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ASSESSMENT OF KNOWLEDGE AND ATTITUDE OF HEALTH CARE PROFESSIONAL'S TOWARD CLINICAL PHARMACY SERVICES IN SHAMBU GENERAL HOSPITAL., HORRO GUDURU WOLLEGA ZONE, NORTH WEST ETHIOPIA

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ABSTRACT

Background: Clinical pharmacy is an expanding patient-oriented, hospital role with the potential in maximizing patient outcome. The discipline arose out of dissatisfaction with old practice norms and the need for a competent health professional with a comprehensive knowledge in the therapeutic use of drugs. Clinical pharmacy services success hinges on the attitude of other health care providers toward the use of pharmacists in a clinical capacity. The finding about level of knowledge and attitude of HCPs would be an important input for concerned governmental or non-governmental institutions to strengthen Pharmaceutical care. The higher number of drug related problems would be solved with the establishment of Pharmaceutical care. **Objective:** To assess knowledge and attitude of health care professional's toward clinical pharmacy services in Shambu General Hospital. **Method:** A cross sectional study design was used on 110 Health Care providers to assess their knowledge and attitude toward Clinical Pharmacy services. **Result**: This study showed that 66.9% of the HCPs have a 'good knowledge' and 67.3% of the HCPs have a 'positive attitude' about clinical pharmacy services. Majority of the HCPs has a good knowledge and a positive attitude towards CPSs. There is no significant difference between the HCPs knowledge of clinical pharmacy services in relation to the HCPs sex, age, profession, sex, and experience. But, the study revealed that there is a significant difference (p=0.009) between HCPs attitude and level education of HCPs. **Conclusion and recommendation**: Majority of the HCPs has a good knowledge and a positive attitude towards CPS. There is no significant difference between the HCPs knowledge of clinical pharmacy services in relation to the HCPs sex, age, profession, qualification, and experience. But, the study revealed that there is a significant difference (p=0.009) between HCPs attitude and qualification of HCPs. Attention should also focus to Hospitals, to implement ward based clinical pharmacy services well. Increasing inter-professional relationships between HCPs and pharmacists in medical and pharmaceutical education curriculum is also needed to enhance collaboration between physicians and pharmacists in patient care.

KEYWORDS: Health care professional, clinical pharmacy, attitude, knowledge, services, Shambu General Hospital.

ABBREVIATIONS/ACRONYMS

CP- Clinical Pharmacy
CPS-Clinical pharmacy services
ED-Emergency Department
FIP- Federation of International Pharmaceutical
GP- General Practitioner
HCP- Health Care Professional
MLT- Medical Laboratory Technologist
MSc- Masters of science
SGH-Shambu General Hospital
QoL-Quality of life
UAE- United Arab Emirates;
WHO- World Health Organization

1. INTRODUCTION

1.1 Background

Clinical pharmacy is a health science discipline whereby pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention. This field of pharmacy practice focuses on patient-oriented rather than drug product-oriented service.

Clinical pharmacists are an essential part of the health care team, as they promote the safe and rational use of medications. The typical role of clinical pharmacists: are ensuring appropriate prescription/therapeutic combinations and administration of the right medicine to the right patient in the appropriate dose via the proper route of administration. Other essential responsibilities of the clinical pharmacist are to monitor patient adherence to therapy, provide drug information, monitor patient responses and laboratory values, and provide patient and provider education.[1]

In increasing patients' adherence to therapy, clinical pharmacists simultaneously decrease the chances of drug-related problems, and in doing so, the patient's quality of life is enhanced and further economic burdens due to drug-related problems are lessened.[2]

The discipline arose out of dissatisfaction with old practice norms and the need for a competent health professional with a comprehensive knowledge in the therapeutic use of drugs. Clinical pharmacists are a primary source of scientifically valid information and advice regarding the safe appropriate and cost effective use of medications. Already, the level of interaction between physicians and pharmacists in developed world is high, resulting in safer, more effective and less costly drug therapy.[3]

Many studies have shown that physicians are receptive to several clinical services provided by pharmacists if these services were provided in the form of consultation or in a supportive role. Still, however, the relationship between the physician and community pharmacist has been described as a 'complex one' and some studies have reported the existence of communication gap between pharmacists and medical doctors.[5,6,7]

Clinical pharmacy services are delivered to minimize the inherent risks associated with the use of medicines and pharmacists have been providing clinical pharmacy services to hospital-based patients for over 40 years. Clinical pharmacy services for individual patients, as described in the Standards, are required to support the objectives of national safety and quality initiatives. They facilitate the continuity of medication management when patients transition between care settings and are applicable in all healthcare sectors and care settings.[5]

Drug treatment is an essential component of medical care to prevent, cure and control disease. Its purpose is to decrease morbidity and mortality and to increase health-related quality of life (HRQoL). Treatment with medicines is a prerequisite for many people in order to function well and be able to live in their own homes as long as possible. However, problems associated with drug treatment such as medication errors and adverse drug events are frequent, especially among the elderly. It has been shown that at least 5% of hospital admissions are caused by drug-related problems; higher prevalence's have typically been found in the elderly population and among psychiatric patients. There is a large potential to improve the situation as the majority of drug-related admissions to hospital has been estimated to be preventable. Given the complexity of the process leading to medication errors and adverse drug events, it is likely that interventions for solving and preventing drug-related problems need to be multifaceted.[6]

The prevalence of poly-pharmacy has increased during recent years. Poly-pharmacy can be justified in patients with multiple co morbidities, but may also be inappropriate. In any case, the risk of adverse drug reactions and drug interactions increase exponentially with the number of drugs taken. On the other hand, under treatment or therapeutic failure may also occur in the elderly. Clinical pharmacists, as key members of a multi-professional healthcare team, are very well suited to perform such systematic medication reconciliations. Based on the ability to reduce medication errors, there is evidence that pharmacist interventions are the most cost effective among studied medication reconciliation interventions.[7,8]

However, also other interventions appear beneficial such as a package of interventions including personnel and documentation changes and systems to better transfer information from the general practitioner to hospital. There is evidence for a positive impact of medication reconciliation procedures on medication errors. Fewer high-quality studies have evaluated the impact of medication reconciliation on adverse drug events or other patient related outcomes.

