

Contextualising the Pharmacist Practicing Clinical Pharmacy in South Africa – Do we Practice What we Preach?

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Abstract

Background: The National Department of Health published their Quality Standards for Healthcare Establishments in South Africa and introduced the National Health Insurance (NHI), with the pilot phase that commenced in 2012. The system requires an adequate supply of pharmaceutical personnel and the direct involvement of clinical pharmacists throughout the medication-use process to ensure continuity of care, minimised risk with increasing improvement of patient outcomes. The study aimed to provide insight into the pressing issues of clinical pharmacy practice in South Africa, and sets out to contextualise the current profile of the pharmacist performing clinical functions.

Methods: The study used a quantitative, explorative, cross-sectional design. The population included pharmacists from private and public tertiary hospitals. A questionnaire was administered, using Typeform™. Ethics approval was obtained from relevant role-players. Categorical data were summarised using frequency counts and percentages; continuous data were summarised by mean values and standard deviations.

Results: The sample size included 70 pharmacists (private sector n=59; public sector n=11). Most participants hold a BPharm degree (64%; n=70). No statistical significance was found between participants in private and public practice. Most pharmacist agreed (32% (private); n=59) and strongly agreed (45% (public); n=11) to have sufficient training to perform pharmaceutical care. The majority respondents felt that interventions made by the pharmacist improved the rational use of medicine (47% (private); n=59; 55% (public); n=11), that pharmacist interventions influence prescribing patterns (42% (private); n=59; 64% (public); n=11) and reduce polypharmacy (41% (private); n=59; 55% (public); n=11). Clinical functions performed most are evaluation of prescriptions (private 90%; public 82%) while the top logistical function for private is daily ordering of medication (40.7%), and public checking of ward stock (36%).

Conclusion: Although not all pharmacists appointed in South Africa has completed the MPharm degree in clinical pharmacy, the pharmacists at ward level perform numerous clinical functions, even if only for a small part of their workday. This paper sets the way to standardise practices of clinical pharmacy in South Africa, with a reflection on the differences in practice in different institutions.

Introduction

In South Africa, there is a marked inequality to medicine access. The WHO states that in South African Health Care, the private sector accounts for 81% of healthcare spending of the gross GPP for health (8.5%), while only serving around 15% of the population. Private healthcare currently accounts for disproportionate availability of facilities as well as extreme misdistribution of pharmaceutical personnel between the private and public sector[1-2].

The worsening burden of infectious disease in Sub-Saharan Africa (including communicable diseases such as HIV and TB, malaria and lower respiratory infections) are leading causes of premature mortality. A rise in non-communicable diseases was also noted in South Africa in recent years, in line with global trends. Furthermore, like many other countries in Africa, South Africa faces a shortage of skilled health workers, including physicians, nurses, dentists and pharmacists. The shortage of key human resources is some of the challenges faced by the current healthcare system[3].

In 2011, the National Department of Health (NDoH) published their Quality Standards for Healthcare Establishments in South Africa, which describes the global development of quality improvement for healthcare facilities. The NDoH, also introduced the National Health Insurance (NHI) with the pilot phase that commenced in 2012[4]. The system will be dependent upon an adequate supply of pharmaceutical personnel[3]. The direct involvement of clinical pharmacists throughout the medication-use process, will ensure continuity of care, minimised risk and even reduced mortalities with an increasing improvement of patient outcomes[5]. Pharmacists are required to play a role in patient safety, clinical governance and care by reducing adverse events caused by medication or medication errors. According to the Quality Standards for Healthcare Establishments, pharmacists must also ensure that medicines are readily available to patients[6].

Although these functions are expected from pharmacists, South Africa has an estimated under-provision of pharmacists of around 60%, with only around 35% working in the institutional section[7]. This leads to a burden on institutional pharmacists to provide pharmacy-based functions like dispensing and procurement. It may also lead to suboptimal clinical care, leaving the pharmacist with minimal or no time to perform ward-based functions and suboptimal clinical care[8].

