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RESEARCH ARTICLE

Knowledge, attitude, and practice of health-care professionals on setting up of clinical pharmacology department in a tertiary care center of South India

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ABSTRACT

Background: Clinical pharmacology (CP) promotes rational use of drugs by integrating pharmacological and medical knowledge. Knowledge helps in enlightening others while attitude and practices define the health-related behavior. **Aims and Objectives:** This study was done to assess the knowledge, attitude, and practice on setting up of CP department among health-care professionals in a tertiary care hospital of South India. **Materials and Methods:** It was a questionnaire-based cross-sectional study carried out in the Department of Pharmacology of a Government Medical College in South Kerala, India. A preformed structured questionnaire consisting of 30 questions (12 questions on knowledge, 9 on attitude, and 9 on practices with appropriate scores) were distributed, filled and collected from pharmacology department and analyzed. Descriptive analysis of data was done using Statistical Package for the Social Sciences 16. **Results:** Out of total 30 distributed questionnaires, all were completely filled (100% response rate) and considered for analysis. Participants had good knowledge regarding CP with mean correct response 17.88 ± 3.8 (74.5%). Mean scores of attitude and practices related questions were found to be 16.93 ± 1.25 (94.06%) and 14.03 ± 2.02 (77.9%), respectively. **Conclusions:** Participants had an excellent positive attitude regarding setting up of a CP unit with good knowledge and practices. There is a compelling need to set up CP department in Government Medical College, Thiruvananthapuram, which will pave ways to major contribution in teaching, patient care, and research.

KEY WORDS: Clinical Pharmacology Department; Knowledge; Attitude; Practice

INTRODUCTION

Clinical pharmacology (CP) is a medical specialty that integrates pharmacological and medical knowledge. CP promotes and takes responsibility for the rational use of drugs (RUD) in individual patients as well as population at large. In outlining the functions of a clinical pharmacologist, the World Health Organization technical report series of 1970[1] mentions as the first obligation "to improve patient care by promoting the safer and more effective use of drugs." The International Union of Basic and CP (IUPHAR) realized that pharmacology had to reach out to the bedside to develop. The discipline grew strongly between 1970 and 1990 but to variable extents in the different European countries.[2,3]

CP is an interdisciplinary specialty. Collaboration with drug experts representing other professions is important, not the least with basic pharmacologists and pharmacists

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whose training in many ways complements that of a clinical pharmacologist. Fruitful collaboration between the three professions is particularly well documented in drug information services.[4] The need to develop CP is largely due to the increasing number of drugs, the occurrence of several therapeutic disasters, realization that effective and safe use of drugs can be greatly improved by scientific study and teaching.[1]

To safeguard individual and public health a substantial expansion of CP is essential. Therefore, this study was planned to assess and analyze the knowledge, attitude, and practice (KAP) of health-care professionals on setting up of CP department.

MATERIALS AND METHODS

This was a cross-sectional, questionnaire-based study conducted in the Department of Pharmacology of a Government Medical College in South Kerala, India. Ethics Committee waiver was obtained. The study period was 1-month. 30 teaching staff of department of pharmacology formed the sample population. The nonteaching staff was excluded from the study. The questionnaire used was developed by the principal investigator by review of literature. It was validated for content and time by piloting among the co-investigators (n = 3). It consisted of total 30 questions divided in four parts: First-demography; second - 12 questions on knowledge about CP; third- 9 questions on attitude regarding setting up and need of CP unit, and fourth- 9 questions on self-reported practices with regard to patient care and research. Each question was scored with a maximum of two marks and minimum of zero. The maximum marks that could be scored in KAP sections were 24, 18, and 18, respectively. Questionnaire was distributed personally by the principal investigator and 15 min was allotted to complete the questionnaire anonymously. Data were entered in Excel and analyzed using descriptive statistics with Statistical Package for the Social Sciences (SPSS) for Windows Version 16.0 (SPSS Inc., Chicago, USA).

