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Original Article

Assessment of Knowledge and Attitude of Healthcare Professionals and Students towards Clinical Pharmacy Services in Southern India

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ABSTRACT

Background: Clinical Pharmacy Services (CPSs) is a branch of health sciences which render patient care by optimizing pharmaceutical therapy and providing guidance to patient regarding health, medications and disease prevention. The implementation of CPSs is required to provide safe, effective and economical drug therapy. **Objectives:** The aim of our study is to assess the knowledge and attitude of HCPs and students towards CPSs in Southern India. **Materials and Methods:** A cross-sectional study was conducted in selected pharmacy, nursing, medical and ayurvedic colleges and selected tertiary care hospital located in Southern India. The pre and post-test questionnaires were used as a tool to gather the data for the study. The frequency, percentage, mean and standard deviation were calculated for continuous variables and the categorical variables were calculated as frequency and percentage. **Results:** A total of 632 questionnaires were responded out of 663 handed out with a response rate of 95.3%. Most of the respondents (441; 69.7%) are between the age 17 and 20 years, with a mean age of 21.1±5.88. Most of the students (507; 85.2%) and HCPs (34; 91.8%) heard about the services and the majority of them responded that they have clinical pharmacist in the hospital in which they are currently practicing. After conducting the awareness session, the major part of students (557; 93.6%) and HCPs (35; 94.5%) responded that they knew CPs were the integral part of medical team. **Conclusion:** The study found that students and HCPs had shallow knowledge and positive attitude regarding CPSs and an incremental response was observed after the awareness session. Thus more and more educational programs should be conducted in healthcare settings to clearly define the scope of CPs.

Keywords: Clinical pharmacy services, Knowledge, Attitude, Healthcare professionals, Clinical pharmacists.

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INTRODUCTION

Clinical pharmacy services (CPSs) is a branch of health sciences which render patient care by optimizing pharmaceutical therapy and providing guidance to patient regarding health, medications and disease prevention.[1-4] Clinical pharmacists are patient-centered, cooperative and inter-professional as they work with physicians, nurses, and other health care professionals to ensure appropriate prescriptions or therapeutic combinations and administration of the right medicine to the right patient in the right dose via the proper route of administration at the right time at an affordable cost.[1,5-7] During traditional system of medicines, only physicians diagnosed the disease and prescribed the medications while pharmacists were dispensing the prescriptions.[2,5] As the years progressed, the scenario of a pharmacist has changed because of increasing complex drug regimens, technical amelioration, changes in the prospection of patients and other HCPs and the emergence of novel diseases in the developing world.[2]

In India, the first pharmacy degree was established at Banaras Hindu University under the captainship of Prof. Mahadev Lal Schroff, the father of Indian pharmacy education in 1932. During 1980's and 90's there was increased consequences of inappropriate medication use such as adverse drug reactions, antimicrobial resistance and poor health outcomes. It is regarded as an awakening phase when the profession realized how crucially important it was for the pharmacist to improve community medication use. This resulted in the first master in pharmacy practice program offered by JSS College of Pharmacy at Mysore and Ooty with the support of Australian Institutions in 1977. The Pharm D program was then introduced in India in 2008.[8]

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The implementation of CPSs is required to provide safe, effective and economical drug therapy.[8,9] In a developing country like India, drug-related problems are increasing day by day. Hospital outpatient departments are always overcrowded; there is a risk of failure of therapy. Consequently, clinical pharmacists can assist doctors by providing advice and information to achieve effective therapeutic outcomes.[8] Clinical pharmacists offer pharmaceutical care, which is the direct provision of pharmacological therapy, to enhance patients' quality of life and obtain definitive clinical outcomes.[10] The success of the CPSs depends on the attitude of physicians and other HCPs in clinical settings.[11] Clinical pharmacists' involvement in providing direct patient care has increased exponentially over time, and as a result, the multidisciplinary healthcare team gradually recognizes its critical role in both inpatient and outpatient settings.[12]

Medication reviews conducted by clinical pharmacists aim to optimize patient medication regimens by identifying and correcting any drug-related problems and ensuring that patients receive safe, appropriate and cost-effective medication regimen in collaboration with physicians and nurses in a healthcare setting.[13,14] Clinical pharmacists will involve in various research activities to obtain further knowledge and practical skills that help to provide advanced pharmaceutical care and improve patients quality of life.[15] At the time of admission and discharge, multidisciplinary teams (that includes CPs) conduct medication reconciliations. This approach will help to reduce length of hospital stays, drug-related problems, and in turn decreases readmission and hospitalization rates.[7,11,16]

