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Research article

Perceptions and experiences of physicians regarding integration of clinical pharmacists in health practices: A survey of hospitals of Karachi, Pakistan

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ABSTRACT

Introduction

Drug-related problems are frequent and may result in reduced quality of life, and even morbidity and mortality. Studies have shown that clinical pharmacists can identify and prevent drug-related problems. Although the physicians in Pakistan like some underdeveloped countries seem to have an opposing view to the expanded role of clinical pharmacists.

Method

A survey was conducted in which assessed physician's interaction, experience and expectations from a pharmacist especially in a patient-oriented role.

Results

The findings reveal limited interactions; those limited interactions included inquiring information about particular drug availability only. About 80 to 90% of physicians have high expectations of pharmacists indicating that they should be solely responsible for any medication related query and should be equipped with extensive knowledge to tackle drug related problems effectively, however a higher % seem to disagree on allowing a clinical pharmacist's intervention within a patient profile, the physicians with less than 10 years experience disagree on allowing them to be involved on the level of consultation regarding drug regimens or other and work side by side with them as core members of healthcare team.

Conclusion

These mixed reviews indicate the lack of comfort of physicians in a clinical setting. There is increasing evidence that participation and interventions of clinical pharmacists in health care positively influence clinical practice yet the state of non recognition of clinical role of pharmacists in Pakistan still needs to be addressed in order to win over physician confidence and comfort and can lead to better outcomes of patient's health and consequently improvement in the health care system of the country.

Keywords: Perception; Experience; Physician; Clinical Pharmacist; Karachi; Pakistan

INTRODUCTION

The legitimacy of expanded roles for pharmacists with different status audiences has been studied in many parts of the world, defining pharmacy as a profession in transition characterized by considerable ambiguity and uncertainty concerning its status as a health care profession. Significant changes have occurred within the profession of

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pharmacy in the past few decades which have led to loss of function, social power and status. The response of the profession has been a movement toward a patient-oriented, clinical role for pharmacists.[1]

Hypotheses concerning level of support for expanded roles of healthcare professionals were derived from two conflict-based models of professionalization: (1) a power model which focuses on conflict between professions and the central role of power in defining occupational territory; and (2) a process model which focuses on conflict of interest and diversity within a profession and the development of 'segments' which struggle for control of a profession's direction.[1] If these conflict based models did not exist, the expanded roles of different health care professions can be given the required support, given that the prescribing is optimal for the individual patient i.e. one of role of a physician, efforts should be made to enhance adherence to medications, one of many roles of a clinical pharmacist.[1, 2]

Clinical pharmacists are uniquely trained in therapeutics and provide comprehensive drug management to patients and providers (includes physicians and additional members of the care team). Pharmacist intervention outcomes include economics, health-related quality of life, patient satisfaction, medication appropriateness, adverse drug events (ADEs), and adverse drug reactions (ADRs). A cornerstone of clinical pharmacy is the identification, solving and prevention of drug-related problems. A clinical pharmacist may assess these drug-related problems in different settings: in hospital multidisciplinary teams, in nursing homes and in primary care.[3, 12]

In Pakistan, the profession lacks government interest, causing clinical and hospital pharmacists to still struggle for the recognition of their professional influence in the healthcare system of Pakistan and face many great barriers to fully execute their potential role irrespective to the amount of human resource in the country, as almost two and half thousand pharmacists graduate every year. Several reasons for the lack of recognition are defined, one of them includes lack of physician-pharmacist interaction at a hospital setting.[11] Due to lack of interaction and knowledge regarding the role of pharmacist in a clinical setting it is still an emerging trend in Pakistan and face the same situation as other developing countries. Physicians in Pakistan are still unsure about the prospect of the inclusion of pharmacist in the clinical and counseling role.[5]

Various studies emphasize that interventions by clinical pharmacists improve clinical outcomes, such as improvement in levels of markers for drug use and disease, for example, more optimal lipid levels and INR levels, reduced length of hospital stay, fewer re-admissions and fewer disease events for e.g. heart failure events or thromboembolism.[8, 10] A proactive rather than a reactive approach seems prudent for obtaining the greatest benefit from the interventions. This includes pharmacist participation in the multidisciplinary team discussions – at the stage of ordering and prescribing – where all types of drug-related problems, including potential problems, are undertaken professional responsibility. There is increasing evidence that participation and intervention of clinical pharmacists have a positive influence on clinical outcomes and can contribute to overall improvement of healthcare.[9,10] Although the exact views and perceptions of Pakistani physicians for this discipline of pharmacy in particular needs to defined, especially in the light of the conflict of interest and diversity among these professions keeping in view the level of support regarding team work needed in the health sector of Pakistan.[8,11, 13]

MATERIALS AND METHODS

A quantitative cross sectional study was conducted among the physicians of Karachi, Pakistan during the time period of March 2013 to December 2013. The target population were the physicians, targeted with a structured questionnaire which was divided into the following parts i.e., demographic information of the physicians, and interactions, expectations and experiences with pharmacist.