Medication review can be provided in different settings, and by different healthcare professionals (e.g. in community pharmacies without any access to patient medical records, in primary care, or in hospital within a multi-professional team). Clinical medication reviews in multi-professional teams, including medication reconciliation procedures at admission and discharge, can reduce the length of hospital stay and reduce rates of hospital readmission.[9]

All healthcare professionals in hospital are more or less involved in the drug therapy process. Physicians' role is evident as they have the overall responsibility for prescribing drugs. Nurses administer most drugs, and may also monitor patients' clinical condition in relation to drug therapy (e.g. effects and adverse events). Assistant nurses may contribute by reporting patients' complaints or symptoms to the healthcare team. Also, the critical role played by pharmacists in the areas of medication safety and management has been recognized. Clinical pharmacists are especially well suited for performing medication reconciliations and their deep knowledge in pharmacokinetics, pharmacodynamics, and drug formulation is valuable when conducting medication reviews. Counseling patients during the hospital stay, at discharge and after discharge are also

activities that have shown to be successfully conducted by clinical pharmacists and which have contributed to improved patient outcomes.[10]

However, the knowledge and skills of clinical pharmacists are best utilized in cooperation with other professionals in multi-professional healthcare teams. The work within such teams involves a negotiated agreement between professionals which value the expertise and contributions that various healthcare professionals bring to patient care .It has been suggested that important factors for successful collaborative relationships are: the behavior of the professionals when initiating a new relationship; trustworthiness i.e. trust or confidence in another's abilities which can result in greater dialogue about problems encountered during patient care; and role specification, a factor which addresses the interactions between professionals in which they reach agreement on roles and responsibilities for each other in caring for mutual patients.[11]

The introduction of clinical pharmacy means that professionals who are traditionally part of healthcare teams, primarily physicians and nurses, started interacting with pharmacist/s with newly introduced patient oriented pharmacy practice. The implications of the interactions between physicians and pharmacists have been studied extensively. Pharmacists delivering clinical pharmacy services serve the interests of individual patients in the various hospital specialties, as well as the wider community by ensuring that medicine therapy is optimal, safe and cost-effective.[12]

1.2 Statement of the problem

Clinical pharmacy services (CPS) is an expanding patient-oriented, hospital role with the potential for encroachment on the physician's role.' CPS's success hinges on the attitude of physicians toward the use of pharmacists in a clinical capacity.[13]

Clinical pharmacy, which is generally considered to involve emphasis upon the therapy as it is designed for a specific patient, has been formally in existence for about 15 years. With an ever-growing body of knowledge coupled with an increasing armamentarium of drugs, clinical pharmacy has sought to rationalize therapeutics and to decrease the incidence of untoward drug-related problems which cost so much; therefore, it is important to determine what health care personnel think about the present and future practice of clinical pharmacy services. The physician, nurse, and dentist are the ones who will provide opportunities for clinical pharmacists to come aboard the health team, and the health industry administrators are the ones who must be convinced of the worth of the clinical pharmacist.[14]

In large part, the success of clinical pharmacy services will depend on the degree to which other health professionals accept the concept and are willing to cooperate with its disciples. Unfortunately, however, our information about the degree of knowledge about, acceptance of, and reaction toward clinical pharmacy by other health workers is meager .If clinical pharmacy were considered a panacea by pharmacists but not accepted as such by non-pharmacists, its chances for growth and acceptance would be bleak.[14,15]

Even though Shambu General Hospital serves large population, clinical pharmacy services are started implementing, all clinical pharmacists in the hospital are less functioning. This implies that all society that is expected to be served by the hospital is directly or indirectly affected by unavailability of Clinical pharmacy service. Thus, in order to implement clinical pharmacy services in the hospitals knowing the level of knowledge and nature of attitude of HCPs plays a crucial role. However no study has been shown to be conducted and published about the knowledge and attitude of health care professionals at Shambu General Hospital, Shambu, Ethiopia.

1.3 Significance of the study

This study is aimed to assess the knowledge and attitude of health care professional's toward clinical pharmacy services in SGH. The study will explore the perception about the newly emerging field of study (CP) which is patient oriented and potentially valuable component of the health care system. Comprehensive and accountable clinical pharmacy services are an essential component of contemporary team-based health care and support the patient's right to safe and high quality care.

The study also helps to strengthen the relationships between the pharmacists and other health professionals by finding out the knowledge and attitude gaps between them. This study is aimed to assess the knowledge and attitude of healthcare professional toward clinical pharmacy services in SGH.

The finding about level of knowledge and attitude of HCPs would be an important input for concerned governmental or non-governmental institutions to strengthen PC. The higher number of drug related problems would be solved with the establishment of PC. Moreover, the study was expected to identify the existing problems to the reality and invite the concerned bodies who are responsible for mitigation of the problems.

The study had identified the challenges that may face clinical pharmacists when they assigned to the hospital to practice their ward based clinical pharmacy services. The results of the finding are expected to call the policy makers to prepare and implement ward based clinical pharmacy job description. The study might actually identify the level of interest of HCPs to welcome the newly assigned clinical pharmacist to their hospital. The study might serves as benchmark for other studies in this area.

2. LITERATUREREVIEW

2.1 Role of Clinical Pharmacist

Clinical pharmacy relates to the safe, effective and economic use of medicines and contributes to the 'patient care journey' at all stages. It is the practice of pharmacy in a multidisciplinary healthcare team directed at achieving patient treatment goals by ensuring the maximization of the effectiveness and tolerability of drug treatment and minimization of drug toxicity in individual patients and that the correct patient receives the optimum dose of the most appropriate medicine for a specific condition via a rational dosage form and regimen over an appropriate time period The roles in individual patient care are changing as the educational formation of the pharmacist as a clinical practitioner develops internationally through changes in university curricula. Clinical practice poses challenges of complexity where the breadth of tasks undertaken by clinicians with patients who may be very sick and vulnerable leads to a high level of clinical uncertainty.[6,8,16] In addition CP facilitate the promotion of good prescribing practice, identify and resolve untoward effects and interactions of medicines, involved in educating and advising patients on medicines and healthcare, monitoring of medicine therapy, involved in prescriber education and research, provision of advice on the clinical use of medicines, cost effective drug utilization and finally promote the quality use of medicines through other activities as appropriate.[16]

Clinical pharmacy services have been shown to identify clinically important drug-related problems, reduce the incidence of clinically important drug-related problems, improve patient education and concordance, improve prescribing, improve clinical outcomes and cost-effectiveness, and also reduce length of hospital stay. Clinical pharmacy is an integral component of medicines management.[16]

2.2. The pharmacist as a health care provider

Pharmacy is the health profession that links the health sciences with the basic sciences; it is committed to ensuring the safe and effective use of medication. Pharmacists' professional roles and responsibilities have evolved historically from a focus on medication compounding and dispensing to extended pharmaceutical care services.[10,16]