A study conducted in Kerala, India, concluded that nurses are willing to collaborate with clinical pharmacist with pleasure to conduct pharmaceutical care.[1] In Kuwait, more than half of the physicians were of positive opinion on the implementation of patient-oriented roles of clinical pharmacists like designing, monitoring outcomes and detecting errors in therapeutic regimens.[14] According to a study done in Ethiopia, more than 70% of the HCPs were of a positive attitude towards CPSs.[5] A systematic review that included 126 studies conducted in US showed the economic benefit in the therapy recommended by pharmacist-directed pharmaceutical care services.[17] The WHO strongly recommends the incorporation of interprofessional education on clinical pharmacy services to health professional training programs for improving patient therapy outcomes through multidisciplinary teams.[1] The failure or unwillingness to involve the CPSs in the healthcare team will hinder the quality of care and increase the hospital cost.[18]

The knowledge and attitude study is needed to strengthen the coordination between the clinical pharmacist and other HCPs by detecting the knowledge and attitude gaps between them.[7] Until now, there have been very limited studies conducted on knowledge and attitude of HCPs towards CPSs in India. The goal of this study is to determine the level of acceptance of integrating clinical pharmacist into healthcare team. Further, the barriers that obstruct the implementation and recognition of CPSs in healthcare are identified and suggestions are provided to overcome the identified barriers. The aim of our study is to assess the knowledge and attitude of HCPs and students towards CPSs in Southern India.

MATERIALS AND METHODS

Study design, study participants, study site

A cross-sectional study was conducted in selected pharmacy, nursing, medical and ayurvedic colleges and selected tertiary care hospital located in Southern India. The study was conducted over a period of 6 months from March to August 2022. The study participants were students from selected colleges and healthcare professionals of tertiary care hospitals located in and around Tumakuru city in Southern India. The study was approved by the institutional ethics committee with reference no. SSCPT/SHRC/PPD/2019-20.

Sample size determination

The sample size required for conducting this study was calculated as 431 by using Epi Info 7dos version 7.2.5.0 software provided by Center for Disease Control and prevention, Clifton road, Atlanta, USA. The expected frequency that the 60% of participants had optimal knowledge and a positive attitude towards CPSs based on similar previous studies conducted. By taking 5% margin of error, at 97% confidence level, the final sample size was calculated as 663 by taking 35% as non-response rate.

Sampling technique

A total of 9021 students and HCPs were taken for study. The 8901 students were considered for calculation based on intake of institution and 120 HCPs were considered for the study. A simple random sampling technique was used to calculate the sample size of 663.

Inclusion and exclusion criteria

Students from pharmacy, nursing, medical and ayurvedic colleges and HCPs from tertiary care hospital were included in this study. The non-cooperative populations and non-HCPs were excluded from the study.

Study tool

An informed consent was obtained from the study participants through informed consent forms that also encompass demographics. The pre and post-test questionnaires were used as a tool to gather the data for the study. The study is conducted in 3 phases where in the first phase informed consent form was given; upon the approval of the participant, pre-test questionnaires were distributed. Next in the second phase awareness program was conducted and in the third phase post-test questionnaires were

distributed. Only a few similar questionnaires were included in pre and post-test form because there is no time gap between the administration of pre and post-questionnaires and also to avoid the participants from memorizing the answers as it affects the results of our study. The prime intention of including the different questions in pre and post-tests is to make sure that the participants will become aware of most of the services provided by clinical pharmacists.

Knowledge questionnaires

The knowledge is assessed by using six close-ended, one open-ended questionnaire in pre-test form and one close-ended, one open-ended questionnaire in post-test form. The closed-ended questions have two options; if they say "yes" then they are considered to know about the service mentioned in that particular question. If the participants say "no" then they are not have the knowledge regarding the mentioned service.

