Original Article

Perceptions and expectations of health care providers towards clinical pharmacy services at a tertiary cancer centre in Qatar

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Abstract

Background: Clinical pharmacy services started in 2009 at the National Center for Cancer Care and Research, Qatar. Clinical pharmacy services was established to provide comprehensive prescription of drug management and support, and consulting services to build clinically efficient and cost-effective pharmacy program.

Aim: To determine perceptions and expectations of healthcare providers toward the clinical pharmacy services at the National Center for Cancer Care and Research.

Methods: A cross-sectional survey of healthcare providers was conducted from January to May 2018. A self-administered electronic/paper survey containing four domains assessing healthcare providers' perceptions and expectations towards clinical pharmacy services, perceived barriers to clinical pharmacist role and suggested area for improvement was sent to 375 healthcare providers including physicians, operational pharmacists, nurses and dietitians.

Results: The response rate was 112/375. Most of the healthcare providers (74%) perceived the increasing interest in clinical pharmacy services. Also, they expected (1) providing consultations regarding appropriate medication choices (82%); (2) providing information about medication availability and shortages (82%); (3) assisting in the prescribing of cost-effective drugs by providing pharmacogenomics information routinely (75%) and (4) Participating actively in research activities (74%). Overall, healthcare providers have a high level of trust in the clinical pharmacists' abilities ($P < 0.01$). Nurses were less appreciative ($P < 0.002$) of the positive role of clinical pharmacists in direct patient care as compared to both physicians and pharmacists (64.2%, 90% and 95.7%, respectively).

Conclusion: This study revealed a positive attitude towards the role of clinical pharmacists by healthcare providers at National Center for Cancer Care and Research. However, there is an area of improvement by empowering with privilege and staffing, elevating the awareness and expansion in the ambulatory care settings.

Introduction

The clinical pharmacy movement began at the University of Michigan and University of Kentucky in the 1960s,[1] since then several studies worldwide and in the region on pharmacist–physician relationships have proven that direct patient care is still dominated by the physician and that pharmacist

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involvement in the decision making is still dependent on the physician. However, physicians consider pharmacists as knowledgeable drug-therapy experts, and they are positively receptive to several clinical services provided by the pharmacist with some reservations.[2–7] Studies have proved that a better collaboration between healthcare providers and pharmacists has led to safer, more effective and less costly drug therapies.[8–10]

In 2011, a study conducted by Zidane et al.[10] in our institute, which aimed to investigate the physicians' perceptions and expectations from their experiences with the pharmacists at Hamad Medical Corporation (HMC), the largest governmental healthcare organization in Qatar, found that physicians were comfortable working with pharmacists and had high expectations of pharmacists in performing their duties. However, physicians reported a poor experience with clinical pharmacists, who infrequently informed them about the effectiveness of alternative drugs, patients experiencing problems with prescribed medications, and who took personal responsibility to resolve any drug-related problem.[10.]To the best of our knowledge, this is the first and maybe the only study to be conducted on the practice of oncology/hematology clinical pharmacy in Qatar, and little is known about how the clinical pharmacy service is accepted by other healthcare providers especially physicians and nurses.

Methodology

Ethical considerations and approval

This study is considered a low or minimal risk study. Ethical approval from HMC Institutional Review Board (IRB) was obtained prior to the start of data collection (RP 17188/17). All the information obtained from the participants were kept confidential and reported as group data with no personal identity. An informed consent was obtained from all participants in the form of a covering letter attached to the questionnaire. The covering letter explained the nature of the study and contained a statement notifying the participant that by completing the questionnaire, they agree to be part of the study. Furthermore, all data that have been obtained were anonymous. All data were kept secured with restricted access to the principal investigator.

Study setting

This study was conducted at the National Center for Cancer Care and Research (NCCCR), which is a member of HMC. Data collection and analysis took place in the same center.

NCCCR is a 65-bed hospital serving as the premier cancer center in Qatar for the management of hematology conditions and malignancies, oncology malignancies as well as providing palliative and supportive care services.

Study design and participants

This study is a cross-sectional questionnaire-based study. It was designed to prospectively determine the perceptions and expectations of healthcare providers (HCPs), namely; physicians, Hospital pharmacists (non-clinical), dieticians and nurses (including different roles) towards the clinical pharmacy services in the hospital.