In developed countries like Europe and the United States clinical pharmacy is well established. Although countries in Africa like Kenya and Nigeria offer training to clinical pharmacists, clinical pharmacy workshops in South Africa started in the early 1980's as isolated workshops[9], after which it rapidly developed for practicing pharmacists, making South Africa the continent-leaders in clinical pharmacy. Globally, there are many differences in the way that pharmacists practice clinical pharmacy[10], and few hospitals provide patient-specific services that frees up a clinical pharmacist from distributive and dispensing responsibilities[5]. In South Africa, the climate in which clinical pharmacy is practiced is changing. Private hospital settings in South Africa have created posts for pharmacists, performing clinical oriented work, requiring a post-graduate degree in clinical pharmacy and preferably antimicrobial stewardship training. Pharmacists with postgraduate qualification in clinical pharmacy are limited, and private institutions make use of ward pharmacists to perform pharmaceutical care[11]. Although South Africa is continually developing and evaluating programmes to assess use of medicines in the country and monitor the care of patients[2], clinical pharmacy services across institutions cannot be generalised and requires further investigation.

The South African Pharmacy Council (SAPC) accepted the postgraduate curriculum that leads to specialist registration for clinical pharmacists, and postgraduate degree programmes with the aim to train clinical pharmacists are offered by universities[12]. However, it cannot be implemented until the registration of the specialisation is in place and accepted by the National Department of Health (NDoH). Unfortunately, no standardised required level of education for practice purposes for clinical pharmacists are in place, which leads to different levels of pharmaceutical care offered in different institutions.

The difference between ward pharmacy and clinical pharmacy as set out by the SAPC, lies in the involvement of the clinical pharmacist as a pharmaceutical partner in the multi professional health care team, as well as the role the clinical pharmacist must play in development and implementation of evidence based policies and procedures. The clinical pharmacist must also perform research and add to the academic community by publishing the research[13-14].

Aim Of The Study

To provide insight into the pressing issues of clinical pharmacy practice in South Africa, the paper sets out to contextualise the current profile of the pharmacists performing clinical functions as well as the different clinical functions performed in the public and private sector of the health care system.

Ethics approval

Ethics approval was obtained from the Sefako Makgatho Health Sciences University Research and Ethics committee (SMUREC) [number: SMREC/H/110/2015: PG], and consent to perform the study was obtained from the participating private healthcare groups as well as from the governmental research offices. Participation in the study was voluntary and consent was obtained. Participants' privacy was maintained throughout the study and all information were handled confidentially.

Key concepts

Educational background:

In this study, educational background is seen as the highest qualification of the participant relating to pharmacy.

Clinical Pharmacy:

can be defined as "*a health science specialty that embodies the application, by pharmacists, of the scientific principles of pharmacology, toxicology pharmacokinetics and therapeutics to the care of patients*" (ACCP)

Clinical Pharmacist:

registered pharmacist trained in clinical aspects of patient care.

Ward Pharmacist:

A registered pharmacist who becomes an integral and indispensable part of the professional health team of the hospital/institution.

Pharmaceutical Care:

originally defined by Hepler and Strand as "*the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life*".

Methods

Study design and duration

The study was an explorative, cross-sectional study, collecting quantitative data prospectively. The data collection period was three months.

Study population and sample

The study population included all pharmacists who are performing clinical pharmacy or rendering pharmaceutical care duties at ward level. The study population was identified purposively from a previous study[15] and included pharmacists from private as well as public tertiary hospitals.

Data collection instrument

A questionnaire was developed from the scope of practice of a clinical pharmacist as published by the SAPC[14] to describe the different functions the clinical pharmacist must perform, as well as from an article by Kaboli, et al,[16] describing the different pharmaceutical care functions.

The questionnaire was developed with the electronic platform Typeform™, with response options including tick-lists, drop down boxes and yes/no answers. Opinion questions used a Likert-scale to indicate the participant's level of agreement with a statement. The questionnaire was used to determine the level of education of the pharmacist performing pharmaceutical care, as well as identify the different functions that they perform at ward level.

The electronic platform Typeform™ was used to administer questionnaires and collect data. The e-mail with the link to the questionnaire was distributed by the researcher and included an information sheet explaining the nature of the research.

Data collection and analysis

This questionnaire provided information on the level of education of pharmacists rendering clinical pharmacy services, either as a clinical pharmacist or as ward pharmacist. Different functions ward pharmacists perform as part of their duties were identified. Data was collated on an Excel™ spreadsheet, and analysed quantitatively, to determine the number of pharmacists rendering pharmaceutical care, and the amount of time spent on these services.