Attitude questions

There are three closed-ended questionnaires in pre-test form and six closed-ended, one open ended questionnaire in post-test form. The closed-ended questionnaires have five options that are assessed by scoring using Likert's scale. The response given were scored as strongly agree(5), agree(4), neutral(3), disagree(2), strongly disagree(1). The participants will be having positive attitude if their scores falls between 12 to 15 in the pre-test and 24 to 30 in post-test.

Statistical analysis

The data was compiled, analyzed and interpreted by using Microsoft Office Excel 2007. The frequency, percentage, mean and standard deviation were calculated for continuous variables. The categorical variables were calculated as frequency and percentage. The tables and graphs were used for the visual interpretation of analyzed data.

RESULTS

A total of 632 questionnaires were responded to out of 663 handed out with a response rate of 95.3%. Most of the respondents (441; 69.7%) are between the age 17 and 20 years, with a mean age of 21.1±5.88. The majority of the respondents are female (448; 74%). Among 632 respondents, students (595; 93.4%) and healthcare professionals (37; 5.8%) were included in the study. The HCP's years of experience, course of studying of students and other demographic details were mentioned in Table 1.

Regarding respondent's knowledge of clinical pharmacy services, most of the students (507; 85.2%) and HCPs (34; 91.8%) heard about the services and majority of them responded that they have clinical pharmacist in the hospital in which they are currently practicing. The responses received regarding knowledge of HCPs (doctors, pharmacists, nurses) and students (pharmacy, nursing, BAMS, MBBS) towards the services offered by CP such as DIC, offering patient care and selection of appropriate therapy for patients is as shown in Table 2.

The response rates on how often the respondents interact with CPs were represented in Figure 1. After conducting the awareness session, (35; 94.5%) HCPs and (557; 93.6%) students responded that they know CPs are integral part of medical team. Majority of the respondents were aware that the patient counseling provided by Cs had multiple benefits as shown in Figure 2.

The responses for attitude questionnaires in pre-test regarding the services such as developing individualized dosage regimen, access to documentation of services, obtaining patient history were shown in Table 3. In the post-test that was conducted following the awareness session, much positive response were obtained regarding cost-efficient therapy, prevention of drug related problems, drug utilization review and providing appropriate rationalized therapy to improve patient care. It is depicted in Table 3. The response regarding how often respondents think that

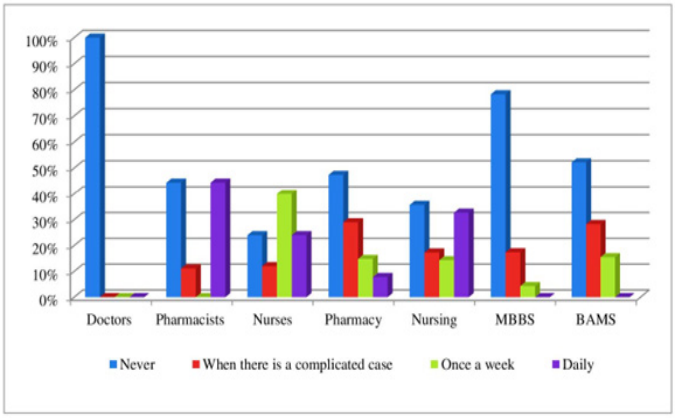

Figure 1: Response (%) on open ended pre-test knowledge questionnaire: How often do you interact with the clinical pharmacist at your hospital setting?

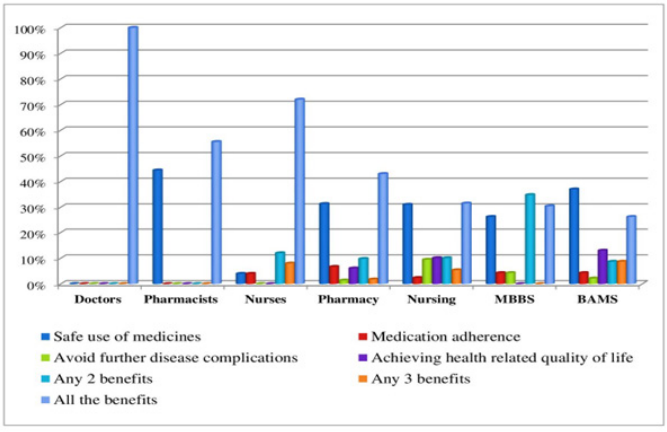

Figure 2: Response (%) on open ended post-test knowledge questionnaire: According to you which are the benefits received by patient after patient education and counselling provided by clinical pharmacist.