Eligibility criteria

All HCPs (physicians, hospital pharmacists (non-clinical), dieticians and nurses (including different roles)) at NCCCR were eligible to participate in the study.

Study sample and sampling technique

The study survey was distributed via a web-based link to 375 HCPs working at NCCCR except clinical pharmacists with the aim to reach a response rate of 60%. It is worth mentioning that NCCCR occupies a total of 375 HCPs.

The secretaries of the following departments were contacted, and the total number of each department staff was initially determined as follows: hospital pharmacists (excluding clinical pharmacists): $n = 46$, physicians: $n = 56$, nurses: $n = 269$, and dieticians: $n = 4$. All these 375 have worked/interacted with clinical pharmacists.

It was planned to close the survey when population responses reach 60% or after the elapse of 4-week duration of opening the survey. The data analysis took place right after collecting the survey.

Survey instrument development and implementation

We used a validated survey that was obtained from previous qualitative interviews with healthcare providers in the hospital and the extant literature that have been published in the Arab region and China. We incorporated minor modifications (with the permission of the authors).[10–16] Based on the literature of similar studies with the same research questions in the Gulf region and worldwide, the questionnaire was created in four domains in addition to participant's demographics:

Domain – 1 intended to measure the expectations of HCPs from the clinical pharmacy services at NCCCR.
Domain – 2 intended to measure the perceptions of HCPs towards the clinical pharmacy services.

Domain – 3 intended to obtain the perceived barriers that can hinder clinical pharmacist's role.

Domain – 4 concentrated on areas of improvement regarding clinical pharmacy services at NCCCR.

Content validity was undertaken by the project research members who have experience with survey development. Based on that, some changes were made. Then, the questionnaire was piloted using a sample of 10 healthcare providers from different specialties (four physicians, three nurses, one dietitian, and two hospital pharmacists) in the hospital in order to determine clarity, readability, and comprehensiveness of all questionnaire items. The piloted responders were given the same time limit and same introductory instructions. Comments regarding allotted timing, understanding of the survey questions, instructions and clarity of the survey questions were asked. Based on responses, few modifications to the draft were made before creating the final online version.

Data analysis

Categorical and continuous values were expressed as frequency (percentage) and mean ± SD or median and interquartile range (IQR), as appropriate. Descriptive statistics were used to summarize demographics of the participants. Pictorial presentations of the key results were made using appropriate statistical graphs. All *P*-values presented were two-tailed, and values of < 0.05 were considered statistically significant.

Data were entered and analyzed using the IBM Statistical Package for Social Sciences (SPSS), version 22. Quantitative data between the two and above independent groups were analyzed using unpaired '*t*-' and Mann–Whitney *U*-tests, as appropriate. Additionally, Likert scale items were expressed in median and IQR. Chi-square test was used to determine significance of differences among the study groups. The results were presented with the associated 95% confidence interval. The level of significance was set a priori at $P < 0.05$.

Results

HCPs' demographic characteristics

Out of the 375 HCPs at NCCCR – Qatar, who received the online link of the survey, a total of 112 responded with a response rate of "30%." As shown in Table 1, more than half of the participants were nurses ($n = 52$, 46%), followed by physicians ($n = 30$, 27%). The majority were females ($n = 75$, 67%). Approximately 52% had a bachelor's degree in their filed. Almost 58% have > 10 years of work experience and 69% have been practicing at NCCCR-HMC for more than five years. The majority of the participants received their degree qualification from Asia and Middle East countries (42.9% and 28.6%, respectively), while about 11.6 % obtained their qualifications from Qatar.

HCPs' perceptions toward clinical pharmacy services at NCCCR

HCPs showed positive perception towards the CPS at NCCCR (summarized in Table 2). The interest in clinical pharmacy profession in Qatar was statistically significant ($P = 0.002$) among HCPs with an agreement percentage of 95.7% for pharmacists, 90 % for physicians and 64.2% for nurses.

In addition, high percentage of agreement was noted among HCPs with regards to the ability of clinical pharmacists to perform medication counseling efficiently and counselling patients about the use of chemotherapeutic agents.