Prior to the data collection, an approval from health care facility and informed, written consent from respondents was obtained. The first part of the questionnaire assessed the level of physician's interaction and reasons for interaction with pharmacist; the second part assessed their expectations with pharmacists; whereas the last part assessed their experiences with pharmacists.

In expectations and experiences section, the physicians had to respond using the 4 point Likert scale hence 1= strongly agree, 2= agree, 3= disagree and 4= strongly disagree. This lower case Scale was used to avoid confusion of neutral opinion.

The survey was limited to physicians from Karachi practicing in different areas which include private, public sector, general and specialized hospitals. A sample size of (N = 300) physicians was selected to

take part in the survey by questionnaire distribution, out of them 278 returned the complete filled questionnaires.

The data were computed and analyzed using Statistical Package for Social Sciences (SPSS version 22) and descriptive analysis was conducted. The results of each item in the questionnaire were reported as percentage *(%)* and sample number *(N)*. The Chi–square test *(X²)* was used to test the importance of association between the independent demographic variables (gender, experience of practice, specialty, and status) and the dependent variables (physician's frequency of interaction, expectations and experience with the pharmacist). Statistical significance was accepted at P value of < 0.05.

RESULTS

A total of 300 questionnaires were sent to the physicians in hospitals of Karachi, Pakistan out of which 278 questionnaires were filled and returned giving a response rate of 92.6%. The results are expressed in the following sections:

- ➢ Demographic information
- ➢ Social information
- ➢ Personal Experiences

Demographic information

The survey incorporated almost an equal number of physicians in terms of gender i.e. males (N = 121, 43.5%) and females (N = 157, 56.5%) as well as place of work i.e. general hospital (N = 142, 51.1%) and specialized hospitals (N = 136, 48.9%). In addition, with regards to the position in organization, the survey incorporated equal number of GPs and Residents i.e. (N = 97, 34.9%) and a third were the consultants (N = 84, 30.2%). Almost a half of the physicians (N = 157, 56.5%) worked at private institutes and slightly less than half in a public health care institute (N = 121, 43.5%). Majority of physicians (N = 131, 47.1%) had a relevant work experience of less than 5 years, a third (N = 92, 33.1%) had an experience between 5-10 years, some (N = 36, 12.9%) had experience greater than 10 years and few (N = 19, 6.8%) had greater than 50 years of relevant work experience. Furthermore, almost a half of the physicians (N = 141, 50.7%) rarely or never interacted with a clinical pharmacist a quarter (N = 69, 24.8%) did however interact with a clinical pharmacist once a week and almost similar number of physicians (N = 68, 24.5%) interacted once daily. The demographic information is tabulated in table 1.

Table 1 Demographic information of physicians

Variable	Sample N (%)
Gender	
Male	121 (43.5)
Female	157 (56.5)
Place of work	
General Hospital	142 (51.1)
Specialized Hospital	136 (48.9)
Current position	
Consultant	84 (30.2)
Resident	97 (34.9)
GP	97 (34.9)
Type of health care institute	
Private	157 (56.5)
Public	121 (43.5)
Years of experience	
<5 years	131 (47.1)
5-10 years	92 (33.1)
> 10 years	36 (12.9)
> 50 years	19 (6.8)
Frequency of Interaction	
never/ rarely	141 (50.7)
once a week	69 (24.8)
once daily	68 (24.5)

Furthermore, with regards to the qualitative aspects, the reasons for interaction normally given by physicians mainly were concerned with the dose related queries (N = 43, 15.5%) followed by pharmaceutical alternative queries (N = 32, 11.5%). Few other reasons for interactions are given in table 2.

