

**THE ROLES OF PHARMACISTS IN CARE OPTIMIZATION FOR
SCHIZOPHRENIC PATIENTS IN FEDERAL NEURO-PSYCHIATRIC
HOSPITAL MAIDUGURI, NORTH-EASTERN NIGERIA**

By

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NIGERIA**

NOVEMBER, 2017

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By

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AHMADU BELLO UNIVERSITY, ZARIA
NIGERIA**

NOVEMBER, 2017

DECLARATION

I declare that the work in this dissertation entitled ‘The roles of pharmacists in care optimization for schizophrenic patients in Federal Neuro-psychiatric Hospital Maiduguri, North-Eastern Nigeria’ has been carried out by me in the Department of Clinical Pharmacy and Pharmacy Practice. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other institution.

Hadiza YUSUF

Date

CERTIFICATION

This dissertation entitled THE ROLES OF PHARMACISTS IN CARE OPTIMIZATION FOR SCHIZOPHRENIC PATIENTS IN FEDERAL NEUROPSYCHIATRIC HOSPITAL MAIDUGURI, NORTH-EASTERN NIGERIA, by Hadiza YUSUF meets the regulations governing the award of the degree Master of Science, Clinical Pharmacy of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This research work is dedicated to Almighty Allah who gave me the strength and knowledge to carry out this work and to my late parents for their tireless support right from when I was a child up to when they departed this world.

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I acknowledge Almighty Allah that has sustained me through the difficult moments encountered during the course of this work.

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ABSTRACT

Provision of pharmaceutical care to patients suffering from schizophrenia poses special challenges due to complexity of the disease state, stigmatization and the side effects associated with antipsychotics. The aim of this study was to evaluate the roles of pharmacists in care optimization for schizophrenic patients. The perception of schizophrenic patients to the roles of pharmacists in care optimization was evaluated under 3 domains: managing therapy, interpersonal relationship and general satisfaction. A total of 160 patients were asked to rate their perception of pharmacists' roles in care optimization by scoring from one (1) to five (5), with 5 indicating the highest score. Their perception was evaluated and results were described using percentages. Furthermore, the association of socio- demographic characteristics of schizophrenic patients with their perception of pharmacists' roles in care optimization was determined using logistic regression. Additionally, the perception of other health care professionals of pharmacists' roles in care optimization for schizophrenic patients was evaluated using a self administered questionnaire of a five point likert scale (strongly disagreed, disagreed, undecided, agreed and strongly agreed). Results were presented in percentages. Also, the extent to which pharmacists perform their roles regarding care optimization was also evaluated using a self administered questionnaire consisting of a five point likert scale (never, rarely, sometimes, most of the time and always) and results were also presented in percentages. It was found that a little over half of schizophrenic patients interviewed had poor perception of pharmacists' roles in care optimization. However, there was no significant difference between the proportion of schizophrenic patients that perceived the roles of pharmacists as being good and those that perceived it as being poor ($\chi^2=2.500$, $p=0.114$, $df=1$). In the different domains on the perception of schizophrenic patients, managing therapy had the least score (48.6%).

Socio-demographic characteristics of schizophrenic patients such as age, gender and marital status do not show significant correlation with the perception of pharmacists' roles in care optimization while level of education: secondary level of education ($p=0.001$), tertiary level of education ($p= 0.001$) showed significant correlation and the odd to perceive the role of pharmacists increases with increasing level of education (Primary; OR= 1.471, Secondary; OR= 4.927, Tertiary; OR=7.293). Majority of other health care professionals positively perceived pharmacists role in care optimization for schizophrenic patients with significant difference ($p\leq 0.05$) across all assessed items. Pharmacists reported varying degrees of involvement in care optimization for schizophrenic patients, including - rarely, sometimes and most of the time. It can therefore be concluded that a little over half of schizophrenic patients had poor perceptions of the roles of pharmacists in care optimization. Level of education was the only socio-demographic characteristic with significant correlation to schizophrenic patients' perceptions. Other health care professionals positively perceived the roles of pharmacists in care optimization for schizophrenic patients. Majority of the pharmacists were sometimes or most of the times involved in care optimization for schizophrenic patients, while only a few proportion of the pharmacists were always involved in care optimization in the different aspects.

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LIST OF ABBREVIATIONS AND ACRONYMS

PC	Pharmaceutical care
ASHP	American Society of Health System Pharmacists
DSM	Diagnostic and Statistical Manual for Mental Disorders
CAT	Computed Axial Tomography
CNS	Central Nervous System
ACT	Active Community Treatment
SGAs	Second Generation Antipsychotics
FGAs	First Generation Antipsychotics
GP	General Practitioner
SPN	Social Psychiatric Nurses
FNPH	Federal Neuro Psychiatric Hospital
ABU	Ahmadu Bello University
SD	Standard Deviation
GP	Good Perception
SPSS	Statistical Package for Social Sciences

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Schizophrenia is one of the most complex and challenging of psychiatric disorders. It represents a heterogeneous syndrome of disorganized and bizarre thoughts, delusions, hallucinations, inappropriate affect, and impaired psychosocial functioning (American Psychiatric Association, 2000).

It is a chronic mental disorder affecting a person's thinking, feeling and behaviour (Tandon and Maj, 2008). Schizophrenia is classified based on the presenting symptoms as disorganised, catatonic, paranoid or undifferentiated and it is caused by alterations in the brain structure and function, a probable developmental disorder due to improper maturation of the nervous system (Schizophrenia Research Institute Australia, 2017).

From the time that Kraepelin first described dementia praecox in 1896 until publication of the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision (DSM-IV-TR) in 2000, the description of this illness has continuously evolved (American Psychiatric Association, 2000).

Pharmaceutical care (PC) is defined as a responsible provision of drug therapy for the purpose of achieving definite outcomes that improve patient's quality of life. The outcomes includes: cure of a disease, elimination or reduction of patients' symptoms and arresting or slowing of a disease process or symptom. Pharmaceutical care involves the process through which a pharmacist cooperates with a patient and other

professionals in designing, implementing, and monitoring a therapeutic procedure that will produce specific therapeutic outcomes for the patient. These involves: identifying potential and actual drug-related problem, resolving actual drug related problems and preventing drug related problems (Hepler and Strand, 1990).

The shift of pharmacy practice from product oriented to patient oriented results in greater interaction between pharmacists and other medical professionals and this has resulted into safer, more effective and less costly therapy in new era of patient care (Mohammed *et al.*, 2014).

1.2 Statement of the Study Problem

It is estimated that approximately 50% of patients with schizophrenia do not take their prescribed medications as directed (Lacro *et al.*, 2002). Study also revealed that 74% of patients with schizophrenia had discontinued medication within 18 months due to non efficacy and intolerable side effects (Lieberman *et al.*, 2005).

1.3 Justification

Pharmaceutical care is a patient centred and outcome oriented pharmacy practice with the goal to optimize health related quality of life and to achieve positive outcomes within realistic economic expenditures, but it is apparently a theoretical statement in many hospital settings in Nigeria (Mohammed, 2014).

The prescription, dispensing, administration and monitoring of antipsychotics requires proper implementation of pharmaceutical care which requires the pharmacist to work in concert with the patient and the patient's other healthcare providers to promote health, to

prevent disease, and to assess, monitor, initiate, and modify medication use to assure that drug therapy regimens are safe and effective (Hepler and Strand,1990).

Various drug treatment options, frequent occurrence of side effects and low antipsychotic medication compliance, give the pharmacists an important role to play in the overall successful treatment of patients with schizophrenia (Rijcken *et al.*, 2002).

Patient perception has gained much attention and has been considered as an integral component in the determination of care outcomes (Rosenthal and Shannon, 1997).

1.4 Aim of the Study

The aim of this study was to evaluate the pharmacists' roles in care optimization for Schizophrenic patients.

1.5 Specific Objectives

1. To identify the perception of schizophrenic patients regarding pharmacists' roles in care optimization.
2. To determine whether socio demographic factors explains the perception of schizophrenic patients regarding pharmacists' roles.
3. To identify the perception of other health care professionals on pharmacists' roles in care optimization for Schizophrenic patients.

1.6 Research Questions

1. What is the perception of schizophrenic patients regarding pharmacists' roles in care optimization?
2. What is the perception of other health care professionals regarding the roles of pharmacists in care optimization for Schizophrenic patients?
3. What is the extent to which Pharmacists are involved in care optimization for Schizophrenic patients?

1.7 Research Hypothesis

1. Socio demographic factors of Schizophrenic patients have no effects on their perception of pharmacists' roles in care optimization [Relates to objective 2].

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Pharmaceutical Care Concept

Over the time, pharmacy has evolved as a caring profession. The focus of the caring has shifted from that of drug oriented to patient oriented (Kleimann and Harvey, 1994). Pharmacists express their caring by preparing drug products in accordance with stringent quality control procedures during the compounding and manufacturing era of the 1950s. In the clinical pharmacy era, pharmacists provide drug information and monitor pharmacokinetic profiles (Kleiman and Harvey, 1994).

Currently, the pharmacy profession is undergoing “reprofessionalization”, exploring the opportunity to mature as a profession by accepting its social responsibility to reduce preventable drug related morbidity and mortality (Hepler and Strand, 1990). Mikeal *et al.* (1975) defined pharmaceutical care as “the care that a given patient requires and receives which assures safe and rational drug usage. Brodie *et al.* , (1980) modifies this definition and suggest that pharmaceutical care includes the determination of the drug needs of an individual patient and the provision, not only of the required drugs but also of the services necessary (before, during and after treatment) to ensure optimally safe and effective therapy. Hepler (1987) defined pharmaceutical care as “a covenantal relationship between a pharmacist and a patient in which the pharmacist performs drug use control functions (with appropriate knowledge and skills) governed by the awareness of and commitment of the patients’ interest. Hepler and Strand (1990) published a seminar paper that connects the philosophy and practice concept of pharmaceutical care. This foundational conceptualization visualized pharmaceutical care as that component of pharmacy practice that entails direct interaction of the

pharmacist with the patient for the purpose of caring for the patient's drug related-needs thus pharmaceutical care is defined as the responsible provision of drug therapy for the purpose of achieving definite outcomes that improves a patients quality of life (Hepler and Strand, 1990). Strand (1998) suggested that the above definition was incomplete. The definition she gave is that pharmaceutical care is "a practice in which the practitioner takes responsibility for a patient's drug related needs and holds himself or herself accountable for meeting these needs. "Strand places great emphasis on the word "practice". To work with this new definition, a pharmacist ascertains all the medicines that a patient is taking, from whatever source, assesses them for reasonableness and effectiveness in the light of the patient's condition, develops a care plan and follows up progress on a regular basis (Azuka, 2010).

A practical definition which allows qualitative performance indicators with respect to patient's needs in addition to the quantitative indicators more commonly employed to asses pharmacy services is that " the pharmacist takes responsibility for the patient's drug related needs and is held accountable for meeting those needs" (Strand, 1998).

2.1.1 The objectives of pharmaceutical care

The initial objectives of the practice were to apply the concept of clinical pharmacy to community or ambulatory practice setting. After different attempts and a lot of lessons learned, it became obvious that clinical pharmacy activities were not recognised or reimbursable as patient care services (Azuka, 2010). The revised objectives were the followings: establish a new standard for medication use by an individual patient, create a patient care practice that interfaces with the standards of medicine and nursing, employ the vocabulary and standards that exist in the health care system, and achieve

recognition and reimbursement as a patient care service that actually stands for the same as “Pharmaceutical Care” in the rest of Europe (Strand, 2002).

According to Anderson (2002) the attributes of pharmaceutical care includes: patient centred, outcome oriented, process and not an event, collaboration with patient and other care givers and shared responsibilities for outcomes of pharmacotherapy.

2.1.2 The roles of pharmacists and collaboration with other health care professionals

Pharmacists being professionals in the multi-disciplinary health care team, their roles/functions cannot be overemphasized in patient care. The expected roles include but not limited to appropriate selection of drugs, patient education, monitoring and assessment of therapy outcomes (Giwa *et al.*, 2011a)

American Society of Health System Pharmacists (ASHP) (1999) report that the pharmacist, collaborating with other health care providers and the patient should identify and evaluate the most appropriate action to ensure the safety and effectiveness of current or planned therapy, thereby minimizing current or potential health related problems.