HCPs' expectations regarding clinical pharmacy services at NCCCR

HCPs expressed major expectations from CPS at NCCCR (summarized in Table 3). The highly rated expectations were as follows: (1) provide consultations regarding appropriate medication choices (82%); (2) provide information about medication availability and shortages (82%); (3) assist in the prescribing of cost-effective drugs by providing pharmacogenomics information routinely (75%) and (4) participate actively in research activities (74%).

The difference between the HCPs groups was statistically significant for the following statement: 'Providing a consultation regarding alternative medication choices $P = 0.017$'.

'Providing information about medication availability and shortages $P = 0.015$' and 'Participating in research activities $P = 0.002$', where the percentage agreement was higher for physicians than pharmacists than nursing respondents, respectively.

While for this statement 'Assisting in the prescribing of cost-effective drugs by providing pharmacogenomics information routinely $P = 0.027$'; physicians and hospital pharmacists showed almost the same percentage of agreement and it was higher than nursing respondents.

In addition, respondents reported other expectations from CPs pertaining to their ability to counter-sign orders, adjusting chemotherapy orders under physician supervision, ensuring completeness and review of discharge medications, providing further education to family members and caregivers, providing updates to the team about newly FDA approved medications, availability of hotline for drug-related questions and availability in all hospital units and during evening and night shifts.

Table 1. Demographics and participant characteristics (N = 112).

Parameters	n (%)
Gender	
Male	37 (33)
Female	75 (67)
Role	
Senior Consultant/Consultant Physician	10 (8.9)
Specialist/Clinical Fellow Physician	17 (15.2)
Resident	3 (2.7)
Senior Hospital Pharmacist/ Hospital Pharmacist	17 (15.5)
Senior Pharmacy Technician/Pharmacy Technician	5 (4.5)
Clinical Nurse Specialist	2 (1.8)
Head Nurse/In-Charge Nurse/Staff Nurse	50 (44.6)
Dietician	1 (0.9)
Others (case managers, patient pathway coordinators)	7 (6.3)
Highest level of education	
Doctorate degree	7 (6.3)
Master's degree	25 (22.3)
Bachelor degree	58 (51.8)
Others (diploma, board certified)	21 (18.8)
Years of work experience in the field (year)	
0–5	11 (9.8)
6–10	36 (32.1)
11–15	25 (22.3)
16–20	21 (18.8)
>20	19 (17)
Number of years working at NCCCR-Qatar (year)	
0–5	35 (31.3)
6–10	32 (28.6)
11–15	42 (37.5)
16–20	3 (2.7)
Country where the participant obtained his/her highest qualifications	
Qatar	13 (11.6)
Middle East	32 (28.6)
Europe	4 (3.6)
North America (USA, Canada)	2 (1.8)
Asia	48 (42.9)
Others	13 (11.6)

NCCCR = National Center for Cancer Care and Research.

Perceived barriers

Along with high perceptions and expectation from CPS role, HCPs appreciated some barriers that can hinder the extension of the CPS role in patients care (as shown in Table 4).

HCPs believed that the specific responsibilities of CPs are not clearly defined and that they are unable to judge the knowledge and level of skills of CPs. HCPs also appreciated that the effect of CPS involvement in other tasks may interrupt the continuity of patient care. On the other hand, the majority of HCPs denied low level of trust in the clinical pharmacist's abilities and unaccessibility of CPs when needed as barriers to CPS role.

Respondents suggested additional barriers affecting the clinical pharmacists' role, such as shortage of staff, overloading with tasks or other responsibilities affecting daily attending to rounds, communication skills with patients and staff in some cases, language barrier for non-English and non-Arabic speaking patients, duty rotation and having no fixed clinical pharmacist in each unit.

Table 2. Perceptions of healthcare providers at NCCCR towards clinical pharmacy services (N = 112).