Table 1: Demographic details of the study respondents.

Demographic characteristic	Frequency (%)	Mean±Standard deviation (for continuous variables)
Age of respondents:		21.1±5.88
17-20 years	441 (69.7)	
21-30 years	180 (28.4)	
31-40 years	5 (0.79)	
More than 40 years	6 (0.94)	
Gender of respondents:		–
Female	448 (74)	
Male	184 (26)	
Age of HCPs:		34.1±16.5
21-30 years	26 (70.2)	
31-40 years	5 (13.5)	
More than 40 years	6 (16.2)	
Gender of HCPs:		–
Female	30 (81.08)	
Male	7 (18.9)	
Profession of HCPs:		–
Doctor	3 (8.1)	
Nurse	25 (67.5)	
Pharmacist	9 (24.3)	
Working experience of HCPs:		7.91±6.85
0-3 years	10 (27.02)	
3-5 years	7 (18.9)	
5-10 years	12 (32.4)	
More than 10 years	8 (21.6)	
Age of students:		20.3±3.06
17-20 years	441 (74.1)	
21-30 years	154 (25.8)	
More than 30 years	0 (0)	
Gender of students:		–
Female	416 (69.9)	
Male	179 (30.08)	
Course of studying:		–
Pharm. D	92 (16)	
B. Pharm	252 (42)	
M. Pharm	14 (2)	
B.Sc Nursing	168 (28)	
BAMS	46 (8)	
MBBS	23 (4)	
Year of studying:		–
First year	38 (7)	
Second year	148 (25)	
Third year	246 (41)	
Fourth year	133 (22)	
Fifth year	23 (4)	
Sixth year	7 (1)	

Table 2: Responses related to closed ended Pre-test and Post-test knowledge based Questionnaires.

Closed ended Pre-test knowledge based Questionnaires									
Sl. No.	Questionnaires	Response	Response in frequency (%)						
			Healthcare professionals *N*=37			Students *N*=595			
			Doctors *N*=3	Pharmacists *N*=9	Nurses *N*=25	Pharmacy *N*=358	Nursing *N*=168	MBBS *N*=23	BAMS *N*=46
01	Have you ever heard about clinical pharmacy services?	Yes	1 (33.3)	9 (100)	24(96)	317 (88.5)	146 (86.9)	12 (52.2)	32 (69.6)
		No	2 (66.6)	0 (0)	1(4)	41 (11.5)	22 (13.1)	11 (47.8)	14 (30.4)
02	Do you have clinical pharmacist at your hospital?	Yes	0 (0)	6 (66.6)	18(72)	228 (63.7)	147 (87.5)	12 (52.2)	23 (50)
		No	3 (100)	3 (33.3)	7(28)	130 (36.3)	21 (12.5)	11 (47.8)	23 (50)
03	Are you aware that hospital pharmacy services and clinical pharmacy services are different from each other?	Yes	0 (0)	9 (100)	20(80)	301 (84)	127 (75.6)	14 (60.9)	37 (80.4)
		No	3 (100)	0 (0)	5(20)	57 (16)	41 (24.4)	9 (39.1)	9 (19.6)
04	Do you know that clinical pharmacist can provide drug related information to the health care professionals through drug information center (DIC)?	Yes	0 (0)	9 (100)	23 (92)	332 (92.7)	132 (78.6)	17 (73.9)	39 (84.8)
		No	3 (100)	0 (0)	2 (8)	26 (7.3)	36 (21.4)	6 (26.1)	7 (15.2)
05	Do you know that clinical pharmacist are capable of offering primary care to the patients?	Yes	2 (66.6)	9 (100)	24 (96)	339 (94.7)	112 (66.7)	13 (56.5)	39 (84.8)
		No	1 (33.3)	0 (0)	1 (4)	19 (5.3)	56 (33.3)	10 (43.5)	7 (15.2)
06	Do you know that availability of clinical pharmacist in the hospital setting will make the selection of appropriate therapy more easier?	Yes	2 (66.6)	9 (100)	22 (88)	321 (89.7)	141 (83.9)	8 (34.8)	32 (69.6)
		No	1 (33.3)	0 (0)	3 (12)	37 (10.3)	27 (16.1)	15 (65.2)	14 (30.4)
Closed ended Post-test knowledge based Questionnaires									
01	Do you think that clinical pharmacist are the integral part of medical team?	Yes	2 (66.6)	9 (100)	24 (96)	344 (96)	157 (93.5)	17 (73.9)	39 (84.8)
		No	1 (33.3)	0 (0)	1(4)	14 (4)	11 (6.5)	6 (26.1)	7 (15.2)

CPs can attend ward rounds, which is essential to provide therapy by interacting with HCPs and students is represented in Figure 3.