An increase in health demands, with a complex range of chronic medicines and poor adherence to prescribed medicines, has forced pharmacists to take a patient-centered approach.[17] The paradigm shift for pharmacy practice took turn in 1990, when Helper and Strand introduced the term "pharmaceutical care".[18] The ethos of clinical pharmacy is that pharmacists provide the standard of pharmaceutical care they would want themselves to receive. The pharmacist develops through experience, training and personal development the attitude, knowledge, skills, relationships and professional responsibilities necessary to provide an effective and efficient clinical pharmacy service. The pharmacist acts as the patient's advocate with respect to the use of medicines.[16]

Over the last few decades, pharmacy organizations and academic training programs around the world have promoted pharmaceutical care as a philosophy and standard of provision of care for patients[19] In essence, the pharmaceutical care concept has transformed the pharmacy profession to be more accountable in patient care, especially to ensure that a patient achieves positive outcomes from drug therapy.[20]

In many parts of the world, pharmacists have played a significant role in provision of pharmaceutical care services. In addition, it is also widely believed that pharmacists can make a great contribution to the provision of the primary health care, especially in developing countries.[12,21] Their role varies in different parts of the world: some deal with the preparation and supply of medicines, while some focus on sharing pharmaceutical expertise with doctors, nurses and patients .Pharmacists may not only contribute to improved use of medications in hospital settings, but also in community pharmacies , primary care centers , and nursing homes . In countries, such as the US, the UK and Canada, the role of pharmacists as members of the healthcare team has expanded beyond conventional medication dispensing decades ago.[22]

2.3 The pharmacy profession in the international context

WHO has contributed effectively towards encouraging and defending the role of pharmacists' worldwide. Although all health care providers and the public are rationally involved in using drugs, WHO has recommended a special role for pharmacists, particularly in quality assurance and the safe and effective administration of drugs.[23] The International Pharmaceutical Federation (FIP) and WHO developed the concept of "The seven star pharmacist", which stated that a well-rounded pharmacist should be a compassionate care giver, decision maker, active communicator, lifelong learner and good manager; and should possess good leadership qualities and the ability to be a teacher and researcher.[24]

There is little published work regarding pharmacist's and general practitioner's perceptions of the roles of a clinical pharmacist or of the potential barriers to pharmacists increasing their involvement in medicines management. A focus group study of community pharmacists' perceptions of their roles indicated that they wished to be an integral part of the patient's health care, be active in health screening and minor illness, and move away from performing technical duties; however, there was not unanimous agreement on all roles.[20,25]

Over the past two decades, growing evidence from within and outside the UK has demonstrated the positive impact of clinical pharmacy services on patient

outcomes; the Department of Health recognized that pharmacists' clinical skills and expertise are an integral part of delivering better services to patients in the 2008 pharmacy White Paper, and reinforced this in 2010, identifying their role in optimizing the use of medicines.[25]

Another study in England; 77.6% GPs agreed on peoples taking more responsibility for their health by visiting a clinical pharmacist about minor illness before consulting their GPs. More than half of GPs recommend to patients that they seek advice from pharmacist about minor illness they did not agree overall with community pharmacists screening for chronic conditions (high blood pressure, high blood glucose), selecting medicines or dosages according to agreed protocols after a general practitioner diagnosis, or running anticoagulant or lithium clinics.[25]

A study by Smith et al found that physicians had different perceptions of the roles of hospital-based pharmacists compared with community pharmacists. For example, there was an agreement by 51% of respondents that hospital pharmacists should assist with designing treatment plans, but only 17% for community pharmacists to do this.[26]

A research done in Punjab, Pakistan revealed that majority of the doctors (84.5 %, 299) expect the pharmacist to take personal responsibility for resolving drug-related problems, and a significant difference was noted with respect to their specialty (p = 0.022). Nearly three quarters (71.8 %, 285) of the doctors expect pharmacists to monitor patient drug therapy response, and this finding was statistically significant (p = 0.001) with respect to practice specialty. About half of the doctors (49.2 %, 174) agreed with the concept of pharmacists selecting appropriate non-prescription medications; a significant difference (p=0.002) was demonstrated with respect to their status.[27]

In Saudi Arabia, a research done on the Attitudes of Emergency Department Staff towards the Role of Clinical Pharmacists revealed that (62.5 %) of the ED staff were aware of the professional degree held by clinical pharmacists (i.e., Pharm D), and a majority, 12 (75.0 %) had heard of a health care professional called a clinical pharmacist. While exploring medical staff attitude toward the availability of a full-time pharmacist in EDs, 13 (81.3 %) of the respondents viewed this favorably while that regarding the role of pharmacists in drug adherence and patient care was viewed less favorably. Fourteen (87.5%) disagreed with giving prescription rights to clinical pharmacists for minor ailments.[28]

In most of such hospitals, individuals with Bachelor of Pharmacy (B.Pharm) degree holders are engaged in conventional pharmacy practice; however, Pharm-Ds, who trained in direct patient care, have recently been joining the services of these hospitals. At the moment, no hospital in the eastern region of Saudi Arabia, or perhaps in the country as a whole, has engaged a clinical pharmacist in a patient care unit, especially the ED. This study aims to evaluate the attitudes and perceptions of medical doctors and nurses in ED about the role of the clinical pharmacist.[28]

Studies have been conducted in some Arab countries to assess physicians' acceptance of the clinical pharmacists' role. In Kuwait, patient care, which involves interaction with and observation of the patient, is still exclusively delivered by physicians and nurses, with the pharmacists' input in managing drug therapy dependent on the physician's willingness to accept that role. In another study in Qatar, Physicians were more comfortable with pharmacist activities closely linked to drug products than responsibilities associated with monitoring and optimization of patient outcomes. Medication education (96.6%) and drug knowledge (90%) were practically unanimously recognized as abilities expected of pharmacists, but consultative roles, such as assisting in drug regimen design were less acknowledged. They proposed pharmacist spend more time with physicians attending joint meetings or education events to help advance acceptance of pharmacists in patient-centered care at this site.[28]

Many studies have shown that physicians are receptive to several clinical services provided by pharmacists if these services were provided in the form of consultation or in a supportive role. Still, however, the relationship between the physician and community pharmacist has been described as a 'complex one' and some studies have reported the existence of communication gap between pharmacists and medical doctors.[29]

In Sudan, physicians were found to be 'uncomfortable' with pharmacists suggesting or recommending prescription medications to their patients, even if it involved the treatment of minor illnesses but in Jordan, the situation was different, as 63 % of physicians expected the pharmacist to educate their patients with regard to the safe and appropriate use of drugs. In addition, approximately half of the physicians agreed that pharmacists were always a reliable source of drug information.[30]