Statements	n (%)					Median (IQR)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
A clinical pharmacist is more helpful when they are located in the ward/clinic as opposed to having to call them	1 (0.9)	2 (1.8)	13 (11.6)	43 (38.4)	53 (47.3)	4 (1)
It is helpful when a clinical pharmacist checks orders before they are carried out	0	0	9 (8)	43 (38.4)	60 (53.6)	5 (1)
A clinical pharmacist can improve the quality of patient care in a hospital setting	0	0	8 (7.1)	45 (40.2)	59 (52.7)	5 (1)
A clinical pharmacist is a valuable patient educator	0	1 (0.9)	5 (4.5)	45 (40.2)	61 (54.5)	5 (1)
A clinical pharmacist is an integral part of the medical team	0	0	3 (2.7)	50 (44.6)	59 (52.7)	5 (1)
A clinical pharmacist can perform medication counseling efficiently	0	0	9 (8)	43 (38.4)	60 (53.6)	5 (1)
A clinical pharmacist in a clinical ward team is a requirement for hospital accreditation	0	0	14 (12.5)	54 (48.2)	44 (39.3)	4 (1)
A clinical pharmacist is able to minimize medication errors	0	2 (1.8)	13 (11.6)	49 (43.8)	48 (42.9)	4 (1)
There is increasing interest in clinical pharmacy as a profession in Qatar	0	0	23 (20.5)	46 (41.1)	43 (38.4)	4 (1)
A clinical pharmacist has the required skills to deal with cancer patients	0	0	23 (20.5)	46 (41.1)	43 (38.4)	4 (1)
A clinical pharmacist is knowledgeable in chemotherapy dosing and dosage adjustments	0	0	11 (9.8)	62 (55.4)	39 (34.8)	4 (1)
A clinical pharmacist is capable of counseling patients about use of chemotherapeutic agents	0	0	8 (7.1)	53 (47.3)	51 (45.5)	4 (1)

NCCCR = National Center for Cancer Care and Research; IQR = interquartile range.
Missing data = 1.

Areas of improvement for clinical pharmacy services

It was majorly believed among HCPs that the areas/ services that maximize CPS contribution to patient care were review of medication errors (84.8%), patient education (82.1) and attending clinical rounds (82.1%) (shown in Figure 1). In addition to that, respondents recommended additional points to improve the clinical pharmacist's role to meet/fulfill patient care, such as physical availability in chemotherapy daycare unit, reviewing of patients one day prior admission to chemotherapy daycare unit, running pharmacist-led clinics, providing chemotherapy education to newly diagnosed patients during clinic visits, review and verification of medication orders, increasing number of staff (especially American oncology pharmacy board certified), being available during weekends, more focus on providing patient education (especially at discharge) and clinical pharmacists deserve more support and further privileges.

Differences among groups

Among the three main domains, perceptions, expectations and barriers related to clinical pharmacy services at NCCCR, statements that were statistically significant are shown in Table 5.

Discussion

Clinical pharmacy service was developed over the past few years and clinical pharmacists became more active members in the healthcare team. However, the clinical pharmacist's role is not yet well recognized among some HCPs and the public. Therefore, understanding the perceptions of HCPs and their expectations of clinical pharmacy services is of great importance to improve the service.

This study revealed a positive perception of HCPs towards the clinical pharmacist's role; most of the percentages of 'strongly agree' and 'agree' in Table 2 were above 75%. The majority of participants agreed that

Table 3. Expectations of HCPs at NCCCR towards clinical pharmacy services ($N = 112$).