DISCUSSION

The knowledge and attitude study conducted regarding CPSs are very limited in India. The clinical pharmacy service is still in infancy stage of development in many developing countries. This study is necessary for the development of clinical pharmacist profession in India as the HCPs are unaware of clearly stated roles and responsibilities carried by clinical pharmacist. CPSs can be successfully implemented only when the HCPs join in collaboration with clinical pharmacist to provide rationalized therapy. This study shows the level of knowledge and attitude of HCPs and students before and after providing awareness on CPSs.

Table 3: Responses related to closed ended Pre-test and Post-test attitude based Questionnaires

Closed ended Pre-test Attitude based Questionnaires									
Sl.No.	Questionnaires	Response	Response in frequency (%)						
			Healthcare professionals *N*=37			Students *N*=595			
			Doctors *N*=3	Pharmacists *N*=9	Doctors *N*=3	Pharmacists *N*=9	Doctors *N*=3	Pharmacists *N*=9	Doctors *N*=3
01	Do you think that clinical pharmacist can develop individualized dosage regimen?	Strongly agree	0 (0)	4 (44.4)	0 (0)	44 (12.3)	3 (1.8)	2 (8.7)	0
		Agree	0 (0)	3 (33.3)	17 (68)	181 (50.6)	91 (54.2)	7 (30.4)	26 (56.5)
		Neutral	0 (0)	1 (11.1)	7 (28)	113 (31.6)	67 (39.8)	11 (47.8)	13 (28.3)
		Disagree	3 (100)	0 (0)	1 (4)	8 (2.2)	7 (4.2)	2 (8.7)	7 (15.2)
		Strongly Disagree	0 (0)	1 (11.1)	0 (0)	12 (3.3)	0	1 (4.3)	0
02	In your opinion do Clinical pharmacists have access to document their inpatient services in the patient's chart?	Strongly agree	0 (0)	5 (55.5)	1 (4)	69 (19.3)	2 (1.2)	3 (13)	1 (2.2)
		Agree	0 (0)	3 (33.3)	15 (60)	199 (55.6)	105 (62.5)	10 (43.5)	28 (60.9)
		Neutral	1 (33.3)	1 (11.1)	6 (24)	79 (22.1)	49 (29.2)	10 (43.5)	12 (26)
		Disagree	2 (66.6)	0(0)	3 (12)	8 (2.2)	12 (7.1)	0	5 (10.9)
		Strongly Disagree	0 (0)	0(0)	0 (0)	2 (0.6)	0	0	0
03	Do you think that clinical pharmacist should take the patient medication and medical history during the time of admission?	Strongly agree	0 (0)	5 (55.5)	1 (4)	141 (39.4)	11 (6.5)	4 (17.4)	11 (23.9)
		Agree	0 (0)	4 (44.4)	15 (60)	174 (48.6)	68 (40.5)	9 (39.1)	26 (56.5)
		Neutral	2 (66.6)	0 (0)	7 (28)	38 (10.6)	73 (43.5)	6 (26.1)	5 (10.9)
		Disagree	1 (33.3)	0 (0)	2(8)	5 (1.4)	16 (9.5)	3 (13.1)	4 (8.7)
		Strongly Disagree	0 (0)	0 (0)	0 (0)	0 (0)	0	1 (4.3)	0
Closed ended Post-test Attitude based Questionnaires									
01	Do you think involvement of clinical pharmacist in patient treatment plan can reduce the health care cost?	Strongly agree	0 (0)	5 (55.5)	4 (16)	115 (32.1)	37 (22)	1 (4.3)	7 (15.2)
		Agree	2 (66.6)	4 (44.4)	21 (84)	168 (46.9)	86 (51.2)	18 (78.3)	32 (69.6)
		Neutral	1 (33.3)	0 (0)	0(0)	53 (14.8)	30 (17.9)	4 (17.4)	4 (8.7)
		Disagree	0 (0)	0 (0)	0 (0)	18 (5)	14 (8.3)	0	2 (4.3)
		Strongly Disagree	0 (0)	0 (0)	0 (0)	4 (1.2)	1 (0.6)	0	1 (2.2)
02	Do you think clinical pharmacist can detect and prevent drug related problems/ medication use error?	Strongly agree	0 (0)	7 (77.7)	4 (16)	171 (47.8)	37 (22)	7 (30.4)	22 (47.8)
		Agree	2 (66.6)	2 (22.2)	21 (84)	150 (41.9)	99 (58.9)	12 (52.2)	23 (50)
		Neutral	1 (33.3)	0 (0)	0 (0)	29 (8.1)	25 (14.9)	4 (17.4)	1 (2.2)
		Disagree	0 (0)	0 (0)	0(0)	8 (2.2)	5 (3)	0	0
		Strongly Disagree	0 (0)	0 (0)	0 (0)	0 (0)	0	0	0

