ORIGINAL ARTICLE

Knowledge, Perception and Expectation of Nurses towards Pharmacists' Roles in Pharmaceutical Care: A Pilot Study in Private Outpatient Haemodialysis Centres in Kuantan, Malaysia.

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Abstract

Introduction: The aim of this study was to assess and evaluate nurses' knowledge, perception, and expectation regarding the potential roles of pharmacists in pharmaceutical care at private outpatient haemodialysis centres.
Methods: A descriptive, cross-sectional study was conducted among nurses who were working in private outpatient haemodialysis centres in Kuantan. Sociodemographic data and parameters measuring nurses' knowledge, perception, and expectation on the potential roles of pharmacist in the centres, were collected using a validated questionnaire distributed by a researcher at the study settings. The nurses gave their consent to participate, and a researcher was present at the centre to assist them fill in the questionnaire. Data was analysed using SPSS.
Results: A total of 63 nurses from 11 centres participated in this study. The results showed that 52.4% of them had adequate knowledge on the potential roles of pharmacist in outpatient dialysis centres. The majority of the nurses agreed or strongly agreed (84%) that pharmacists are reliable as the source for general and clinical drug information. At least 50.8% of them expected pharmacists to resolve drug-related problems at dialysis centre.
Conclusion: This study found that the nurses expressed adequate level of knowledge, perception, and expectation on the potential roles of pharmacists in outpatient dialysis centres. A majority of them had a positive perception on pharmacists in expanding pharmaceutical services in the outpatient dialysis centres.
Keywords: *Knowledge, perception, expectation, nurse, pharmacist's role, outpatient dialysis centre.*

Introduction

Haemodialysis, which is usually initiated in patients with end-stage renal disease (ESRD) is one of the modalities available under renal replacement therapy alongside continuous ambulatory peritoneal dialysis and renal transplant.[1] In haemodialysis, patients spend approximately three to four hours, three times a week attach to a dialysis machine, and this treatment is usually performed at outpatient haemodialysis centre.[2] Generally, patients with ESRD who are on dialysis have multiple comorbidities and are taking on average 10 to 12 medications daily.[3]

In Malaysia, government haemodialysis centres are very limited as public hospitals are overrun by a great number of patients with chronic kidney disease and thus, able to accept a limited number of patients for maintenance dialysis.[4] Besides, kidney transplant candidates or those with reversible acute injuries have limited access to these hospitals.[5] Consequently, such limitation has created a demand for haemodialysis services in the private sector as most of the patients opt for private outpatient haemodialysis centres.[6] Furthermore, these centres are run heavily by nurses, with the majority of them having a post-basic certificate in renal nursing, whereby they undergo a six-month competency training in providing safe and skilful nursing care to ESRD patients.

Nurses are mostly occupied with daily tasks related to the dialysis process, and they usually do not have dedicated time to verify patients' medication adherence[7] or to educate the patients about medication use.[8] Poor medication adherence is common among dialysis patients[9] and identifying it can be challenging for nurses since it requires frequent reviewing of patients' medications and verifying prescription filling records.[10] Besides, haemodialysis patients are more likely to encounter pharmaceutical care issues due to their various comorbidities, complex medication regimen, frequent medication adjustments on dialysis versus non-dialysis days, restricted lifestyles, and high daily intake of medications.[11,12,13] Pharmaceutical care issues in dialysis-dependent patients have been shown to impose a substantial economic burden.[14]

An extended role for pharmacists in private outpatient haemodialysis centre may be needed to improve dialysis care to cope with the increasing burden of renal diseases in Malaysian population. Unfortunately, to date, pharmacists are not available on-site to help nephrologists, physicians, and nurses manage the pharmaceutical care of dialysis patients. Furthermore, this is a setting where access to patients is privileged since each dialysis session lasts for three to four hours, which allows an ideal opportunity for a pharmacist to provide specialised pharmaceutical care to patients. As nurses play a significant role in caring for dialysis patients, determining their knowledge on pharmaceutical care aspect of patient is significant in investigating the status of pharmacy practice in these centres. Gaining insight into nurses' perceptions and expectations towards potential roles of a pharmacist can be considered essential to implement pharmaceutical services in this setting successfully. Therefore, this study was aimed to evaluate nurses' knowledge of pharmaceutical care aspect of patient; and to determine their perception and expectation regarding the potential roles of pharmacist in private outpatient haemodialysis centres.

