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EFFECT OF PHARMACEUTICAL CARE TRAINING ON KNOWLEDGE ATTITUDE AND PRACTICES OF PHARMACISTS IN MAHARASHTRA

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ABSTRACT: The objective of the study was to assess the effect of Pharmaceutical care training on Knowledge, Attitude and Practices of Pharmacists from various settings. In this prospective interventional study, a validated Knowledge, Attitude and Practice questionnaire was administered, before and after an educational training to the pharmacists belonging to hospital, community and corporate settings of Pune district of Maharashtra. The Post-training impact on knowledge, attitude and practices was assessed by administering the same questionnaire after 3 months to the same set of pharmacists. The results were analyzed using paired 't' test and simple descriptive analysis. A total of 446 pharmacists were enrolled in the study. In the post-educational intervention, the overall Knowledge scores of participants were found to have significantly increased from 177.40 ± 59.62 to 325.8 ± 76.11; a mean score with value of p= 0.0089, a significant improvement in Attitude from 302.40 ± 82.80 to 409.80 ± 22.90; a mean score with value of p = 0.0234 and improvement in Practice component was from 149.20 ± 53.03 to 225.40 ± 47.49; a mean score with p value of p = 0.0436. The study concluded that post educational-intervention significantly improved Knowledge and Attitude compared to Pharmaceutical care practices of the pharmacists from all settings, and the dispensing of medicines is still the dominant service in community Pharmacy. Robust Continuing Education modules can be used for career-long learning and professional development of Pharmacists to improve their Practices towards Pharmaceutical care.

INTRODUCTION: Over the last decade, pharmacy profession has evolved from just compounding and dispensing drugs, to providing patient care, termed as pharmaceutical care. Based on Helper and Strand's definition, WHO states that: Pharmaceutical care is a philosophy of practice in which the patient is the primary beneficiary of the pharmacist's actions.

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Pharmaceutical care (PC) focuses on the attitudes, behaviors, commitments, concerns, ethics, functions, knowledge, responsibilities and skills of the pharmacist in providing drug therapy with the goal of achieving definite therapeutic outcomes towards patient health and quality of life [1, 2].

The concept of 'Pharmaceutical Care' has been accepted and implemented in most countries. There are a number of studies in community settings that have demonstrated promising impact of pharmaceutical care on patients [3, 4]. Patients in most developed countries are provided meticulous pharmaceutical care. Although most of the services rendered involve dispensing; there is a growing shift towards providing services like patient

education, counselling, monitoring pharmaco-therapy, identification, drug-related problem resolution and its documentation [4, 5, 6]. However, pharmacists in developing countries are still underutilized. Their role as a healthcare professional is not considered necessary by either the community or other healthcare providers [7]. In India, as professional and educational standards are improving, the pharmacist's role in patient care is expected to grow. Lack of proper education and training of pharmacists, weak implementation of existing laws, scanty clinical knowledge and lack of recognition of the pharmacy as a distinct yet integral part of healthcare profession by other healthcare professionals; have been identified as main barriers to the provision of pharmaceutical care [8]. Pharmacist can directly influence the improvement in disease management by providing community based pharmaceutical care [9].

Pharmacists must evolve from dispensers to medication management practitioners. Therefore their knowledge, attitude and practices are the key necessities, so that they can work along with physicians to significantly improve the health of the patients. A study conducted by Lim and Lim proved that such a collaboration showed significant improvements in HbA1c, glucose and LDL cholesterol levels and medication adherence in patients with diabetes [10].

Providing continuing pharmacy education can be a considerable milestone in development of community pharmacist to meet the increasing expectations of regulatory authorities [11]. The purpose of this knowledge, attitude and practices (KAP) study is to assess the status and changes in knowledge, attitude and practices of pharmacists in various pharmacy-practice setups. The knowledge, attitude and practices are important factors characterized by dynamism and unique inter-dependence. KAP studies are important and effective in terms of providing baseline for evaluating interventional programs [12]. It is expected that, factors that hinder a better understanding of patient care, shall be identified with the ultimate goal of overcoming and improving them, so that effective pharmaceutical care can be delivered by pharmacists. This study was designed and conducted with the aim of thoroughly training pharmacists in pharmaceutical care services and to assess the impact of such training on their actual provision of pharmaceutical care to the patients.

MATERIAL AND METHODS: This prospective interventional study was designed to assess the impact of an educational and training program on dispensing pharmacists' KAP towards pharmaceutical care services. The study was conducted in Pune district of Maharashtra, over a period of twelve months after approval of Ethics Committee (Ref: BVDUMC/IEC/74) and higher authorities of participating pharmacists. The practicing pharmacists from three different settings namely community, corporate and government sector were recruited in the study. All pharmacists were pharmacy council registered. They had not participated in any such trainings earlier. They had volunteered to participate in this educational training program on invitation.