Closed ended Pre-test Attitude based Questionnaires								
Sl.No.	Questionnaires	Response	Response in frequency (%)					
			Healthcare professionals *N*=37			Students *N*=595		
			Doctors *N*=3	Pharmacists *N*=9	Doctors *N*=3	Pharmacists *N*=9	Doctors *N*=3	Pharmacists *N*=9	Doctors *N*=3
03	Do you think that clinical pharmacist can involve in the drug utilization review (DUR)?	Strongly agree	0 (0)	7 (77.7)	1 (4)	94 (26.3)	20 (11.9)	0	6 (13)
		Agree	3 (100)	1 (11.1)	22 (88)	223 (62.3)	113 (67.3)	15 (65.3)	35 (76.1)
		Neutral	0 (0)	0 (0)	2 (8)	40 (11.1)	32 (19)	7 (30.4)	5 (10.9)
		Disagree	0 (0)	0(0)	0 (0)	1 (0.3)	3 (1.8)	1 (4.3)	0
		Strongly Disagree	0 (0)	1 (11.1)	0(0)	0 (0)	0	0	0
04	Will you agree that clinical pharmacist can improve overall patient outcome / quality of patient care?	Strongly agree	0 (0)	7 (77.7)	7 (28)	136 (38)	20 (11.9)	3 (13)	8 (17.4)
		Agree	1 (33.3)	2 (22.2)	18 (72)	188 (52.5)	114 (67.9)	17 (74)	29 (63)
		Neutral	1 (33.3)	0 (0)	0 (0)	34 (9.5)	26 (15.5)	3 (13)	8 (17.4)
		Disagree	1 (33.3)	0 (0)	0 (0)	0	6 (3.6)	0	1 (2.2)
		Strongly Disagree	0 (0)	0(0)	0 (0)	0	2 (1.1)	0	0
05	Do you think that the implementation of clinical pharmacy services is desirable in health care system?	Strongly agree	0 (0)	6 (66.6)	3 (12)	155 (43.3)	25 (14.9)	1 (4.3)	17 (37)
		Agree	1 (33.3)	3 (33.3)	21 (84)	175 (48.9)	116 (69)	12 (52.2)	24 (52.1)
		Neutral	1 (33.3)	0 (0)	1 (4)	27 (7.5)	22 (13.1)	9 (39.1)	4 (8.7)
		Disagree	1 (33.3)	0(0)	0 (0)	1 (0.3)	5 (3)	1 (4.3)	1 (2.2)
		Strongly Disagree	0 (0)	0(0)	0(0)	0	0	0	0
06	Do you think that all the healthcare professionals will accept the involvement of the clinical pharmacist in providing optimal rationalized therapy to patients?	Strongly agree	1 (33.3)	5 (55.5)	4 (16)	110 (30.7)	20 (11.9)	0	7 (15.2)
		Agree	1 (33.3)	4 (44.4)	15 (60)	171 (47.8)	103 (61.3)	14 (60.9)	26 (56.5)
		Neutral	1 (33.3)	0(0)	6 (24)	75 (20.9)	40 (23.8)	8 (34.8)	11 (23.9)
		Disagree	0 (0)	0(0)	0(0)	2 (0.6)	5 (3)	1 (4.3)	2 (4.3)
		Strongly Disagree	0 (0)	0(0)	0(0)	0	0	0	0