Table 2 Reasons for interaction

Reason for interaction	Sample N (%)
Drug availability queries	21 (7.6)
Drug alternative queries	24 (8.6)
Drug dosage queries	43 (15.5)
Side effects queries	13 (4.7)
Drug interaction queries	12 (4.3)
Drug Availability queries / Drug alternative queries	32 (11.5)
Drug availability queries / Drug dosage queries	13 (4.7)
Drug availability queries / Side Effects queries	2 (0.7)
Drug availability queries / Drug interaction queries	7 (2.5)
Drug alternative queries / Drug dosage queries	4 (1.4)
Drug alternative queries / Side effects queries	8 (2.9)
Drug alternative queries / Drug interaction queries	2 (0.7)
Drug dosage queries / Side effects queries	1 (0.4)
Drug dosage queries / Drug interaction queries	10 (3.6)
Side effect queries / Drug interaction queries	4 (1.4)
Drug availability queries / Drug alternative queries / Drug dosage queries	6 (2.2)
Drug availability queries / Drug dosage queries / Side effects queries	6 (2.2)
Drug availability queries / Side effects queries / Drug interaction queries	2 (0.7)
Drug alternative queries / Drug dosage queries / Side effects queries	8 (2.9)
Drug alternative queries / Side effects queries / Drug interaction queries	9 (3.2)
Drug dosage queries / side effects queries / Drug interaction queries	11 (4.0)
Drug dosage queries / Drug interaction queries / Drug availability queries	7(2.5)
Drug dosage queries / Drug interaction queries / Drug alternative queries	4 (1.4)
Drug Availability queries / Drug alternative queries / Side effects queries	8 (2.9)
Drug Availability queries / Drug alternative queries / Drug interaction queries	21(7.6)

Social information

The social aspects of the study revealed that the demographics influenced the perceptions of the physicians. The demographics such as the designation, working experience and organization influenced their expectations from clinical pharmacists. The study investigated the associations of the health care institute of physicians and their expectations from a clinical pharmacist. Social variables pertaining to clinical pharmacists were asked about. Table 3 provides a detailed account.

Table 3 Health care institute of physicians affecting their expectation from a clinical pharmacist

S.No	Variable	Institute	Strongly	Agree	Disagree	Strongly	P-value
1.	To take personal responsibility for resolving any drug-related problems	Private	30 (19.1)	91 (58)	26 (16.6)	10 (6.4)	*0.00*
		Public	13 (10.7)	49 (40.5)	27 (22.3)	32 (26.4)	
2.	To be knowledgeable drug therapy expert	Private	77 (49)	77 (49)	1 (.6)	2 (1.3)	*0.00*
		Public	17 (14)	100	4 (3.3)	0 (0)	
3.	To assist me in designing drug therapy treatment plans for my patients	Private	38 (24.2)	60 (38.2)	54 (34.4)	5 (3.2)	*0.00*
		Public	16 (13.2)	96 (34.5)	104 (37.4)	24 (8.6)	
4.	To monitor my patients' response to drug therapy	Private	35 (22.3)	111	11 (7.0)	0 (0)	*0.00*
		Public	8 (6.6)	86 (71.1)	25 (20.7)	2 (.9)	
5.	Educate patient about save use of medication	Private	55 (35)	91 (58)	11 (7)	0 (0)	*0.008*
		Public	22 (18.2)	89 (73.6)	10 (8.3)	0 (0)	
6.	To know the specific indication of each drug I prescribe.	Private	30 (19.1)	90 (57.3)	29 (18.5)	8 (5.1)	*0.001*
		Public	17 (14)	94 (77.7)	10 (8.3)	0 (0)	
7.	To be available to me for consultation when I see patients (e.g. During rounds)	Private	14 (8.9)	68 (43.3)	59 (37.6)	16 (10.2)	*0.00*
		Public	19 (15.7)	20 (16.5)	56 (46.3)	26 (21.5)	
8.	To assist my patients in selecting appropriate non-prescription medications	Private	38 (24.2)	47 (29.9)	36 (22.9)	36 (22.9)	*0.40*
		Public	16 (13.2)	30 (24.8)	39 (32.2)	36 (29.8)	

With respect to the position in the health care institute, it was formulated as a demographic variable which was tested for association with their expectations from a clinical pharmacist. Table 4 provides a detailed account.