Statements	n (%)					Median (IQR)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Clinical pharmacists' support of team' decisions						
Participating in daily clinical rounds	1 (0.9)	2 (1.8)	10 (8.9)	47 (42)	52 (46.4)	4 (1)
Providing information about medication efficacy and safety	0	1 (0.9)	8 (7.1)	44 (39.3)	59 (52.7)	5 (1)
Providing evidence-based drug therapy recommendations when requested	0	1 (0.9)	11 (9.8)	50 (44.6)	50 (44.6)	4 (1)
Providing a consultation regarding alternative medication choices	0	1 (0.9)	14 (12.5)	53 (47.3)	44 (39.3)	4 (1)
Selecting appropriate general dosing regimens	0	0	9 (8)	55 (49.1)	48 (42.9)	4 (1)
Providing advice on special disease state modified dosing (e.g. renal, hepatic)	0	1 (0.9)	8 (7.1)	53 (47.3)	50 (44.6)	4 (1)
Providing information about drug interactions	0	1 (0.9)	8 (7.1)	45 (40.2)	58 (51.8)	5 (1)
Monitoring outcomes of drug therapy and treatment plans	0	4 (3.6)	19 (17)	50 (44.6)	39 (34.8)	4 (1)
Provide consultation regarding appropriate and safe chemotherapy dosing regimens and dosage adjustment	0	0	8 (7.1)	57 (50.9)	47 (42)	4 (1)
Counselling patients about the safe and appropriate use of chemotherapeutic agents	0	0	9 (8)	55 (49.1)	48 (42.9)	4 (1)
Detection and management of chemotherapy-related side effects	0	2 (1.8)	15 (13.4)	53 (47.3)	42 (37.5)	4 (1)
Monitoring adverse drug reactions in hospitalized patients	0	3 (2.7)	14 (12.5)	58 (51.8)	37 (33)	4 (2)
Monitoring adverse drug reactions in discharged patients	0	7 (6.3)	24 (21.4)	42 (37.5)	30 (26.8)	4 (2)
Assessing patient adherence to drug therapy	0	7 (6.3)	24 (21.4)	44 (39.3)	37 (33)	4 (1)
Providing consultation about medication use in pregnancy	0	2 (1.8)	23 (20.5)	47 (42)	40 (35.7)	4 (1)
Assessing a patient's contraindication to different chemotherapeutic agents	0	1 (0.9)	13 (11.6)	56 (50)	42 (37.5)	4 (1)
Resolving drug-therapy related problems	0	2 (1.8)	15 (13.4)	57 (50.9)	38 (33.9)	4 (1)
Clinical pharmacists' auxiliary work						
Providing information about medication availability and shortages	3 (2.7)	3 (2.7)	19 (17)	41 (36.6)	46 (41.1)	4 (1)
Assisting in the prescribing of cost-effective drugs by providing pharmacogenomics information routinely	0	5 (4.5)	18 (16.1)	51 (45.5)	38 (33.9)	4 (1)
Making medication decisions based on medication pricing	1 (0.9)	6 (5.4)	29 (25.9)	43 (38.4)	33 (29.5)	4 (2)
Participating in research activities	0	0	24 (21.4)	51 (45.5)	37 (33)	4 (1)
Performing medication reconciliation for hospitalized patients[a]	0	3 (2.7)	19 (17)	49 (43.8)	40 (35.7)	4 (1)
Providing education to other healthcare providers	1 (0.9)	3 (2.7)	10 (17.9)	56 (50)	32 (28.6)	4 (1)
Managing outpatient clinics for the management of chemotherapy selected side effects	2 (1.8)	3 (2.7)	29 (25.9)	50 (44.6)	28 (25)	4 (1.75)
Managing the anti-coagulation clinic	3 (2.7)	3 (2.7)	40 (35.7)	41 (36.6)	25 (22.3)	4 (1)
Managing the anemia clinic	3 (2.7)	4 (3.6)	45 (40.2)	40 (35.7)	20 (17.9)	4 (1)

Table 3. Continued

Statements	n (%)					Median (IQR)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Clinical pharmacists' independent decision-making activities						
Checking chemotherapy prescriptions and protocols to help prevent medication errors	2 (1.8)	0	8 (7.1)	44 (39.3)	58 (51.8)	5 (1)
Managing the dosing of certain drugs based on therapeutic drug monitoring	1 (0.9)	1 (0.9)	9 (8)	46 (41.1)	55 (49.1)	4 (1)
Managing the dosing of total parenteral nutrition (TPN)	1 (0.9)	1 (0.9)	20 (17.9)	46 (41.1)	44 (39.3)	4 (1)

HCP = healthcare provider; NCCCR = National Center for Cancer Care and Research; IQR = interquartile ranges.
Missing data = 1.

Table 4. Perceived barriers that can hinder a clinical pharmacist's role (N = 112).

