



A CROSS-SECTIONAL STUDY COMPARING THE KNOWLEDGE OF ESSENTIAL MEDICINES AMONG UNDER GRADUATE MEDICAL STUDENTS OF A TERTIARY CARE TEACHING HOSPITAL

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Abstract

Background: Essential medicine list of a country covers the drugs used for the treatment of prevalent diseases and commonly used drugs. The latest update of the National list of essential medicines of India was done in the year 2022. The competency based medical education in India envisages the Indian medical graduate to demonstrate the ability to prescribe therapies based on the principles of rational drug therapy, scientific validity, evidence, and cost. It is crucial for the Indian medical graduate to acquire knowledge on essential medicines as they ensure safe and cost-effective treatment. This study evaluates and compares the knowledge of essential medicines among undergraduate medical students of MBBS (Bachelor of Medicine, Bachelor of Surgery) course.

Materials and method: 250 undergraduate medical students, 125 each from phase II and phase III of MBBS course were randomly selected for the study. A revalidated questionnaire consisting of multiple-choice questions was distributed among the students and collected after filling. Analysis was done based on the points scored by each student.

Results: Among the 250 students participated, 3 % do not know the concept of essential medicines and 2 % are not sure about their understanding of essential medicines concept. The response to questionnaire showed that 20 % of students scored below 50 % points. The analysis proved a statistically significant difference in knowledge of essential medicines between phase II and phase III MBBS students.

Conclusion: The Knowledge of essential medicines among MBBS students are limited. The students of Phase III MBBS course had more knowledge on essential medicines compared to the students who had completed phase II MBBS.

Key words: Essential medicines, knowledge, MBBS, drugs,

Introduction

Essential medicines are those that satisfy the priority health care needs of the population. They are intended to be available within the context of functional health systems at all times, in appropriate dosage forms of assured quality and at prices that individuals and communities can afford. Essential

medicines are listed by governments to ensure optimum usage of these well tested and cheaper medicines which are efficacious and safe¹. The World Health Organisation publishes a model Lists of Essential Medicines which serve as a guide for the development and updating of national and institutional essential medicine lists to support the procurement and supply of medicines in the public sector, reimbursement schemes, donations, and local medicine production². A medical graduate should be capable of treating common diseases and emergency cases. As part of this, a young graduate should have thorough knowledge in the pharmacology of drugs used for routine treatment and in emergency conditions. They should be able to discuss and describe about types, mechanism of action, doses, adverse drug reactions, drug interactions, indications and contraindications of drugs. Drug is any substance or product that is used or is intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient.³ Some of the Essential drugs are Adrenaline, Atropine, Amiodarone, Diazepam, Calcium gluconate, Lignocaine, Dopamine, Insulin, Lorazepam, Morphine, Frusemide, Salbutamol, Ondansetron and Hydrocortisone. Current National List of Essential Medicines (NLEM) of India which was revised in the year 2022 contains 384 Medicines. NLEM helps to provide quality medical care, rational drug use and cost-effective treatment options⁴. It is important to ensure that students have proper knowledge about drugs, which instils in them the confidence to put the theory in to practice, when they study disease and treat patients in their future practice. The competency based medical education in India intends to prepare the medical students to provide health care to the evolving needs of the nation and the world. A medical student should have the knowledge about essential and commonly used drugs and should understand the Pharmacologic basis of therapeutics⁵.

The competency based medical education in India divides MBBS courses in to 3 phases. Phase I, II and III over a duration of 4.5 years. The medical students learn Pharmacology in the phase II along with other paraclinical subjects and clinical postings. The 30-month phase III includes clinical postings and learning of clinical subjects⁵. The students get acquainted with medical conditions and drugs as they advance in their course, and they should apply their knowledge of essential medicines while learning as it promotes rational prescription. The student who has completed Phase III will continue with compulsory rotatory medical internship. The study aims to evaluate and compare the knowledge of MBBS students about the knowledge of essential medicines based on phase of study.

Materials and methods

This cross-sectional comparative study was conducted among 250 medical students who have completed Phase II and Phase III of MBBS course in Government Medical College Thrissur. The study was conducted in the Department of Pharmacology, Government Medical College Thrissur, From 16th December 2024 to 16th April 2025 after getting approval from Institutional Ethics Committee and institutional research committee. A written informed consent was obtained from the study participants. The students not willing to participate were excluded from the study. Confidentiality and anonymity of the participants information were maintained throughout the study.

Study procedure

A questionnaire with 30 multiple-choice questions was distributed among 175 Phase II and 175 phase III MBBS students. 125 completed forms from Phase II students and 125 Phase III completed MBBS students were selected randomly according to the inclusion and exclusion criteria. The incomplete and partially filled responses were excluded. The students were evaluated by the points scored from the questionnaire. Total points were 30 with each correct response to the question carried one point. The questionnaire was validated by the department of Pharmacology, Thrissur government Medical College. The National List of Essential Medicines of India 2022 was referred to select the drugs and all questions on these drugs were selected from Essentials of medical Pharmacology K D Tripathi, which is one of the textbooks prescribed by the Kerala University of Health Sciences for undergraduates.

Data analysis:

Data was collected, coded and entered in Microsoft excel and analysed using SPSS statistical software. The knowledge of essential drugs between Phase II and phase III students were analysed by independent t test.