A 15 items' questionnaire comprising of 5 questions assessing "Knowledge" component, 5 questions assessing "Attitude" component, and another 5 questions to assess "Practice" component was designed and developed. Both pre- and post-training questionnaire possessed the same set of questions. Reference for components used were from similar published studies and literatures. Questionnaire was customized to suit local requirements. The content validation was done by the senior professors of clinical pharmacy department and community experts. The questionnaire also included preliminary questions to capture demographic details such as name, age, gender, educational background and practice experience of the respondents. This study included 'pre' and 'post'-educational interventional assessment of KAP among the volunteered practicing dispensing pharmacists.

A training manual on pharmaceutical care was developed by referring to the textbooks, other training manuals, published literature and outcome of previously completed study: 'Training Need Assessment', conducted on a smaller sample of participants of this study. The main components of manual included: Definition, introduction, aim and objectives, of pharmaceutical care by pharmacists; who all are responsible for pharmaceutical care, benefits of providing pharmaceutical care, components of pharmaceutical care, how to carry-

out pharmaceutical care in different settings, barriers in pharmaceutical care and how to overcome the barrier. Contents of manual were reviewed by the senior faculty of the pharmacy practice department and experts from community. Half-a-day workshop on pharmaceutical care was organized for volunteer practicing pharmacists at their respective institutions periodically. The KAP questionnaire was administered before starting the trainings.

Post-collection of responses to the KAP questionnaire, the above stated topics of the manual were covered. The mode of delivery was through experts and senior faculty of Pharmacy practice and Pharm. D using powerpoint presentations, blackboard explanation, audio-visual aids and website links. The trainings were in form of group-interactive sessions with feedback system at the end of each training session.

Baseline knowledge, attitude and practices of the participating pharmacists were assessed by applying the questionnaire before the educational program. The post training impact on knowledge, attitude and practices was assessed by administering the same questionnaire after 3 months to the same set of pharmacists. The pre and post-training knowledge, attitude and practices of the participants were compared, and results were analyzed using the paired 't' test in Graph Pad prism statistical software and simple descriptive analysis.

RESULTS: A total of 500 pharmacists were identified for enrollment, of which 446 were complying with inclusion criteria and were included in the study. Of these: 148 were from Government sector, 148 were from community and 150 were from corporate sector.

374 participants (83.84%) were males and 72 participants (16.14%) were female. Majority (74.66%) belonged to age group of 20-35 years, 16.36% of participants were 36-45 years. Mean age was 31.86681716 ± 8.75342754y. Most participants (79.82%) were Diploma in Pharmacy (D. Pharm); 18.16% participants were Bachelor in Pharmacy (B. Pharm) qualification. Practice experience of 46.86% participants was more than 5 years. Mean practice experience was found to be 8.306275395 ± 7.824341852 y. Participants' complete demographic details are presented in **Table 1**.

TABLE 1: DEMOGRAPHICS DATA OF PARTICIPANTS (n=446)

Characteristics	Frequency	%	Mean
Gender			
Male	374	83.85	
Female	72	16.15	
Age in years			
20-35	333	74.66	
36-45	73	16.36	
46-55	37	8.2	31.866 ± 8.75
>55	3	0.6	
Qualification			
D. Pharm	356	79.82	
B. Pharm	81	18.16	
M. Pharm	9	2.01	
Practice experience in years			
<5	209	46.86	
6-10	105	23.54	
11-15	73	16.36	8.306 ±7.824
>15	59	13.22	
Participants' practicing sectors			
Government	148	33.18	
Community	148	33.18	
Corporate	150	33.64	

Evaluation of Participants' Knowledge, Attitude, Practices towards Pharmaceutical Care: A total of 446 pharmacists of Pune District completed the pre- and post-training, KAP questionnaire. Pre- and post-training knowledge, attitude and practices of the participants were compared and results were analyzed using Chi-square test in Graphpad Prism statistical software. In the post-educational intervention, the overall knowledge score of participants was found to have increased from 177.40 ± 59.62 to 325.8 ± 76.11, which was highly significant outcome with value of P = 0.0089. The knowledge with respect to pharmaceutical care was assessed with 5 questions in knowledge component.

Maximum (92.37%) responded correctly to Q1 framed on knowledge of prescription audit by pharmacists, 74.43% responded correctly to Q2 on knowledge of drug related problems, and 86.77% responded correctly to Q5 on knowledge of patient counselling. Regarding Q3 related to drug interactions and Q4 related to ADRs a comparatively lower response rate was obtained in terms of the knowledge, in comparison to other questions.