2.1.2.1 The pharmaceutical care philosophy

Pharmaceutical care is both a philosophy and a model of pharmacy practice. It affects the way a pharmacist thinks and act. The philosophy of pharmaceutical care has four basic components: “social need”, “patient-centered care”, “caring”, and “pharmacists’ responsibilities” (Hepler and Strand, 1990).

2.1.2.2 Social need

Studies in the United States have shown that 1.3 million hospitalizations and 63,000 deaths are caused by the inappropriate use of prescription drugs each year (Johnson and Bootman, 1997). This suggests that one in ten patients are more likely to get injured by a prescription drug than by an auto accident in any given year. It also indicates that the number of people who commit suicide, murdered or die in auto accidents combined is roughly equal to the number of people who die as a result of medication problems in any given year (Azuka, 2010). Report indicated that 76 billion dollars was saved in health care expenditure and 120,000 deaths per year prevented if pharmacists were more fully utilized in community health care (Johnson and Bootman, 1995). This means that for every health care dollar spent on purchasing medications, an additional dollar is being spent to deal with misuse of medications. These figures indicate major public health problems. The poor and the elderly are the most likely to suffer from medication misuse. Pharmacists are the most accessible health care professional but yet being underutilized. The potential for improvement in quality of life and in cost reductions is great (Azuka, 2010).

Drug related morbidity and mortality are often preventable, and pharmaceutical care services can reduce the number of adverse drug reactions, the length of hospitalization and cost of care (Hepler and Strand, 1990). When pharmacists prevent drug induced diseases, they are contributing to public health, and when they cause appropriate drug use thereby preventing disease complication, they improve the quality of life of patients. Pharmaceutical care provides great opportunity to become a patient advocate. As drug therapy is associated with risks and benefits, the pharmacist therefore becomes a risk

manager thereby optimizing the goal of drug therapy and improving on existing results (Opara and Arigbe, 2003).

2.1.2.3 Patient centered approach

The “patient – centered” approach means to see the patient as a whole. Pharmaceutical care is a generalist approach. The same care process is to be used by practitioners irrespective of practice setting, hospital or community. Practitioners inclination is to care for the patients needs using quality assurance tools analogous to pharmacists’ care of drug products (Azuka, 2010).

2.1.2.4 Caring

There are three component of caring with regards to pharmaceutical care:

1. To assess the patients need
2. To bring resources to meet those needs
3. Follow up to determine whether what has been done was beneficial or otherwise.

Without the above components there is no pharmaceutical care.

2.1.2.5 Pharmacists’ responsibilities

Pharmacists’ are responsible for identifying a patients’ drug related needs and meeting those needs better than anybody else. For a pharmacist to be responsible, he or she must have both the cognitive base and right attitude to render the service to the patient as a professional responsibility and not an option (Strand, 1998).

Professionals take responsibility for any function they performed. In the practice of clinical pharmacy, pharmacists would have to share responsibility for outcomes of medicines they dispense, with other care givers.

2.1.3 Principles of practice for pharmaceutical care

The American Pharmaceutical Association (1996) adopted some principles for the practice of pharmaceutical care as a patient-centered, outcome oriented pharmacy practice that requires the pharmacist to work in concert with the patient and the patient's other health care providers to promote health, to prevent disease, and to assess, monitor, initiate, and modify medication use to ensure that drug therapy regimen is safe and effective. The goal of pharmaceutical care is to optimize the patient's health related quality of life, and achieve positive clinical outcomes, within realistic economic expenditures. To achieve the goal of pharmaceutical care, the following must be accomplished:

2.1.3.1 Establishment and maintenance of a professional relationship

The pharmacist must interact with the patient to assure that a relationship based upon caring, trust, open communication, and mutual decision making is established and maintained. In such relationship, the pharmacist has to take the patient's welfare paramount, maintains an appropriate attitude of caring for the patient's welfare, and uses all his or her professional knowledge and skills on the patient's behalf. In exchange, the patient agrees to give personal information and preferences, and participate in the therapeutic plan. The pharmacist develops mechanism to assure the patient has access to pharmaceutical care at all times.

2.1.3.2 Development of patient- specific database

The pharmacist have to collect and/or generate subjective and objective information regarding the patient's general health and activity status, past medical history, medication history, social history, diet and exercise history, history of present illness,

and economic situation (financial and insured status). Sources of information may include but are not limited to, the patient, medical chart and reports, pharmacist-conducted health/physical assessment, the patient's family or care giver, insurer, and other health care providers including physicians, nurses, middle level practitioners and other pharmacists. This information must be timely, accurate, complete, readily retrievable and updated, since it will be the basis for decisions regarding the development and subsequent modification of the drug therapy plan. Any information regarding a patient should be maintained in a confidential manner.

2.1.3.3 Evaluation of a patient data and development of a care plan

Based upon a thorough understanding of the patient and his or her condition and its treatment, the pharmacist, with the patient including other health care providers as necessary, should develop an outcome-oriented drug therapy plan. The plan may have various components, which address each of the patient's diseases or conditions. In designing a therapeutic plan, the pharmacist must put into consideration the psychosocial aspects of the disease as well as the potential relationship between the cost and/or complexity of therapy and patient adherence.

A pharmacist, being one of the patient's advocates, assures the coordination of drug therapy with the patient and patient's other health care providers. In addition, the patient must be informed about the various pros and cons (cost, side effects, different monitoring aspect etc.) of the options relative to the drug therapy and instances where one option may be more beneficial based on the pharmacist's professional judgement. The important elements of the plan, including the patients' responsibilities, must be carefully and clearly explained to the patient. Information should be provided to the

patient at the level of his understanding. The drug therapy plan should be documented in the patient's pharmacy record and communicated to the patient's other health care providers as necessary.

2.1.3.4 Provision of necessary information and supplies

The pharmacist providing pharmaceutical care assumes ultimate responsibility for assuring that his/her patient has been able to obtain, and is appropriately using any drug and related products or equipment necessary for achieving the drug therapy plan. The pharmacist should also assure that the patient has a thorough understanding of disease and the therapy or medication prescribed. Furthermore, the pharmacist is also responsible for monitoring the patient's progress in achieving the specific outcomes according to strategy developed in the drug therapy plan. The pharmacist coordinates changes in the plan with the patient and the patients other health care providers as appropriate and necessary in order to maintain or enhance the safety and/or effectiveness of drug therapy and help minimise overall healthcare costs. Patients progress is accurately documented in the pharmacy record and communicated to the patient and to the patient's other health care providers as the settings for care changes, thus helping assure continuity of care as the patient moves between the community setting, the institutional setting, and the long-term care setting.

2.1.4 Steps in providing pharmaceutical care to patients

Pharmaceutical care has been defined as a nine step process (Cipolle *et al.*, 1998). Strand (1998) identified three basic components as: assessment of patients need; development of a care plan; and follow up evaluation. Azuka (2010), although portraying a similar process delineates six steps in the overall process.

2.1.4.1 Establishing a professional/ therapeutic relationship.

Pharmaceutical care is patient-centered and the pharmacist is expected to interact with one patient at a time. When a pharmacist greets a patient, shows empathy and asks how the patient is feeling, a therapeutic relationship is initiated. The pharmacist makes the patient feel that, he or she is concerned about the patient's health and then introduces pharmaceutical care and its benefit to the patient. Establishing a therapeutic relationship facilitates patients' granting of authority to the pharmacists to undertake responsibility on the patient's behalf.

2.1.4.2 Collect patient specific subjective and objective data

Pharmacist role depends on the amount of patients information at hand and how it is been utilized. Patients' data can be obtained by interviewing the patient; the care givers and the patient's relatives or friends. Other sources of patient's data include: reviewing of existing medical records, laboratory reports and physical assessment using the skills of inspection, palpation, percussion and auscultation as appropriate. These procedures would yield subjective and objective patient data.

2.1.4.3 Evaluate data and identify health and drug therapy problems

Critical thinking, problem solving skills and systematic approach are essential in evaluating data and identifying health and drug therapy problems. The pharmacist compares each drug treatment with a problem and ensures that every drug is managing a condition and that every condition is being managed with or without a drug. Where a drug is used, it should be assessed for indication, safety, efficacy, compliance and appropriateness of dosage regimen and form. Health problems may include a medical or psychiatric diagnosis, patient complaint, an abnormal laboratory test result, an abnormal

observation (sign or symptom), a social or financial situation, a psychological concern or a physical limitation/ disability.

Drug therapy problems should be identified and briefly described. The severity of problems are assessed and prioritized to determine whether an intervention is necessary immediately, later, or not really needed. Adequate evidence (such as primary literature) supporting the existence of a drug-related problem, and therapeutic principles that are used as a basis for solving the problem should be provided by the pharmacist.

2.1.4.4 Develop and implement Pharmaceutical care plans

A pharmaceutical care plan is a means of solving the identified problems. The first section of the written plan of action should define patient specific goals (“what”) and this should not be confused with the methods (“how”). Goals should be definite, achievable (realistic) and consistent with professional responsibilities of the pharmacist. Two major types of Pharmacists’ interventions are patient- focused and drug- focused interventions. Patient- focused interventions include assisting patients with compliance problems, patient education and counselling beyond Omnibus Budget Reconciliation Act (OBRA, 1990), monitoring the patient, implementing non drug therapy and referral. Drug- focused interventions include recommendation on adding a new drug, discontinuing medication, changing drug, dose, interval, duration or dosage form, and monitoring parameters. Monitoring parameters are those laboratory tests, clinical measurements, generic/disease specific quality of life instruments, patient knowledge or satisfaction, and observations that are to be prospectively followed in order to provide feedback on the status of the patient’s health and drug therapy problem. Each parameter should include the time when it will be obtained and by which health professional. Prior

to implementation of pharmaceutical care plans the pharmacist should ensure that the patient has all the supplies (drug and information) needed for the patient to comply.

2.1.4.5 Evaluate the interventions and follow-up

Pharmaceutical care is outcome- oriented. The pharmacist should determine whether his intervention improved patient outcome (clinical, humanistic and economic). A follow-up indicates the need to modify care plan and lessons for the future.

2.1.4.6 Document activities

Pharmaceutical care activities must be documented in the appropriate data forms. This step runs throughout the entire pharmaceutical care process. Documentation provides evidence for what was done, audit trail and continuity of care when another pharmacist is on duty. It also provides data for practice research. Documentation generates three types of record namely: pharmaceutical care patient chart, created primarily for the practitioner's use; patients personalized pharmaceutical care plan, generated for the patient use; and practice management report that is used to manage the practice (Cipolle *et al.*, 1998)

2.1.5 Benefits of pharmaceutical care

Pharmaceutical care provides patients with better cure rate, reduction in target symptoms, reduction in adverse drug reaction, improves patient knowledge, optimises patient expectations, enhances patient satisfaction, improves quality of life, prolongs life, reduces hospitalization, reduces cost of care to the patient and frees man hour for patient to be more productive and earn more. It also enhances professional survival, improves professional image, promotes professional growth and development, enhances

job satisfaction and provides additional earning to pharmacists by getting reimbursed from cost saving. To the government, it reduces escalating cost of care, reduces burden in the health care delivery system and enhances productivity through a healthy workforce (Azuka, 2010).

2.1.6 Barriers to the implementation of pharmaceutical care

2.1.6.1 Pharmacists' attitudes

Since pharmaceutical care is a practitioner driven, barriers pertaining to the pharmacist are the most important. These include: knowledge, attitude, skills, understanding of pharmaceutical care, orientation towards traditional dispensing, interests, lack of time, inertia and personal energy. Attitude factors may represent key obstacles in realizing pharmacist's contribution to society (Knapp, 1997).

2.1.6.2 Settings

Though the practice of pharmaceutical care is dependent on the practitioner and not on the setting, an appropriate setting would facilitate the process (Strand, 1998).