Table 4 Position of physicians affecting their expectation from clinical pharmacists

S.No	Variable	Designation	Strongly Agree	Agree	Disagree	Strongly Disagree	P-value
1.	To take personal responsibility for resolving any drug-related problems	Consultant	10 (11.9)	25 (29.8)	16 (19)	33 (39.3)	*0.00*
		Resident	11 (11.3)	64 (66)	16 (18.5)	6 (6.2)	
		GP	22 (22.7)	51 (52.6)	21 (21.6)	3 (3.1)	
2.	To be knowledgeable drug therapy expert	Consultant	14 (16.7)	70 (83.3)	0 (0)	0 (0)	*0.00*
		Resident	54 (55.7)	40 (41.2)	1 (1)	2 (2.1)	
		GP	26 (26.8)	67 (69.1)	4 (4.1)	0 (0)	
3.	To assist me in designing drug therapy treatment plans for my patients	Consultant	8 (9.5)	36 (42.9)	26 (31)	14 (16.7)	*0.00*
		Resident	32 (33)	19 (19.6)	40 (41.2)	6 (6.2)	
		GP	14 (14.4)	41 (42.3)	38 (39.2)	4 (4.1)	
4.	To monitor my patients' response to drug therapy	Consultant	9 (10.7)	71 (84.5)	4 (4.8)	0 (0)	*0.00*
		Resident	28 (28.9)	65 (67)	4 (4.1)	0 (0)	
		GP	6 (6.2)	61 (62.9)	28 (28.9)	2 (2.1)	
5.	Educate patient about save use of medication	Consultant	9 (10.7)	73 (86.9)	2 (2.4)	0 (0)	*0.00*
		Resident	46 (47.4)	49 (50.5)	2 (2.1)	0 (0)	
		GP	22 (22.7)	58 (59.8)	17 (17.5)	0 (0)	
6.	To know the specific indication of each drug I prescribe.	Consultant	24 (28.6)	53 (63.1)	7 (8.3)	0 (0)	*0.01*
		Resident	10 (10.3)	66 (68)	17 (17.5)	4 (4.1)	
		GP	13 (13.4)	65 (67)	15 (15.5)	4 (4.1)	
7.	To be available to me for consultation when i see patients (e.g. During rounds)	Consultant	10 (11.9)	14 (16.7)	35 (41.7)	25 (29.8)	*0.00*
		Resident	2 (2.1)	56 (57.7)	29 (29.9)	10 (10.3)	
		GP	21 (21.6)	18 (18.6)	51 (52.6)	7 (7.2)	
8.	To assist my patients in selecting appropriate non-prescription medications	Consultant	14 (16.7)	12 (14.3)	18 (21.4)	40 (47.6)	*0.00*
		Resident	20 (20.6)	47 (48.5)	13 (13.4)	17 (17.5)	
		GP	20 (20.6)	18 (18.6)	44 (45.4)	15 (15.5)	

Personal experiences

Furthermore, the study investigated the associations of relevant work experience of physicians and their expectations from a clinical pharmacist. Table 5 provides a detailed account.

Table 5 Experiences of physicians affecting their expectation from clinical pharmacists

S.No	Variable	Experience	Strongly Agree	Agree	Disagree	Strongly Disagree	P-value
1.	To take personal responsibility for resolving any drug-related problems	< 5	30 (17.9)	81 (48.2)	36 (21.4)	21 (12.5)	0.165
		5-10	11 (15.3)	40 (55.6)	10 (13.9)	11 (15.3)	
		>10	2 (5.3)	19 (50)	7 (18.4)	10 (26.3)	
2.	To be knowledgeable drug therapy expert	< 5	54 (32.1)	108 (64.3)	4 (2.4)	2 (1.2)	0.002
		5-10	36 (50)	35 (45.8)	1 (1.4)	0 (0)	
		>10	4 (10.5)	34 (89.5)	0 (0)	2 (0.7)	
3.	To assist me in designing drug therapy treatment plans for my patients	< 5	36 (21.4)	58 (34.5)	57 (33.9)	17 (10.1)	0.002
		5-10	16 (22.2)	15 (20.8)	36 (50)	5 (6.9)	
		>10	2 (5.3)	23 (60.5)	11 (28.9)	2(5.3)	
4.	To monitor my patients' response to drug therapy	< 5	24 (14.3)	112 (66.7)	30 (17.9)	2 (1.2)	0.025
		5-10	10 (13.9)	60 (83.3)	2 (2.8)	0 (0)	
		>10	9 (23.7)	25 (65.8)	4 (10.5)	0 (0)	
5.	Educate patient about save use of medication	< 5	44 (26.2)	109 (64.9)	15 (8.9)	0 (0)	0.243
		5-10	26 (36.1)	42 (58.3)	4 (5.4)	0 (0)	
		>10	7 (18.4)	29 (76.3)	2 (5.3)	0 (0)	
6.	To know the specific indication of each drug i prescribe.	< 5	17 (10.1)	118 (70.2)	25 (14.9)	8 (4.8)	0.006
		5-10	20 (27.8)	43 (59.7)	9 (12.5)	0 (0)	
		>10	10 (26.3)	23 (60.5)	5 (13.2)	0 (0)	
7.	To be available to me for consultation when i see patients (e.g. During rounds)	< 5	25 (14.9)	44 (26.2)	74 (44)	25 (14.9)	0.000
		5-10	4 (5.6)	38 (52.8)	19 (26.4)	11 (15.3)	
		>10	4 (10.5)	6 (15.8)	22 (57.9)	6 (15.8)	
8.	To assist my patients in selecting appropriate non-prescription medications	< 5	36 (21.4)	44 (26.2)	53 (31.5)	35 (20.8)	0.00
		5-10	10 (13.9)	31 (43.1)	9 (12.5)	22 (30.6)	
		>10	8 (21.1)	2 (5.3)	13 (34.2)	15 (39.5)	