Statements	n (%)					Median (IQR)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
The specific responsibilities of a clinical pharmacist are not clearly defined.	2 (1.9)	18 (16.7)	30 (7.8)	41 (38)	17 (15.7)	4 (1)
Physicians and other healthcare members are unaware of the benefits of having a clinical pharmacist on their team	7 (6.5)	40 (37)	23 (21.3)	29 (26.9)	9 (8.3)	3 (2)
Healthcare members are unable to judge the knowledge and level of skills of the clinical pharmacist	3 (2.8)	33 (30.6)	31 (28.7)	33 (30.6)	8 (7.1)	3 (2)
Healthcare members have a low level of trust in the clinical pharmacist's abilities	13 (12)	53 (49.1)	19 (17.6)	17 (15.7)	6 (5.6)	2 (1)
The clinical pharmacist does not have the proper communication skills needed for interaction with other healthcare providers	10 (9.3)	36 (33.3)	30 (27.8)	24 (22.2)	8 (7.4)	3 (2)
Healthcare professionals have no prior experience of working with a clinical pharmacist	10 (9.3)	37 (34.3)	27 (25)	26 (24.1)	8 (7.4)	3 (2)
Involvement of clinical pharmacists in other tasks interrupt the continuity of patient care	8 (7.4)	31 (28.7)	24 (22.2)	31 (28.7)	14 (13)	3 (2)
Clinical pharmacists are not accessible when needed	10 (9.3)	43 (39.8)	26 (24.1)	20 (18.5)	9 (8.3)	3 (2)

IQR = interquartile ranges.
Missing data = 4.

clinical pharmacist is an integral part of the medical team and can improve the quality of patient care in the hospital setting. Moreover, most of participants agreed that clinical pharmacists are able to minimize medication errors and thought that it is helpful if he/she checks orders before they are carried out. This finding is in agreement with previous studies that demonstrated appreciation of the role of clinical pharmacists as part of medical team and their ability to improve quality of medical care.[13,16]

Contrary to some previous studies where participants had lower acceptance of the pharmacist's role as patient educator[16,17]; most of the participants in our study thought that the clinical pharmacist is a valuable patient educator; as he/she can perform medication counselling efficiently and is capable of counseling patients about the use of chemotherapeutic agents.

With regards to expectations, our study shows that HCPs appear to have high expectations of clinical pharmacists as knowledgeable drug therapy experts.
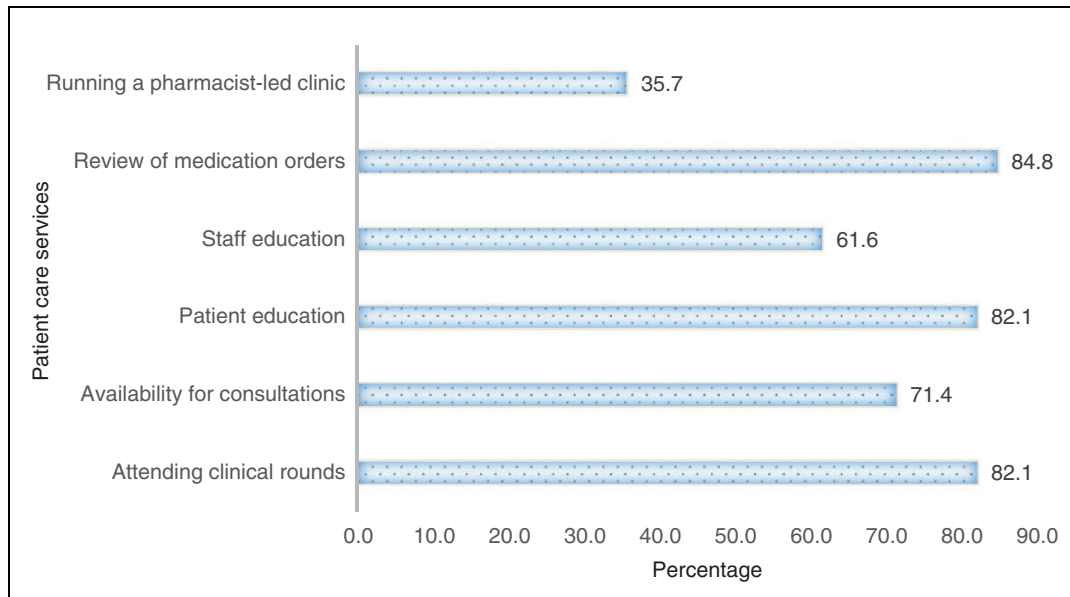
Figure 1. Services that are important in maximizing a clinical pharmacist's contribution to patient care.

More participants expected clinical pharmacists to provide information about medication efficacy and safety and selecting appropriate dosing regimens. Similarly, the majority agreed on their ability to monitor outcomes of drug therapy and adverse drug reactions in hospitalized patients. This is consistent with regional studies conducted in UAE, Jordan and Saudi Arabia.[12,18,19]

Expectations were slightly lower in terms of ability to monitor adverse drug reactions in discharged patients and assessing patients' adherence to drug therapy. In contrast to previous studies that showed reluctance of physicians to accept pharmacist's role in any prescribing aspect,[6,11,20,21] most HCPs in our study agreed on the important role of clinical pharmacist in managing the dosing of certain drugs based on therapeutic drug monitoring as well as parenteral nutrition dosing. This opinion may be attributed to the continuous contribution of NCCCR clinical pharmacists in those areas, which increased the belief in their knowledge.

However, the expectations of HCPs were less strong regarding the pharmacist-managed clinics; possible explanation to this finding is the unavailability of clinical pharmacists in NCCCR clinics and so lack of interaction between them and physicians in this context. Moreover, pharmacist-led clinics were recently introduced in Qatar and the Middle East, therefore maybe less acknowledged by HCPs.

One of the major barriers reported by the majority of respondents is the unclear definition of the clinical pharmacist roles and responsibilities. About a third of the respondents were unaware of the benefits that

clinical pharmacists can provide to the healthcare team. The same results came from other studies in the Gulf region which mentioned that one of the barriers is lacking of a clear policy to identify the clinical pharmacy roles.[22]

Most of the respondents (61%) disagreed with the statement that 'healthcare members have a low level of trust in the clinical pharmacists' abilities,' which reflects a good perception of the clinical pharmacy services. Although some studies revealed very positive perceptions towards clinical pharmacists and the clinical pharmacy services, the interesting thing is that pharmacists thought that the physicians' perceptions about clinical pharmacists' roles are suboptimal. This might reflect a low level of confidence and fear from the new roles and responsibilities of the clinical pharmacists.[22,23]

About one-third of the respondents agreed that HCPs have no previous experience of working with clinical pharmacists, while about 45% disagreed with the statement and the answer of 25% came as neutral.

The diversity of answers might be explained by the fact that respondents obtained their education, training, and experience from different places; physicians who were trained in north America are exposed to more advanced clinical pharmacy service and this might reflect their positive perceptions and high expectations from the pharmacy services.[22]

Results of the questionnaire revealed some areas of improvement for the clinical pharmacy services. The majority of respondents mentioned that pharmacists' involvement in reviewing medication orders for appropriateness is the most important area of improvement. Respondents also highlighted the importance of

Table 5. Statements were statistically significant differences were identified among groups (N = 106).

Statements	Groups	n (%) Strongly disagree /disagree	Neutral	Strongly agree/agree	P-value
Perception: There is increasing interest in clinical pharmacy as a profession in Qatar	Nursing	0	19 (35.8)	34 (64.2)	0.002
	Pharmacy	0	1 (4.3)	22 (95.7)	
	Physicians	0	3 (10)	27 (90)	
Expectations: Providing a consultation regarding alternative medication choices	Nursing	1 (1.9)	12 (22.6)	40 (75.5)	0.017
	Pharmacy	0	1 (4.3)	22 (95.7)	
	Physicians	0	0	30 (100)	
Expectations: Providing information about medication availability and shortages	Nursing	4 (7.5)	13 (24.5)	36 (67.9)	0.015
	Pharmacy	2 (8.7)	5 (21.7)	16 (69.6)	
	Physicians	0	0	30 (100)	
Expectations: Assisting in the prescribing of cost-effective drugs by providing pharmacogenomics information routinely	Nursing	1 (1.9)	13 (24.5)	39 (73.6)	0.027
	Pharmacy	3 (13)	3 (13)	17 (73.9)	
	Physicians	1 (3.3)	1 (3.3)	28 (93.3)	
Expectations: Participating in research activities	Nursing	0	19 (35.8)	34 (64.2)	0.002
	Pharmacy	0	2 (8.7)	21 (91.3)	
	Physicians	0	2 (6.7)	28 (93.3)	
Barriers: Physicians and other healthcare members are unaware of the benefits of having a clinical pharmacist on their team	Nursing	22 (44.9)	13 (26.5)	14 (28.6)	0.038
	Pharmacy	5 (21.7)	5 (21.7)	13 (56.5)	
	Physicians	18 (60)	4 (13.3)	8 (26.7)	
Barriers: Healthcare members are unable to judge the knowledge and level of skills of the clinical pharmacist	Nursing	13 (26.5)	18 (36.7)	18 (36.7)	0.007
	Pharmacy	3 (13)	8 (34.8)	12 (52.2)	
	Physicians	17 (56.7)	4 (13.3)	9 (30)	
Barriers: Healthcare members have low trust in the clinical pharmacist's abilities[b]	Nursing	31 (58.5)	10 (18.9)	8 (15.1)	0.01
	Pharmacy	6 (26.1)	7 (30.4)	10 (43.5)	
	Physicians	25 (83.3)	1 (3.3)	4 (13.3)	
Barriers: The clinical pharmacist does not have the proper communication skills needed for interaction with other healthcare providers	Nursing	20 (40.8)	16 (32.7)	13 (26.5)	0.013
	Pharmacy	5 (21.7)	7 (30.4)	11 (47.8)	
	Physicians	20 (66.7)	4 (13.3)	6 (20)	
Barriers: Healthcare professionals have no prior experience of working with a clinical pharmacist[b]	Nursing	24 (45.3)	12 (22.6)	13 (24.5)	0.014
	Pharmacy	4 (17.4)	6 (26.1)	13 (56.5)	
	Physicians	17 (56.7)	7 (23.3)	6 (20)	
Barriers: Involvement of clinical pharmacists in other tasks interrupt the continuity of patient care	Nursing	21 (42.9)	13 (26.5)	15 (30.6)	0.047
	Pharmacy	5 (21.7)	7 (30.4)	11 (47.8)	
	Physicians	11 (36.7)	2 (6.7)	17 (56.7)	
Barriers: Clinical pharmacists are not accessible when needed	Nursing	20 (37.7)	14 (26.4)	15 (28.3)	0.045
	Pharmacy	9 (39.1)	5 (21.7)	9 (39.1)	
	Physicians	21 (70)	5 (16.7)	4 (13.3)	