2.1.6.3 Public attitudes and expectations

The assignment of roles to a professional depends on the public's perception of the profession and hence, professionals have anticipatory social roles. There are places where the public does not expect certain health care role from the pharmacist and this can be a de-motivating factor. Health promotion is an integral part of pharmaceutical care. A survey of consumers' view in UK indicated that many consumers did not perceive a role for community pharmacists in health promotion contrary to the professions presumptions (Anderson, 1998). Consumer perception and expectations changed based on prior experience. There is indication that patient expectations of

pharmacy improve with the delivery of pharmaceutical care as the pharmacist increases his interaction with patients (Erstad *et al.*,1994).

2.1.6.4. Lack of standards

Pharmaceutical care will fail if each pharmacy organisation or individual pharmacists are allowed to define pharmaceutical care on their own agenda (Al- Shaqha and Zairi, 2001). Perhaps the most important step facing pharmacists is to agree on a standardised method for pharmaceutical care. It is important to decide what method pharmacists will use to collect the patient information, used to identify and resolve drug-related problems as well as documenting the practice (Azuka, 2010).

2.1.6.5 Systems related barrier

A major system-related barrier in healthcare setting is the lack of a comprehensive, ongoing process for defining the appropriate outcomes of drug therapy (May, 1993). For employers and other purchasers to understand the quality of the health care for which they are paying, defining the quality and appropriateness of outcomes is needed. Physical facilities limit the ability of the pharmacists to provide pharmaceutical care. Dedicated areas in which the pharmacist can provide patient consultations or drug therapy information, are often lacking (Azuka, 2010)

2.2 Schizophrenia and its Management

Schizophrenia is one of the most complex and challenging of psychiatric disorders. It represents a heterogeneous syndrome of disorganized and bizarre thoughts, delusions, hallucinations, inappropriate affect, and impaired psychosocial functioning. From the time that Kraepelin first described dementia praecox in 1896 until publication of the

Diagnostic and Statistical Manual of Mental Disorders, in 2000, the description of this illness has continuously evolved (American Psychiatric Association, 2000).

2.2.1 Epidemiology

According to the Epidemiologic Catchment Area Study, the U.S. lifetime prevalence of schizophrenia ranges from 0.6% to 1.9%, with an average of approximately 1% (Jones and Buckley, 2006). With only a few possible exceptions, the worldwide prevalence of schizophrenia is remarkably similar among all cultures. Schizophrenia most commonly has its onset in late adolescence or early adulthood and rarely occurs before adolescence or after the age of 40 years. Although the prevalence of schizophrenia is equal in males and females, the onset of illness tends to be earlier in males. Males most frequently have their first episode during their early twenties, whereas with females it is usually during their late twenties to early thirties (Jones and Buckley, 2006)

2.2.2 Etiology

Although the aetiology of schizophrenia is unknown, research has demonstrated various abnormalities in brain structure and function (Harrison, 1999) however, these changes are not consistent among all individuals with a diagnosis of schizophrenia, and much has yet to be learned about its pathogenesis. The cause of schizophrenia is likely multifactorial; that is, multiple pathophysiologic abnormalities can play a role in producing the similar but varying clinical phenotypes we refer to as schizophrenia. A neurodevelopmental model has been evoked as one possible explanation for the aetiology of schizophrenia.(Weinberger, 2003).This model proposes that schizophrenia has its origins in some as yet unknown in utero disturbance, possibly occurring during the second trimester of pregnancy. Evidence for this is provided by the abnormal

neuronal migration demonstrated in most studies of schizophrenic brains. This “schizophrenic lesion” can result in abnormalities in cell shape, position, symmetry, connectivity, and functionally to the development of abnormal brain circuits (Weinberger, 2003). Changes are consistent with a cell migration abnormality during the second trimester of pregnancy, and some studies associate upper respiratory infections during the second trimester of pregnancy with a higher incidence of schizophrenia (Brown and Susser, 2002).

2.2.3 Pathophysiology

Computed axial tomography (CAT) scans and magnetic resonance imaging (MRI) studies show increased ventricular size, particularly in the third and lateral ventricles, in subtypes of schizophrenics. Recent studies also show a small decrease in brain size compared to matched controls. These changes appear to be consistent with brain asymmetry, the ventricular enlargement being most pronounced in the left temporal horn, and the decreased cortical size being most obvious in the left temporal lobe (Harrison, 1999). Not only does premorbid lower hippocampus volume predict onset of symptoms in high-risk individuals, these structural changes can progress throughout the course of the illness. A reduction in medial temporal lobe volume has been reported in high-risk patients after they were scanned, indicating that some brain changes can be associated with the evolution of psychosis. In an extended analysis, high-risk subjects were compared with first-episode chronic schizophrenia and normal control groups according to hippocampus and amygdale volumes at baseline (Velakoulis *et al.*, 2006). No difference in MRI volumes between the high-risk subjects and normal controls were observed, irrespective of whether the at-risk patients did or did not progress to overt psychosis. First-episodes schizophrenia (but not other psychosis) groups had reduced

(left) hippocampal volume. The implication that these changes occur during transition is intriguing and accords well with the notion of psychosis as a biologically toxic event. Changes in hippocampal volume may correspond with impairment in neuro psychological testing, and these patients may have poorer response to first-generation antipsychotics (FGAs) (Mathalon *et al.*, 2001) Rather than a decrease in the number of neurons in affected brain areas, a decrease in axonal and dendritic communications between cells can result in a loss of connectivity that can be important with respect to neuronal adaptively and CNS homeostasis (Harrison, 1999) These changes are likely consistent with the evidence for abnormal neuronal pruning (Weinberger, 2003). Human brain-imaging studies reveal that medications can influence brain structure in treated patients with repeated MRI brain scans. (Lieberman *et al.*, 2005) The clinical relevance of these findings is not yet established.

2.2.4 Symptoms

The DSM-IV-TR classifies the symptoms of schizophrenia into two categories which includes positive and negative symptoms. The positive symptoms include; suspiciousness, delusions, hallucinations and conceptual disorganization while negative symptoms include; affective flattening, alogia, anhedonia and avolition function (Vellegan *et al.*, 2004). Recently greater emphasis has been placed on a third symptom category known as cognitive dysfunction and this includes impaired attention, impaired working memory and impaired executive function (Vellegan *et al.*, 2004).

2.2.5 Clinical presentation

Schizophrenia is the most common functional psychosis, and great variability occurs in clinical presentation. Despite numerous attempts to portray a stereotype in movies and

on television, the stereotypic schizophrenic essentially does not exist. Moreover, schizophrenia is not a “split personality.” It is a chronic disorder of thought and affect with the individual having a significant disturbance in interpersonal relationships and ability to function in society. The first psychotic episode can be sudden in onset with few premorbid symptoms, or commonly can be preceded by withdrawn, suspicious, peculiar behaviour (schizoid). During acute psychotic episodes, the patient loses touch with reality, and in a sense, the brain creates a false reality to replace it. Acute psychotic symptoms can include hallucinations (especially hearing voices), delusions (fixed false beliefs), and ideas of influence (beliefs that one’s actions are controlled by external influences). Thought processes are disconnected (loose associations), the patient may not be able to carry on logical conversation (alogia), and can have simultaneous contradictory thoughts (ambivalence). The patient’s affect can be flat (no emotional expression), or it can be inappropriate and labile. The patient is often withdrawn and inwardly directed (autism). Uncooperativeness, hostility, and verbal or physical aggression can be seen because of the patient’s misperception of reality. Self-care skills are impaired, and the patient is frequently dirty, unkempt, and in general has poor hygiene. Sleep and appetite are often disturbed. When the acute psychotic episode remits, the patient typically has residual features. This is an important point in differentiating schizophrenia from other psychotic disorders. Although residual symptoms and their severity vary, patients can have difficulty with anxiety management, suspiciousness, and lack of volition, motivation, insight, and judgment. Therefore, they often have difficulty living independently in the community. They have difficulty understanding the importance of treatment, including medications, in maintaining their ability to function in society. Therefore they tend to discontinue

medications and other treatments, and this increases the risk of relapse and rehospitalisation ((Joseph *et al.*, 2008).

2.2.6 Management of schizophrenia

Pharmacotherapy is the mainstay of treatment in schizophrenia, and it is impossible in most patients to implement effective psychosocial rehabilitation programs in the absence of antipsychotic treatment (Lehman *et al.*, 2004). A pharmacotherapeutic treatment plan should be developed that delineates drug-related aspects of therapy. Explicit end points should be defined, including realistic goals for the target symptoms most likely to respond, and the relative time course for response (Lehman *et al.*, 2004). Other goals include avoiding unwanted side effects, using the minimum effective dose, emphasizing adequate time as a primary variable in determining response, and limiting augmentation medications to nonresponsive patients.

2.2.7 Non pharmacologic therapy

Psychosocial rehabilitation programs oriented toward improving patients' adaptive functioning are the mainstay of nondrug treatment for schizophrenia. These programs can include case management, psycho education, targeted cognitive therapy, basic living skills, social skills training, basic education, work programs, supported housing, and financial support. In particular, programs aimed at employment and housing has been the more effective interventions and is considered "best practices." Programs that involve families in the care and life of the patient have been shown to decrease rehospitalisation and improve functioning in the community. For particularly low-functioning patients, assertive intervention programs, referred to as active community treatment (ACT), are effective in improving patients' functional outcomes. ACT teams

are available on a 24-hour basis and work in the patient's home and place of employment to provide comprehensive treatment, including medication, crisis intervention, daily living skills, and supported employment and housing (Lehman *et al.*, 2004).

2.2.8 Pharmacologic therapy

The importance of initial accurate diagnostic assessment cannot be overemphasized. A thorough mental status examination, physical and neurologic examination, complete family and social history, and laboratory workup must be performed to confirm the diagnosis and exclude general medical or substance-induced causes of psychosis. Laboratory tests, biologic markers, and commonly available brain imaging techniques do not assist in diagnosis or selection of medication. A pre-treatment patient workup is important in not only excluding other pathology, but in serving as a baseline for monitoring potential medication-related side effects, and should include: vital signs, complete blood count, electrolytes, hepatic function, renal function, electrocardiogram, fasting serum glucose, serum lipids, thyroid function, and urine drug screen ((Joseph *et al.*, 2008).

2.2.8.1 Second generation antipsychotics

Second-generation antipsychotics (SGAs) include; aripiprazole, clozapine, olanzapine, paliperidone, quetiapine, risperidone and ziprasidone. SGAs (with the exception of clozapine) have become first-line agents in the treatment of schizophrenia (Moore *et al.*, 2007). No absolute criterion distinguishes atypical (second-generation) from typical (traditional, conventional, or first-generation) antipsychotics, and no universally

accepted definition exists for an atypical antipsychotic (Meltzer, 2004). Second-generation antipsychotics, a more appropriate term, common to all definitions is the ability of the drug to produce antipsychotic response with few or no acutely occurring extra pyramidal side effects. Other attributes that have been ascribed to SGAs include enhanced efficacy, particularly for negative symptoms and cognition; absence or near absence of propensity to cause tardive dyskinesia; and lack of effect on serum prolactin (Meltzer, 2004). To date, the only approved SGA that fulfils all of these criteria is clozapine (Meltzer, 2004). Although conflicting, some evidence suggests that SGAs can have superior efficacy for the treatment of negative symptoms, cognition, and mood (Moore *et al.*, 2007). Whether these differences are a result of differences in core efficacy or differences in side-effect profile is unknown. The major advantage of atypical antipsychotics can be their lower risk of neurologic side-effects, particularly effects on movement.