Doctors and community pharmacists have little interaction in Libya and UAE, based on the findings of one particular study which showed that almost 70 and 60 % of doctors in Libya and UAE, respectively, either 'rarely' or 'never' discussed patients' drug therapy with a pharmacist.[31]

In some of the non-European countries, the high regard of pharmacists is believed to be an outcome of pharmacy as an education degree, rather than the perceived function and role of pharmacists within their primary healthcare. Clearly there are still misconception and confusion among the public on the function of pharmacists.[31]

In the United States, there was a similar agreement by physicians that pharmacists should be involved in assisting patient compliance with medicines ; report adverse drug reactions to the physician; advice on cost-effectiveness of medicines; provide accurate medicines information on the medicine's use, risk, and benefits; and aid a physician in selecting a medicine to be prescribed. As with the UK studies, there was less support for screening for chronic conditions suggesting alterations to medicine regimens, and selecting medicines according to a physician developed protocol. Allowing greater access to over-the-counter (OTC) medicines had a variable response depending on the medicines, but generally there was little support for this from the physician's.[32] In developed countries like Australia 72% general practitioners (GPs) did not agree that pharmacists' advice conflicted with their own; 94% agreed they had a good working relationship with the pharmacists, and none believed that pharmacists contacted them unnecessarily.[33]

A study conducted in UAE on HCPs and pharmacy college students, medical college students, 57 dental college students an nursing college students; minority of students (104, 39 %) believed that there is increasing interest in UAE in clinical pharmacy as a profession while more than half of the students 154(57 %) believed that there is increased interest in clinical pharmacists serving on the healthcare team in order for a hospital to secure accreditation.[34]

When the students were asked about the ability of clinical pharmacists to minimize medication errors and improve patient therapeutic outcomes, 217 (81 %) of them agreed with the statement. The majority of the respondents 221(82 %) reported that their institutions do not offer clinical pharmacy or Phar.D. degree programs. However, 173 (64 %) reported that they had heard of such programs during the course of their studies. One hundred eighty one (67 %) of the students agreed that clinical pharmacists should be allowed to acquire training and qualifications in certain medical areas to enable them effectively discharge the responsibility of patient counseling in chronic illnesses. Of all the respondents, only 146 (54 %) of the students perceived that the presence of clinical pharmacists will be accepted by other healthcare staff in their daily practices.[34]

3. OBJECTIVES

3.1 General objective

- To assess knowledge and attitude of health care professional's toward clinical pharmacy services in Shambu General Hospital.

3.2 Specific objective

- To determine the level of knowledge of HCPs toward clinical pharmacy services.
- To describe the attitude of HCPs about clinical pharmacy services.
- To identify factors associated with the attitude and knowledge of other health care providers on the role of clinical pharmacist.

4. METHODOLOGY

4.1 Study Setting and period

The study was conducted in Shambu General Hospital (SGH), Shambu town, Horro Guduru Wollega zone, Oromia region, western Ethiopia which is found at 315 km from Addis Ababa. According to the central statistical Agency of 2013 G.C, the current population size of the zone is 1,000,330. The dominant ethnic group is Oromo. The town has governmental and private organizations/ service providers to the community such as Government Hospital and Health center, elementary, Junior Secondary and preparatory schools and colleges. Telephone, electric, banks, post office, private pharmacy, clinics, drug vendors, etc are from the most prominent mentionable services provided in Shambu town.[35]

SGH has many departments and wards like Outpatient department (OPD), medical ward, gynecology and obstetrics ward, pediatrics ward and surgical ward. It delivers diversified health services and clinics including the emergency services, eye clinic, dental clinic, mother and child health (MCH), psychiatry clinic, laboratory, X-ray, and follow up of chronic disease like TB and HIV AIDS. The Hospital possesses outpatient, inpatient, emergency and ART pharmacies.

The study was conducted from March 10, 2017 to April 10, 2017 G.C.

4.2 Study design

A cross sectional study was conducted by means of semi-structured and self-administered questionnaire to assess the knowledge, attitude of health care professionals toward clinical pharmacy services who work in Shambu General Hospital.

4.3 Population

4.3.1 Source population

The source of population for the study was HCP working in SGH as of April 2017.

4.3.2 Study population

All HCPs who work in Shambu General Hospital and who fulfill inclusion criteria.

4.5 Inclusion and exclusion criteria

4.5.1 Inclusion criteria

All healthcare professionals in SGH especially those had opportunity to attend inpatient (wards) and outpatient department (OPD). HCPs on administrative levels like medical director of the hospital were also a candidate of the study.

4.5.2 Exclusion criteria

Clinical pharmacists and HCPs that leave the hospital for training or other reasons temporarily during the study

period and who were not willing to participate in the study.

4.6 Variables

4.6.1 Dependent variables

- Knowledge and attitude of other HCPs towards Clinical pharmacy services.
- Attitude of other HCPs towards Clinical pharmacy services.

4.6.2 Independent variables

- Demographic characteristics (age, sex).
- Profession with current qualification.
- Year of experience.

4.7 Operational definition

- **Knowledge-** is accordingly the concepts and information that HCPs have regarding CP services.
- **Attitude-** is the perception and internal feeling that HCPs possess towards PC services which may be positive or negative.
- **Good knowledge** –categorized if the respondents answer to the knowledge questions is above the mean value.
- **Insufficient knowledge**–categorized if the respondents answer to the knowledge questions is below the mean value.
- **Positive attitude** - categorized if the respondents answer to the attitude questions is above the mean value.
- **Negative attitude**- categorized if the respondents answer to the attitude questions is below the mean value.

4.8 Sample size and sampling technique

Given the small number of the targeted population, no sampling method was used. The sample populations were selected by using non-probability convenient sampling technique and all study populations were included in the study. The total sample was 116 health professionals.

4.9 Data collection process

A semi-structured questionnaire was be prepared by the principal investigator containing the variables to be measured are designed, developed and utilized by the principal investigator or data collector after permission obtained from SGH. Questionnaires were randomly distributed to HCPs in their respective wards. The participants were informed the highlight of the study during questionnaire distribution.

The participants were also provided a time to fill the questionnaires and after certain period of time the filled questionnaires were collected carefully by principal investigator.

4.10 Data quality control

The clarity and completeness checkup of data collection formats was be under taken on ten subjects from nurse and midwifery students practicing at Shambu General hospital before the actual data collection and data clearing was be done every day, formats with insufficient information were excluded from the study to avoid error. Then collected data was processed and retained cautiously in the line of its objective.

4.11 Data processing and analysis

Once the data collected it was compiled, processed, entered and analyzed manually. Tables and figures were used to illustrate the results. Chi square test was used to identify any significant difference among the participants' responses regarding certain statements in the questionnaire with a significant level of p value of < 0.05.

4.12 Ethical considerations

A formal letter was written from Drug Information Service Director, Shambu General Hospital to SGH Chief Executive Officer in order to get permission to conduct the study. Staff members of SGH including the physician, Pharmacists, Nurses and other health care providers, permission for any cooperation were politely asked. Moreover, the benefits of the study was explained to the concerned body that the data would be required only to identify the obstacles concerning implementation of newly emerging clinical pharmacy services in SGH and to invite concerned body to tackle the obstacle that would be revealed by the study. The issue of confidentiality was discussed with the participants before going to collect data. Thus, the confidentiality was ensured by avoiding personal identification, restriction of data access to the third party.

4.13 Limitation and challenges of the study

The main limitation of the study was the unavailability of reference to compare the outcomes of the study with other related studies. In addition, the study has some limitations with regard to the small sample size of participants' and non-respondents and the results of the study cannot be generalized for Shambu or Ethiopia as the study is confined to only Shamb General Hospital. short study period was among limitation of the study to be mentioned.

5. RESULT

5.1 Sociodemographic characterstics of respondents

A total of 116 questionnaires were distributed to S.G.H HCPs and 110 HCPs completed the questionnaire with a response rate of 94.8%.

Table 5.1 summarizes the socio demographic characteristics of the respondents. The respondents were 91 (82.7%) male and 19 (17.3 %) female. Among them were 19(17.3%) physicians, 46(41.8%) clinical nurses, 1(0.9%) health officers, 23(20.9) midwifes, 3(2.7%) x-ray technician, and the remaining 9 (8.2%) were MLTs. Regarding the age of the respondents 95(86.4%) were between 20 to 45 years of age and the remaining 15(13.6%) were above 45 years of the age.

Table 5.1: Sociodemographic data of the respondents at SGH(n=110,April to March,2017).

	Frequency		Percent (%)
Sex	Male	91	82.7
	Female	19	17.3
Age	20-45	95	86.4
	>45	15	13.6
Profession	Physician	19	17.3
	c. nurse	46	41.8
	H.O	1	0.9
	Anesthetics	3	2.7
	Dentist	1	0.9
	Pharmacist	5	4.5
	Midwife	23	20.9
	x-ray technician	3	2.7
	MLT	9	8.2
Level of education	Specialist	2	1.8
	GP	18	16.4
	Msc.	-	-
	Bsc.	35	31.8
	Diploma	55	50
Experience	1-5 year	75	68.2
	5-10year	30	27.3
	>10year	5	4.5

In relation to the level of education of the respondents, 2(1.8%) were specialists, 18(16.4%) were GPs, 35(31.8%) were BSc nurses and the remaining 55(50%) were diplomas. With respect to the experience of the respondents 75(62.8%) have 1-5 years of experience, 30(27.3%) have 5-10 years of experience and the remaining 5(4.5%) have an experience greater than 10 years.

5.2 Knowledge of HCPs Towards the Role of CPs

Majority of 97(88.2%) the respondents previously heard about clinical pharmacy program and 85(77.3%) of the respondents know that they have a clinical pharmacist in their hospital. Regarding the difference between community pharmacy and clinical pharmacy, 68(61.8%) responded that the two fields are different and 89(80.9%) of the HCPs think clinical pharmacists are patient oriented. On the other hand 87(79.1%) of the respondents believe that clinical pharmacists can be involved in rounds and 78(70.9%) thinks clinical pharmacists contribute to drug therapy decision making on rounds.

Although 71(64.5%) of HCPs think clinical pharmacists can review medication profile, however when asked whether clinical pharmacists can assess pre-admission medication use, only 43(39.1%) agreed that clinical pharmacists assess pre-admission medication use.

Table 5.2: Knowledge of HCPs toward Clinical pharmacy services at SGH (n=110, April to March, 2017).

No.	Statements	Yes (%)	No(%)
1	I have heard about clinical pharmacy services in Ethiopia	97(88.2)	13(11.8)
2	I know that there are clinical pharmacists in our hospital	85(77.3)	25(22.7)
3	I know that there are clinical pharmacy and community pharmacy are different	68(61.8)	42(38.2)
4	I know that Clinical pharmacists are patient oriented	89(80.9)	21(19.1)
5	I know that clinical pharmacists attend ward round and morning session	87(79.1)	23(20.9)
6	I know clinical pharmacists can involve review medication profile	71(64.5)	39(35.5)
7	I know that clinical pharmacists can assess pre-admission medication use	43(39.1)	67(60.9)
8	I know that clinical pharmacists can contribute to drug therapy decision making on rounds	78(70.9)	32(29.1)

The mean score of the knowledge questions was found to be 5.09 and the mean score is used to differentiate the degree of knowledge of the respondents. Thus, respondents scoring greater than 5 are classified as having a 'good knowledge' and respondents scoring less than 5 are regarded as having' insufficient knowledge'.

Majority 74(66.9%) of the HCPs have a 'good knowledge' about the role of clinical pharmacists while the remaining 36(33.1%) have 'insufficient knowledge'.

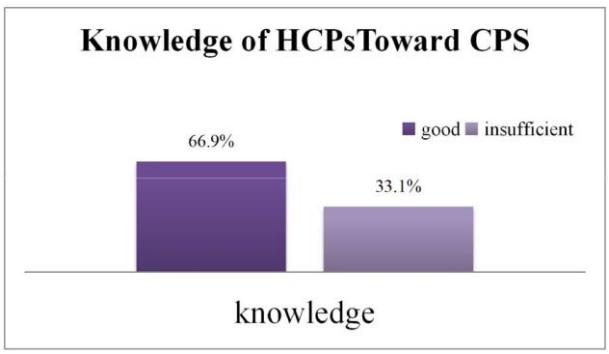

Figure 5.1: Knowledge of HCP towards CPS at SGH, from March 10, 2017 to April 10, 2017.

Table 5.3: Association between knowledge of HCPs and independent variable at SGH (n=110, April to March, 2017).

Variable		Knowledge				Chi-square	P-value
		Insufficient Knowledge		Good Knowledge			
		Frequency	%	Frequency	%		
Sex	Male	12	15.6	65	84.4	0.1142	0.744
	Female	6	18.2	27	81.8		
	Total	18	16.4	92	83.6		
Age	20-45	45	47.4	50	52.6	1.018	0.313
	>45	5	33.3	10	66.7		
	Total	50	45.5	60	54.5		
Profession	physician	9	45	11	55	0.313	0.997
	C.nurse	6	13.1	40	86.9		
	H.O	1	_	0	_		
	Anesthetics	1	33.3	2	66.7		
	Pharmacist	2	40	3	60		
	midwifery	6	26.1	17	73.9		
	XRT	1	33.3	2	66.6		
	MLT	2	22.2	7	77.8		
	Total	28	25.5	82	74.5		
Level of education	Specialist	1	50	1	50	3.299	0.509
	GP	8	44.4	10	55.5		
	Msc	-	-	-	-		
	Bsc	11	31.4	24	68.6		
	Diploma	23	41.8	32	58.2		
	Total	43	39.1	67	60.9		
Experience	1-5years	32	42.7	43	57.3	1.185	0.553
	5-10	9	30	21	70		
	>10	2	40	3	60		
	Total	43	39.1	67	60.9		

Table 5.3 shows the data in respect of HCPs knowledge in relation to their sex, age, profession, qualification and experience. Regarding HCPs' knowledge of CPs role, there is no significant difference in relation to their sex (p=0.744), age (p=0.313), profession (0.997), level of education (p=0.509), and experience (p=0.553).

5.3 Attitude of HCPs toward CPS

The majority of HCPs (93, 84.5 %) reported that the CP's are an important integral part of the clinical ward team. Respondents' belief in clinical pharmacists' capacity to improve the quality of patient care in a hospital setting was relatively high with 82(74.5%). Seventy six (69.1%) of the respondents agree with the clinical pharmacists role in making the selection of appropriate therapy easier. In the other hand, 79(71.8%) of the respondents belief that CPs are ideal professionals to help in reducing the chances of drug related problems or medication errors. In addition 49(44.5%) belief that Physicians/nurses workload will be shared if CPs are authorized to prescribe and majority of the HCPs 70(63.6%) are willing to seek assistance from the CPs in designing drug therapy treatment plans.

Regarding CPs role conducting the counseling sessions to increase adherence, 75(68.2) agree with the role but 78(70.9%) belief that CPs are reliable source of drug product information.

Table 5.4: attitude of HCPs toward clinical pharmacy services at SGH (n=110, April to March, 2017).

No.	Statement	Agree (%)	Disagree (%)	Neutral (%)
1	The clinical pharmacist is an important integral part of the clinical ward team	93(84.5)	4(3.6)	13(11.8)
2	The clinical pharmacist can improve the quality of patient care in a hospital setting	82(74.5)	19(17.3)	9(8.2)
3	Availability of the clinical pharmacist in your setting will make the selection of appropriate therapy more easier	76(69.1)	23(20.9)	11(10)
4	Clinical pharmacists are ideal professionals to help in reducing the chances of drug related problems or medication errors.	79(71.8)	24(21.8)	7(6.4)
5	Physicians/nurses workload will be shared if clinical pharmacist are authorized to prescribe	49(44.5)	48(43.6)	13(11.8)

6	I'd be willing to seek assistance from the clinical pharmacist in designing drug therapy treatment plans for my patient.	70(63.6)	28(25.5)	12(10.9)
7	Adherence to drug therapy will be higher if clinical pharmacists conduct the counseling sessions.	75(68.2)	24(21.8)	11(10)
8	Clinical pharmacist are reliable source of drug product information	78(70.9)	11(10)	21(19.1)
9	maximize cost effectiveness when prescribing a medication	80(72.7)	18(16.4)	12(10.9)
10	provide information regarding the availability of a drug and drug alternatives	74(67.3)	22(20)	14(12.7)
11	Clinical pharmacists are better suited to identify and report ADR and drug interactions.	72(65.5)	30(27.3)	9(8.2)
12	Clinical pharmacists can monitor response to drug therapy.	61(55.5)	32(29.1)	17(15.5)

The mean score of the HCPs attitude toward CPS was found to be 8.75 and the mean score is used to differentiate the attitude of the respondents into negative and positive attitude. Thus, respondents scoring greater than 9 are classified as having a 'positive attitude' and respondents scoring less than 9 are regarded as having a 'negative attitude' towards CPS.

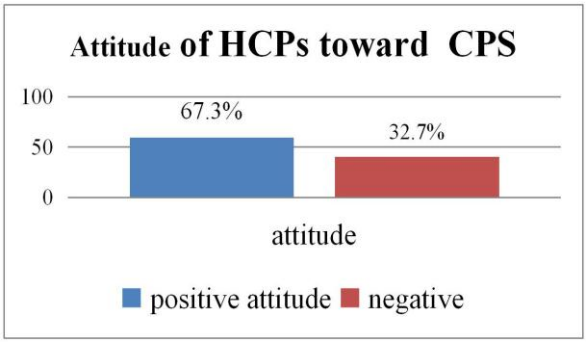

Figure 5.2: Attitude of HCP toward CPS at SGH, from March 10, 2017 to April 10, 2017.

Majority 74(67.3%) of the HCPs have a 'positive attitude' about the role of clinical pharmacists while the remaining 36(32.7%) have 'negative attitude'.

Table 5.5: Association of HCPs attitude with independent variables at SGH, from March 10, 2017 to April 10, 2017.

Variable		Attitude				Chi-square	P-value
		Negative attitude		Positive attitude			
		frequency	%	frequency	%		
Sex	Male	24	31.2	53	68.8	0.283	0.598
	Female	12	36.4	21	63.6		
	Total	36	32.7	74	67.3		
Age	20-45	23	28.8	57	71.2	2.133	0.144
	>45	13	43.3	17	56.7		
	Total	36	32.7	74	67.3		
Profession	Physician	10	52.6	9	47.4	10.662	0.059
	Dentist	-	-	1	100		
	Anesthetics	1	33.3	2	66.7		
	C.nurse	12	26.1	34	73.9		
	H.O	-	-	1	100		
	midwifery	10	43.5	13	56.5		
	XRT	1	33.3	2	66.7		
	MLT	2	22.2	7	77.8		
	Total	36	32.7	74	67.3		
Level of education	Specialist	-	-	2	100	7.345	0.009
	GP	10	55.6	8	45.5		
	Msc	-	-	-	-		
	Bsc	15	42.9	20	57.1		
	Diploma	11	20	44	80		
	Total	36	32.7	74	67.3		
Experience	1-5years	28	37.3	47	62.7	1.003	0.394
	5-10	6	20	24	80		
	>10	2	40	3	60		
	Total	36	32.7	74	67.3		

Regarding the attitude of HCPs attitude with respect to sex of the respondents, there is no significant difference (p=0.598) between the sex of the respondent, and their attitude towards CPS with the majority of male respondents 53(68.8%) having a 'positive attitude' as compared to female respondents 21(63.8%).