Categorical data (e.g. demographic characteristics, qualifications, etc.) were summarised by frequency counts and percentage calculations with 95% confidence intervals. Continuous data (e.g. the years in practice and the time spend on ward activities) were summarised by mean values and standard deviations. Percentages for public and private sector participants were compared by the Fisher Exact test. Pearson and Spearman correlation coefficients and 95% confidence intervals were calculated as applicable. P-values <0.05 were considered significant. Where applicable Bonferroni corrections were applied to p-values. All statistical analyses were performed on SAS (SAS Institute Inc., Carey, NC, USA), Release 9.4.

Results

Participant enrolment and response rate

The sample size included 86 identified pharmacists from 130 hospitals, 72 (n=79) in the private sector and 14 (n=79) in the public sector. In the private sector, seven pharmacists resigned from the time of identification, thus the questionnaire was distributed to 65 pharmacists. Pharmacists were grouped according to geographic location and questionnaires were distributed electronically per province. A very good response rate for both the public and private sector was obtained; 59 (n=65; 88.61%) and 11 (n=14; 78.57%) respectively, resulting in an overall response rate of 88.61%. Figure 1 depicts the enrolment process and the study population as grouped geographically.

Demographic profile of pharmacists practicing clinical pharmacy

Female participants represented 87.14% (n=70) of the study population, while most participants (50%; n=70) were in the age group 31-40 years of age and hold a BPharm degree (64.28%; n=70). No statistical significance was found between demographic data of participants in the private sector and those in the public sector. More than half of pharmacists (54.29%; n=70) reported that they spend only 1-2 hours per day in the ward doing clinical pharmacy activities. The demographic data of the participants are depicted in Table 1.

Table 1
Demographic Profile of the participants

		Public	Private	Total	p-value*
Gender	Female:	9 (12.86%)	52 (74.29%)	61 (87.14%)	0.6249
	Male:	2 (2.86%)	7 (10.0%)	9 (12.86%)	
Age	20-30 year:	3 (4.29%)	12 (17.14%)	15 (21.43%)	0.1909
	31-40 year:	6 (8.57%)	29 (41.43%)	35 (50%)	
	41-50 year:	2 (2.86%)	4 (5.71%)	6 (8.57%)	
	Older:	0 (0%)	14 (20%)	14 (20%)	
Race	African:	6 (8.57%)	7 (10.0%)	13 (18.57%)	0.0004
	Asian:	3 (4.29%)	3 (4.29%)	6 (8.57%)	
	Caucasian:	2 (2.86%)	42 (60.0%)	44 (62.86%)	
	Coloured:	0 (0%)	3 (4.29%)	3 (4.29%)	
	Other:	0 (0%)	4 (5.71%)	4 (5.71%)	
Qualification	Dip Pharm:	0 (0%)	1 (1.43%)	1 (1.43%)	0.0143
	BPharm:	3 (4.29%)	42 (60.0%)	45 (64.28%)	
	MPharm/MSc(Med):	7 (10.0%)	14 (20.0%)	21 (30%)	
	PharmD/PhD:	1 (1.43%)	1 (1.43%)	2 (2.86%)	
Societies	PSSA:	6 (8.57%)	31 (44.29%)	37 (52.86%)	0.5347
	SAAHIP:	3 (4.29%)	14 (20.0%)	17 (24.28%)	
	SASOCP:	5 (7.14%)	33 (47.14%)	38 (54.29%)	
	Other:	0 (0%)	12 (17.14%)	12 (17.14%)	
Years' Experience	0-5 years:	3 (4.29%)	11 (15.71%)	14 (20.00%)	0.0798
	6-10 years:	2 (2.86%)	23 (32.86%)	25 (35.71%)	
	11-20 years:	5 (7.14%)	9 (12.86%)	14 (20 %)	
	More than 20 years:	1 (1.43%)	16 (22.86%)	17 (24.29 %)	
Years Clinical Experience	0-1 year:	3 (4.29%)	16 (22.86%)	19 (27.14%)	0.7194
	2-3 years:	6 (8.57%)	28 (40.0%)	34 (48.57%)	
	4-5 years:	2 (2.86%)	7 (10.0%)	9 (12.86%)	
	More than 5 years:	0 (0%)	8 (11.43%)	8 (11.43%)	
Hours spend in ward	1-2 hours:	9 (12.86%)	29 (41.43%)	38 (54.29%)	0.0891

3-4 hours:	0 (0%)	18 (25.71%)	18 (25.71%)
4-6 hours:	0 (0%)	4 (5.71%)	4 (5.71%)
7-8 hours:	2 (2.86%)	9 (12.86%)	10 (14.29%)

*Statistical significance were derived from using Fisher's Exact test

Perceptions of pharmacists regarding pharmaceutical care and educational background.