[a]Six participants were eliminated as they do not fit to be with one of the three groups.
[b]Missing data = 4.

involving clinical pharmacists in providing education either to the staff or the patients and their families as well as attending clinical rounds and providing consultation to HCPs. In fact, the responses are in alliance with the international development of the clinical pharmacy services and the role of pharmacists from the traditional compounding and dispensing to be more focused on direct patient care and providing education and consultations.[24]

The pharmacist-led clinic model is known in North America and the UK, either to provide a counseling and education services to the patients and families or

to utilize the pharmacists' skills as independent/ supplementary prescribers for dose optimization in coordination with the multidisciplinary team.

Study limitations

The study has several limitations. Using a self-completed questionnaire for data collection means that the results depend on the respondents' interpretation of the questionnaire items which could be dissimilar between different respondents. There is possibility of social response bias that could tempt the respondents to give a socially desirable response rather than what they really think or believe, given the fact that the study was conducted in a single treatment center. However, assurance of confidentiality by using an online survey may have helped to reduce the social desirability bias. Despite sending multiple reminders, the percentage of non-respondents could be another limitation that might affect the generalizability of the findings. However, 112 responders are representing a good number with a good representation of different HCPs at NCCCR. The response to this study was voluntary; it is therefore possible that HCPs who were interested in pharmacy services and have more interaction with clinical pharmacists were more likely to fill in the questionnaire, and the opposite might be correct too. Finally, the data came from a representative sample of one cancer center in one city with limited number of beds, which might limit the generalizability of our results.

Although many studies explored physicians' perceptions about the role and impact of clinical pharmacists, to the best of our knowledge, this paper was the first one to explore HCPs perceptions of the role of clinical pharmacist with regards to cancer care and chemotherapy. The majority of participants thought that clinical pharmacists are knowledgeable in chemotherapy dosing and dosage adjustments and expected them to provide consultation regarding appropriate and safe chemotherapy dosing regimens as well as detection and management of chemotherapy-related side effects. This highlights the extended role of clinical pharmacists in more specialized areas.

Conclusion

Healthcare professionals in the cancer centre in Qatar, NCCCR, have a positive perception towards CPS and the role of clinical pharmacists in appropriate therapeutic management and patients' education and significant role in optimized dosing of chemotherapy. However, there's an area of improvement that is related to empowering the clinical service with privilege and staffing and elevating the awareness towards the expansion of the service in the ambulatory settings.

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