Methods

Study design

A descriptive, cross-sectional study was conducted among the nurses who are working in participating private outpatient haemodialysis centres in Kuantan, Pahang, Malaysia. Due to geographical proximity, ease of accessibility, time constraints, and lack of funding, a convenient sampling technique was used for this study. The study protocol was reviewed and approved by IIUM Research Ethics Committee (IIUM/504/14/11/2/IREC 836).

Permission from the authorities of each haemodialysis centre was obtained prior to data collection. Nurses who agreed to participate and were available during the study provided written consent before filling in the questionnaire. A researcher was present at the dialysis centres during the whole process of answering the questionnaire to assist the nurses. Nurses who were on maternity leave and unavailable during data collection period were excluded from the study. High level of confidentiality and anonymity was maintained throughout the study.

Study material

The questionnaire was formatted as a paper-based survey and was divided into four sections. The first part was about sociodemographic information of the participants. The second part evaluated the knowledge of the respondents on pharmaceutical care aspect of patient. The third part assessed the perception of the nurses on pharmacy profession in general. The fourth part included statements on the expectation of respondents about potential roles of pharmacist in private outpatient haemodialysis centres.

The questionnaire was designed by a thorough literature review of related published studies [15-23] of which, the questions were shortlisted to be included in the final questionnaire. The preliminary version of the questionnaire was then sent to seven experts for content and face-validity. Three of them were the academic members of the pharmacy practice department and the remaining were that of nursing department in International Islamic University Malaysia (IIUM). Several amendments were made in the questionnaire following the recommendations of the experts.

Statistical data and analysis

Data collected from the questionnaire were entered into SPSS version 21. Statistical significance was accepted at P value of < 0.05. Scoring of the knowledge part was determined by giving one (1) point for each correct answer and zero (0) for wrong answer or no response. The total knowledge score that ranged from zero to 33, were calculated by adding-up the scores for each question in the section. For perception and expectation parts, the respondents were asked to indicate the level of agreement for each statement using a 5-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree. The possible scores for both perception and expectation sections ranged from zero to 20 and from zero to 30, respectively.

Median split method was chosen as it helps data analyses to be conducted and interpreted readily. [24] The coding scheme chosen for this method was "all values on the continuous variable below the median are low and all values at or above the median are high". [25] Therefore, respondents with total score on each of knowledge, perception, or expectation sections below the median were categorised as having inadequate knowledge, negative perception, or low expectation. Conversely, those with a total score of equal or greater than the median was categorised as having adequate knowledge, positive perception, or high expectation.

Results

A total of 63 nurses from 11 private haemodialysis centres agreed to participate in this pilot study. The demographic data of the respondents were summarised in Table 1. The majority of the respondents of this study were female (92.1%), diploma holder (98.4%), and had completed the post-basic training in renal nursing course (66.7%). The respondents represented a wide range of ages and experiences. The number of respondents in the age category of 21–30 years old was the highest (71.4%). Only 3.2% of the respondents were above 50 years old. The mean age was 30.52 ± 6.68 years old. On average, the respondents have been working as nurses at the dialysis centre for 5.27 ± 4.26 years.

The complete responses of the nurses towards the questions regarding pharmaceutical care aspect of patient in private outpatient haemodialysis centre were presented in Table 2. When asked about

pharmaceutical care, almost all of the respondents (n=62) acknowledged identification of pharmaceutical care issues as one of its objectives. Most of them (n=60) viewed pharmacist as the most appropriate profession to perform medication reconciliation. The majority of them (63.5%) were not aware that over-the-counter (OTC) medications, herbal preparations, and supplements should be included in the list of medication for medication reconciliation. Over half of those surveyed did not know that drug dosage adjustment is based on the creatinine clearance (CrCl) of patients (57.1%, n=36) and the dosage of drugs eliminated by liver should not be adjusted based on patients' kidney function (73.0%, n=46). Some of the nurses could not identify that non-steroidal anti-inflammatory drugs (NSAIDs) such as naproxen (50.8%, n=32), ibuprofen (47.6%, n=30), and mefenamic acid (41.3%, n=26) are not advisable to be taken by dialysis patients for pain management.

Figure 1 described the complete responses of nurses' perception towards pharmacist profession. The majority of the nurses (84.1%) agreed or strongly agreed that a pharmacist is reliable as the source for general and clinical drug information. Nearly three-fourths of them (69.8%) believed that a pharmacist should routinely counsel patients regarding the safe use of their medications. When asked about whether a pharmacist should monitor the pharmacotherapeutic regimens and plans, only a small number of them (1.6%) disagreed on it. A high proportion of nurses (68.2%) agreed or strongly agreed that a pharmacist should exclusively supply, control, and dispense drugs.

