patient suffering from common cold, fever and body ache.

Average number of medicines prescribed by the interns and students per prescription are 2.44 and 2.11 respectively.

Tables 3, 4 and 5 provide the details regarding the parameters included by the participants in their prescriptions and the medications prescribed.

DISCUSSION

Prescribing is a complicated task involving various processes and abilities which renders its assessment very difficult. Through this study we attempted to assess the knowledge of the medical students and interns regarding different aspects of prescribing like drug and patient related factors, drug promotional literature, ADR reporting and

package inserts. The participants' preferences regarding the use of generic or trade name while prescribing and their preferred drug information sources were studied. Their attitudes with respect to newer drugs, polypharmacy and patient communication were examined.

Both the group of students and interns exhibited fairly sound knowledge and attitudes without any significant differences between them. More number of students preferred using trade names (32.7%) when compared to generic names (27.3%). The students may be unaware of the advantages of prescribing medications by their generic names. Use of generic names in prescriptions provides flexibility to the dispensing pharmacist and generic drugs are less expensive than brand-name drugs. The use of brand names may be acceptable only when problems of bioavailability are expected[8].

Non official drug formularies (CIMS, IDR, Drug Index) were the most preferred source of information for 88(75%) interns, followed by textbooks, journals and internet which is identical to the information sources of the study participants of an earlier study conducted among postgraduate students in India[9].

Doctors need to be able to access drug information, assess therapeutic claims and find authoritative and reliable evidence in support of their therapeutic decisions[5]. Non official drug formularies are not a reliable source as the publisher does not independently verify or investigate the representations and recommendations that are part of each medication's listing which is provided to them by the manufacturer[10]. Instead, learning how to use the official formularies like the National Formulary of India, British National Formulary and if possible, Clinical Evidence and the Cochrane database, as a student would be of immense benefit to them in the future[5].

The mean number of drugs prescribed by the students and interns for the given clinical condition were 2.11 and 2.44 which is less when compared to other studies in India where the mean number was much higher[11-12].

Prescribing errors can generally be categorized into those of decision making and prescription writing[13].

Errors in prescription writing were commonly found among the students and interns. Most of the prescriptions were lacking in important entries like the date of prescribing, and particulars of the prescriber. These elements, according to the WHO, are essential when filling a prescription. Moreover they are very useful to the dispensing pharmacist for contacting the prescriber in case of any clarification[8]. A student may have a good understanding of pharmacology, but his quality of writing prescriptions may be poor because of lack of care in checking for errors[14].

Directions or instructions for medication use were absent in almost all prescriptions which is in contradiction to their positive attitude exhibited earlier regarding their responsibility of providing patient instructions. Attitudes do not necessarily match behaviour. Several studies show that what people think may not be a good way to predict their behaviour[15]. Adequate knowledge on rational drug use does not always result in rational prescribing behaviour. Therefore actual behaviour is preferred as a measurement[16].

Earlier in the questionnaire more number of students preferred using trade names (32.7%) when compared to generic names (27.3%) but their written prescriptions contained 86% generic names. This mismatch may be due to their ignorance of the trade names of the prescribed drugs as they are not taught about the trade names during their pharmacology training.

In prescribing a treatment, the prescriber can choose between drug therapy, a combination of drug and nondrug therapy or only a non-drug approach[3]. Only a small number of our participants had suggested non drug measures as they may not be aware of their importance.

When the prescriptions were analysed with respect to the medications prescribed, antibiotics were prescribed by 40% of the students. In case of interns only 13% had prescribed them.

Using antibiotics for the treatment of common cold is one of the commonest types of antibiotic misuse. Lack of knowledge and laxity regarding antibiotic use if not addressed early on can result in indiscriminate antibiotic use leading to the development of resistance.

Our study findings reveal that the participants' fairly sound knowledge, attitude and preferences do not match with their practical prescribing skills which were lacking in many aspects. This was similarly demonstrated by earlier studies as well[8,17]. Knowing what drug to prescribe to which patient may not necessarily translate to a good prescription[18]. Thus in order to apply pharmacology knowledge for better prescribing, it may require additional training and/or experience[19]. Learning about prescribing and therapeutics must not be isolated during one and half year of pharmacology training but it has to be identified as an important theme throughout the entire medical course[20].

The WHO guide for good prescribing which takes the student through a structured problem-solving six-step process in choosing and prescribing a suitable drug for an individual patient has shown to be of benefit in improving the student prescribing skills. It is commonly suggested as a good foundation for the design of a targeted prescribing curriculum[14].

Education has an important role but there may be a ceiling to the benefits it can achieve. There is a need for a strong multi-faceted system-based approach to keep the prescribing errors at bay[2].

The teachers must lead by example, prescribing should be based on essential drugs list and hospital formulary, hospital antibiotic protocol should be strictly adhered to. Continuous qualitative prescription analysis and regular feedback to the prescribers should be undertaken. A sense of accountability and an overall culture of professionalism and rational prescribing should flourish. All these coupled together may bring about an immense impact on the prescribing behaviour of the future generation of prescribers who are under our care.

CONCLUSION

The knowledge and attitudes of the students regarding safe prescribing were comparable to the interns which were satisfactory. The main concern was regarding the students' unnecessary prescribing of antibiotics for a self limiting viral illness and their prescription writing skills which calls for our attention. Effective interventions to improve and maintain safe prescribing behaviour of interns and medical students need to be introduced.

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