In the post interventional training it was observed that there was favourable increment in the attitude towards all the domains related to pharmaceutical care practices and the responsibilities of pharmacists. The increase in attitude from 302.40 ± 82.80 to 409.80 ± 22.90 was relatively significant with (P = 0.0353). The attitude of participants with respect to pharmaceutical care was assessed with 5 questions in attitude component. In this category 94.17% participants responded correctly to Q1 on attitude towards providing patient care services, 94.39% responded positively to Q4 related to responsibility of pharmacists in positive patient outcomes and 97.30 % responded positively to Q5 related to low status of patient care practices currently in India.

A comparatively lower response rate was obtained for Q2 and Q3 based on responsibility of pharmacists towards drug safety and regular-interventions respectively. There was a post training increment observed in the Practices component towards all the aspects related to pharmaceutical care by pharmacists from: 149.20 ± 53.03 to 225.40 ± 47.49 with a reasonable significant impact of (P = 0.0436). Practices of pharmacists with respect to pharmaceutical care was assessed with 5 questions in practice component. In this category 62.10% responded correctly to Q4 framed to assess the frequency of patient-counselling by the pharmacists, 60.08% responded correctly to Q5 related to solving of drug related problems by pharmacists for the patients.

TABLE 2: EVALUATION OF KNOWLEDGE, ATTITUDE AND PRACTICES OF PARTICIPANTS

Questions related to Knowledge	**Correct response before training: n=446 (%)**	**Correct response after training: n=446(%)**	**Two-tailed P-value**
Q.1: What are the main components of a standard prescription?	279(62.55%)	412(92.37%)	
Q.2: What do you mean by drug related problems?	156(34.97 %)	332(74.43%)	
Q.3: Enlist two examples of drug interactions.	123(27.57 %)	240(53.81%)	0.0089
Q.4: Give two examples of adverse drug reactions.	173(38.78)	258(57.84%)	
Q.5.Give two patient counselling tips for Paracetamol.	156(34.97)	387(86.77%)	
Questions related to Attitude Do you think.....?	**Positive responses before training: n=446 (%)**	**Positive response after training: n=446 (%)**	**Two-tailed P-value**
Q1: Pharmacists' professional services (like drug information and patient counselling) are necessary in health care system?	386(86.54)	420(94.17%)	
Q2: Pharmacists are responsible for drug safety?	296(66.36)	376(84.30)	
Q3: Pharmacists can reduce patient sufferings by interventions.	230(51.56)	398(89.23)	0.0234
Q4: Pharmacist is responsible for patient care services and its outcomes.	213(47.57)	421(94.39)	
Q5: Current pharmacy services for patient, in India are not satisfactory.	387(86.77)	434(97.30)	
Questions related to Practices	**Correct response before training: n=446 (%)**	**Correct response after training: n=446 (%)**	**Two-tailed P-value**
Q1: What do you do when you see a dangerous drug-drug interaction in a patient's prescription?	115(25.78)	225(50.44)	
Q2: How many prescription corrections did you get done from doctors in a year?	136(30.49)	187(41.92)	
Q3: Do you ask the female patients if they are pregnant or breast feeding before dispensing the medicines to them?	87(19.50)	170(38.11)	0.0436
Q4: How many times do you counsel and what do you counsel the patients about medicines?	208(46.63)	277(62.10)	
Q.5: What types of drug related problems of a patient have you solved till now?	200(44.84)	268(60.08)	

A low response rate (50.44%) was observed towards Q1 based on providing knowledge and instructions by pharmacists to the patients on drug interaction also a low response (41.92%) was obtained for Q2 regarding pharmacists interventions in case of any drug related issues of the patients and lowest response (38.11%) for Q3 towards practice of taking patient history before dispensing was observed. The above observations are shown in **Table 2**. The overall evaluation confirmed that there was a very significant increase in the knowledge component of the participants and a relatively significant increase in the overall attitude and practice components related to pharmaceutical care. Majority (more than 90%) of respondent pharmacists gave feedback stating that trainings had: fulfilled their need to gain knowledge, helped in thinking more positively and motivated them to improve their pharmaceutical care practices effectively. They demanded continuation of such trainings on regular basis for a long term, and also specific to certain critical diseases like hyper-tension and diabetes, since on regular basis they encounter maximum patients with such diseases, who definitely need pharmaceutical care.

DISCUSSION: This study was carried out to assess the KAP of dispensing pharmacists towards pharmaceutical care services. The study also evaluated the effectiveness of educational inter-vention program on pharmaceutical care, so as to motivate pharmacists in providing professional services and thus benefit the patients. Knowledge and skill are essential to provide meaningful and useful professional services. It is paramount for all healthcare professionals including pharmacists to have the necessary knowledge and attitude to carry out their professional services.

The findings of this study demonstrated that the knowledge component of the participants had increased from pre-training test score of 177.40 ± 59.62 to post-training test score of 325.8 ± 76.11, which is a very significant improvement (P= 0.0089), suggesting that trainings had enhanced knowledge whereas the baseline knowledge of pharmacists was quite low with regards to core pharmaceutical care elements like drug related problems, drug related problems, ADRs and medication patient counselling.

The response towards assessment of prescription details, was satisfactory at baseline, since the pharmacists are mainly involved in dispensing, which is the dominant activity in their practices. Findings of various other studies regarding the assessment of KAP of pharmacists towards pharmaceutical care suggests that community pharmacists are having inadequate knowledge regarding pharmaceutical care [13]. This was also highlighted in a study carried out in metro Manila where the pharmacists had low perceived level of understanding the concept of pharmaceutical care. Most of the respondents believed that a postgraduate degree is a requirement to provide pharmaceutical care in the Philippines [14].

In another study by MA'AJI Hadiza Usman it was observed that the respondents had a knowledge deficit of pharmaceutical care concept. 97.5% of the respondents defined pharmaceutical care as pharmacists offering advice and counselling during drug dispensing only, yet 80% defined it as dispensing of medications only [15]. In current study it was observed that post-training there was an improvement in the attitude of participants towards pharmaceutical care practices. Improvement in attitude from 302.40 ± 82.80 to 409.80 ± 22.90 was quite significant with P-value of 0.0234. Despite our practicing pharmacists' low level of pre-training knowledge, their attitude towards this subject was at a high level. However, increase in knowledge of pharmaceutical care post-training also lead to improvement in attitudes towards pharmaceutical care.

All pharmacists were keen to provide patient counselling and felt responsible towards drug safety issues, but showed reservations over their responsibility clinical outcome of the patient and active participation in interventions. This may be due to lack of clinical knowledge and confidence. Also, they felt that clinicians were entirely responsible for clinical outcomes of the patients. These findings are comparable with a study by Oparah *et al*., in which 75% of a sample of 1500 Nigerian pharmacists had positive attitude towards pharmaceutical care and were also enthusiastic to put pharmaceutical care into practice. But they too expressed serious concerns regarding their knowledge and professional skills [16].

These findings were in contrast with a study carried out in Moldova, in which the pharmacists appeared to be deeply involved in traditional practices of dispensing only and were reluctant to practice pharmaceutical care [17]. Another finding of this study was a reasonably significant improvement in the practices towards pharmaceutical care activities and responsibilities of the pharmacists after receiving training. A reasonably significant improvement from 149.20 ± 53.03 to 225.40 ± 47.49 with a P-value of 0.0436 was observed. Pre-training responses of all the participants were significantly low in all key aspects of pharmaceutical care practices including patient counselling, solving drug related problems, doing interventions, ADR management and informing drug interactions.

Post-training, the pharmacists received a good insight into practices, yet they could not implement their insights in an effective manner. In a similar review study by Alanazi AS in KSA, it was found that dispensing of medicines is the dominant service provided by community pharmacists with very limited scope for pharmaceutical care services [18]. Findings were also in line with another study by Toklu *et al*., in which the community pharmacists did not provide warning of possible drug interactions and related information to the patients [19]. In another study by Lao, pharmacists' poor practice became evident by the lack of drug information given to any of the patients [20].

The educational and training interventions in the current study confirms that knowledge, attitude and practice of the pharmacist: positively improved in all aspects above baseline. Although direct measurement in quality of patient care could not be established, it is expected that increments in community pharmacist's knowledge, attitude and practice can help in delivering better pharmaceutical care and provide more benefits to the patient. The finding clearly emphasizes the need of motivation to pharmacists towards pharmaceutical care. Training alone will not lead to the expected level of practices implying the need of other administrative incentives to ensure pharmaceutical care services. The findings can serve as a reference for the future planning, design, and improvement in continuing Education to pharmacists in India.

Further continuing education modules focused on critical diseases may be planned, prepared and imparted during the career-span of pharmacists in order to ensure learning and professional development.

Limitations: Although the pre and post educational intervention showed that the knowledge, attitude and practice of the pharmacist improved significantly, a direct measurement in quality of care to patient could not be carried-out.

The study design involved a basic and general training related to pharmaceutical care components, hence no critical diseases' specific training could be given in order to make them experts in PC.

CONCLUSION: The study concluded that post educational-intervention significantly improved Knowledge and Attitude compared to Pharmaceutical care practices of the pharmacists from all settings, and the dispensing of medicines is still the dominant service provided by Pharmacists. Robust Continuing Education modules can be used for career-long learning and professional development of Pharmacists to improve their Practices towards Pharmaceutical care.

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