2.2.8.2 *First generation antipsychotics*

First generation antipsychotics include; chlorpromazine, fluphenazine, haloperidol, loxapine, molindone, perphenazine, thioridazine, thiothixene and trifluoperazine. Maintenance effectiveness studies in individuals with chronic schizophrenia do not show any major overall clinical outcome differences between using the First generation antipsychotics (FGAs) perphenazine versus SGAs. However, in first episode schizophrenia, SGAs are often considered first-line treatments because of the risk of tardive dyskinesia with FGAs (Lehman *et al.*, 2004). This can be of particular significance in individuals with their first psychotic break, as they seem particularly susceptible to extra pyramidal side effects. No known differences exist in efficacy between low- and high potency FGAs. Previous patient or family history of response to

an antipsychotic is helpful in the selection of an agent. Traditional dosage equivalents (expressed in “chlorpromazine equivalent dosages”— the equipotent dosage of any traditional FGA compared with 100 mg of chlorpromazine) can assist in determining the effective dosage range if the need arises to treat a patient with a different FGA. However, because SGAs differ in mechanism of action, the dose equivalents have little relevance when comparing dosages of SGAs (Joseph *et al.*, 2008).

2.3 Relevance of Pharmaceutical Care in Schizophrenic Patients

Because of the varying medical treatment options, the frequent occurrence of side effects and the extremely low medication compliance, the pharmacist might play an important role in overall successful treatment of patients with schizophrenia. Communication between pharmacist and antipsychotic drug user at the outset of treatment can include reviewing the purpose of the medication, target symptoms, the comparative timing of potential benefits and side effects, how to identify and manage antipsychotic-related side effects and patient concerns (Rijcken *et al.*, 2002) Earlier research to the current role of the pharmacist world-wide revealed that there is growing awareness among pharmacists concerning their additive value to care providing in schizophrenia (Taylor and Harding, 2001).

Research revealed that one of the most important aspects which is currently lacking in schizophrenia care, is the sufficient delivery of detailed antipsychotic drug information (Rijcken *et al.*, 2002). Informing patients and their relatives can improve the confidence in care providers and in medication (Motlova, 2000). Improved adherence to first use of antipsychotic can decrease chances of relapse and long-term prognosis can improve (Power *et al.*, 1998).

2.3.1 Advising, prescribing and auditing pharmacotherapy in schizophrenia

One of the most important aspects of disease management in schizophrenia is putting the patient central in health care, by equal focussing on the disease of all care providers. The patient centralisation automatically suggests that, in the ideal case, treatment strategies of all care providers are mutually adapted to the personal needs of the patient (Figure 2.1). However, uniformly provision of services may lead to losing touch with the individual patient. Thus, the main treatment provider, who usually concerns the psychiatrist, should be aware of all other caring activities surrounding the individual patient (Rijcken *et al.*, 2002).

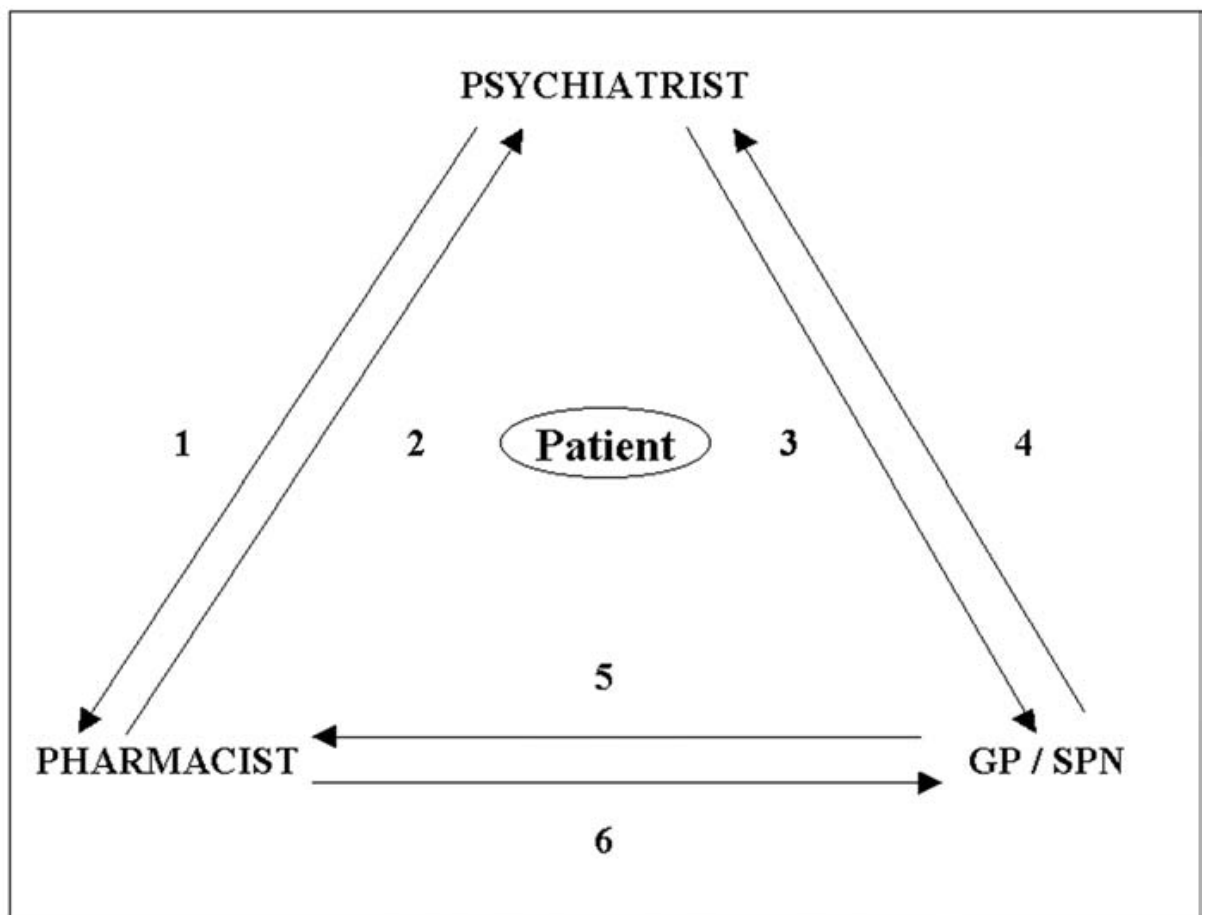


Figure 2.1: Communication Patterns in Cross-Sectoral Schizophrenia Consultation: who Communicates Towards the Patient?

Key: GP-General practitioner, SPN- Social psychiatric nurses

1: Providing relevant patient information and indicators for relapse

2: Providing prescription and individual patient information

3: Providing relevant patient information and indicators for relapse

4: Providing information concerning current treatment state and indication of relapse

5: Providing information concerning current pharmacotherapeutical treatment state and indication of relapse

6: Providing general drug information and individual prescription information

Source: Rijcken *et al.*, 2002

Since a multidisciplinary treatment approach to psychiatric rehabilitation has been proven to positively influence outcome of disease (Lieberman *et al.*, 2001), pharmacists should be encouraged to collaborate with other healthcare professionals and paramedics in mental health care.

Pharmacists are at the end of the prescribing process and are often the last health care professional with whom the patient has contact before making their medicine-taking decision. This places pharmacists and pharmaceutical care in strong position in terms of involvement in decisions about medicine taking. Especially in schizophrenia, a well-educated and motivated pharmacist may be an ideal medication expert in the integrated care with all care-providers surrounding the patient with schizophrenia (Rijcken *et al.*, 2002).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Description of the Study Area

Federal Neuro-Psychiatric Hospital (FNPH), Maiduguri was established in 1995 along with four other Federal Neuro-Psychiatric Hospitals (FNPH, 2015). The services of the hospital took off in 1999 (FNPH, 2015). The hospital has recorded 67,000 mental health cases in the past 18 years. FNPH, Maiduguri is a regional Psychiatric Hospital; it serves the north-east region of Nigeria (Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe State) and also receives influx of patients from the neighbouring countries of Chad, Cameroon, and Niger Republics. The centre is a 150- bed capacity established to provide clinical services, research and training in mental health to the people living in the North Eastern part of the country.



FIGURE 3.1 Map of Nigeria Showing the North-East Region

Source: Daily Trust, 2017. Available at-www.dailytrust.com.ng

3.2 Sample Size Determination

3.2.1 Schizophrenic patients

The prevalence of schizophrenia in Federal Neuro-psychiatric hospital Maiduguri was estimated to be around 9.63% (FNPH, 2016). Based on this the required sample size for this study was calculated as shown below using the formula reported by Ahmed *et al.* (2012).

Sample size, $n = [z/\Delta]^2 p(1-p)$

$n = [1.96/0.05]^2 0.096(1-0.096)$

$n = 39.2^2 \times 0.096 \times 0.904$

$n = 133$

$n =$ required sample size

$z =$ standard deviation = 1.96

$\Delta =$ Absolute precision = 0.05(5%)

$p =$ Anticipated population proportion = 9.6%

Adding 20% of this to take care of attrition;

$(20/100) \times 133$

$0.2 \times 133 = 27$

$133 + 27 = 160$

Therefore, the sample size for Schizophrenic patients to be recruited was estimated to be 160 subjects.

3.2.2 Other Health Care Professionals

The total population of other health care professionals during the period of this study was 140 from hospital record (physicians- N=25, psychologists- N=4, Nurses- N=85, medical lab scientists- N=14, radiographers-N=10 and radiologists-N=2).

Based on this the sample size was calculated using the formula described by Yamane and Taroas reported by Keneth *et al.* (2012).

$$n = N/1+N (e)^2$$

$$n = 140/1+ 140 (0.05)^2$$

$$n = 140/1.35$$

$$n = 103.7$$

$$n = 104$$

n= desired sample size

N= estimated size of the study population

e= margin of error (0.05)

Adding 15% of this to take care of attrition;

$$15/100) \times 104$$

$$0.15 \times 104 = 15.6$$

$$15.6 + 104 = 119.6$$

Therefore the number of other health care professionals to be recruited was estimated to be 120.

3.2.3 Pharmacists.

All Pharmacists (N=16) also participated in the study.

3.3 Study Population

Study 1- Schizophrenic Patients

Schizophrenic patients that were registered and attend the specialist clinic were the respondents for this study.

Study 2- Other Health Professionals

Physicians, psychologists, nurses, radiographers, radiologists and medical laboratory scientists working at Federal Neuro-Psychiatric Hospital Maiduguri.

Study 3- Pharmacists

Pharmacists working at Federal Neuro-Psychiatric Hospital Maiduguri.

3.3.1 Inclusion criteria

Study 1-Schizophrenic patients

Schizophrenic out-patients attending the psychiatric hospital that were physically and emotionally stable, who had been well controlled with drugs, who had been on antipsychotic medications for at least 6 month, were 15 years of age or older and had consented to participate in the study.

Study 2- Other health care professionals

Physicians, psychologists, nurses, radiographers, radiologists and medical laboratory scientists that were involved in schizophrenic patient's management.

Study 3- Pharmacists

Pharmacists involved in direct interaction with Schizophrenic patients.

3.3.2 Exclusion criteria

Study 1- Schizophrenic patients

Schizophrenic out-patients, who were attending the clinic but had not started antipsychotics, not stable enough to complete the questionnaire and had not consented to participate.

Study 2- Other health care professionals

Physicians, psychologists, nurses, radiographers, radiologists and medical laboratory scientists that were not involved in schizophrenic patient's management

3.4 Sample Selection

Study 1- Schizophrenic patients

Systematic random sampling (sampling interval, $N = 2$) was conducted for schizophrenic patients on the clinic days.

Study 2- Other health care professionals

Proportionate quota sampling was conducted for other health care professionals (physicians, psychologists, nurses, medical laboratory scientists radiologists and radiographers).

Study 3- Pharmacists

Purposeful sampling was conducted for pharmacists.

3.5 Ethical Considerations

Ethical approval was obtained from the Ethical Review Committee of Federal Neuro-Psychiatric Hospital Maiduguri with strict adherence to their requirements (Appendix I). Written consent of the participants was obtained after the purpose of the research had been clearly explained to them (Appendix II).

3.6 Study Design

The study was a cross sectional study; where by respondents (pharmacists, other health care professionals and patients) were interviewed once using the designed data instrument between September and October 2016 (Appendix III, IV and V). One hundred and sixty schizophrenic patients were asked to rate their perceptions of pharmacists' roles under 3 domains (managing therapy, interpersonal relationship and general satisfaction) by scoring from one (1) to five (5), 5 indicating the highest score. The total score for individual patient in the different domains and the pooled (overall score from the 3 domains put together) were obtained. The perception for each domain and the pooled perception (overall perception from the 3 domains) were obtained based on the mean score from each domain and the pooled. In the different domains and pooled, patients having up to the mean score and above were considered to have good perception while those having below it were considered to have poor perception, Association between socio- demographic characteristic of schizophrenic patients with their perception of pharmacists' roles in care optimization was determined using logistic regression.

Other health care professionals were administered questionnaires consisting of a five point likert scale (strongly disagreed, disagreed, undecided, agreed and strongly agreed)

to show their perception of the roles of pharmacists in care optimization for schizophrenic patients. Strongly disagreed and disagreed were considered to be negative perception while strongly agreed and agreed were considered to be positive perception and chi-square was used to compare proportions. Furthermore, pharmacists were administered a questionnaire consisting of a five point likert scale (never, rarely, sometimes, most of the time and always) to show the extent to which they perform their roles in care optimization for schizophrenic patients.

3.7 Data Instrument

3.7.1 Questionnaire development

Structured questionnaires were designed for the collection of data from pharmacist, other health care professionals and schizophrenic patients. The selection of domains and items was based on previously published questionnaires (Giwa *et al.*, 2011a; 2011b; Luz *et al.*, 2007) with slight modifications. Questionnaire for schizophrenic patients consist of a five point score of 1-5 where 5 indicates highest perception. For other health care professionals, the questionnaire consist of a five point likert scale of strongly disagreed, disagreed, undecided, agreed and strongly agreed. For pharmacists the questionnaire also consist of a five point liker scale of never, rarely, sometimes, most of the time and always.

3.7.2 Questionnaire validation process

3.7.2.1 Face validity

The developed questionnaires were reviewed by project supervisors for face validity of questions in terms of content, scope and appropriateness of each item on the questionnaire.

3.7.2.2 Pretesting of questionnaires

A five days pilot study was conducted in an alternating similar setting to the one in which the study was conducted (Psychiatric clinic, ABU Teaching Hospital Shika, Zaria, Kaduna State. The three questionnaires were pre-tested by administering to 10% of Schizophrenic patients (n=16), other health care professionals (n=12) and Pharmacists (n=2). Appropriate corrections were made based on the analysis of the pre-tested questionnaire.

3.8 Data Collection

The data instruments were administered to pharmacists, other health care professionals and schizophrenic patients. One week duration was given to pharmacists and other health care professionals to complete the questionnaires. For schizophrenic patients, the structured questionnaires were used in face- to-face communication by interviewer with the support of patients care givers on clinic days using systematic random sampling on each of the clinic days. Demographic profiles of Schizophrenic patients were obtained from patients records.

3.9 Data Analysis and Presentation

The collected data was analysed using Statistical package for social science (SPSS) version 20 (SPSS Inc, Chicago, Illinois, USA) and presented using frequency distribution tables. Logistic regression was used to find association between socio demographic variables and schizophrenic patients' perceptions while Chi - square was used to find significant difference between categorical variables. P – Values of ≤ 0.05 were considered to be statistically significant.

CHAPTER FOUR

4.0 RESULTS

4.1 Distribution of Schizophrenic Patients According to their Socio-Demographic Characteristics in Federal Neuro Psychiatric Hospital Maiduguri

A total of one hundred and sixty patients were interviewed giving a response rate of 100%. Out of the 160 patients interviewed, 93 (58.1%) were males while 67 (41.9%) were females. Eighty five (53.1%) out of the 160 respondents, fell within the age range of 25-40. Ninety patients (56.3%) had no formal education. Seventy four patients (46.3%) were single, 53 (33.1%) were married, 17 (10.6%) were divorced while 16 (10.0%) were widowed (Table4.1).

Table 4.1: Distribution of Schizophrenic patients according to their socio-demographic characteristics in Federal Neuro Psychiatric Hospital Maiduguri

Variables	Distribution (n=160)	Percentage distribution (%)
Sex		
Male	93	58.1
Female	67	41.9
Age group (years)		
< 25	35	21.9
25-40	85	53.1
>40	40	25.0
Level of education		
Primary	25	15.6
Secondary	28	17.5
Tertiary	17	10.6
No formal education	90	56.3
Marital status		
Single	74	46.3
Married	53	33.1
Divorced	17	10.6
Widowed	16	10.0

4.2 Perception of Schizophrenic Patients Regarding Pharmacists' Roles in Care Optimization

4.2.1 Distribution of schizophrenic patients perception scores of the roles of pharmacists in care optimization across the three activity domains in federal neuro psychiatric hospital maiduguri

The perception of schizophrenic patients of pharmacists' roles regarding care optimization was evaluated using three domains: managing therapy, interpersonal relationship and general satisfaction.

In managing their therapy, 50 respondents (31.2 %) rated efforts of pharmacists to check with them about how well their medications were working as 5 (highest score) while 47 (29.4 %) rated the item as 1 (lowest score). On giving them information about the proper storage of their drugs, seventy five respondents (46.9 %) rated pharmacists' effort as 1 (lowest score). One hundred and fifteen respondents (74.7 %) also rated pharmacists' efforts in giving them information about expected result of medical therapy as 1. Eighty six (53.8 %) out of the 160 respondents, rated the pharmacists' effort in using information about their previous condition or drugs when assessing their drug therapy as 1 (lowest score). The role of pharmacists in ensuring good interpersonal relationships on all assessed aspects was rated 3 and above by majority of the respondents.

Under the general satisfaction domain, privacy of conversations with the pharmacists was rated 4 by 47 of the respondents (28.8 %). Professional appearance of the pharmacists was rated 5 by 85 (53.1%) of respondents and satisfaction with pharmacy services overall was rated 5 by 101 (63.1%) of the respondents (Table 4.2).

Table 4.2: Schizophrenic Patients' Perception Scores of the Roles of Pharmacists in Care Optimization across the Three Activity Domains in Federal Neuro Psychiatric Hospital Maiduguri

Items	n= 160 Score Frequency (%)				
	1	2	3	4	5
Managing therapy					
The Pharmacist's effort to check with you about how well your medications are working	47 (29.4)	9 (5.6)	27 (16.9)	27 (16.9)	50 (31.2)
The Pharmacist's effort to give you information about the proper storage of your drug	75 (46.9)	9 (5.6)	19 (11.9)	21 (13.1)	36 (22.5)
The Pharmacist's effort in giving you information about the result you can expect from your drug therapy	115(74.7)	8 (5.2)	9 (5.8)	10 (6.5)	12 (7.8)
The Pharmacist's effort in using information about your previous condition/drugs when assessing your drug therapy	86 (53.8)	5 (3.1)	21 (13.1)	19 (11.9)	29 (18.1)
Interpersonal relationship					
The Pharmacist's interest in your health	14 (8.8)	11 (6.8)	25 (15.6)	56 (35.0)	54 (33.8)
The Pharmacist's professional relationship with you	19 (11.8)	18(11.3)	32 (20.0)	40 (25.0)	51 (31.9)
The help you get from the Pharmacist to avoid unnecessary costs related to your prescriptions	34 (21.2)	3 (1.9)	20 (12.5)	55 (34.4)	48 (30.0)
The amount of time the Pharmacists spend with you	35 (21.9)	19(11.9)	32 (20)	37 (23.1)	36 (22.5)
The Pharmacist's effort in giving you instruction about how to take your medication	2 (1.3)	2 (1.3)	17 (10.6)	46 (28.7)	93 (58.1)
The way the Pharmacists answer your question	5 (3.3)	5 (3.3)	27 (17.9)	41 (27.2)	73 (48.3)
General satisfaction					
The privacy of your conversation with the pharmacist	28 (17.5)	11 (6.8)	32 (20.0)	46 (28.8)	43 (26.9)
The professional appearance of the pharmacist	0 (0.0)	0 (0.0)	16 (10.0)	59 (36.9)	85 (53.1)
Your pharmacy services overall	0 (0.0)	0 (0.0)	14 (8.8)	45 (28.1)	101(63.1)

Item score: 1= lowest score and 5= highest score.

4.2.2 Mean perception scores of schizophrenic patients' perception of pharmacists' roles in care optimization across all assessed domains in Federal Neuro Psychiatric Hospital Maiduguri

The perception for each domain and the pooled perception were obtained based on the mean score from each domain and the pooled. The highest perception score was in the domain of general satisfaction (82.3%), followed by interpersonal relationship (74.3%). Managing therapy had the lowest score of 48.6 % (Table4.3)

Table 4.3: Mean perception scores of Schizophrenic patients' perception of pharmacists' roles across all assessed domains in Federal Neuro Psychiatric Hospital Maiduguri

Domain (n= 160)	No of Items	Total P. score	P. score Mean \pm SD	P. score (%) Mean \pm SD
Perception regarding managing therapy	4	20	9.7 \pm 4.1	48.6 \pm 20.9
Perception regarding interpersonal relationship	6	30	22.3 \pm 5.1	74.3 \pm 17.2
Perception regarding general satisfaction	3	15	12.3 \pm 2.0	82.3 \pm 13.9
Pooled perception	13	65	44.4 \pm 8.5	68.3 \pm 13.1

P= perception, SD = Standard deviation

4.2.3 Schizophrenic patients' perception of pharmacist roles across assessed domains in Federal Neuro Psychiatric Hospital Maiduguri

In the domain of managing therapy, patients having a score of 48.6 % and above were considered to have good perception while those having below it were considered to have poor perception. In the domain of interpersonal relationship, patients having a score of 74.3 % and above were considered to have good perception while those having below it were considered to have poor perception. In the domain of general satisfaction, patients having 82.3% and above were considered to have good perception while those having below it were considered to have poor perception. For the pooled perception, patients having 68.3 % and above were considered to have good perception while those having below it were considered to have poor perception.

The general satisfaction domain had the highest number of respondents with good perceptions (53.1 %), followed by the interpersonal relationship domain (50.6%). Managing therapy had the least number of respondents with good perceptions (49.4%). For the pooled perception, only 43.7 % had good perceptions (Table 4.4).

Table 4.4: Schizophrenic patients' perception of pharmacist roles across assessed domains in Federal Neuro Psychiatric Hospital Maiduguri

Domain	Perception		Test statistics	Total (%)
	Good (%)	Poor (%)		
Managing therapy	79 (49.40)	81 (50.60)	$\chi^2=0.025$, P =0.874, df=1	160 (100)
Interpersonal relationship	81 (50.60)	79 (49.40)	$\chi^2=0.025$ P =0.874 df=1	160 (100)
General satisfaction	85 (53.10)	75 (46.90)	$\chi^2=0.625$ P =0.625 df=1	160 (100)
Pool	70 (43.75)	90 (56.25)	$\chi^2=2.500$ P =0.114 df=1	160 (100)

4.3 Association between Schizophrenic Patients' Perception of Pharmacists' Roles and Socio-Demographic Characteristics in Federal Neuro Psychiatric Hospital Maiduguri

Table 4.5 shows the univariate and multivariate analysis of socio- demographic factors determining the perception of Schizophrenic patients of pharmacists' roles in care optimization. Several socio-demographic factors including age, gender and marital status showed no significant correlation with respondent perceptions. However, secondary and tertiary education showed significant correlations even after adjusting for other confounding variables. Schizophrenic patients with secondary education ($p=0.001$) were 4.9 times more likely to perceive pharmacists' roles as being good than patients with no formal education. Similarly, patients with tertiary education ($p=0.001$) were also 7.3 times more likely to have good perceptions of pharmacists' roles.

Table 4.5: Association between Schizophrenic patients' perception of pharmacists' roles and socio-demographic characteristics in Federal Neuro Psychiatric Hospital Maiduguri

Factors	F	GP (%)	P Value	Univariate		P Value	Multivariate	
				OR	95 CI		OR	95 CI
Age								
< 25	35	54.3	0.309	1.607	0.644 – 4.007	0.636	1.339	0.400 - 4.476
25 – 40	85	40.0	0.791	0.902	0.421 – 1.933	0.436	0.684	0.263 - 1.778
> 40	40	42.5	Ref					
Gender								
Male	93	43.0	Ref					
Female	67	44.8	0.824	1.074	0.571 – 2.023	0.120	1.993	0.835 - 4.755
Level of Education								
No formal edu.	90	31.1	Ref					
Primary	25	44.0	0.231	1.740	0.702 – 4.310	0.434	1.471	0.559 - 3.868
Secondary	28	67.9	0.001	4.675	1.882 – 11.614	0.001	4.927	1.869 - 12.986
Tertiary	17	70.6	0.004	5.314	1.709 – 16.529	0.001	7.293	2.149 - 24.751
Marital Status								
Single	74	50.0	Ref					
Married	53	41.5	0.345	0.710	0.348 – 1.446	0.545	0.199	1.490 - 1.490
Divorced	17	29.4	0.132	0.417	0.133 – 1.301	0.559	0.153	2.039 - 2.039
Widowed	16	37.5	0.367	0.600	0.198 – 1.821	0.552	0.142	2.143 - 2.143

Logistic regression: F= Frequency, GP= Good perception, OR= odd ratio, Ref= Reference.

4.4 Perception of Other Health Care Professionals of Pharmacists' Roles in Care Optimization for Schizophrenic Patients

Out of the 120 questionnaires administered to other health care professionals, 111 was retrieved giving a 92.5 % response rate.

4.4.1 Perception of other health care professionals of pharmacists' roles in the area of patient counselling, source of drug literature, patient supplies, Pharmacists' competence and documentation of care in Federal Neuro Psychiatric Hospital Maiduguri

Eleven (9.9%) out of 111 other health care professionals had negative perception, 14 (12.6) were undecided and 86 (77.5%) had positive perceptions on the role of pharmacists in patient counselling on usage, side effects and interaction of antipsychotics. Also eleven (9.9%) had negative perception, 14 (12.6 %) were undecided and 86 (77.5%) had positive perceptions that pharmacists were source of current and up to date drug literature. There was a statistically significant difference between this proportions ($\chi^2=97.4$, $P < 0.05$, $df=2$) (Table4.6).

Table 4.6: Perception of Other Health Care Professionals of Pharmacists' Roles in the Areas of Patient Counselling, Source of Drug Literature, Patient Supplies, Pharmacists' Competence and Documenting Care in Federal Neuro Psychiatric Hospital Maiduguri

Element	Negative perception (%)	Undecided (%)	Positive Perception (%)	Test statistics		
				χ^2	P	Df
Patient counselling on usage, side effects and interactions of antipsychotics	11 (9.9)	14 (12.6)	86 (77.5)	97.4	P< 0.05	2
Source of current and up to date drug literature	11 (9.9)	14 (12.6)	86 (77.5)	97.4	P< 0.05	2
Provide adequate patient supplies, information and knowledge	15 (13.5)	10 (9.0)	86 (77.5)	97.6	P< 0.05	2
Competence and knowledgeable	4 (3.6)	14 (12.6)	93 (83.8)	123.4	P< 0.05	2
Documenting patient care and evaluating outcomes	20 (18.0)	22 (19.8)	69 (62.2)	41.5	P< 0.05	2

4.4.2 Perception of other health care professionals on Pharmacists' roles in the area of therapeutic plan development, implementation, monitoring and evaluation in Federal Neuro Psychiatric Hospital Maiduguri

In the area of therapeutic plan development, implementation, monitoring and evaluation, 19 (17.1%) out of the 111 other health care professionals had negative perceptions, 15 (13.5%) were undecided and 77 (69.4%) had positive perceptions on the role of pharmacists in developing care plan. There was a statistically significant difference between these proportions ($\chi^2 = 65.0$, $P < 0.05$, $df = 2$). Ten (9.0%) out of the 111 other health care professionals had negative perceptions, 21 (18.9%) were undecided and 80 (72.1%) had positive perception on the role of pharmacists in having access to patient data. There was a statistically significant difference between these proportions ($\chi^2 = 76.5$, $P < 0.05$, $df = 2$) (Table 4.7).

Table 4.7: Perception of other health care professionals of Pharmacists' roles in the area of therapeutic plan development, implementation, monitoring and evaluation in Federal Neuro Psychiatric Hospital Maiduguri

Element	Negative perception (%)	Undecided (%)	Positive perception (%)	Test statistics		
				χ^2	P	Df
Developing therapeutic care plan	19 (17.1)	15 (13.5)	77 (69.4)	65.0	P< 0.05	2
Access to patient data	10 (9.0)	21 (18.9)	80 (72.1)	76.5	P< 0.05	2
Involve in Schizophrenic patients drug regimen	16 (14.4)	16 (14.4)	79 (71.2)	71.5	P< 0.05	2
Ensure antipsychotic drug safety and therapeutic appropriateness	11 (9.9)	15 (13.5)	85 (76.6)	93.6	P< 0.05	2
Involve in patient care	9 (8.1)	11 (9.9)	91 (82.0)	18.2	P< 0.05	2
Assessment, identification and resolving drug therapy problems	13 (11.7)	14 (12.6)	84 (75.7)	89.5	P< 0.05	2
Monitor adherence, efficacy and adverse drug reactions	20 (18.0)	17 (15.3)	74 (66.7)	55.6	P< 0.05	2

4.4.3: Perception of other health care professionals of pharmacist's roles in the area of improving patients' quality of care in Federal Neuro Psychiatric Hospital Maiduguri

Fifteen (13.5%) out of 111 other health care professionals had negative perception, 11 (9.9%) were undecided and 85 (76.6%) positively perceived the role of pharmacists in ensuring that schizophrenic patients return for medication refill or review. There was a statistically significant difference between these proportions ($\chi^2= 93.6$, $P<0.05$, $df= 2$). Six (5.4%) out of 111 other health care providers had negative perception, 24 (21.6%) were undecided and 81(73%) had positive perception on the role of pharmacists in ensuring antipsychotic availability. There was a statistically significance difference between these proportions ($\chi^2= 82.8$, $P< 0.05$, $df= 2$) (Table 4.8).

Table: 4.8 Perception of Other Health Care Professionals of Pharmacist’s Roles in the Area of Improving Patients’ Quality of Care in Federal Neuro Psychiatric Hospital Maiduguri

Element	Negative perception (%)	Undecided (%)	Positive perception (%)	Test statistics		
				χ^2	P	Df
Ensuring schizophrenic patients return for medication refill or review	15 (13.5)	11 (9.9)	85 (76.6)	93.6	P<0.05	2
Ensuring antipsychotic availability	6 (5.4)	24 (21.6)	81 (73.0)	82.8	P<0.05	2
Monitoring patients compliance to antipsychotic therapy	13 (11.7)	19 (17.1)	79 (71.2)	72.0	P<0.05	2
Reassured Patients to improve quality of life	5 (4.5)	8 (7.2)	98 (88.3)	150.9	P<0.05	2
Re-emphasised Physicians’ Instruction	21 (18.9)	15 (13.5)	75 (67.6)	59.0	P<0.05	2

4.5 The Role of Pharmacists and the Extent of Care Optimization in Schizophrenic Patients

All of the 16 Pharmacists whose consents were sought to participate agreed to answer the self administered questionnaire giving a response rate of 100%.

4.5.1 Pharmacists' roles and extent of involvement in therapeutic plan formulation, implementation, modification, monitoring, evaluation and documentation of antipsychotic therapy in Federal Neuro Psychiatric Hospital Maiduguri

Out of the 16 pharmacists that participated in the study, one (6.3%) always develop therapeutic care plan for schizophrenic patients, two (12.5%) always have access to information on schizophrenic patients, while only seven (43.7%) sometimes assessed antipsychotic therapy (Table 4.9).

Table 4.9: Pharmacists' roles and extent of involvement in therapeutic plan formulation, implementation, modification, monitoring, evaluation and documentation of antipsychotic therapy in Federal Neuro Psychiatric Hospital Maiduguri

Element	Never (%)	Rarely (%)	Sometimes (%)	Most of the Time (%)	Always (%)
Developing therapeutic care plan	2 (12.5)	4 (25.0)	3 (18.7)	6 (37.5)	1(6.3)
Access to information on Schizophrenic patients	0 (0.0)	2 (12.5)	8 (50.0)	4 (25.0)	2 (12.5)
Determination of product formulary	1 (6.3)	2 (12.5)	3 (18.7)	6 (37.5)	4 (25.0)
Assessed antipsychotic Therapy	0 (0.0)	1 (6.3)	7 (43.7)	6 (37.5)	2 (12.5)
Identified, resolved and prevented drug therapy problems	0 (0.0)	1 (6.3)	2 (12.5)	7 (43.7)	6 (37.5)
Modification of therapy for schizophrenic patients	1 (6.3)	3 (18.7)	4 (25.0)	6 (37.5)	2 (12.5)
Monitor antipsychotic drug regimen	1 (6.3)	1 (6.3)	6 (37.5)	3 (18.7)	5 (31.3)
Followed up/assessed therapeutic effect of drugs used for schizophrenia	2 (12.5)	4 (25.0)	4 (25.0)	4 (25.0)	2 (12.5)
Evaluate cost effectiveness of Schizophrenic therapy	0 (0.0)	1 (6.3)	7 (43.7)	4 (25.0)	4(25.0)
Documenting interventions	0 (0.0)	4 (25.0)	9 (56.3)	3 (18.7)	0 (0.0)

4.5.2 Pharmacists' roles in schizophrenic patients counselling in Federal Neuro Psychiatric Hospital Maiduguri

Out of the 16 pharmacists that participated in this study, three (18.7%) always had access to current drug literature on schizophrenia, six (37.5%) always had adequate information for antipsychotic therapy and always maintained a care, friendly and responsible relationship with schizophrenic patients. Also, out of the 16 pharmacists, five (31.2%) always discuss side effects and interaction of antipsychotics, one (6.3%) always provide medication information leaflet to schizophrenic patients while none (0.0%) was always involve in seminar presentation on schizophrenic patient counselling (Table 4.10).

Table 4.10: Pharmacists' roles in Schizophrenic patients counselling in Federal Neuro Psychiatric Hospital Maiduguri

Element	Never (%)	Rarely (%)	Sometimes (%)	Most of the Time (%)	Always (%)
Access to current drug Literature on Schizophrenia	0 (0.0)	1 (6.3)	9 (56.3)	3 (18.7)	3 (18.7)
Adequate information for antipsychotic therapy	0 (0.0)	1 (6.3)	2 (12.5)	7 (43.7)	6 (37.5)
Care, friendly and responsible relationship with schizophrenic patients	0 (0.0)	1 (6.3)	4 (25.0)	5 (31.2)	6 (37.5)
Discussed side effects and interactions of antipsychotics	0 (0.0)	1 (6.3)	6 (37.5)	4 (25.0)	5 (31.2)
Provide medication information leaflet to Schizophrenic patients	0 (0.0)	5 (31.2)	8 (50.0)	2 (12.5)	1 (6.3)
Seminars on Schizophrenic Patients counselling	1 (6.3)	7 (43.7)	7 (43.7)	1 (6.3)	0 (0.0)

4.5.3 Pharmacists' roles in their relationship with other health care professionals in Federal Neuro Psychiatric Hospital Maiduguri

Eight (50%) out of 16 pharmacists Always maintained open and effective means of communication with other health care professionals while four (25%) sometimes document the result of each schizophrenic patients (Table 4.11).

Table 4.11: Pharmacists' Roles in their Relationship with Other Health Care Professionals in Federal Neuro Psychiatric Hospital Maiduguri

Element	Never (%)	Rarely (%)	Sometimes (%)	Most of the time (%)	Always (%)
Maintained open and effective means of communication	0 (0.0)	1 (6.3)	2 (12.5)	5 (31.2)	8 (50.0)
Educate on the management of Schizophrenic patients	0 (0.0)	1 (6.3)	9 (56.2)	4 (25.0)	2 (12.5)
Documenting the results of each Schizophrenic patient	2 (12.5)	5 (31.2)	4 (25.0)	1 (6.3)	4 (25.0)

CHAPTER FIVE

5.0 DISCUSSION

This study conducted at Federal Neuro Psychiatric Hospital Maiduguri evaluated the role of pharmacists in care optimization for Schizophrenic patients and the perception of schizophrenic patients and other health care professionals of the roles of pharmacists in care optimization for Schizophrenic patients.

The socio-demographic characteristic of the patients in this study shows the type of patients attending this facility. Majority of the patients were male. This may be due to the fact that the onset of schizophrenia tends to be earlier in males than females (American Psychiatric Association, 2000). The age group with the highest number of patients is 25-40, and this agrees with an earlier study which revealed that schizophrenia has its onset in late adolescence or early adulthood (American Psychiatric Association, 2000). Large proportions of the patients had no formal education and were single. This might reflect the fact that most patients suffering from schizophrenia will to a certain extent, be disabled due to the disorder which could eventually lead to their withdrawal from active society (Rijcken *et al.*, 2002).

A customer's perceived value of service has been identified as one of the most important drivers of satisfaction. Perception of schizophrenic patients of pharmacists' roles in care optimizing was evaluated under three domains: managing therapy, interpersonal relationship and general satisfaction. Under the managing therapy domain, less than half of the patients rated the efforts of pharmacists in checking with them about how well their medications were working as 5 (highest score). Pharmaceutical care is outcome oriented; therefore pharmacists need to determine

whether their interventions actually improve patient's outcomes (Azuka, 2010). About half of the patients rated the pharmacists' effort in giving them information about the proper storage of their drug as 1 (lowest score). Proper storage is necessary to ensure stability and efficacy of drugs. Majority of schizophrenic patients rated very low pharmacists' efforts in giving them information about result they could expect from their drug therapy. This is similar to findings from an earlier study conducted in Netherland, which revealed that an important aspect lacking in schizophrenia care, was the sufficient delivery of detailed antipsychotic drug information (Rijcken *et al.*, 2002). Informing patients and their relatives about various aspects of medication use can improve patient confidence in care providers and medication. Another aspect where respondents scored pharmacists very low was in using information about their previous conditions/drugs to assess their drug therapy. An important step in pharmaceutical care is to collect patient specific subjective and objective data. What the pharmacist can do for a patient depends on how much information about the patient he has and how it is utilized (Motlova, 2000).

Pharmaceutical care is patient-centred and good patient interaction is a prerequisite for this. Establishing a therapeutic relationship facilitates patients' granting authority to the pharmacist to undertake responsibilities on the patients' behalf (Azuka, 2010). Results from this study showed good patient perceptions of pharmacist roles in ensuring interpersonal relationship in all aspects. Majority of the patients were generally satisfied with the role of the pharmacists in optimizing their care. Patient satisfaction is an integral component of the quality of health care. High satisfaction promotes positive health behaviours such as compliance and continuity with providers (Zastowny *et al.*, 1989). Patients who were satisfied with their overall care are more likely to take

medications properly and less likely to change from one health care professional to another (Zastowny *et al.*, 1989).

Within the different domains studied in this work, general satisfaction had the highest score while managing therapy had the least score. This is similar to a previous study conducted in Nigeria, where managing therapy also had a lower score compare to other domains (Igbanugo *et al.*, 2014). It has also been shown that patients are not very familiar with drug therapy management as an expanded responsibility of the pharmacist (Law *et al.*, 2008). Managing therapy is an important aspect of pharmaceutical care and the roles of pharmacists in this aspect need to be highlighted.

In the pool perception, over half of the patients perceived the role of pharmacists in care optimization to be poor; however there was no statistically significant difference between the proportion of patients that perceived it as good or poor.

Socio-demographic factors such as age, gender and marital status did not show any significant correlation with the perceptions of schizophrenic patients except the level of education of the patients which showed a significant correlation. The odd to perceive the roles of pharmacists increase with increasing level of education. Patients with secondary or tertiary education were more likely to have good perceptions of pharmacists' roles than those with primary or no formal education. This is similar to a previous study conducted in Jordan where it was discovered that patients with higher education denote a higher score of satisfaction and trust (Feras, 2011).

This study also evaluated the perception of other health care professionals on pharmacists' roles in care optimization for schizophrenic patients. Majority of other health care professionals positively perceived the roles of pharmacists in the area of patient counselling, source of drug literature, patient supplies and documentation of care. This is similar to a previous study conducted in Nigeria, where it was discovered that the roles of pharmacists for HIV/AIDS patients were positively perceived by other health care professionals (Giwa *et al.*, 2011b). Professional competence of the pharmacists was also positively perceived by other health care professionals. It has been stated that pharmacists could facilitate improved prescribing and medicines management by working closely with other health care professionals (Boorman and Cairns, 2000).

Also, majority of other health care professionals positively perceived the roles of pharmacists in therapeutic plan development, implementation, monitoring and evaluation of interventions. A previous study has shown that pharmacists assist in identifying potential risks for development of neuroleptic induced tardive dyskinesia. It was proposed that morbidity associated with neuroleptic- induced tardive dyskinesia has exposed health care providers to legal repercussions, therefore, pharmacists' intervention may aid in the reduction of legal liabilities (Lacro *et al.*, 1994).

Furthermore, majority of other health care professionals positively perceived the roles of pharmacists in improving patients' quality of life. This is very important because the role of pharmacists needs to be perceived by other health care professionals before effective collaboration can take place. As earlier stated, pharmaceutical care does not

exist in isolation from other health care services (Van Mil *et al.*, 2004). It must be provided in collaboration with patients and other health care professionals.

The extent to which pharmacists were involved in care optimization for schizophrenic patients was also evaluated. Only a small proportion of the pharmacists were always involved in therapeutic plan formulation, implementation, modification, monitoring, evaluation and documentation of antipsychotic therapy. This falls short of the steps of pharmaceutical care which requires pharmacists to develop a pharmaceutical care plan, implement, modify, monitor and document activities (Azuka, 2010).

Only small proportions of the pharmacists always have access to current drug literature on schizophrenia. However, most of them reported that they sometimes have access to current drug literature on schizophrenia. Azuka, (2010), stated that in order for pharmacists to effectively function in a psychiatric setting they should understand the general approaches to managing psychiatric illnesses. Majority of the pharmacists maintained a care, friendly and responsible relationship with schizophrenic patients which according to Strand (1998) will enhance achievement of desired outcome of pharmaceutical care. Less than half of the pharmacists always discussed side effects and interactions of antipsychotics with schizophrenic patients which falls short of the American patients' Bill of right which states that the patient has the right to and is encouraged to obtain from care givers appropriate, current and understandable information about diagnosis, treatment and prognosis (AHA, 2002).

About half of the pharmacists maintained that they rarely organise seminars on schizophrenic patients counselling. It has been stated that pharmacists should be kept

updated with recent drug related information by attending regular education and training programmes (Juno, 2014). A multidisciplinary treatment approach to psychiatric patients has been proven to positively influence outcome of disease (Lieberman, 2005).

5.1 Limitations of the Study

1. The research results are applicable to one Psychiatric facility and may not be generalised to other psychiatric facilities in Nigeria.
2. Getting Schizophrenic patients that meet the inclusion criteria was difficult and time consuming due to the nature of their disorder.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

A little over half of the schizophrenic patients had poor perceptions of the roles of pharmacists in care optimization. However, there was no statistically significant difference between the groups of Schizophrenic patients that perceived the roles of pharmacists as poor and those that perceived it as good.

Also, the level of education was the only socio-demographic characteristic with significant correlation to schizophrenic patients' perception. Schizophrenic patients with higher level of education were more likely to have good perceptions.

In addition, other health care professionals had positive perceptions on the role of pharmacists in care optimization for schizophrenic patients.

Also, it was discovered that majority of the pharmacists were sometimes or most of the time involved in care optimization for schizophrenic patients but only a few proportions of the pharmacists were always involved in care optimization in the different aspects.

6.2 Contributions to Knowledge

1. Majority of Schizophrenic patients in Federal Neuro-Psychiatric Hospital Maiduguri had poor perceptions of Pharmacists' roles.
2. Other health care professionals had positive perceptions of the roles of pharmacists in care optimization for Schizophrenic patients.

6.3 Recommendations

1. Pharmacists need to be better educated on the importance of their roles in optimizing care for schizophrenic patients. They should strive to always meet their roles as perceived by other members of health care professionals since inter professional barrier is not a problem in this facility.
2. Capacity building in terms of training particularly on managing therapy should be advocated by the hospital management for pharmacists in this facility.
3. Specific attention by the pharmacists should be targeted towards schizophrenic patients with only primary or no formal education. In discharging their roles to this group of patients, pharmacists should provide adequate care and invest more time to patient care and education about their disease state and drugs in order to improve outcome.
4. Qualitative enquiry into reasons why pharmacists were not always involved in care optimization for schizophrenic patients is an area where further research can be carried out.

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APPENDICES

Appendix I: Copy of Ethical Approval Letter

FEDERAL NEURO-PSYCHIATRIC HOSPITAL
P. M. B 1322
BAGA ROAD, MAIDUGURI, NIGERIA.



☎ 076 - 235204
Fax - 235112

Cable & Telegram: FNP, MAIDUGURI

Ethical Review Committee,
Federal Neuro-psychiatric Hospital,
Maiduguri.
4th August, 2016.

Hadiza Yusuf
Department of Clinical Pharmacy
And Pharmacy Practice Faculty of Pharmaceutical
Sciences Ahmadu Bello University, Zaria


RE: APPLICATION FOR ETHICAL CLEARANCE

Sequel to your application dated 4th April 2016, seeking for ethical clearance to carry out a research titled "Evaluation of Pharmacists role in Optimizing Pharmaceutical Care for Schizophrenic Patient in Federal Neuro Psychiatric Hospital Maiduguri",

2 It is my pleasure to convey to you the approval of the committee having considered it to substantially conform to the requirements for the conduct of medical research as enshrined in the declaration of Helsinki.

3 you are also required to submit a copy of your final project to the committee as part of the requirements

4 Accept our congratulation, thank you

Yours Faithfully,

Dr. Ibrahim A. Mshelia
Head Ethical Review Committee

1

Appendix II: Sample of Information and consent form.

INFORMATION AND CONSENT FORM

Hello, my name is Hadiza Yusuf. I am a student at the Department of Clinical Pharmacy and Pharmacy Practice, Ahmadu Bello University, Zaria. I am presently conducting a study titled “Evaluation of Pharmacist’s role in care optimization for Schizophrenic patients : perception of schizophrenic patients and other members of health care professional in Fedreal Neuro Psychiatric Hospital Maiduguri, North-Eastern Nigeria”. I am humbly seeking your consent to participate in the study.

The questionnaire will take not more than twenty minutes to complete. The information you may provide will be recorded but kept strictly confidential and only used for the research purpose.

Participation in this evaluation study is absolutely voluntary and you can choose not to answer any individual question or all of the questions. However, I hope that you will participate in this since your views are very important for this study. Are you willing to participate?

I agreed to participate.....

In the presence of as witness.

Date.....

Appendix III: Questionnaire for Schizophrenic Patients

THE PERCEPTION OF SCHIZOPHRENIC PATIENTS ON PHARMACIST'S ROLES IN CARE OPTIMIZATION

1. Demographic profile of respondents

Age(years)

Gender

Male

Female

Level of education

primary

Secondary

Tertiary

No formal education

Marital status

Single

Married

Divorced

Widow

Rate your perception of pharmacists' role in care optimization by scoring from 1-5. 5 indicates the highest score.

1. Managing therapy

1. The pharmacists' effort to check with you about how well your medications

Are working

2. The pharmacists' effort to give you information about the proper storage of your drugs

3. The pharmacists' effort in giving you information about the results you can expect from your therapy.

4. The pharmacists' effort in using information about your previous conditions/drugs when assessing your drug therapy

2. Interpersonal relationship

1. The pharmacist's interest in your health

2. The pharmacist's professional relationship with you.

3. The help you get from the pharmacist to avoid unnecessary costs related to your prescriptions

4. The amount of time the pharmacist spends with you

5. The pharmacists' effort in giving you instructions about how to take your medication

6. The way the pharmacist answer your questions

3. General satisfaction

1. The privacy of your conversations with the pharmacists

2. The professional appearance of the pharmacists'

3. Your pharmacy services overall

Appendix IV: Questionnaire for other health care professionals

Perceptions of Other health care professionals on Pharmacists' roles in care optimization for Schizophrenic patients.

1. Profession:

Physician	<input type="text"/>
Psychologist	<input type="text"/>
Nurse	<input type="text"/>
Radiographer	<input type="text"/>
Radiologist	<input type="text"/>
Medical lab scientist	<input type="text"/>

Write **5** for **strongly agreed**, **4** for **agreed**, **3** for **undecided**, **2** for **disagreed** and **1** for **strongly disagreed** to indicate your perception of Pharmacist's role under the following sections

1. Your perception of pharmacists roles in their involvement in patient counselling, source of drug literature, patients supplies, pharmacist's competence and documentation of plan.

Element

1. Patient counselling on usage, side effects and interactions of antipsychotics
2. Source of current and up to date drug literature
3. Provide adequate patient supplies, information and knowledge.
4. Competence and knowledgeable
5. Documenting patient care and evaluating outcome

2. Your perception on Pharmacist's roles in their involvement in therapeutic plan development, implementation, monitoring and evaluation.

Element

1. Developing of therapeutic care plan
2. Access to patient data

3. Involve in schizophrenic patients drug regimen

4. Ensure antipsychotic drug safety and therapeutic appropriateness

5. Involve in patient care

6. Assessment, identification and resolving drug therapy problems

7. Monitoring adherence, efficacy and adverse drug reactions

4. Your Perception on Pharmacist's roles in optimizing pharmaceutical care for schizophrenic patients in improving patient's quality of life.

1. Reassured patients to improve quality of life

2. Re-emphasised physicians instruction

3. Ensuring schizophrenic patients return for medication refill or review

4. Ensuring antipsychotic availability

5. Monitoring patients compliance to antipsychotic therapy

Appendix V: Questionnaire for the roles of pharmacist in care optimization for schizophrenic patients

QUESTIONNAIRE FOR THE ROLES OF PHARMACISTS IN CARE OPTIMIZATION FOR SCHIZOPHRENIC PATIENTS

Please circle the answer that most represent your response.

1. Pharmacist’s role and extent of involvement in therapeutic plan formulation, implementation, modification, monitoring, evaluation and documentation of antipsychotic therapy.

- | | | | | | |
|--|--------------|---------------|------------------|-------------------------|---------------|
| 1. Developing therapeutic care plan | Never | Rarely | Sometimes | Most of the time | Always |
| 2. Access to information about schizophrenic patients | Never | Rarely | Sometimes | Most of the time | Always |
| 3. Determination of product formulary | Never | Rarely | Sometimes | Most of the time | Always |
| 4. Assessed antipsychotic therapy | Never | Rarely | Sometimes | Most of the time | Always |
| 5. Identified, resolved and prevented drug therapy problems | Never | Rarely | Sometimes | Most of the time | Always |
| 6. Modification of therapy for schizophrenic patients | Never | Rarely | Sometimes | Most of the time | Always |
| 7. Monitor antipsychotic drug regimen | Never | Rarely | Sometimes | Most of the time | Always |
| 8. Followed up/assessed therapeutic effect of drugs used for schizophrenia | Never | Rarely | Sometimes | Most of the time | Always |
| 9. Evaluate cost effectiveness of schizophrenic therapy | Never | Rarely | Sometimes | Most of the time | Always |
| 10. Documenting interventions | Never | Rarely | Sometimes | Most of the time | Always |

2. Pharmacist’s roles in schizophrenic patients counselling.

- | | | | | | |
|---|--------------|---------------|------------------|-------------------------|---------------|
| 1. Access to current drug literature on schizophrenia | Never | Rarely | Sometimes | Most of the time | Always |
|---|--------------|---------------|------------------|-------------------------|---------------|

2. Adequate information for antipsychotic therapy

Never Rarely Sometimes Most of the time Always

3. Care, friendly and responsible relationship with schizophrenic patients

Never Rarely Sometimes Most of the time Always

5. Discussed side effects and interactions of antipsychotics

Never Rarely Sometimes Most of the time Always

6. Provide medication information leaflet to schizophrenic patients

Never Rarely Sometimes Most of the time Always

7. Seminars on schizophrenic patients counselling

Never Rarely Sometimes Most of the time Always

3. Pharmacists roles in their relationship with other health care professionals

1. Maintained open and effective means of communication

Never Rarely Sometimes Most of the time Always

2. Educate on the management of schizophrenic patients

Never Rarely Sometimes Most of the time Always

3. Documenting the results of each schizophrenic patient

Never Rarely Sometimes Most of the time Always

Appendix VI: Descriptive statistic of Schizophrenic patients' perception of Pharmacists' roles in care optimization.

	N	Minimum	Maximum	Mean	Std. Deviation
percent perception regarding managing therapy	160	15.00	100.00	48.6250	20.94430
percent perception regarding interpersonal relationship	160	26.67	170.00	74.3958	17.29577
percent perception regarding general satisfaction	160	46.67	100.00	82.3750	13.93500
Percent pool perception	160	30.77	103.08	68.3077	13.12955
Valid N (listwise)	160				

Appendix VII : Level of perception regarding managing therapy

	Frequency	Percent	Valid Percent	Cumulative Percent
Poor perception	81	50.6	50.6	50.6
Valid Good perception	79	49.4	49.4	100.0
Total	160	100.0	100.0	

Appendix VIII: Level of perception regarding Interpersonal relationship

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Poor perception	79	49.4	49.4	49.4
Valid Good perception	81	50.6	50.6	100.0
Valid Total	160	100.0	100.0	

Appendix IX: Level of perception regarding General satisfaction

	Frequency	Percent	Valid Percent	Cumulative Percent
Poor perception	75	46.9	46.9	46.9
Valid Good perception	85	53.1	53.1	100.0
Total	160	100.0	100.0	

Appendix X : Level pooled perception

	Frequency	Percent	Valid Percent	Cumulative Percent
Poor perception	90	56.3	56.3	56.3
Valid Good perception	70	43.8	43.8	100.0
Total	160	100.0	100.0	

Appendix XI : Age group 1 * Level pooled perception Cross tabulation

		Level pool perception		Total
		Poor perception	Good perception	
Age group 1	Count	16	19	35
	< 25 % within Age group 1	45.7%	54.3%	100.0%
	Count	51	34	85
	25 - 40 % within Age group 1	60.0%	40.0%	100.0%
	Count	23	17	40
	> 40 % within Age group 1	57.5%	42.5%	100.0%
Total	Count	90	70	160
	% within Age group 1	56.2%	43.8%	100.0%

Appendix XII : Gender * Level pool perception Cross tabulation

		Level pool perception		Total	
		Poor perception	Good perception		
Gender	Male	Count	53	40	93
		% within Gender	57.0%	43.0%	100.0%
	Female	Count	37	30	67
		% within Gender	55.2%	44.8%	100.0%
Total	Count	90	70	160	
	% within Gender	56.2%	43.8%	100.0%	

Appendix XIII: Level of education * Level pooled perception Cross tabulation

			Level pool perception		Total
			Poor perception	Good perception	
Level of education	Primary	Count	14	11	25
		% within Level of education	56.0%	44.0%	100.0%
	Secondary	Count	9	19	28
		% within Level of education	32.1%	67.9%	100.0%
	Tertiary	Count	5	12	17
		% within Level of education	29.4%	70.6%	100.0%
	No formal education	Count	62	28	90
		% within Level of education	68.9%	31.1%	100.0%
Total	Count	90	70	160	
	% within Level of education	56.2%	43.8%	100.0%	

Appendix XIV: Marital status * Level pooled perception Cross tabulation

			Level pool perception		Total
			Poor perception	Good perception	
Marital status	Single	Count	37	37	74
		% within Marital status	50.0%	50.0%	100.0%
	Married	Count	31	22	53
		% within Marital status	58.5%	41.5%	100.0%
	Divorced	Count	12	5	17
		% within Marital status	70.6%	29.4%	100.0%
	Widow	Count	10	6	16
		% within Marital status	62.5%	37.5%	100.0%
	Total	Count	90	70	160
		% within Marital status	56.2%	43.8%	100.0%

Appendix XV: Association of socio-demographic characteristics of Schizophrenic patients with their perception of pharmacists' roles in care optimization.

Variables in the Equation

	B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Step 1 ^a gender(1)	.072	.323	.049	1	.824	1.074	.571	2.023
Constant	-.281	.209	1.805	1	.179	.755		

a. Variable(s) entered on step 1: gender.

Variables in the Equation

	B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Step 1 ^a Level of edu.			16.268	3	.001			
level(1)	.554	.463	1.432	1	.231	1.740	.702	4.310
level(2)	1.542	.464	11.031	1	.001	4.675	1.882	11.614
level(3)	1.670	.579	8.325	1	.004	5.314	1.709	16.529
Constant	-.795	.228	12.189	1	.000	.452		

a. Variable(s) entered on step 1: level.

Variables in the Equation

	B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Step 1 ^a Marital status			2.902	3	.407			
marital(1)	-.343	.363	.893	1	.345	.710	.348	1.446
marital(2)	-.875	.581	2.272	1	.132	.417	.133	1.301
marital(3)	-.511	.566	.814	1	.367	.600	.198	1.821
Constant	.000	.232	.000	1	1.000	1.000		

a. Variable(s) entered on step 1: marital.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Step 1 ^a	Agegrp		2.440	2	.295			
	Agegrp(1)	.292	.616	.224	1	.636	1.339	.400 4.476
	Agegrp(2)	-.379	.487	.606	1	.436	.684	.263 1.778
	gender(1)	.689	.444	2.414	1	.120	1.993	.835 4.755
	Level			17.057	3	.001		
	level(1)	.386	.493	.612	1	.434	1.471	.559 3.868
	level(2)	1.595	.494	10.402	1	.001	4.927	1.869 12.986
	level(3)	1.987	.623	10.156	1	.001	7.293	2.149 24.751
	Marital			1.730	3	.630		
	marital(1)	-.607	.513	1.398	1	.237	.545	.199 1.490
	marital(2)	-.582	.661	.777	1	.378	.559	.153 2.039
	marital(3)	-.594	.692	.737	1	.391	.552	.142 2.143
	Constant	-.652	.575	1.284	1	.257	.521	

a. Variable(s) entered on step 1: Agegrp, gender, level, marital.

Appendix XVI: Chi-square test for the perception of other health care professionals.

Test Statistics

	Patient counselling on usage, side effects and interactions of antipsychotics
Chi-Square	97.459 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	source of current and up to date drug literature
Chi-Square	97.459 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Provide adequate patient supplies, information and knowledge
Chi-Square	97.676 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Competence and knowledgeable
Chi-Square	128.486 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Documenting patient care and evaluating outcome
Chi-Square	41.568 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Development of therapeutic care plan
Chi-Square	65.081 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Access to patient data
Chi-Square	76.595 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Involve in schizophrenic patient's regimen
Chi-Square	71.514 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Ensure antipsyctic drug safety and therapeutic appropriateness
Chi-Square	93.622 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Involve in patient care
Chi-Square	118.270 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Assessment, identification and resolving drug therapy problems
Chi-Square	89.568 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Monitoring adherence, efficacy and adverse drug reaction
Chi-Square	55.622 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Ensuring schizophrenics patients return for medication refill or review
Chi-Square	108.571 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 35.0.

Test Statistics

	Ensuring antipsychotic availability
Chi-Square	82.865 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Monitoring patients complianc to antipsychotic therapy
Chi-Square	72.000 ^a
df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

Test Statistics

	Reassured patients to improve quality of life
Chi-Square	150.973 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.

	Re-emphasised physicians instruction
Chi-Square	59.027 ^a
Df	2
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.0.