The study findings revealed that 91.8% of HCPs previously heard about CPSs because of the presence of a pharmacy practice department in the hospital. This study is in line with the study conducted in Ethiopia by G Fekadu *et al.*[11] In this study about 85.3% of students had previously heard about CPSs as the Pharm D course was started in majority of the institutions since few years. This finding is relatively less when compared to a study done among students by Eman Abu-Gharbieh *et al.* as most of clinical pharmacy started in recent years in UAE.[19]

Among the respondents, 89.1% of HCPs were of the opinion that the presence of CPs will make selection of appropriate therapy much easier. This is incremental findings when compared to a study conducted by G Fekadu *et al.*, where 61.9% of them shown positive response.[11] The HCPs attitude regarding taking medical history and access to document CPSs in patient chart was found to be 67.5% and 64.8% respectively. These results are considered to be somewhat less compared to a study done by A I Bilal *et al.*[9] The reason behind these findings is that the majority of HCPs in our study were unaware of many services provided by CPs in direct patient care.

After the awareness session, 94.5% of HCPs and 96.6% of students think that CPs are integral part of the medical team. These

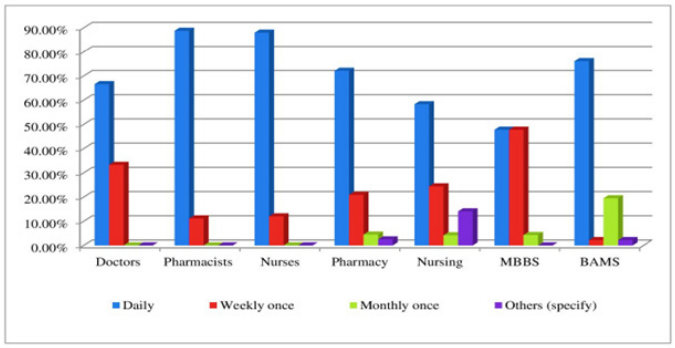

Figure 3: Response (%) on open ended pre-test attitude questionnaire: How often do you think that clinical pharmacist can attend the ward rounds?

responses were found to be more when compared to a study conducted by Eman Abu-Gharbieh *et al.*[19] The positive response is high in our study as we have provided the information on scope of CPSs through awareness sessions which is lacking in the study compared.

In our study positive attitude and adequate response on knowledge were shown among HCPs and students in post-test compared to the pre-test. This results are concordant with the study done in kerala among nurses by Belsy Boban *et al.*[1] Various opinions of participants were encountered regarding implementation of CPSs in their hospitals. Majority of the participants were having positive opinion regarding the implementation. But most of the ayurvedic students were of the opinion that ayurvedic medicine practice does not require CPSs as these medications are much safer with lesser adverse effects. Our study response shows that most of the HCPs and students think that the CPs will be accepted by other HCPs in providing optimal rationalized therapy to patients.

This study gives the insights on importance of accepting CPSs in the direct patient care settings. The study could not include more number of HCPs because busy schedule of HCPs. As this study was conducted in Tumakuru city of Southern India, the results cannot be generalized to whole nation.

CONCLUSION

The study found that students and HCPs had shallow knowledge and positive attitude regarding CPSs and an incremental response was observed after the awareness session. So after gaining adequate knowledge from awareness session the HCPs were willing to collaborate with CPs in providing rationalized therapy to patient. Thus more and more educational programs should be conducted in healthcare settings to clearly define the scope of CPs and to eliminate the communication gaps between CPs and other HCPs, which stood as a barrier to promoting the clinical pharmacist's role to provide direct patient care. Henceforth the implementation of CPSs should be increased in developing countries to provide efficient and effective treatment to patient.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

CPSs: Clinical Pharmacy Services; **CPs:** Clinical Pharmacists; **BAMS:** Bachelor of Ayurvedic Medicine and Surgery; **MBBS:** Bachelor of Medicine and Bachelor of Surgery; **DIC:** Drug Information Center; **DRPs:** Drug Related Problems; **HCPs:** Health Care Professionals; **WHO:** World Health Organization; **QOL:** Quality Of Life; **UAE:** United Arab Emirates.

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