As shown in table5.5 above, there is no significant difference/association (p=0.144) between the attitude and age of HCPs with 57(71.2%) of respondents aged between 20 up to 45 years of age having a 'positive attitude' and 17(56.7%) of respondents aged greater than 45 have a positive attitude towards CPS.

The perception of CPS in patient management varied among the different professions studied with 34 (73.6%) of the nurses, midwifes 13(56.5) and medical lab technology7 (77.8) having a good attitude as compared with 7 (47.4 %) of physicians. However, there is no significant difference (p=0.059) between attitude on the CPS and profession of HCPs. In addition, there is no significant difference with experience (p=0.394) of the HCP in relation to their attitude. However, there was significant difference in level of education (p=0.009).

6. DISCUSSION

In interpreting the findings of this study, the reader is cautioned that the study is only a modest, regional effort to grapple with a complex national problem. Since the respondents were all from S.G.H, and since members of a state public health association are probably not representative of the larger group of practicing health professionals, generalization of the findings is not warranted. Furthermore, non-response bias could affect the accuracy of the findings in an unknown manner, both in terms of degree and direction.

Interestingly, majority of HCPs Previously heard about clinical pharmacy program 97(88.2%) compared to a study done in UAE medical students only two-thirds of the medical students knew about the clinical pharmacy program and these is probably associated with the start of clinical pharmacy work at the start of the academic year. More than half 85(77.3 %) of them knows that there are CPs in S.G.H but not functioning well due to the misunderstanding of the role of CPs as those CPs are obliged to serve as a community pharmacists as the structure for CPs in the health care system is yet to be implemented.

Regarding the difference between community pharmacy and clinical pharmacy, 68(61.8%) responded that the two fields are different and 89(80.9%) of the HCPs think clinical pharmacists are patient oriented. This may be attributed to the fact that the term clinical means literally 'belonging to a bed'.[34]

The majority of HCPs (93, 84.5 %) reported that the CP is an important integral part of the clinical ward team was relatively less as compared to a study done in UAE in which the majority of HCPs (253, 95.5 %) reported that the clinical pharmacist is an important integral part of the clinical ward team.[34]

However, respondents' belief in clinical pharmacists' capacity to improve the quality of patient care in a hospital setting was relatively high with 74.5% of the respondents agreeing as compared to the study on attitude of healthcare providers and medical students on CPSs was also conducted on three randomly selected hospitals and six health-related colleges in United Arab Emirates, indicated that most of the medical students and healthcare providers(three-quarters of HCPs agreeing)believed that clinical pharmacists can help improve the quality of healthcare services. Regarding CPs role conducting the counseling sessions to increase adherence, only 68.2% of HCPs agree which is relatively similar to a study done in New Zealand only 59% of general practitioners agreeing that this should be CPS.[24] And Other studies on perceptions, experiences, and expectations of physicians regarding the role of pharmacists in hospital settings were also conducted in Jordan; in which more than half of the physicians were welcome that pharmacists counsel and educate their patients regarding appropriateness and safety use of the prescribed medications. Fewer physicians (28.2%) agreed that pharmacists informed them regarding DRPs experienced by their patients.[37]

Seventy point nine (70.9%) percent of the respondents believe that CP's are reliable source of drug product information. Thus, it is somewhat less as compared to a study done in Kuwait in which 75% of physicians concurred that pharmacists are a reliable source of drug information. Even if 44.5% of HCPs believe that physicians/nurses work load will be shared if CP's are authorized to prescribe, a greater number of physicians appeared uncomfortable with pharmacists prescribing. This finding supports a number of previous studies that showed that physicians are reluctant to accept pharmacist services which include any aspects of prescribing.[23]

In general, Majority 66.9% of the HCPs have a 'good knowledge' about clinical pharmacy services while the remaining 33.1% have 'insufficient knowledge' depending on the mean score which was found to be 5.09. Regarding HCPs' knowledge of clinical pharmacists' role with respect to their sex, there is no significant difference (p=0.744) thus there is no association between sex of the respondents and knowledge of the respondents.

As the study shows, 67.3% of the HCPs have a 'positive attitude' about the clinical role of pharmacists. In addition there is no a significant difference (p=0.598) between the sex of the respondent, and their attitude towards the role of CPs with the majority of male respondents (65, 84.4%) having a 'positive attitude' as compared to that of female respondents 27(81%).

To identify factors associated with the knowledge and attitude of HCPs, additional factors have been assessed. These factors include age of the respondents, profession of the respondents, qualification of the respondents, and experience of the respondents. There is no significant difference between the respondents' knowledge or attitude and those factors. Thus there is no association, but there is significance difference in level of education and attitudes of HCPs.

7. CONCLUSIONANDRECOMMENDATION

7.1. Conclusion

HCPs were willing to collaborate with clinical pharmacists in monitoring drug therapy and improving patient care. Consequently, measures to promote and extend clinical pharmacy services should be adopted and implemented in S.G.H.

Majority of the HCPs has a good knowledge and a positive attitude towards CPSs. There is no significant difference between the HCPs knowledge of clinical pharmacists' role in relation to the HCPs sex, age, profession, sex, and experience. But, the study revealed that there is a significant difference (p=0.009) between HCPs attitude and level education of HCPs.

7.2. Recommendations

The following recommendations indicate the areas seen as most urgently needing attention. Repeat the basic procedure used in this study on a larger population of health professionals, administrators and change agents and the patient consumer. Ministry of health in collaboration to Universities: to provide progressive training to further improve the attitude and knowledge of healthcare professionals towards pharmaceutical care services.

Attention should also focus to Hospitals, to implement ward based clinical pharmacy services well. Increasing inter-professional relationships between HCPs and pharmacists in medical and pharmaceutical education curriculum is also needed to enhance collaboration between physicians and pharmacists in patient care.

To help assure wide adoption of the concept by pharmacists and to make these services generally available, intense programs to make pharmacy practitioners aware of the full scope of their professional domain and to specifically prepare them to provide these services in realistic service settings must be offered.

Finally, assuming cost effectiveness has been demonstrated, the economic barriers which impede the adoption of these services must be removed and replaced with positive economic sanctions.

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REFERENCE

1. Society of Critical Care Medicine and the American College of Clinical Pharmacy. Position paper on critical care pharmacy services. Pharmacotherapy, 2000; 20: 1400-1406.
2. Thomas set KB, Fairs R. Survey of pharmacy services provision in the emergency department. Am J Health System Pharm, 2003; 60: 1561-1564.
3. American College of Clinical Pharmacy. The definition of clinical pharmacy. Pharmacotherapy 2008; 28: 816-817.
4. Bradshaw SJ, Doucette WR. Community pharmacists as patient advocates: physician attitudes. J Am Pharm Assoc 1998; 38: 598-602.
5. Barker KN, Valentino JG: On a political and legal foundation for clinical pharmacy practice. J Am Pharmaceutical Association, 1972; 12: 202-206, 237.
6. Randall L. Lambert, BS The Pharmacist's Clinical Role As Seen by Other Health Workers AJPH, March, 1977; 67(3).
7. American College of Clinical Pharmacy. Practice Guidelines for Pharmacotherapy Specialists. A Position Statement. Pharmacotherapy, 2000; 20(4): 487-490.
8. New tool to enhance role of pharmacists in health care http://www.who.int/mediacentre/news/new/2006/nw05/en/index.html
9. Burkhart MI, Wermeille JP. Multidisciplinary medication review: evaluation of a pharmaceutical care model for nursing homes. Int J Clin Pharm, 2011 Jun; 33(3): 549-57.
10. Farris KB, Limos FF, Benrimoj S: Pharmaceutical Care in Community Pharmacies: Practice and Research from Around the World. Ann Pharmacotherapy, 2005; 39(9): 1539-1541.
11. Rovers JP, Currie JD, Hagel HP, McDonough RP, Sobotk JL: A practical guide to pharmaceutical care Washington, DC: American Pharmaceutical Association, 2003.
12. Jesson J, Bissell P: Public health and pharmacy: A critical review. Critical Public Health, 2006; 16: 159-169.

13. Gilbert L: To Diagnose, Prescribe and Dispense: Whose Right Is It? The Ongoing Struggle between Pharmacy and Medicine in South Africa. Current Sociology, 2001; 49: 97-118.
14. Mil V: Pharmaceutical care the future of pharmacy. 1999 http://dissertations.ub.rug.nl/FILES/faculties/science/2000/j.w.f.van.mil/titlecon.pdf.
15. Baillie GR, Romeo B. New York State primary care physicians' attitudes to community pharmacists' clinical services. Arch Intern Med, 1996; 156(13): 1437–1441.
16. Linda J.M. Bryant, Ph.D General practitioners' and pharmacists' perceptions of the role of community pharmacists in delivering clinical services.
17. Smith WE, Ray MD, Shannon DM. Physicians' expectations of pharmacists. Am J Health System Pharm, 2002; 59(1): 50–57.
18. Chisholm-Burns MA, Kim Lee J, Spivey CA, Slack M, Harrier RN, Hall-Lipsy E, et al. US pharmacists' effect as team members on patient care: systematic review and meta-analyses. Med Care, 2010 Oct; 48(10): 923-33.
19. Hepler C, Strand L: Opportunities and responsibilities in pharmaceutical care. J Hosp Pharm, 1990; 47(3): 533-543.
20. Leape LL, Cullen DJ, Clapp MD, Burdick E, Demonaco HJ, Erickson JI, Bates DW. Pharmacist participation on physician rounds and adverse drug events in the intensive care unit. JAMA, 1999; 282: 267-270.
21. Borja-Lopetegi A, Webb DG, Bates I, Sharott P. Association between clinical medicines management services, pharmacy workforce and patient outcomes. Pharm World Sci, 2008; 30: 411-50.
22. Abeles AZ, Baughman OL, III. The clinical pharmacist as a preceptor in a family practice residency training program. Farm Med, 2002; 34: 658-662.
23. L. Mat owe, a E.A. Abahussain Physicians' Perceptions and Expectations of Pharmacists' Professional Duties in Government Hospitals in Kuwait © 2006 S. Karger AG, Kuwait.
24. Simpson D. What is medicines management and what is pharmaceutical Care Pharm J., 2001; 266(7133): 150.
25. Zwarenstein M, Goldman J, Reeves S. Inter-professional collaboration: Effects of practice-based interventions on professional practice and Healthcare outcomes. Cochrane Database Syst Rev., 2009(3): CD000072.
26. Geurts MM, Talsma J, Brouwers JR, de Gier JJ. Medication Review an Reconciliation with Cooperation between Pharmacist and General Practitioner and the Benefit for the Patient: a Systematic Review. Br J Clan Pharmacol, 2012 Jan 13.
27. SairaAzhar, Mohamed A Hassali Doctors' Perception and Expectations of the Role of the Pharmacist in Punjab, Pakistan.
28. BTahir M Khan1, Chohan M Shahzad Attitudes of Emergency Department Staff towards the Role of Clinical Pharmacists in a Region of Saudi Arabia; 2011 http://www.tjpr.orghttp://dx.doi.org/10.4314/tjpr.v11i3.18.
29. Ranelli PL, June Biss J. Physicians' perceptions of communication with and responsibilities of pharmacists. Am Pharm Assoc, 2000; 40: 625-630.
30. Koshman SL, Charrois TL, Simpson SH, McAlister FA, Tsuyuki RT. Pharmacist care of patients with heart failure: a systematic review of randomized trials. In Arch tern Med, 2008 Apr 14; 168(7): 687-94.
31. Abduelkarem A, Sharif S. Current Levels of Interaction between the Physician and Pharmacist: A Comparative Study in Libya and UAE. Jordan J Pharm Sci, 2008; 1: 146-155.
32. Vasileff HM, Whitten LE, Pink JA, Goldsworthy SJ, Angley MT. The Effect on medication errors of pharmacists charting medication in an Emergency department. Pharm World Sci, 2009 Jun; 31(3): 373-9.
33. Agrawal A. Medication errors: prevention using information technology systems. Br J ClinPharmacol, 2009 Jun; 67(6): 681-6.
34. Elman Abu-Gharbieh1, Sahar Fahmy Attitudes and Perceptions of HCP and Medical Students Towards Clinical Pharmacy Services in UAE; Trop J Pharm Res, 2010; 9(5): 421-30.
35. Central statistical authority, Statistical abstract 1999. Addis Ababa Ethiopia CSA, 2000.
36. Azhar S. The role of pharmacists in developing countries: the current scenario in Pakistan. Hum Resour Health, 2009; 7(1): 54.
37. Tahaineh LM. Perceptions, experiences, and expectations of physicians in hospital settings in Jordan regarding the role of the pharmacist. Res Social Adm Pharm, 2009; 5(1): 63-70.