Results

Among the 250 students, 126 were females and 124 were males (Table 1). 3 % of the total 250 students did not know the concept of essential medicines and 2% were not sure about their understanding of the concept of essential medicines. Out of the total 30 points on knowledge of essential medicine drugs, 20 % students scored less than 15 points, 39.6% scored 16-20 points, 29.6% scored 21-25 points and 10.8% scored 25-30 points (Table.2). The students in both groups were divided into two categories, where high knowledge group includes students with more than or equal to 50% points and low knowledge category has students with less than 50% points. The low knowledge category constitutes 20 per cent of total 250 students of which a higher proportion (66%) of phase II completed students than phase III completed students (34%). Also, low knowledge category has a higher proportion of male students (56%) (Table. 3) (table 4).

The mean points scored out of the total 30 points on knowledge of essential drugs for Phase II completed students was 18.70 ± 3.97 whereas the score for Phase III completed students was 20.25 ± 4.07 . The Analysis of knowledge of essential medicines of Phase II completed and phase III completed students proves that there is a statistically significant difference on knowledge of essential drugs between students of different phases of study with t value 3.056 and p value 0.002. The students who had completed phase III have a higher mean score compared to the students who have completed phase II. This shows students gain more knowledge about essential drugs as they complete phase III. The mean points out of 30 points on knowledge of essential drugs for female students is 19.36 ± 4.02 and male students is 19.58 ± 4.16 . The analysis of knowledge on essential medicines of male students and female students showed there is no statistically significant difference between them with t value 4.19 and p value 0.676 (table 5).

Discussion

The practise of adhering to essential medicine list for treatment allows the people of every country to access affordable medical treatment, which leads to better health outcomes. To ensure rational prescribing every medical graduate should have adequate knowledge on essential medicines of their region. Poor learning in clinical pharmacology and therapeutics during the undergraduate medical curriculum may underlie the lack of prescribing competencies among recent graduates⁶. Learning is a lifelong process for a doctor but it is also important to know how much knowledge about drugs they have imbibed during their MBBS course so that it can be used in future for academic policy purposes in medical pharmacology. In this study, we had compared and evaluated the knowledge of MBBS students about pharmacology of Essential Medicines

Evaluation of knowledge of essential medicine drugs among MBBS students

The concept of essential medicines was known to the majority (95%) of the students. A study done by Jani C K et al⁷ showed a similar finding where 75.1% were able to define the NLEM. The knowledge of essential medicine assessed by points scored out of 30 revealed that 20% of 250 students scored less than 15 points, 69.2 % scored 16-25 points and 10.8 % scored 25-30 points. 20% of the students have less than 50% score on knowledge of essential medicines. This data showed that knowledge on essential medicine drugs among MBBS students is inadequate and the concept of essential medicine and the drugs in essential medicine list must be taught separately to the students emphasising their due importance. The limited knowledge of essential medicines among medical interns was reported by studies done by Hooli T V et al⁸ and Hanumaiah V et al⁹ and the need for regular training on essential medicines is emphasised by Sakshi Singh et al.¹⁰

Comparison of Knowledge of essential medicine drugs between Phase II and Phase III MBBS students

The study also proved there was difference in the knowledge of essential medicines among phase II MBBS students and Phase III MBBS students with t value 3.056 and p value 0.002. The phase III students with mean score of 20.25 ± 4.07 out of 30 have higher knowledge on essential medicines compared to phase II with mean score of 18.70 ± 3.97 out of 30. This explicates that students become more familiar with essential drugs as they progress in their course.

These results were comparable with studies done by Tank SY et al¹¹ and Surendra KV et al¹². In a study by Brinkman, David J et al, there was considerable evidence that final-year medical students have insufficient prescribing competencies, and it was needed to ensure that medical students prescribe safely and effectively.¹³ Thus, the study emphasises the importance to introduce awareness sessions on essential drugs in order to increase the knowledge of essential drugs during the last part of the MBBS course in order to promote rational drug therapy.

Conclusion

The current study proved that the knowledge of essential medicine among MBBS students is not satisfactory. The phase III completed MBBS students who were at the final stage of the MBBS course had more knowledge of essential medicines compared to phase II completed students. Students during the later stages of MBBS course get more acquainted with practical aspects of drug therapy. The study suggests that it will be beneficial if an awareness session on Pharmacology of essential medicine drugs is included in the last part of MBBS programme.

Limitations

The study was carried out in one centre.

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Conflict of interest

No conflict of interest declared.

Table.1 Distribution of students based on gender and phase of study

Gender	Phase I(group1)	Phase II (group 2)	Total
Male	63	63	126
Female	62	62	124
Total	125	125	250

Source: primary data

Table.2 The Knowledge of Essential medicines Among MBBS students on Essential medicines

Points	No of students	Percentage
≥ 15	50	20
16-20	99	39.6
21-25	74	29.6
26-30	27	10.8
Total	250	100

Source: primary data

Table.3 Knowledge of Essential Medicine Among Male and Female Medical Students

Category	Low Knowledge students (20%)	High knowledge students (80%)
Male	28(56%)	98(49%)
Female	22(44%)	102(51%)
Total	50	200

Low knowledge<15 points out of 30, high knowledge≥15 points out of 30

Source: primary data

Table.4 Knowledge of Essential Medicine Among Phase II and Phase III Medical Students

	Category	Low Knowledge students (20%)	High knowledge students (80%)
Phase completed	Phase II	33(66%)	92(46%)
	Phase III	17(34%)	108(54%)
	Total	50(100%)	200(100%)

Source: Primary date

Table.5 Comparison of knowledge of essential medicine based on Phase of study and Batch

		N	Mean score (30)	Std Deviation	t value	P value
Phase of study completed	Phase II	125	18.70	3.97	3.056	0.002
	Phase III	125	20.25	4.07		
Gender	Female	124	19.36	4.02	4.19	0.676
	Male	126	19.58	4.16		

Source: Primary data

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