The complete responses of nurses' expectation towards the pharmacists' potential roles in private outpatient haemodialysis centre were displayed in Figure 2. It was observed that 71.4% of respondents expected a pharmacist to resolve any drug-related problem occurred. Almost all of the respondents (96.8%) agreed or strongly agreed that a pharmacist should provide drug information to other healthcare professionals. Nearly one-fifth of them (17.5%) were neutral when asked whether they can receive help from a pharmacist in the drug administration procedure. More than half of them (65.1%) emphasised that the pharmacist should monitor patients' response to drug therapy. The majority of them (93.7%) appeared to have a high expectation of a pharmacist in educating and counselling patients on the safe use of medications. Over half of them (76.2%) agreed that a pharmacist should assist patients in selecting appropriate non-prescription medications.

Overall, the present study showed that 52.4% of nurses possessed adequate knowledge of pharmaceutical care aspect of patient in private outpatient haemodialysis centre. About three-fifths of the respondents (57.1%) had a positive perception towards pharmacist profession. It is revealed that 61.9% of the respondents had high expectation towards pharmacist's potential roles in the private outpatient haemodialysis centre. Table 3 represents the distribution of nurses according to their level of knowledge, perception, and expectation.

Discussion

Over the last decade, pharmacist's roles have been expanding in pharmaceutical care. The number of pharmacists providing services beyond the traditional role of dispensing medications has flourished to include services such as medication management reviews, chronic disease management, and smoking cessation programme. In Malaysia, pharmacists seem to be dedicated to uphold the profession by adopting the pharmaceutical care concept in providing more patient-oriented services. Nevertheless, the provision of such extended services at the moment is voluntary and is not standardised across practice.[26] In the context of Malaysian private outpatient haemodialysis centres, the profession is still struggling to establish its name as pharmacist's involvement is very limited. Similarly, countries including Australia, Portugal, and United States faced the same situation as

there was an inadequate participation of pharmacists in this setting.[19,23,27,28]

It is acknowledged that Pharmaceutical Services Division from Ministry of Health Malaysia has broadened its services to dialysis patients in public sector by the establishment of Dialysis Medication Therapy Adherence Clinic (MTAC). Deployment of pharmacist to this facility can bring positive impact to the patients as well as provide continuity of pharmaceutical care.[29] The presence, involvement, and value of pharmacist should ideally be felt and accepted in the outpatient setting as well to provide effective pharmaceutical care services to dialysis patients. As most of the daily duties were performed by nurses in the outpatient dialysis centres, it is best if both pharmacists and nurses can synergise their expertise and work together.

Most of the nurses responded correctly to statements related to pharmaceutical care and medication review. As polypharmacy is highly prevalent in dialysis patients,[30] the contribution of pharmacist performing medication review could be crucial to resolve any drug record discrepancies and to identify any drug-related problems, which the latter serves as one of the major functions of pharmaceutical care.[31] However, majority of them were not aware that over-the counter (OTC) medications, herbal preparations, and supplement should be included in the list for medication reconciliation. This finding is consistent with a review[32] which stated that medication list by dialysis nurses lacks accurate information on medications taken at home and prescribed outside of dialysis centre, OTC as well as herbal medications. It was also stated that most dialysis centres lack effective systems for medication reconciliation. Due to the complicated nature of medication therapy in dialysis patients, a multidisciplinary approach comprises pharmacist, nephrologist, physician, and nurses within dialysis centre can be suggested, where each profession should have an assigned duty in the medication reconciliation process.

It can be observed that some of the nurses could not respond correctly to questions related to drug dosage adjustment. Pharmaceutical care issues may be minimised with the vigilance of pharmacists in proper monitoring of the need for dosage adjustment.[8] It is quite alarming to observe nearly half of the nurses in this study did not know that non-steroidal anti-inflammatory drugs (NSAIDs) should be avoided in haemodialysis patients. Pharmacists are in an instrumental position to educate dialysis patients about avoiding NSAIDs as they have been shown to negatively impact residual renal function and may cause sodium retention, hypertension, and gastrointestinal toxicity.[1] Dialysis patients are more susceptible to fluid and electrolyte changes, thus, may put them at a greater risk of harm from NSAIDs use than the general population.[33-35]

Most of the respondents significantly agreed that pharmacist is reliable as source of general and clinical drug information. This finding is supported by studies conducted in United States of America[36] and Pakistan[17] where nurses seek for pharmacists' advice and feel that pharmacists can improve patients' safety and quality of life. Moreover, majority of them perceived that pharmacist should routinely counsel patients regarding the safe use of their medications. This result is in agreement with an earlier qualitative study [37] which mentioned that this role is clear and well understood by nurses. Over half of those surveyed concurred that pharmacist should monitor pharmacotherapeutic regimens and plans. The expertise of pharmacists in pharmacotherapy can aid in improving treatment response and reducing adverse events in dialysis patients. [38] Almost three-fourths of the respondents significantly agreed that pharmacists exclusively supply, control, and dispense drugs. This finding is in accordance with a previous study [39] where a comparable fraction of nurses expressed similar notion, which can easily predict the current pharmacist's role in dispensing medications.

Majority of nurses in this study expected pharmacist to resolve any drug-related problems occurred. Similar finding was found in a previous study [17] where nurses expect pharmacist to take personal responsibility in resolving drug-related

problems. Nurses mostly believed that pharmacists are well suited for this role possibly because they are trained in pharmacology and pharmacotherapy of different diseases including kidney diseases. [40] A significant numbers of nurses in this study expected pharmacists to provide drug information to other healthcare professionals, help them in drug administration procedure, monitor patients' response to drug therapy, and to educate as well as counsel patients on the safe use of medicines. This is very promising in the light of extending the roles of pharmacists in dialysis centres and the emergence of good pharmacy practice (GPP) concept, where all the aforementioned roles have been recommended in well-established guidelines on GPP.[41] Furthermore, three-fourths of the respondents significantly expected pharmacist to assist patients in selecting appropriate non-prescription medications. This finding is reassuring considering the increasing availability of these medications in Malaysia, which may encourage patients to believe that there is a drug treatment for every illness. [42] Besides, the use of such medications may increase the risk of self-medication being undertaken when medical aid should have been sought. Therefore, this finding can be a step forward to strengthen the potential advisory role of pharmacist in dialysis centre.

The results reported in this study should be considered within the context of its limitations. The respondents were selected based on a convenience sample, representing nurses from outpatient private haemodialysis centres in Kuantan, which may not be generalised for nurses out of this district. However, despite of these limitations, this pilot study can provide valuable nurses' insight on pharmaceutical care and the current situation about potential roles of pharmacists in pharmaceutical care at private outpatient haemodialysis centres. These can be used to further investigate in bigger nurses' population in the future.

Conclusion

It appears that in this study, more than half of the nurses possessed adequate knowledge of pharmaceutical care aspect of patient in private outpatient haemodialysis centre. The level of nurses' knowledge towards this matter is appreciable, and this study identified positive perception and high expectation regarding the potential roles of pharmacists in the setting.

Conflict of interest

The authors declared to have no conflicts of interest to disclose.

Table 1. Demographic characteristics of the participated Nurses

Demographic Characteristics	**Category**	**N = 63**	
		n	**%**
Gender	Male	5	7.9
	Female	58	92.1
Age (Years)	20-30	45	71.4
	31-40	13	20.6
	41-50	3	4.8
	> 50	2	3.2
Education Background	Diploma	62	98.4
	Degree	1	1.6
Completion of Post-Basic Training in Renal Nursing	Yes	42	66.7
	No	21	33.3
Year of Experience as a Nurse in Dialysis Centre (Years)	< 1-4	30	47.6
	5-8	26	41.3
	9-12	4	6.3
	> 12	3	4.8

Table 2. Nurses' Knowledge Regarding Pharmaceutical Care Aspect of Patient in Private Haemodialysis Centre

Questions/Statements	Correct responses		Incorrect responses	
	n	%	n	%
1(a). The identification of drug-related problem is one of the objectives of pharmaceutical care.	62	98.4	1	1.6
1(b). The provision of pharmaceutical care has benefited end-stage renal disease patients economically and clinically.	59	93.7	4	6.3
1(c). The referrals to physicians or nurses are important outcomes of pharmaceutical care practice.	60	95.2	3	4.8
2(a). Pharmacist is the most appropriate profession to be responsible for medication reconciliation.	60	95.2	3	4.8
2(b). Over-the-counter medications, herbal preparations, and supplements should not be included in the list of medications.	23	36.5	40	63.5
3(a). Reviewing medication profile allows all medication information to be obtained including medications that were not prescribed during their hospital follow-up.	58	92.1	5	7.9
3(b). Provision of patients' education increases the patients' knowledge on medication and subsequently, improves their adherence.	60	95.2	3	4.8
3(c). Counselling on dialysis compliance, diet, and medications improves the awareness of patients' conditions.	62	98.4	1	1.6
4(a). Drug dosage adjustment is based on creatinine clearance of patients.	27	42.9	36	57.1
4(b). Drug dosage adjustment is not the prime aspect of pharmacotherapy in the patients.	34	54.0	29	46.0
4(c). Dosage of drugs eliminated by liver should be adjusted based on the patients' kidney function.	17	27.0	46	73.0
5. Activities that can be performed by pharmacists to dialysis patients for education and counselling purposes:				
(a) Assessment of compliance.	47	74.6	16	25.4
(b) Provision of medical and therapeutic information.	48	76.2	15	23.8
(c) Training regarding the self-administration of drugs.	63	100.0	0	0.0
(d) Counselling on the side effects and interaction of drugs.	63	100.0	0	0.0
6(a). Pharmacists are experts in recommending dosage adjustment in dialysis patients.	34	54.0	29	46.0
6(b). Pharmacists are experts in counselling dialysis patients on medication use.	60	95.2	3	4.8
6(c). Pharmacists are experts in drug-laboratory and drug-disease interactions.	59	93.7	4	6.3
6(d). Pharmacists are experts in diagnosing dialysis patients.	44	69.8	19	30.2
7(a). Non-adherence to prescribed medications is uncommon.	20	31.7	43	68.3
7(b). The drug regimens change quite frequently.	50	79.4	13	20.6
8. Managements indicated in dialysis patients:				
(a) Restriction of salt intake.	63	100.0	0	0.0
(b) Electrolytes management.	54	85.7	9	14.3
(c) Restriction of fluid intake.	63	100.0	0	0.0
(d) Anaemia management.	62	98.4	1	1.6
9(a). Majority of antihypertensives should be taken after dialysis.	48	76.2	15	23.8
9(b). It is advisable to take oral iron supplement with food.	36	57.1	27	42.9
9(c). Phosphate binders need to be chewed together with food.	62	98.4	1	1.6
9(d). Administration time for all types of insulin of various regimens is affected by dialysis.	9	14.3	54	85.7
10. Drugs which are advisable to be taken by dialysis patients experiencing pain:				
(a) Naproxen.	31	49.2	32	50.8
(b) Ibuprofen.	33	52.4	30	47.6
(c) Paracetamol.	63	100.0	0	0.0
(d) Mefenamic acid.	37	58.7	26	41.3

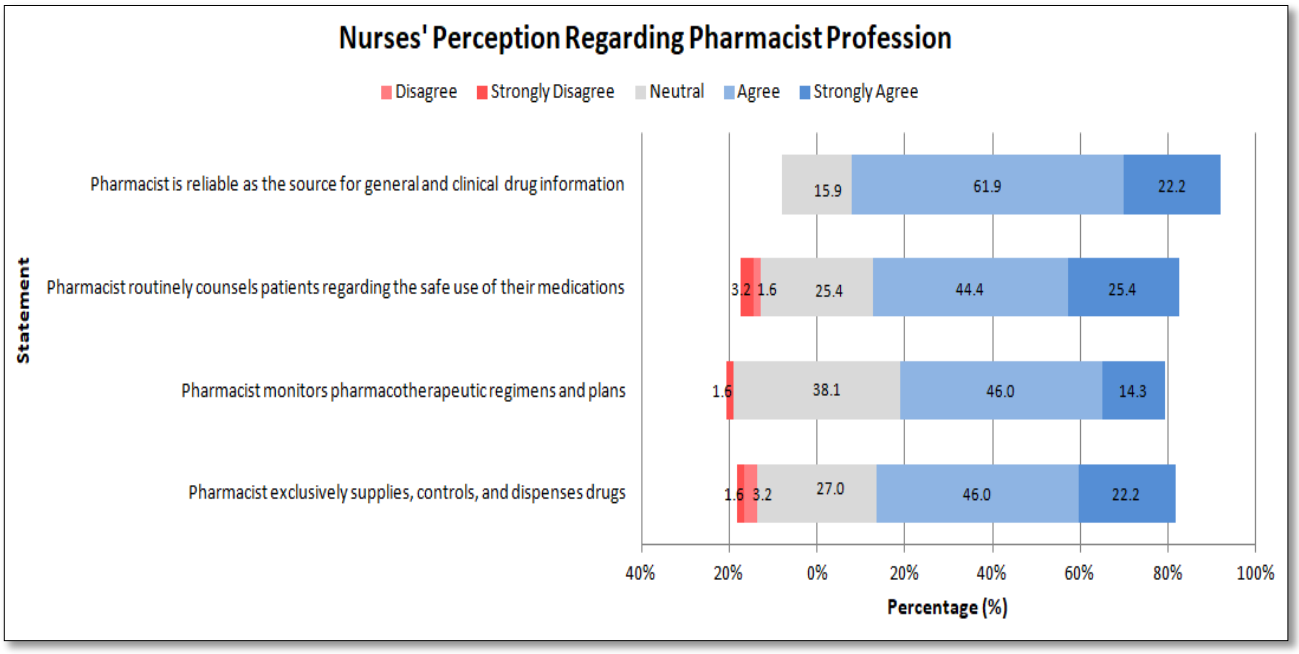

Figure 1. Nurses' Perception Regarding Pharmacist Profession

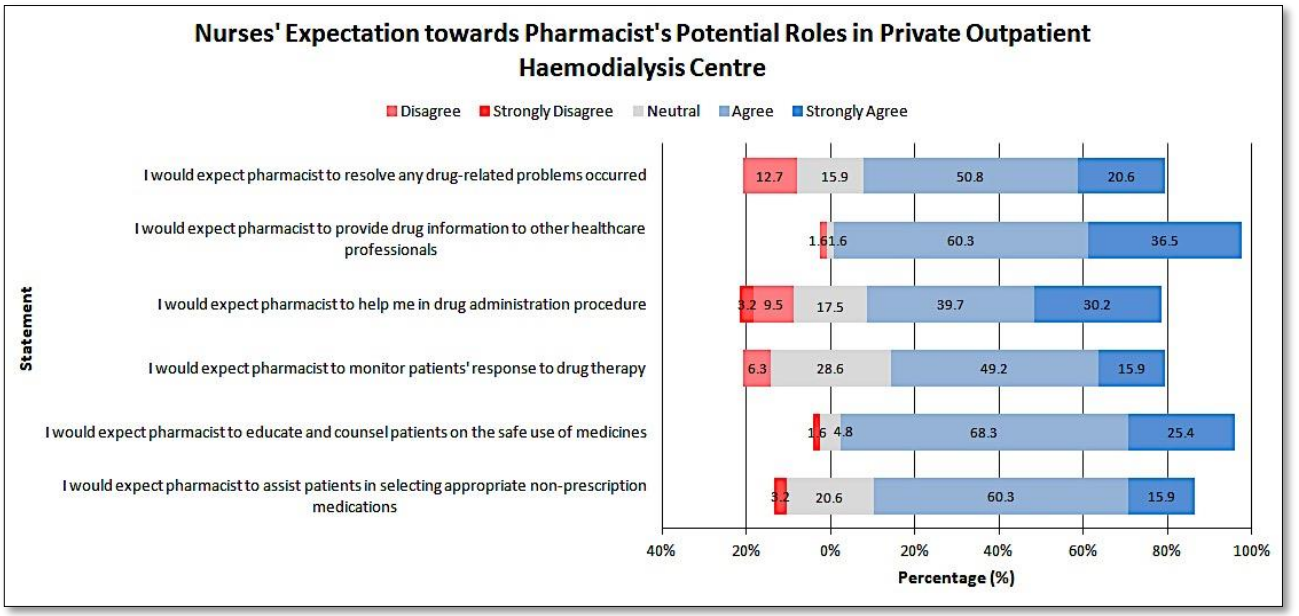

Figure 2. Nurses' Expectation towards Pharmacist's Potential Roles in Private Outpatient Haemodialysis Centre

Table 3. Distribution of Nurses According to Level of Knowledge, Perception, and Expectation

Domain	Minimum Total Score Obtained	Median Cut-off Point	Maximum Total Score Obtained	Categorisation Upper row (≥ Median) Lower row (< Median)	N = 63 n	 %
Knowledge	18	26	30	Adequate	33	52.4
				Inadequate	30	47.6
Perception	8	16	20	Positive	36	57.1
				Negative	27	42.9
Expectation	16	24	30	High	39	61.9
				Low	24	38.1

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