Most pharmacist in the private sector (32.2%; n=59) agreed and in the public sector strongly agreed (45.45%; n=11) that they have the necessary training to perform pharmaceutical care. The majority of respondents felt that interventions made by the pharmacist improved the rational use of medicine (47.46% in the private sector; n=59 and 54.55% in the public sector; n=11). They are of the opinion that their interventions can influence prescribing patterns in their institution (42.37% in the private sector; n=59 and 63.63% in the public sector; n=11) and that interventions may reduce polypharmacy (40.67% in the private sector; n=59 and 54.55% in the public sector; n=11). No statistical significance was detected between the opinions of pharmacists in the private and public sector. Table 2 depicts the perceptions of pharmacists in the private and public sectors as well as the statistical significance between the opinions of the two groups.

Table 2
Perceptions of Pharmacists

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		p-value*
	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	
Do you have the necessary training to do your work?	13 22.03%	5 45.45%	19 32.20%	2 18.18%	11 18.64%	1 9.09%	13 22.03%	1 9.09%	5 8.47%	0 0%	0.4206
Interventions made by the pharmacist improved the rational use of medicine	28 47.46%	6 54.55%	16 27.12%	2 18.18%	5 8.47%	0 0%	5 8.47%	1 9.09%	5 8.47%	2 18.18%	0.7651
Interventions made by the pharmacists can influence prescribing patterns	25 42.37%	7 63.63%	18 30.51%	1 9.09%	8 13.56%	1 9.09%	4 6.78%	0 0%	4 6.78%	2 18.18%	0.3026
Interventions made by the pharmacist can reduce the practice of polypharmacy	24 40.67%	6 54.55%	21 35.59%	3 27.27%	6 10.16%	0 0%	6 10.16%	0 0%	2 3.39%	2 18.18%	0.2380
*Statistical significance were derived from using the Fisher's Exact test											

As shown in Table 3, no statistical significance (p=0.662) could be found between the actual qualification held by participants and their opinion on whether they have the necessary qualification to perform clinical pharmacy functions. Participants who obtained a Master's degree are divided as five (n=21) strongly agreed that they have the necessary qualifications, while five disagreed.

Table 3
Opinion on Qualification compared to Qualification

Opinion: Do you have the necessary Qualification to perform clinical pharmacy functions?	BPharm**	MPharm/MSc(Med)	PharmD/PhD	Total	p-value*
Strongly Agree	11	5	1	17	p = 0.662
Agree	13	6		19	
Neutral	9	3		12	
Disagree	9	5		14	
Strongly Disagree	2	2	1	5	

* Statistical significance were derived from using Fisher's Exact test with Bonferoni corrections

** BPharm including enrolled for continued studies

Current practice of clinical pharmacy

Pharmacists indicated the type of functions they perform in the ward setting. The functions were separated into clinical functions, which included adverse drug reaction monitoring, evaluating prescriptions, checking medication safety, discussing medication related problems with prescribers, education to nursing staff, doctors and patients, medication reconciliation, ward rounds and therapeutic drug monitoring. The logistical functions included checking expiry dates of ward stock, cytotoxic admixing, daily ordering of medication and ordering of ward stock and scheduled drugs. The clinical function that is performed most is the checking and evaluation of prescriptions (private sector 89.9% and the public sector 81.8%) while the top logistical function for the private sector is daily ordering of medication (40.7%), while in the public sector it is the checking of ward stock and expiry dates (36.4%). The top six clinical functions, with a 95% confidence interval is depicted in Figure 2, and the top five logistical functions, with a 95% confidence interval is depicted in Figure 3. The differences between the private and public sector are indicated.

Discussion

In previous studies it was found that paper surveys achieved significantly higher (43.4% vs 43.4%33.7%) response rates compared to online surveys[17]. Reasons for this phenomenon was stated to include factors like complicated login procedures, trouble with web navigation and unclear instructions. The response rate in this study was very high, compared to those stated in literature, possibly because the population was identified from a previous study[15], purposively and a link to the questionnaire was provided via e-mail, which made the process easier. The questionnaire was also short with easy to answer questions and took less than 10 minutes to complete.