RESULTS

All 30 participants filled and returned the questionnaire within the stipulated time frame. Response rate was 100%. The participants were two professors, two associate professors, six assistant professors, two senior residents, and 18 junior residents of pharmacology department. Age range was 25-60 years with male:female ratio of 1:14. The mean total score was 48.85 ± 5.31 (81.41%) as shown in Figure 1.

Mean knowledge score was 17.88 ± 3.8 (74.5%) as shown in Figure 1. High scores (>75%) were 53.3% as shown in Table 1. As summarized in Table 2, 53.3% knew definition of CP and 80% knew official birth date of CP. However,

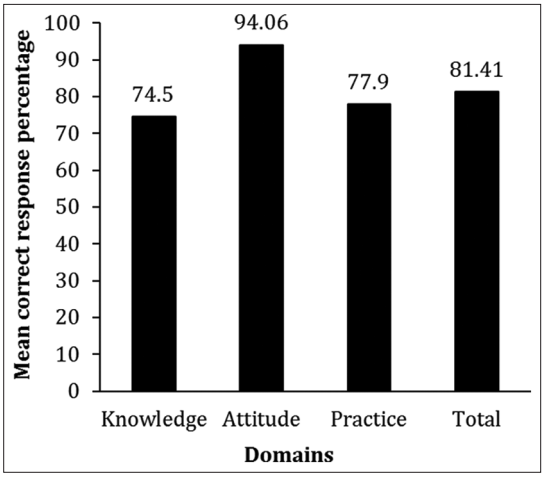

Figure 1: Mean correct response scores of study participants

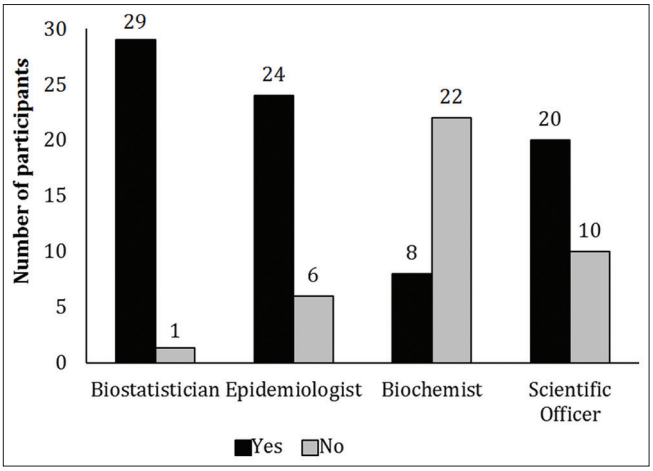

Figure 2: Other faculties required in clinical pharmacology unit

Table 1: Scores based on the performance of the study participants

Scores of participants (%)	*n*=30 (%)			
	Knowledge	Attitude	Practice	Overall score
Low score (<50)	3 (10)	0	0	0
Medium score (51-75)	11 (36.7)	1 (3.3)	13 (43.3)	5 (16.7)
High score (>75)	16 (53.3)	29 (96.7)	17 (56.7)	25 (83.3)

Maximum score for knowledge=24, maximum scores for attitude and practice=18 each

43.3% thought that there was no need of beds for patients for setting up CP unit. As shown in Figure 2, 96.6% knew that a biostatistician was required as a faculty and 73.3% did not know that a biochemist was required for setting up a CP unit. As shown in Figure 3, majority knew that high-performance liquid chromatography (HPLC) and sphygmomanometer were essential equipment for the unit. However, the majority did not know that spirometer was essential equipment. As depicted in Figure 4, the knowledge about setting up a computer assisted lab in the CP unit was good.

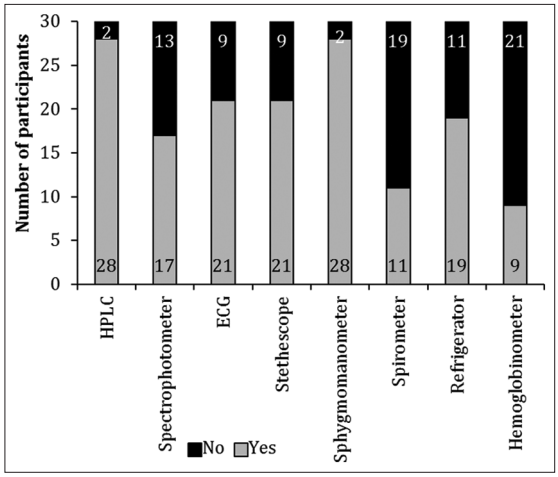

Figure 3: Instruments required in clinical pharmacology unit. HPLC: High-performance liquid chromatography, ECG: Electrocardiogram

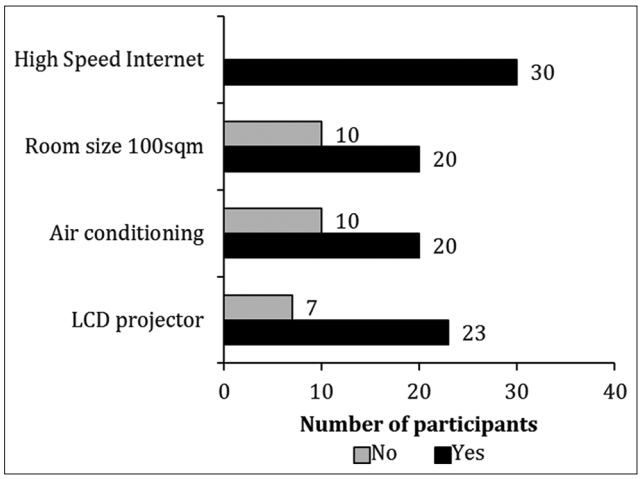

Figure 4: Features of a computer assisted lab in clinical pharmacology unit

The mean attitude score was 16.93 ± 1.25 (94.06%) and 96.7% were high scorers (Table 1). Out of 30 participants, 96.7% opined that CP unit is essential in the institution and 90% were interested in setting up the unit. All the participants agreed that CP department would not only improve quality of medical care as it will assist the clinician for drug-associated problems but also play an important role in patient treatment as shown in Table 3. As shown in Figure 5, the majority opined that setting up CP unit would help in prescription auditing, toxicological analysis, and drug utilization studies. However, more participants had negative attitude related to promotion of rational drug use. Attitude on provision of drug information services had an equal number of participants with positive and negative attitude.

The mean practice score was 14.03 ± 2.02 (77.9%) and 56.7% were high scores (>75%) as shown in Table 1. As summarized in Table 4, 63.3% wanted to form drug committees and release drug information booklets as well as provide patients with drug information services and toxicological analysis. 96.7% wanted to participate in teaching, research, and patient care. 60% wanted to improve pharmacovigilance system in the institution.

Table 2: Correct versus incorrect response regarding knowledge on CP unit

Questions	Scores *n*=30 (%)		
	0	1	2
Definition of CP	0	14 (46.7)	16 (53.3)
Official birth date of CP	6 (20)	0	24 (80)
Department to which CP unit be attached	1 (3.3)	21 (70)	8 (26.7)
Location of CP unit	3 (10)	0	27 (90)
Beds required in CP unit	13 (43.3)	0	17 (56.7)
Appropriate room size of CP unit	6 (20)	0	24 (80)
Additional qualified staff requirements	1 (3.3)	26 (86.7)	3 (10)
Need to have animal house for setting CP unit	4 (13.3)	0	26 (86.7)
Other faculties required in CP unit	Figure 2		
Instruments required for setting up CP unit	Figure 3		
Features of computer assisted lab in CP unit	Figure 4		

0: Incorrect/don't know/unattempted, 1: Answer correct, 2: All answers correct/best response. CP: Clinical pharmacology

Table 3: Positive versus negative attitude on CP unit

Questions	Scores *n*=30 (%)	
	No-0	Yes-2
Is CP unit essential?	1 (3.3)	29 (96.7)
Will CP unit improve quality of medical care?	0	30 (100)
Is training in therapeutic drug monitoring required?	2 (6.7)	28 (93.3)
Are you interested in setting up CP Unit?	3 (10)	27 (90)
Do you think CP unit has important role in patient treatment?	0	30 (100)
Can drug utilization studies reduce treatment cost?	1 (3.3)	29 (96.7)
Can CP unit assist the clinician for drug associated problems?	0	30 (100)
Do you want your center to be zonal center for pharmacovigilance?	1 (3.3)	29 (96.7)
Do you need to have funds from government for doing research work?	0	30 (100)
Activities in CP unit that can help improve treatment	Figure 5	

CP: Clinical pharmacology

DISCUSSION

CP involves all aspects of the relationship between drugs and humans. It developed as a discipline in the 1960s in the west and it began in India due to efforts of stalwarts such as

Table 4: Practices regarding CP unit

Questions	Scores *n*=30 (%)		
	0	1	2
Practice CP units in other institutions	1 (3.3)	26 (86.7)	3 (10)
Form drug committees and release drug information booklets	1 (3.3)	19 (63.3)	10 (33.3)
Provide patients with drug information services and toxicological analysis	1 (3.3)	19 (63.3)	10 (33.3)
Spread awareness of pharmacovigilance using posters, newspaper ads	1 (3.3)	7 (23.3)	22 (73.3)
Participate in teaching, research and patient care	1 (3.3)	0	29 (96.7)
Improve pharmacovigilance system in the institution	0	18 (60)	12 (40)
Perform therapeutic drug monitoring for drugs	4 (13.3)	0	26 (86.7)
Perform research works in CP unit	0	0	30 (100)
Perform clinical trials	6 (20)	0	24 (60)

0: Incorrect/don't know/unattempted, 1: Answer correct, 2: All answers correct/best response, CP: Clinical pharmacology

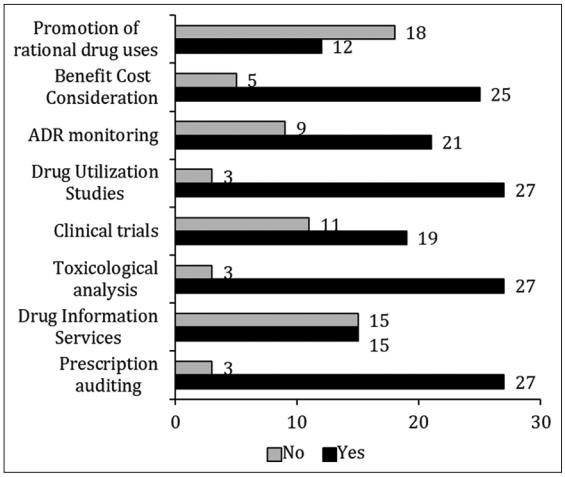

Figure 5: Activities in clinical pharmacology unit that help improve treatment

Dr. U. K. Sheth, Dr. Ranjit Roy Chaudhary, Dr. P. L. Sharma, and many others.[5] This study was performed among health-care professionals to assess the KAP of setting up of CP department in a tertiary care hospital. Response rate was 100%. More than 50% correctly defined CP and 80% knew official birth date of CP.

The disciplines that contribute to pharmacology (molecular pharmacology, systems pharmacology, safety pharmacology, CP, pharmacokinetics, drug metabolism, pharmacogenetics, experimental medicine, clinical trials, pharmacovigilance, etc.,) have grown up in different academic departments and communication between them is suboptimal, even in industry.[6] In this study, 90% was interested in setting up CP unit. The institutions with CP departments are limited in India. The requirement of inpatient set up with 8-16 beds and 100 m^2 space is essential for the setting up of the department. It requires staff which includes trained Clinical Pharmacologists, Physicians, Biostatisticians, Epidemiologists, Biochemists, and Scientific Officers. HPLC, spectrophotometer, electrocardiogram, sphygmomanometer, stethoscope, spirometer, refrigerator and hemoglobinometer are essential equipments required in the unit. The requirements of computer assisted lab are special and expensive arrangement with high-speed internet, air conditioning, and projection facilities.

Kshirsagar et al., opined that there was an urgent need to provide training in CP to contribute to better public health, hospital practice, and ethical drug development process.[5] In this study, the majority of the participants agreed to the need of training in CP. Training in CP and its principles would promote rational drug use by the concerted effort of all in the department.

In Nigeria, a study was done to assess how adequately the undergraduate CP teaching had prepared interns in Nigeria for safe and rational prescribing.[6] Teaching in academic CP includes laboratory science and clinical science encompassing pharmacological aspects as well as biochemistry, physiology, statistics, and clinical medicine. Teaching also includes all aspects of practical drug therapy as underpinned by the science of pharmacology.[7] Currently, several institutions have incorporated more CP hours with special emphasis on clinical trials, ethics, informed consent, and drug used in special groups in both theories as well as practicals.[8,9] In a study done by Palappallil et al., the majority of undergraduate MBBS students opined that CP exercises were thought provoking. Drug use in special groups such as the children, pregnant ladies, geriatric population, those with renal and hepatic diseases were the favorites in terms of interest as future relevance in management of patients.[10] In this study, 96.7% wanted to participate in teaching, research, and patient care.

Relevant, easily accessible and authentic drug information at point of care is essential for decision-making when prescribing. The complexity of drug prescribing has increased with patient safety becoming a major public concern.[11] CP department plays an important role by educating other physicians in internal medicine, pediatrics, neurology, psychiatry, geriatric medicine or oncology about the principles of drug evaluation and RUD. These roles necessitate having access to a unit with critical mass, who can master diversified methods for monitoring and improving the quality of drug therapy.[12] In a study by Rahmner et al., the participating prescribers opined that they needed drug information on drug-drug interactions, adverse effects, allergic hypersensitivity, dose related to age, indication, duration and treatment plan.[13] CP department can assist the physicians in patient care as opined by the majority of participants in the study.

The tertiary care institution, where the study was conducted, is an adverse drug reaction monitoring center under the Pharmacovigilance Programme of India (PvPI). By routinely monitoring, recording, and reporting adverse reactions to higher center the participants contribute to drug safety evaluation. The participants agreed that the center may be upgraded to a higher level in PvPI. Through posters, advertisements, and sensitization programs awareness among patients and health-care professionals in pharmacovigilance are created.

The Kerala state drug formulary was prepared with immense contribution from the teaching faculty of the institution.[14] The formulary is a useful tool in solving serious health related problems due to treatment with ineffective, poor quality products or incorrect and irrational use of medicine as well as improve cost-effective utilization of drugs. The participants opined that district drug committees should be formed and drug information booklets should be released periodically.

If CP department is started, it can act as a referral for pharmacokinetic and pharmacodynamic evaluation of patients referred for therapeutic drug monitoring, perform prescription auditing and drug utilization studies and research, toxicological analysis and conduct of clinical trials. 86.7% wanted to perform therapeutic drug monitoring for drugs, 60% wanted to perform clinical trials, and all the respondents wanted to perform research works in CP unit. Requirement of funds is an important factor for setting up a therapeutic drug monitoring unit as well as conduct of research as opined by the participants.

Limitations of the Study

The sample size was small and further study needs to be conducted encompassing more pharmacologists from other institutions.

CONCLUSION

There is a widespread belief that CP services has not fully delivered on its early promise and may be faltering, particularly in tertiary care hospitals. This study suggests the need to have CP department to improve pharmacovigilance system, to perform therapeutic drug monitoring and research activities so that a major contribution can be delivered in the field of teaching, patient care, and research.

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