In addition, the study investigated the associations of the health care institute of physicians and their personal experience from a clinical pharmacist. Table 6 provides a detailed account.

Table 6 Health care institute of physicians affecting their personal experience from clinical pharmacists

S.No	Variable	Institute	Strongly	Agree	Disagree	Strongly	P-
1.	Pharmacists are a reliable source of general drug information	Private	48 (30.6)	97 (61.8)	9 (5.7)	3 (1.9)	0.014
		Public	22 (18.2)	77 (63.6)	18 (14.9)	4 (3.3)	
2	Pharmacists are a reliable source of clinical drug information	Private	28 (17.8)	108 (68.8)	19 (12.1)	2 (1.3)	0.034
		Public	21 (17.4)	68 (56.2)	26 (21.5)	6 (5.0)	
3.	Pharmacists routinely counsel my patients regarding the safe and appropriate use of their	Private	10 (6.4)	77 (49)	68 (43.3)	2 (1.3)	0.00
		Public	2 (1.7)	69 (57)	37 (30.6)	13 (10.7)	
4.	Pharmacists routinely inform me if they discover clinical problems with my prescriptions'	Private	38 (24.2)	85 (54.1)	34 (21.7)	0 (0)	0.00
		Public	20 (16.5)	57 (47.1)	27 (22.3)	17 (14)	
5.	Pharmacists routinely inform me about more cost-effective alternatives to the drugs	Private	10 (6.4)	67 (42.7)	77 (72.3)	3 (1.9)	0.00
		Public	14 (11.6)	37 (30.6)	51 (42.1)	19 (15.7)	
6.	Pharmacists frequently ask me to clarify for them the drug therapy objectives.	Private	2 (1.3)	58 (36.9)	94 (59.9)	3 (1.9)	0.00
		Public	4 (3.3)	80 (66.1)	22 (18.2)	15 (12.4)	
7.	Pharmacists appear willing to take personal responsibility for resolving any drug-related problems they discover	Private	11.9 (4.5)	83 (52.9)	56 (35.7)	11 (7.0)	0.00
		Public	14 (11.6)	32 (26.4)	47 (38.8)	28 (23.1)	
8.	I am willing to in-corporate the pharmacotherapy for the patient with consultation of the pharmacist	Private	6 (3.8)	119 (75.8)	20 (12.7)	12 (7.6)	0.00
		Public	17 (14)	57 (47.1)	20 (16.5)	27 (22.3)	

Moreover, the study investigated the associations of the designations of physicians affecting their
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personal experiences from a clinical pharmacist. Table 7 provides a detailed account

Table 7 Position of physician affecting the experience with clinical pharmacists

S.No	Variable	Designation	Strongly Agree	Agree	Disagree	Strongly Disagree	P-value
1.	Pharmacists are a reliable source of general drug information	Consultant	12 (14.3)	63 (75)	9 (10.7)	0 (0)	*0.00*
		Resident	38 (39.2)	57 (58.8)	2 (2.1)	0 (0)	
		GP	20 (20.6)	54 (55.7)	16 (!6.5)	7 (7.2)	
2.	Pharmacists are a reliable source of clinical drug information	Consultant	16 (19)	45 (53.6)	23 (27.4)	0 (0)	*0.00*
		Resident	10 (10.3)	77 (79.4)	10 (10.3)	0 (0)	
		GP	23 (23.7)	54 (55.7)	12 (12.4)	8 (8.2)	
3.	Pharmacists routinely counsel my patients regarding the safe and appropriate use of their medications	Consultant	4 (4.8)	44 (52.4)	29 (34.5)	7 (8.3)	*0.83*
		Resident	2 (2.1)	54 (55.7)	41 (42.3)	0 (0)	
		GP	6 (6.2)	48 (49.5)	35 (36.1)	8 (8.2)	
4.	Pharmacists routinely inform me if they discover clinical problems with my prescriptions'	Consultant	12 (14.3)	48)57.1)	15 (17.9)	9 (10.7)	*0.00*
		Resident	28 (28.9)	55 (56.7)	14 (14.4)	0 (0)	
		GP	18 (18.6)	39 (40.2)	32 (33)	8 (8.2)	
5.	Pharmacists routinely inform me about more cost-effective alternatives to the drugs	Consultant	8 (9.5)	20 (23.8)	46 (54.8)	10 (11.9)	*0.00*
		Resident	0 (0)	46 (47.4)	51 (52.6	0 (0)	
		GP	16 (16.5)	38 (39.2)	31 (32)	12 (7.9)	
6.	Pharmacists frequently ask me to clarify for them the drug therapy objectives.	Consultant	2 (2.4)	42 (50)	31 (36.9)	9 (10.7)	*0.00*
		Resident	0 (0)	35 (36.1)	60 (61.9)	2 (2.1)	
		GP	4 (4.1)	61 (62.9)	25 (25.8)	7 (7.2)	
7.	Pharmacists appear willing to take personal responsibility for resolving any drug-related problems they discover	Consultant	4 (4.8)	28 (33.3)	23 (27.4)	29 (34.5)	*0.00*
		Resident	0 (0)	62 (63.9)	31 (32)	4 (4.1)	
		GP	17 (17.5)	25 (25.8)	49 (50.5)	6 (6.2)	
8.	I am willing to in-corporate the pharmacotherapy for the patient with consultation of the pharmacist	Consultant	2 (2.4)	47 (56)	12 (14.3)	23 (27.4)	*0.00*
		Resident	2 (2.1)	79 (81.4)	14 (14.4)	2 (2.1)	
		GP	19 (19.6)	50 (51.5)	14 (14.4)	14 (14.4)	

Similarly, the study investigated the associations of the work experience of physicians and their account of personal experience with a clinical pharmacist. Table 8 provides a detailed account.

Table 8 Experience of physician affecting their personal experiences with a clinical pharmacist

S.No	Variable	Experience	Strongly Agree	Agree	Disagree	Strongly Disagree	P-value
1.	Pharmacists are a reliable source of general drug information	< 5	54 (32.1)	93 (55.4)	14 (8.3)	7 (4.2)	0.00
		5-10	8 (11.1)	60 (83.3)	4 (5.6)	0 (0)	
		>10	8 (21.1)	21 (55.3)	9 (23.7)	0 (0)	
2.	Pharmacists are a reliable source of clinical drug information	< 5	37 (22)	100 (59.5)	25 (14.9)	6 (3.6)	0.028
		5-10	6 (8.3)	55 (76.4)	9 (12.5)	2 (2.8)	
		>10	6 (15.8)	21 (55.3)	11 (28.9)	0 (0)	
3.	Pharmacists routinely counsel my patients regarding the safe and appropriate use of their medications	< 5	8 (4.8)	78 (76.4)	69 (41.1)	13 (7.7)	0.072
		5-10	4 (5.6)	45 (62.5)	21 (29.2)	2 (2.8)	
		>10	0 (0)	23 (60.5)	15 (39.5)	0 (0)	
4.	Pharmacists routinely inform me if they discover clinical problems with my prescriptions'	< 5	26 (15.5)	83 (49.4)	44 (26.9)	15 (8.9)	0.004
		5-10	24 (33.3)	38 (52.8)	8 (11.1)	2 (2.8)	
		>10	8 (21.1)	21 (55.3)	9 (23.7)	0 (0)	
5.	Pharmacists routinely inform me about more cost-effective alternatives to the drugs	< 5	16 (9.5)	58 (34.5)	75 (44.6)	19 (11.3)	0.067
		5-10	4 (5.6)	34 (47.2)	31 (43.1)	3 (4.2)	
		>10	4 (10.5)	12 (31.6)	22 (57.9)	0 (0)	
6.	Pharmacists frequently ask me to clarify for them the drug therapy objectives.	< 5	6 (3.6)	91 (54.2)	55 (32.7)	16 (9.5)	0.000
		5-10	0 (0)	22 (30.6)	48 (66.7)	2 (2.8)	
		>10	0 (0)	22 (65.8)	13 (34.2)	0 (0)	
7.	Pharmacists appear willing to take personal responsibility for resolving any drug-related problems they discover	< 5	19 (11.3)	57 (33.9)	73 (43.5)	19 (11.3)	0.00
		5-10	0 (0)	44 (61.1)	19 (26.4)	9 (12.5)	
		>10	2 (5.3)	14 (36.8)	11 (28.9)	11 (28.9)	
8.	I am willing to in-corporate the pharmacotherapy for the patient with consultation of the pharmacist	< 5	21 (12.5)	98 (58.3)	26 (15.5)	23 (13.7)	0.029
		5-10	0 (0)	55 (76.4)	8 (11.)	9 (12.5)	
		>10	2 (5.3)	23 (60.5)	6 (15.8)	7 (18.4)	

DISCUSSION AND CONCLUSION

The economic aspects of the participation of the clinical pharmacist in the healthcare team undoubtedly influenced many health care professions with a solution to queries associated with the drug and its dosage forms, regimens, frequency etc.[2, 3] According to the results extracted from this survey concerning the demographic aspect of physician shown in table 1 it is found that majority of the physicians were under the age of 30 years out of which females were more in number than the males as described in table 2. The percentage of physicians graduated from private institutions was greater than from public sector health care institutes. Also large segment of the physicians that responded to the survey was currently practicing in general hospitals in which a slightly higher percentage of residents and general physicians were found than that of consultants. As the ages of the respondents less

than 30 years and work experience less than 5 years were common in the results, it can be assumed that this time period was adequate to experience the role of a clinical pharmacist within their general practice.

Clinical pharmacist's interaction with physician runs side by side in their daily practice which surely is a healthy tactic in order to transact the knowledge and eradicate adverse effects and certain complications regarding drugs information illustrated in table no 3. An infelicitous result obtained that says the interaction of physician and a clinical pharmacist take place rarely or never displayed in table no 2 which is quite unhealthy to the norm which a health system based on.[2, 4]

This practice is commonly seen in the hospitals located in Karachi where physicians especially consultants takes a complete charge of a patient, neglecting the role and knowledge of pharmacist especially clinical pharmacist because of their so many years of experience which makes them a kind of dominant authority and on top of the food chain. [6-9] Rest of the interaction was due to drug dosage and availability queries from the pharmacy in which a physician is slightly unaware. Surprisingly, physicians do not interact with clinical pharmacists about drug-drug interaction which as a matter of fact is the most occurring episode above all either in general or specialized hospitals. Also, certain queries about drug alternatives, side effects are one of the reasons of interaction between physicians and pharmacists which is less in number. From here one can predict that majority of the physicians in Karachi hospitals do not concern clinical pharmacists about the drug related side effects and drug interactions as the percentage of both these queries only asked by 4 to 4.5% of physicians.[10]

Expectation from a clinical pharmacist is always been high from other health care professionals especially physician which is why the results illustrated in table no 4 also tells the same thing. 91% of physician working in a private hospitals accept the truth that a clinical pharmacist should take personal responsibility for resolving any drug-related problems out of which 52.6% are general physician and 66% of residents, here also the expectation from consultants seems to be quite low about 29.8%. The ratio of strongly disagree is highest in the public sector hospitals where mostly consultants denied the accountability of the clinical pharmacist to take this responsibility of resolving any drug related problems.

The knowledge based expectations from a clinical pharmacist becomes quite high, as shown in table 7

that reveals that 82.6% of physicians from public hospitals wants a clinical pharmacist to be knowledgeable drug therapy expert, also 49% physician from private hospitals agree on the same aspect. It is a regular and apparent job of a clinical pharmacist to assist the patients in selecting appropriate medications even if they are not from the prescription; this is because of they are equipped with knowledge about drug related problems. The response to this question was that the majority of the physicians from both public and private hospitals tend to disagree on this issue while less than half agreed. It is may be due to various reasons amongst which a prominent one seems to be related with their ownership on a patient profile/ case. 47.6% of consultants, 17.5 % of residents and 15.5 % of physicians strongly disagree on the same case where clinical pharmacist is asked to assist their patients about selecting the appropriate nonprescription drugs, this question also deviates from the survey with a probability value (P value = 0.40). Educating the patients regarding the safe and sound use of drugs is something physicians seems to be so conscious about, which is why they seemed to strongly agree or agree on the area where they are asked whether clinical pharmacists should be responsible for this solely or not, 86.9% of consultants agreed on this issue so do the 59.8% of general physicians.

In private hospitals out of 151 physicians 91 agree on giving this responsibility to the clinical pharmacists whereas 89 physicians out of 121 in public sector hospitals agreed on the same thing. The expectation of the interaction of clinical pharmacists and physicians seems acceptable when it was found out that majority of the physician wants a clinical pharmacist to be available for consultation when they are on a clinical round, 57.75 of residents seems to agree to this because of their perpetual rounds in the hospitals on each day. While consultants responded on the same issue to a very less extent (16.7% agree). This is where we concluded that a greater number of physicians have high expectations from clinical pharmacists.

In order to know about the experience of the physician with the pharmacist and their drug based knowledge, some questions were asked revealing overwhelming results. The physicians were asked if they agree that a clinical pharmacist is a reliable source of general drug information or not, on which greater number of physicians agree (61.8% of private hospitals and 63.6% from public sector hospitals). The statistical P value came along with an accepting value i.e. (P value = 0.014).

Astonishingly, 63 out of 84 consultants agree (58.8% residents and 55.7% GP's). It is also noted that these physicians were with work experience less than 5 years or between 5 to 10 years, and 29 out 38 respondents agreeing were the ones with more than 10 year experience.

This point is clearly noticeable that physicians are accepting the fact that clinical pharmacists have greater expertise about clinical drugs and they are the reliable source of clinical drug information, resulting a positive response from a large number of physician from private hospitals (68.8%) with (56.2%) of public sector hospital physicians.

An optimum era of experience is sufficient for a physician to realize the importance of a clinical pharmacists intervention as 55 out of 72 physicians with 5-10 years' experience agree that pharmacist are the reliable source of clinical drug information. The point where statistics report *(P value)* seems to falter is that whether a physician would prefer a clinical pharmacist to routinely counsel their patients regarding the safe and appropriate use of their medications. The general practice in many hospitals of Karachi, Pakistan has shown that majority of the physicians would not prefer this change; whereas only some consultants and general physicians seem to agree. [10]

Another part of the result reveals the exact situation that a pharmacist is meant to be in a hospital. Clinical pharmacists should routinely inform physicians if they discover clinical problems with the prescriptions. About 80% of physicians from private hospitals agree that allows a clinical pharmacist to intervene in patient medication profiles. 57.1% of consultants agree while 56.7% of residents and 40.2% of general physicians disagree on the respected sight. These findings also portray that physicians having more than 10 years' experience are ready for a clinical pharmacist to assist in the prescriptions for the errors. Pharmacist knows about drugs than anyone else in health care profession which is why they know the cost effective drugs having same potency and clinical effect.[3,11]

The physicians were asked if they are willing that pharmacists routinely inform them about more cost-effective alternatives to the drugs. In private hospitals 77 out of 151 disagree while 67 agreed, this is because the years of experience, the chart showing physician with respected years of experience value clearly reveals that physicians having greater than 10 years' experience disagree while the physicians with 5-10 years' experience agree (not strongly). It can be concluded that the experienced chose expensive medications first in order to refrain from compromising the patient's health upon cost effectiveness. [12, 13]

SUPPORTING INFORMATION
Information about the authors

NK is a Master's research student and KM is an academician at Department of Pharmacy, Health and Well Being, Faculty of Applied Sciences, University of Sunderland, England. AA is a Master's research student at Department of Pharmacy, Health and Well Being, Faculty of Applied Sciences, University of Sunderland, England and Assistant Professor at Department of Pharmacy Practice, Faculty of Pharmacy, Ziauddin University in Karachi, Pakistan. SS is a pharmacy student at Faculty of Pharmacy, Ziauddin University in Karachi, Pakistan.

Author's Contributions

NK conceived the idea and wrote the introduction with AA and SS, conducted a literature review with AA and collected the data with AA and SS, AA designed the study with NK and carried out the data analysis and formulated the methods and results. SS assisted in introduction, wrote the abstract and discussed and concluded the study with AA and NK. AA carried out the final editing of the manuscript with NK. The whole work was carried out under the guidance of KM. KM refined the research objectives and assisted in method formulation and data analysis.
AA = Atta Abbas, NK = Nabeel Khan, KM= Ken McGarry, SS = Sadaf Shahid

Conflict of interests

The authors declare no conflict of interests exists.

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