The majority of the participants were female, and in the age group 20-30 years, which is representative of the pharmacy community in South Africa. The SAPC reported that around 62% of the pharmacy workforce comprises of women and the greater part of pharmacists in South Africa are younger, with most pharmacists falling in the age group below 35 years[7]. The race of practicing pharmacists, especially in the private sector, is still predominantly Caucasian. According to the SAPC this follows the profile of pharmacists in South Africa, as 51% of actively practicing pharmacists in South Africa is white, compared to 20% Asian and 23% Black[7].

Both in the public and private sectors, with staff-shortages more pronounced in public than in private institutional sectors[7], the majority of pharmacists felt that their involvement in ward-based pharmaceutical care can improve the rational use of medication, influence prescribing practice and reduce polypharmacy in their different settings. Many studies around the world have been published to support this belief. The top clinical functions pharmacists spend time on include adverse drug reaction monitoring, evaluating prescriptions, checking medication safety, medication reconciliation, ward rounds and therapeutic drug monitoring. The role of clinical pharmacists in medication errors, adverse drug events, therapeutic drug monitoring and antimicrobial stewardship[18-23] have been described extensively, both internationally and nationally. Furthermore, the role of the pharmacist in speciality settings like critical care, neonatology, cardiology and infectious diseases has been described[24-27].

In this study, no differences were found in the opinions of pharmacists on pharmaceutical practice rendered regardless of their highest qualification. The Master's degree in Clinical Pharmacy offered by the Sefako Makgatho Health Sciences University (SMU), consist of a didactic modular component (two years) and a research component[12]. Many of the pharmacists participating in the study completed the modular component of their degree, but are still busy with the research component, hence did not obtain the degree yet. Differences between older and younger pharmacists, or pharmacists doing clinical work for longer were also insignificant, unlike a study done in Russia, where clinical pharmacy is also relatively new, and indicated that younger pharmacists (20-30 years old) do significantly fewer activities like prescription validation and evaluation of patient satisfaction than their older counterparts[28]. Pharmacists are performing a variety of functions at ward level, which include clinical functions as well as logistical functions.

Recommendation

A certification system for qualified clinical pharmacists needs to be put in place, resulting in dedicated posts for clinical pharmacists. This will result in a system where dedicated posts for clinical pharmacists will result in adequate time in the workday so that the clinical pharmacist may provide quality clinical services to patients.

Conclusion

To the knowledge of the researcher, this is the first study in South Africa, which sought to engage pharmacists in pharmaceutical practice-based research on a large scale. Many studies worldwide have shown the positive impact a clinical pharmacist can bring about in the healthcare setting. Although not all pharmacists appointed in South Africa have completed the MPharm degree in clinical pharmacy, the pharmacists performing clinical functions at ward level perform numerous clinical functions, even if they spend only a small part of their workday in the wards. Around 90% of pharmacists doing clinical work evaluate prescriptions for medication errors in the ward setting, and feel that by doing that they reduce medication errors and improve prescribing patterns in their standardise practices of clinical pharmacy in South Africa.

Declarations

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The study or manuscript was not funded.

Conflict of interest

The study was not funded and was part of a PhD study to improve the delivery of clinical pharmacy services in South Africa. The authors have disclosed that they do not have significant relationships or financial interests in any commercial companies related to this study or article.

Hospital Practice peer reviewers on this manuscript have no relevant financial relationships to disclose.

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Figures

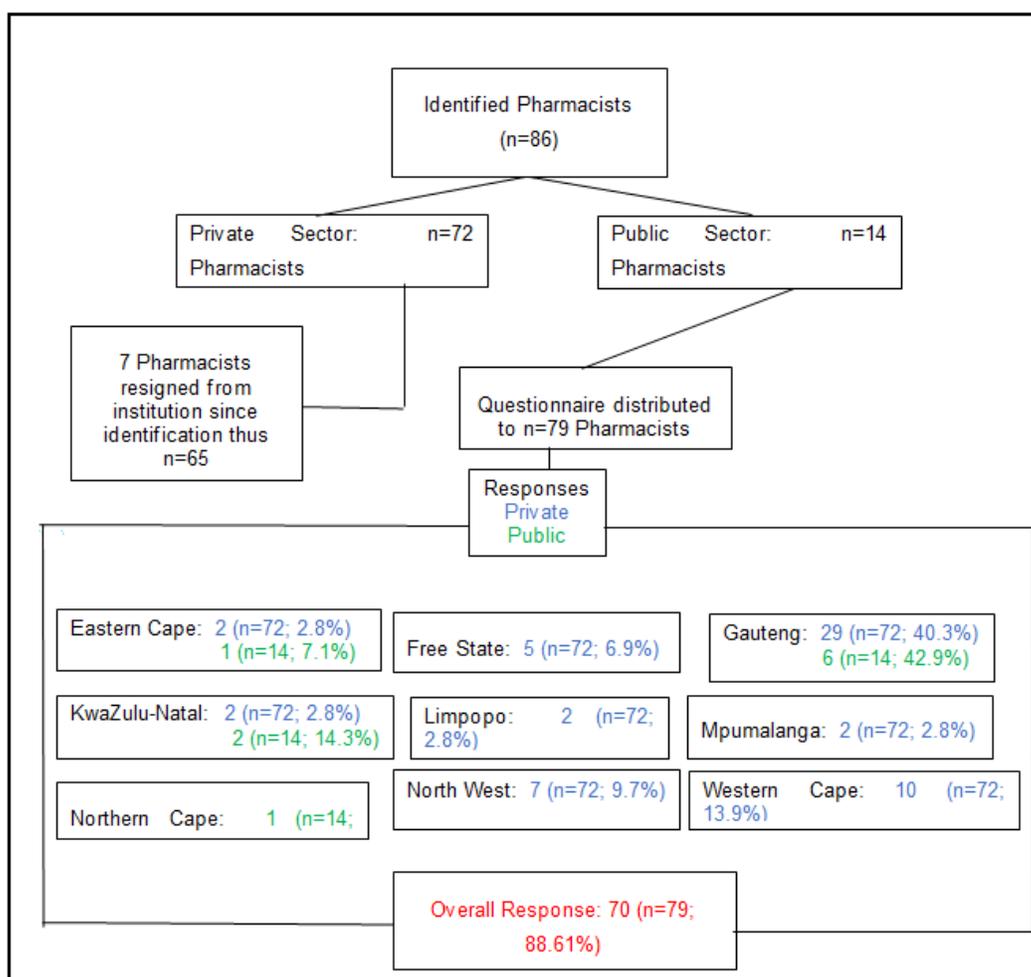


Figure 1

Number of respondents

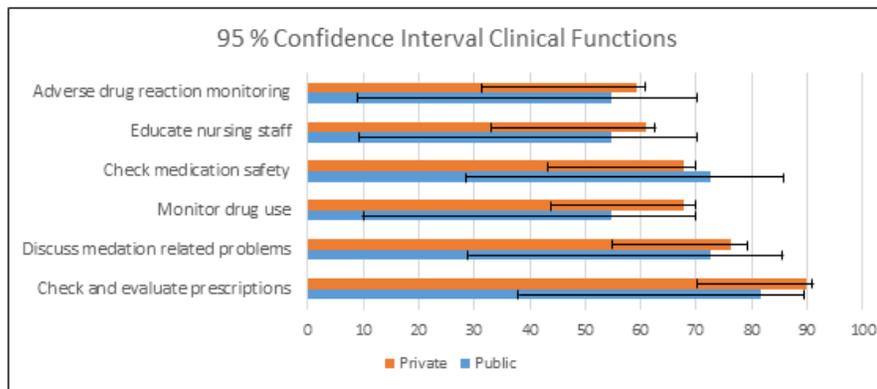


Figure 2

Clinical functions

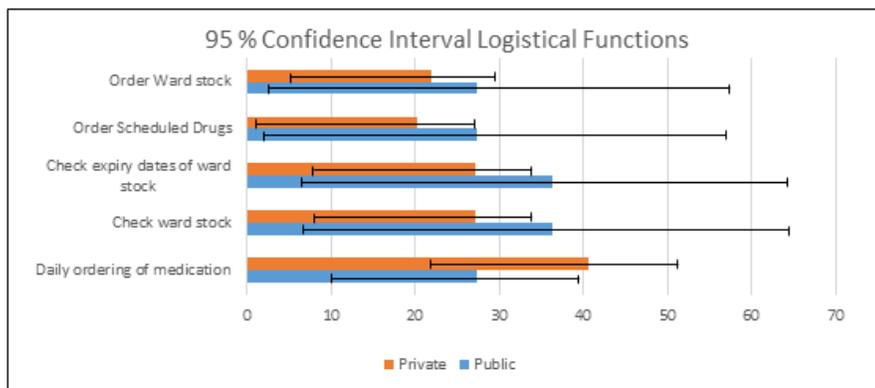


Figure 3

Logistical functions

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [QuestionnaireClinicalfunctions.docx](#)