ASSESSMENT OF DRUG THERAPY PROBLEMS ENCOUNTERED BY COMMUNITY PHARMACISTS IN BENIN CITY, EDO STATE NIGERIA

BY

AMUAMUZIA DAVID MABATENEZEMI

PHA1908462

SUPERVISED BY

Pharm Dr. J.O IDIAKE

DEPARTMENT OF CLINICAL PHARMACY

FACULTY OF PHARMACY

UNIVERSITY OF BENIN

BENIN CITY

NOVEMBER 2025

ASSESSMENT OF DRUG THERAPY PROBLEMS ENCOUNTERED BY COMMUNITY PHARMACISTS IN BENIN CITY, EDO STATE NIGERIA

BY

AMUAMUZIA DAVID MABATENEZEMI
PHA1908462

SUPERVISED BY

Pharm Dr. J.O IDIAKE

A PROJECT SUBMITTED TO THE DEPARTMENT OF CLINICAL PHARMACY AND PHARMACY PRACTICE, FACULTY OF PHARMACY, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE.

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF DOCTOR OF PHARMACY (PHARM.D) DEGREE.

NOVEMBER 2025

CERTIFICATION

This is to certify that this project work was carried out by **AMUAMUZIA DAVID MABATENEZEMI** with matriculation number **PHA1908462** in the Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, University of Benin, Benin-City, in partial fulfillment of the requirements for the award of Doctor of Pharmacy (Pharm.D) degree.

AMUAMUZIA DAVID MABATENEZEMI **(PROJECT STUDENT)**	**DATE**
PHARM. DR J.O. IDIAKE **(PROJECT SUPERVISOR)**	**DATE**
DR. M.I OSARENMWINDA **HEAD OF DEPARTMENT**	**DATE**

DEDICATION

This project work is dedicated to God Almighty for His guidance, mercies, grace, direction and provision throughout the course of this study and to my family for their love, support, and encouragement throughout this academic journey.

ACKNOWLEDGEMENT

I sincerely express my gratitude to God Almighty for His mercies throughout Pharmacy school. To my project supervisor Pharm. Dr J.O. Idiake, I highly treasure the time spent working under your supervision. Thank you for you invaluable assistance and unceasing corrections throughout the period of this project work.I extend my heartfelt appreciation to other lecturers in the Faculty of Pharmacy who have in one way or the other been impactful to me.

Most importantly I appreciate my Parents **Mr and Mrs. Dennis Amuamuzia** for their prayers, unending support, food supplies and more.

To my siblings; sis Olama, sis oyinyechi, sis Anita, Daniel and Duke, I am grateful for your unwavering prayers, support and belief in my academic pursuits. To my family, in general I am grateful.

I also wish to acknowledge the contributions of my friend, Miss Gracious, for her help and assistance throughout the course of this study.

Finally I wish to acknowledge my self, **Mr. David Mabatenezemi Amuamuzia** for I played a pivotal role for the success of this study. God bless me now and the journey ahead, for it was tough but through hiis grace, it was a success.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

BACKGROUND: Drug Therapy Problems (DTPs) are a major global public health concern, contributing significantly to preventable morbidity, mortality, and healthcare costs, particularly in low- and middle-income countries like Nigeria.

Community pharmacists, as the most accessible healthcare providers, are pivotal in addressing DTPs, which range from inappropriate prescribing and dosing errors to patient non-adherence. However, the prevalence and specific characteristics of DTPs encountered in Nigerian community practice are often underreported and undocumented, creating a critical knowledge gap that hinders targeted intervention development.

OBJECTIVES: This study aimed to assess the Drug Therapy Problems (DTPs) encountered by community pharmacists in Benin City, Edo State, Nigeria. The specific objectives were to determine the prevalence and classes of DTPs using Cipolle's classification and to explore factors associated with their occurrence in community pharmacy practice.

METHODS: A descriptive cross-sectional study was conducted among a calculated sample of 169 community pharmacists in five local government areas of Benin City. Data were collected using a self-structured questionnaire focused on pharmacist demographics and the frequency of DTPs experienced over a three-month period, classified according to the Cipolle–Strand–Morley model. Data analysis was performed using IBM SPSS version 30, employing descriptive statistics (frequencies, percentages) and Chi-square tests to assess associations, with statistical significance set at $p < 0.05$.

RESULTS: Out of 169 pharmacist respondents, the majority were male (55.6%) and relatively young, aged 30–39 years (34.3%), with Pharm.D being the highest qualification (47.3%). The study confirmed a high occurrence of DTPs. The most frequently encountered DTPs were Adverse Drug Reactions (ADR) (49.1% reported often/always), Dosage too high (46.1% reported often/always), Ineffective drug therapy (41.4% reported often/always), and Non-adherence to medication regimen (39.1% reported often/always). Chi-square analysis showed no statistically significant association between demographic factors (gender, age, years of experience, qualification, or ownership) and the overall occurrence of DTPs ($p > 0.05$) although descriptive trends indicated that younger pharmacists (20–39 years), those with less than 10 years of experience, and Pharm.D holders reported higher DTP rates.

CONCLUSION: Drug therapy problems are highly prevalent in community pharmacy practice in Benin City, with issues related to dosage errors, adverse reactions, and patient non-adherence being the most dominant. This high prevalence necessitates the urgent adoption of structured pharmaceutical care documentation systems, enhanced patient counselling, and institutionalized collaboration between community pharmacists and prescribers to mitigate medication-related harm and optimize patient outcomes.

KEY WORD: Drug therapy problems, Community Pharmacist, Prevalence, Adverse Drug Reaction, Non-adherence, Benin City

CHAPTER ONE

INTRODUCTION

1.0 INTRODUCTION AND BACKGROUND OF STUDY

Drug-therapy problems (DTPs) represent one of the most significant challenges in achieving optimal pharmacotherapeutic outcomes worldwide. The concept refers to any event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes (Cipolle, Strand, & Morley, 2012). These problems can occur at any stage of the medication-use process—prescribing, dispensing, administration, or patient adherence—and can lead to treatment failure, adverse reactions, hospitalization, or even death. Globally, DTPs contribute substantially to preventable morbidity and mortality, with the World Health Organization (WHO, 2023) estimating that medication errors alone account for over 42 billion USD in avoidable health-care costs each year.

The burden of DTPs is particularly critical in low- and middle-income countries (LMICs) such as Nigeria, where systemic weaknesses in healthcare delivery, poor regulation of medicine use, and limited access to pharmaceutical care amplify the risks (Auta *et al.*, 2018). Studies from sub-Saharan Africa demonstrate that between 40% and 60% of hospital admissions are associated with medication-related problems (Ofori-Asenso *et al.,* 2016). In these settings, inappropriate prescribing, polypharmacy, and lack of patient education are persistent contributors to poor therapeutic outcomes.

Community pharmacists, being the most accessible healthcare professionals to the public, occupy a pivotal role in detecting, preventing, and resolving drug-therapy problems. In Nigeria, community pharmacies often serve as the first point of contact for individuals seeking medical

advice or treatment (Oparah & Kikanme, 2006). Given their strategic position within the primary-care framework, community pharmacists are uniquely positioned to identify DTPs through medication review, patient counselling, and collaboration with prescribers. However, the extent to which these roles are optimally performed varies across regions due to differences in professional training, policy support, and healthcare infrastructure (Erah, 2002; Adibe *et al.,* 2016).

Drug-therapy problems can manifest as unnecessary drug therapy, need for additional therapy, ineffective medication, inappropriate dosage, adverse drug reactions, or non-adherence (Cipolle *et al.,* 2012). Each category has implications for patient safety, quality of life, and healthcare cost. A retrospective analysis in the United States revealed that nearly 7% of emergency-room visits were drug-related, with more than 60% of these deemed preventable (Bates *et al.,* 2015). Similar patterns have been reported in Europe and Asia, underscoring that DTPs are a global patient-safety issue that transcends healthcare systems and economic levels (Sweileh *et al.,* 2017).

In the African context, the problem is compounded by the prevalence of self-medication and non-prescription access to antibiotics and other potent drugs. A cross-sectional study in Ethiopia reported that 58.6% of community-pharmacy clients engaged in self-medication without professional guidance, resulting in a high incidence of adverse events and therapeutic failure (Bekele & Hirbu, 2020). Similarly, Nigerian studies have shown that non-adherence, incorrect dosing, and the use of substandard or counterfeit drugs remain major challenges (Fadare *et al.,* 2015; Adibe *et al.,* 2016). These findings emphasize the necessity of evidence-based interventions targeting community pharmacies, where most medication transactions occur.

Benin City, the capital of Edo State in southern Nigeria, typifies an urban setting where community pharmacies bridge the gap between the public and formal healthcare institutions. Despite the relatively high density of registered pharmacies in the metropolis, anecdotal and empirical evidence suggests that DTPs are common in routine practice (Afolabi *et al.,* 2017). Contributing factors include the over-the-counter sale of prescription-only medicines, lack of structured documentation systems for pharmaceutical care, and insufficient pharmacist–physician collaboration. Furthermore, limited patient follow-up and economic barriers often result in incomplete therapies or drug substitution, which predispose patients to therapeutic failure and antimicrobial resistance (WHO, 2021).

International frameworks now highlight the importance of pharmaceutical-care models in reducing medication-related harm. The Pharmaceutical Care Network Europe (PCNE, 2017) and the International Pharmaceutical Federation (FIP, 2020) both advocate systematic identification, classification, and management of DTPs through collaborative practice. Such frameworks encourage pharmacists to perform comprehensive medication reviews, assess appropriateness, and document outcomes. In developed nations, the implementation of these models has led to measurable reductions in adverse events and improvements in therapeutic effectiveness (Basger *et al.,* 2018). However, in Nigeria, integration of structured DTP documentation into community practice remains limited, primarily due to lack of training, inadequate time, and absence of reimbursement for cognitive services (Erah, 2002; Segun & Damilola, 2022).

The relevance of DTP studies in Benin City therefore lies in providing empirical data on the nature, frequency, and determinants of these problems, as well as the types of interventions employed by community pharmacists. Previous studies conducted in tertiary-care settings, such as the University of Benin Teaching Hospital, have demonstrated the effectiveness of

pharmacists in identifying and resolving DTPs through clinical reviews and prescriber collaboration (Ojeh *et al.,* 2015). However, there is a paucity of research focusing specifically on community pharmacists, despite their crucial role in outpatient and self-medication contexts. Understanding the local patterns of DTPs can inform continuing professional-development programs, influence policy design, and strengthen the overall pharmaceutical-care framework in Edo State and beyond.

Ultimately, the assessment of drug-therapy problems encountered by community pharmacists in Benin City serves not only to quantify the burden but also to reveal gaps in practice and policy. The findings of such a study can support the development of targeted interventions—ranging from pharmacist training to improved regulatory oversight—that aim to enhance medication safety and optimize therapeutic outcomes across the healthcare continuum.

1.1 CAUSES OF DRUG-THERAPY PROBLEMS

Drug-therapy problems seldom arise from a single error; rather, they reflect complex interactions between prescribers, pharmacists, patients, and the healthcare system. Evidence from multiple African and international studies identifies recurrent sources of DTPs that can be broadly grouped into prescribing-level, dispensing-level, patient-related, and systemic factors (Adibe *et al.,* 2016; Bekele & Hirbu, 2020).

1. Prescribing-level causes.

Prescribing errors remain a leading contributor to DTPs worldwide. These include selection of inappropriate drug regimens, failure to consider drug–drug interactions, and omission of necessary therapy (Bates *et al.,* 2015). In Nigeria, studies show that incomplete patient histories and poor access to diagnostic results often lead physicians to rely on empirical therapy, which

increases the risk of inappropriate drug choice (Fadare *et al.,* 2015). A review conducted at the National Orthopedic Hospital, Enugu, found that 46 percent of identified DTPs stemmed from incorrect drug selection or wrong dosing regimens (Adibe *et al.,* 2016).

2. Dosing and monitoring failures.

Sub-therapeutic dosing or overdosing can result from failure to adjust medication for renal or hepatic impairment, age, or weight (Ofori-Asenso *et al.,* 2016). A lack of regular therapeutic-drug monitoring and inadequate laboratory support further compound this problem. Bekele and Hirbu (2020) reported that delayed laboratory results and absence of institutional antimicrobial guidelines accounted for 38 percent of antimicrobial-related DTPs in Ethiopian hospitals.

3. Patient-related factors.

Non-adherence, self-medication, and use of traditional or herbal remedies alongside prescribed medicines are common in many African communities. Socioeconomic barriers, complex dosing schedules, and limited health literacy often drive these behaviors (Segun & Damilola, 2022). A community-pharmacy survey in southwestern Nigeria found that 58 percent of DTPs were directly attributable to poor adherence or incorrect self-administration (Afolabi *et al.,* 2017). Intentional non-adherence due to cost or misconceptions about medicines also remains a serious challenge.

4. Dispensing-level causes.

Pharmacists may contribute unintentionally to DTPs through errors in drug selection, labelling, or counselling. Workload pressure, insufficient staffing, and inadequate use of automation in many community pharmacies heighten this risk (Erah, 2002). The absence of standardized dispensing-check protocols means errors may go undetected until adverse effects occur.

5. Systemic and regulatory causes.

Weak enforcement of prescription-only medicine laws allows unqualified personnel to dispense potent drugs, especially antibiotics and psychotropics. Frequent drug-stock-outs and inconsistent supply chains compel pharmacists to substitute medicines without consulting prescribers, leading to therapeutic failures (WHO, 2021). Furthermore, limited integration between pharmacy and clinical information systems restricts communication and follow-up regarding therapy outcomes (Auta *et al.,* 2018).

6. Information and documentation gaps.

The absence of electronic medication-review tools and poor record-keeping hinder the identification of recurrent DTPs (Segun & Damilola, 2022). Many community pharmacists rely on memory rather than structured documentation, reducing opportunities for data-driven improvement.

Taken together, these causes highlight the need for a multifaceted response—strengthened regulatory frameworks, improved interprofessional communication, continuous professional development for pharmacists, and patient-education strategies—to minimize the frequency and impact of DTPs in community practice.

1.2 RISK FACTORS ASSOCIATED WITH DRUG-THERAPY PROBLEMS

Several patient-drug and system-related variables increase the likelihood of drug-therapy problems. Understanding these risk factors helps pharmacists identify high-risk patients and design targeted interventions (Cipolle *et al.,* 2012; Ofori-Asenso *et al.,* 2016). Evidence from Nigeria and other low- and middle-income countries reveals that the frequency of DTPs rises markedly in the presence of polypharmacy, advanced age, chronic comorbidity, and socioeconomic constraints (Adibe *et al.,* 2016; Bekele & Hirbu, 2020).

1. Polypharmacy (Multiple medicines)

Polypharmacy—commonly defined as the concurrent use of five or more medications—has been consistently identified as the strongest predictor of DTPs. As the number of prescribed drugs increases, so does the probability of drug–drug interactions, therapeutic duplication, and dosing errors. In Ethiopia, Bekele and Hirbu (2020) reported an adjusted odds ratio (AOR) of 4.0 for DTPs among patients taking 4–6 drugs and 13.5 among those taking seven or more. Similar findings have been documented in Nigerian hospital settings, where polypharmacy is often linked to self-medication and fragmented care (Adibe *et al.,* 2016).

2. Advanced Age and Physiologic Changes.

Elderly patients experience pharmacokinetic and pharmacodynamic alterations that increase their susceptibility to adverse effects and dosing errors. Reduced renal and hepatic clearance, altered body-fat composition, and multiple comorbidities complicate dosage adjustment (Ofori-Asenso *et al.,* 2016). Studies in Nigeria have shown that patients aged ≥ 60 years have a two- to three-fold higher risk of ADR-related DTPs compared with younger adults (Fadare *et al.,* 2015).

3. Chronic and Complex Diseases.

Conditions such as hypertension, diabetes, HIV/AIDS, asthma, and tuberculosis require long-term multidrug therapy. Drug–drug interactions, the need for additional therapy, and adherence issues are particularly prevalent in these groups (Ojeh *et al.,* 2015). Pharmacists play a vital role in monitoring ART regimens and antihypertensive combinations to minimize such problems.

4. Inadequate Monitoring and Laboratory Support.

In resource-limited environments, laboratory delays and absence of therapeutic-drug-monitoring facilities prevent timely dosage adjustment and detection of adverse effects. Bekele and Hirbu (2020) identified lack of timely laboratory results as a significant determinant of antimicrobial-related DTPs.

5. Socioeconomic Status and Health Literacy.

Patients with low income or limited education are more likely to interrupt therapy due to cost, use leftover drugs, or misinterpret dosing instructions (Segun & Damilola, 2022). In a community-pharmacy survey in Lagos, over 55 percent of respondents cited financial barriers as the main reason for non-adherence (Afolabi *et al.,* 2017).

6. Gender and Cultural Factors.

Cultural perceptions about illness and gender-based decision-making can influence medication use. Some studies have shown higher non-adherence among female patients, partly due to social roles and economic dependence (Auta *et al.,* 2018).

7. Health-System Limitations.

Frequent drug shortages, absence of treatment guidelines, and poor continuity of care between prescribers and pharmacists contribute significantly to DTP risk (WHO, 2021). Weak information systems and inadequate pharmacist access to patient records hinder detection of previous adverse events or duplications.

Recognizing these risk factors allows community pharmacists to prioritize medication reviews, offer adherence counselling, and coordinate with prescribers to optimize therapy. Early identification of high-risk individuals—particularly the elderly, polypharmacy patients, and those with chronic diseases—remains a cornerstone of effective pharmaceutical-care delivery.

1.3 CLASSES OF DRUG-THERAPY PROBLEMS

To ensure a systematic approach to identifying and resolving medication-related issues, several classification systems have been developed. Among the most widely applied are the **Cipolle–Strand–Morley model and the Pharmaceutical Care Network Europe (PCNE)** system. These frameworks categorize DTPs into defined classes that facilitate documentation, comparison, and intervention evaluation (Cipolle, Strand, & Morley, 2012; PCNE, 2017).

In Nigerian and broader African studies, the seven-category Cipolle taxonomy is commonly used because of its simplicity and suitability for community-pharmacy and clinical practice. The categories are as follows:

1. Unnecessary drug therapy.

This occurs when a patient receives a medication without a valid indication, when duplicate therapy is prescribed, or when non-drug therapy would be more appropriate (Cipolle *et al.,* 2012). For example, prescribing antibiotics for viral infections or maintaining antihypertensive drugs

despite controlled blood pressure may constitute unnecessary therapy. Adibe *et al.,* (2016) found that about 10 percent of DTPs in their hospital review were unnecessary-therapy cases resulting from empirical or duplicate prescriptions.

2. Needs additional drug therapy.

This problem arises when an untreated condition exists, when preventive or synergistic therapy is required, or when a drug is needed to achieve optimal efficacy. In antimicrobial-use audits in Ethiopia, "needs additional therapy" accounted for nearly 20 percent of identified DTPs (Bekele & Hirbu, 2020). Nigerian pharmacists have similarly documented frequent omission of adjunct drugs such as gastroprotective agents in patients on NSAIDs.

3. Ineffective drug therapy.

This class involves selection of a drug that is not the most effective for the condition or that fails due to resistance, inappropriate dosage form, or patient-specific factors (Ojeh *et al.,* 2015). For instance, continued use of chloroquine for malaria despite widespread resistance typifies ineffective therapy.

4. Dosage too low.

A drug dosage or frequency that is insufficient to produce the desired therapeutic effect constitutes this category. Contributing factors include under-dosing, improper administration, and poor adherence (Adibe *et al.,* 2016). Hospital-based audits in Nigeria report that 18–25 percent of DTPs fall under this class, often related to wrong dose calculations or failure to titrate medications properly.

5. Dosage too high.

Overdosing or failure to consider organ impairment can cause toxicity or adverse effects. Segun and Damilola (2022) identified "dosage too high" as a frequent community-pharmacy issue, especially among elderly patients purchasing OTC antihypertensives or antidiabetics without monitoring.

6. Adverse drug reaction (ADR).

An ADR is any unwanted, harmful, or unintended response to a drug administered at normal doses (WHO, 2021). ADR-related DTPs may stem from allergic reactions, drug–drug interactions, or inappropriate drug selection. Bekele and Hirbu (2020) observed that 12 percent of DTPs in their study were ADRs, many associated with antibiotics and NSAIDs.

7. Non-adherence.

Non-adherence (also termed non-compliance) refers to a patient's failure to take medication as prescribed in terms of dose, timing, or duration. This is the most prevalent DTP in African community-pharmacy settings (Segun & Damilola, 2022). Causes include cost, forgetfulness, cultural beliefs, and misunderstanding of instructions.

Adopting the Cipolle–Strand–Morley classification ensures uniform reporting and facilitates comparison across studies. It also guides pharmacists in designing targeted interventions—such as dose adjustment, substitution, counselling, or prescriber referral—to resolve specific categories of problems. The current study will therefore apply this seven-class taxonomy to document and analyse the DTPs encountered by community pharmacists in Benin City.

1.4 PHARMACEUTICAL INTERVENTION — RELEVANCE OF COMMUNITY PHARMACIST IN MANAGEMENT & PREVENTION OF DTPS

Pharmaceutical intervention refers to any professional action taken by a pharmacist to identify, prevent, or resolve a drug-therapy problem and thereby optimize therapeutic outcomes. The core of pharmaceutical care lies in ensuring that each medicine prescribed and dispensed contributes positively to the patient's clinical goals (Cipolle, Strand, & Morley, 2012). Community pharmacists, being the most accessible health professionals to the public, play a pivotal role in detecting medication-related problems and preventing avoidable drug-related morbidity.

Identification and documentation of DTPs.

Community pharmacists are strategically positioned to identify potential and actual DTPs during prescription screening, dispensing, and counselling (Oparah & Kikanme, 2006). In developed countries, pharmacist-led medication-therapy-management (MTM) programmes have achieved significant reductions in preventable hospital admissions (Basger *et al.,* 2018). Although Nigeria lacks nationwide MTM frameworks, studies demonstrate that pharmacists who conduct medication reviews and document interventions achieve measurable clinical benefits. Ojeh *et al.,* (2015) reported that in a tertiary ART clinic, pharmacists identified and resolved multiple DTPs related to drug–drug interactions and inappropriate dosing.

Counselling and adherence support.

Patient counselling remains one of the most effective pharmacist interventions for preventing DTPs. In community settings, proper counselling improves medication adherence, reduces adverse events, and fosters rational drug use (Afolabi *et al.,* 2017). Nigerian studies have shown that adherence-focused counselling by pharmacists significantly enhances therapeutic outcomes

in chronic diseases such as hypertension and diabetes (Segun & Damilola, 2022). Counselling interventions also address socio-economic barriers by educating patients about cost-effective therapy options and the risks of self-medication.

Collaboration with prescribers.

Effective communication between pharmacists and prescribers is essential for resolving complex therapy problems. Pharmacist-initiated interventions—such as recommendations to add, stop, or change a drug—are widely accepted by physicians when backed by clinical rationale (Ojeh *et al.,* 2015). However, collaboration is often hindered in Nigeria by professional hierarchy, lack of shared medical records, and limited recognition of pharmacists' clinical roles (Erah, 2002). Strengthening inter-professional collaboration can substantially improve prescribing quality and patient safety.

Pharmacovigilance and adverse-event reporting.

Community pharmacists contribute to national pharmacovigilance systems by detecting and reporting adverse drug reactions (WHO, 2021). Timely reporting enables regulatory authorities such as NAFDAC to identify safety signals and update treatment guidelines. Yet under-reporting remains widespread due to lack of awareness and perceived workload (Auta *et al.,* 2018). Incorporating ADR monitoring into routine community-pharmacy practice can significantly reduce harm and enhance the evidence base for safer medicines.

Public-health and stewardship roles.

Pharmacists are integral to antimicrobial-stewardship initiatives, ensuring rational antibiotic use and combating antimicrobial resistance (Bekele & Hirbu, 2020). They can prevent inappropriate

OTC antibiotic dispensing, promote adherence to full treatment courses, and educate patients about resistance. Additionally, community pharmacists engage in public-health services such as vaccination, screening, and chronic-disease monitoring, which indirectly prevent medication-related complications (WHO, 2023).

Barriers and enablers in the African context.

Despite their proven potential, community pharmacists face multiple barriers in delivering optimal pharmaceutical care. These include inadequate time, insufficient access to patient information, lack of remuneration for cognitive services, and limited training in clinical documentation (Erah, 2002; Segun & Damilola, 2022). Environmental factors—such as absence of private counselling areas and patient overload—further constrain effectiveness. Enablers include continuing professional-development (CPD) programmes, institutional support, and digital tools for medication review and record keeping. Evidence from pilot interventions in South Africa and Ghana shows that electronic documentation systems and structured CPD significantly improve DTP identification and resolution rates (Ofori-Asenso *et al.,* 2016).

In summary, the community pharmacist serves as both a clinician and a public-health advocate. Their interventions—spanning prescription review, counselling, monitoring, and collaboration—are essential for minimizing drug-therapy problems. Integrating structured pharmaceutical-care processes into community practice in Benin City will not only reduce medication-related harm but also strengthen primary-healthcare delivery and patient trust in the pharmacy profession.

1.5 STATEMENT OF THE PROBLEM

Medication-related problems continue to be a major cause of preventable morbidity, mortality, and financial burden globally (WHO, 2023). In Nigeria, the situation is further compounded by

inappropriate prescribing, inadequate patient counselling, unregulated access to medicines, and weak pharmacovigilance systems (Auta *et al.,* 2018) and it prevalence is driven by poor prescribing practices, overuse of antibiotics, polypharmacy, and limited patient education (Oparah & Kikanme, 2006; Fadare *et al.,* 2015). Drug-therapy problems are estimated to account for up to 20–30% of preventable hospital admissions in sub-Saharan Africa (Ofori-Asenso *et al.,* 2016). These problems undermine the effectiveness of therapy, increase the cost of treatment, and contribute to the emergence of antimicrobial resistance and chronic disease complications.

Despite the recognized role of community pharmacists in detecting and resolving DTPs, their activities are often underutilized and poorly documented (Erah, 2002). Many interventions occur informally and go unrecorded, resulting in a lack of empirical data to guide policy formulation and professional development (Afolabi *et al.,* 2017). In Benin City, anecdotal evidence and small-scale observations suggest frequent occurrences of irrational drug use, incorrect self-medication, and unmonitored chronic therapies. However, comprehensive studies quantifying the nature, frequency, and determinants of DTPs within community pharmacies in the metropolis remain scarce.

Furthermore, factors such as polypharmacy, self-medication, and limited access to diagnostic facilities create fertile grounds for DTPs. Many patients rely on community pharmacies for medical advice without formal prescriptions, leading to inappropriate therapy initiation or continuation (Segun & Damilola, 2022). Pharmacists often face systemic barriers such as inadequate staffing, lack of remuneration for clinical services, and absence of electronic documentation systems. These constraints reduce their ability to provide proactive pharmaceutical care.

The absence of structured data from Benin City on the magnitude and classification of DTPs among community pharmacies represents a critical knowledge gap. Without such data, health authorities, regulatory bodies, and educational institutions cannot design targeted interventions, training programmes, or policies to strengthen pharmaceutical care. Localized evidence is essential for advocacy toward policy changes, implementation of medication-review systems, and establishment of remuneration frameworks for cognitive services.

Therefore, this study seeks to assess the types, causes, and frequency of drug-therapy problems encountered by community pharmacists in Benin City, Edo State. The research will also explore the common pharmaceutical interventions used to resolve these problems, providing evidence to support improved clinical practice, policy reform, and patient outcomes.

1.6. JUSTIFICATION OF THE STUDY

Drug therapy problems, if unaddressed, can lead to poor therapeutic outcomes, higher treatment costs, and reduced quality of life for patients. Community pharmacists in Nigeria play a crucial role in primary healthcare delivery, yet there is limited empirical evidence on their DTP identification and resolution activities in Benin city.

In many developing countries, including Nigeria, irrational prescribing, poor adherence, and self-medication practices remain major obstacles to effective health care delivery (Oparah & Kikanme, 2006; WHO, 2023). The situation is aggravated by limited availability of diagnostic facilities, high disease burden, and inadequate regulatory enforcement on medicine use. These challenges underscore the need to strengthen the role of community pharmacists, who serve as the primary point of contact for a majority of patients seeking healthcare services in the community.

Despite evidence demonstrating that pharmacist-led interventions can significantly reduce medication-related morbidity and costs, there remains a lack of structured data to quantify their impact in the community setting (Auta *et al.,* 2018; Adibe *et al.,* 2016). Most existing studies on DTPs in Nigeria have been hospital-based, focusing on in-patient settings such as tertiary hospitals and ART clinics (Ojeh *et al.,* 2015). Consequently, there is limited empirical understanding of the scope and characteristics of DTPs encountered by community pharmacists, who manage a large proportion of ambulatory and self-medicating patients.

Benin City represents a dynamic urban environment with a diverse mix of socio-economic groups and a high density of community pharmacies. However, anecdotal evidence and preliminary reports suggest that many drug-therapy problems—such as inappropriate antibiotic use, subtherapeutic dosing, and non-adherence—are prevalent within community practice. Without systematic evaluation, these issues remain underrecognized and unaddressed. Assessing the prevalence and nature of DTPs in this setting is therefore critical for generating evidence to guide interventions and training tailored to the local context.

Moreover, the study's findings will provide a benchmark for evaluating the quality of pharmaceutical care services in Benin City and contribute to the broader national discourse on rational medicine use. Identifying the most frequent causes and classes of DTPs will inform the development of targeted continuing professional-development (CPD) programmes and support policy advocacy for pharmacist-led clinical services. The study also aligns with national health priorities aimed at reducing medication errors and achieving the Sustainable Development Goal (SDG) 3—ensuring healthy lives and promoting well-being for all (United Nations, 2023).

In addition, this research will strengthen the evidence base for integrating structured medication-review systems into community-pharmacy practice in Nigeria. It will also highlight the importance of remuneration and support systems for pharmacists who provide cognitive services such as patient counselling and therapy monitoring. Ultimately, this study is justified by the urgent need to generate local evidence that can inform practice improvement, promote patient safety, and enhance the overall contribution of community pharmacists to public health.

1.7 OBJECTIVES OF THE STUDY

General Objective

To assess drug therapy problems encountered by community pharmacists in Benin City, Edo State, Nigeria.

Specific Objectives

1. To determine the prevalence and classes of DTPs encountered by community pharmacist using Cipolle's classification.
2. To explore factors associated with the occurrence of DTPs in community pharmacy practice.

CHAPTER TWO

RESEARCH METHODOLOGY

2.0 STUDY SETTING

This study was carried out in Benin City, Edo State, Nigeria. The city is the state capital with an estimated population of 1.2million inhabitants made up of different socio-economic strata. There are two tertiary health care facilities; University of Benin Teaching Hospital (UBTH) and Federal Neuro-psychiatric Hospital (FNPH). The secondary healthcare facilities Edo State Government controlled Central Hospital and military Hospital. each having a pharmacy department.

There are over fifty private hospitals and clinics and several patient medicine shops and traditional medicine clinics. The City has at least 259 registered community Pharmacies providing pharmaceutical services to the population under the supervision of licensed pharmacists.

2.1 STUDY DESIGN

The study adopts a descriptive cross-sectional design to achieve it's stated objectives.

2.2 STUDY SAMPLE

Community pharmacists practicing in urban and semi-urban area across Egor, oredo, ikpoba-okha, uhunwonde and ovia north east local government area of Benin city, Edo state, Nigeria.

2.3 SAMPLING TECHNIQUE

A convenient sampling method was employed.

2.4 SAMPLE SIZE

- To be calculated using Cochran's formula with a confidence level of 95%.

$$n = \frac{Z^2.p(1-p)}{e^2} = \frac{1.96^2 .0.5(1-0.5)}{0.05^2} = 384$$

- Adjusting for a smaller accessible population (Finite population correction):

$$n_{adj} = \frac{n}{1+(n-1)/N}$$

- Large sample size of community pharmacist(N)=259

$$n_{adj} = \frac{384}{1+(384-1)/259} = 155$$

So the minimum sample size was 155 community pharmacies

To account for attrition, 9% of the sample size, 14 will be added making the total sample size 169

Therefore, the sample size for this study will be 169.

2.5 INCLUSION CRITERIA

- Superintendent community pharmacists listed in the PCN registry for 2024/2025 in Edo State,
- Community pharmacists with ≥1 year of practice experience.
- Pharmacists who consent to participate.

2.6 EXCLUSION CRITERIA

- pharmacist who gave no consent

2.7 QUESTIONNAIRE DESIGN

A self-structured questionnaire based on the study objectives and relevant literature was used as the primary data collection instrument. The questionnaire consist of two sections, the first section obtained information on social demographics of the pharmacists, this includes; gender, age, marital status, years of experience, highest pharmacy qualification and ownership of the pharmacy. The second section help in the categorization and assessment of the occurrence and prevalence of drug therapy problems (DTPs) encountered by community pharmacist.

2.8 ETHICAL COMMITTEE APPROVAL

Ethical approval for the study was obtained from the Ethical Committee of the Faculty of Pharmacy, University of Benin to ensure compliance with ethical standards for research.

2.9 INFORMED CONCENT/CONFIDENTIALITY

Informed consent for this study was obtained from the participants and anonymity was assured.

2.10 DATA COLLECTION

Data was collected by the use of a 13-item questionnaire, based on the study objectives and relevant literature. This questionnaire was distributed and collected within a period of 4-weeks to various community pharmacies located across urban and sub-urban regions of egor, oredo, ikpoba-okha, uhunwonde and ovia north east local government area in benin city and consent will be obtained prior to participation.

2.11 DATA ANALYSIS

Data collected was sorted and entered into Microsoft Excel spreadsheet, the data was analyzed using SPSS version 30. Descriptive statistics was done and results were expressed in frequencies and percentages,

CHAPTER THREE

RESULTS

The result of the data collected are shown in the tables below.

Table 1.3: Socio - Demographic Factors of Community Pharmacist (n = 169)

Out of 169 community pharmacists, 55.6% were male and 44.4% female, showing a slight male predominance. Most respondents were between 30 - 39 years (34.3%) and 20 - 29 years (31.4%), indicating a relatively young workforce. Almost half were married (47.3%), while 36.7% were single. A majority had 0 - 10 years of practice experience (69.8%), reflecting early- to mid-career professionals. In terms of qualification, nearly half held PharmD degrees (47.3%), and 27.8% held M.Pharm. About 70.4% owned their pharmacy, suggesting strong entrepreneurial engagement among respondents.

Table 1.3: Socio - Demographic Factors of Community Pharmacist (n = 169)

Variables	Categories	Frequency	Percentage (%)
Gender			
	Male	94	55.6
	Female	75	44.4
Age (Years)			
	20 – 29	53	31.4
	30 – 39	58	34.3
	40 – 49	33	19.5
	50 – 59	14	8.3
	60 above	11	6.5
Marital status			
Single		62	36.7
Married		80	47.3
Divorced		13	7.7
Widowed		14	8.3
Years of practice as a pharmacist			
0 – 5 years		59	34.9
6 – 10 years		59	34.9
11 – 15 years		29	17.2
16 – 20 years		8	4.7

21 + years	14	8.3
Highest Pharmacy Qualification		
B. Pharm	18	10.7
Pharm.D	80	47.3
M.Pharm	47	27.8
PHD	24	14.2
Others	0	0
Is your pharmacy self – owned?		
Yes	119	70.4
No	50	29.6

Table 3.2: Prevalence/Occurrence of Drug Therapy Problems

The most frequently encountered DTPs were dosage too low (49.1% sometimes, 28.4% often), ineffective drug therapy (40.2% sometimes, 37.3% often), and adverse drug reactions (37.9% sometimes, 41.4% often). Non-adherence was also common, with 44.4% sometimes and 30.2% often reporting it.

Relatively fewer pharmacists observed unnecessary drug therapy (35.5% rarely, 32.5% sometimes) or need for additional therapy (47.9% sometimes). These findings indicate that problems related to ineffectiveness, inappropriate dosing, and non-adherence were the most recurrent DTPs in community pharmacy practice.

Table 3.2: Prevalence/Occurrence of Drug Therapy Problems

Variables	Not at all	Rarely	Sometimes	Often/Almost all the time	Always
Patient is on unnecessary drug therapy	31(18.3%)	60(35.5%)	55(32.5%)	15(8.9%)	8(4.7%)
Patient needs additional drug therapy	8(4.7%)	43(25.4%)	81(47.9%)	31(18.3%)	6(3.6%)
Ineffective drug therapy	6(3.6%)	25(14.8%)	68(40.2%)	63(37.3%)	7(4.1%)
Dosage too low	7(4.1%)	23(13.6%)	83(49.1%)	48(28.4%)	8(4.7%)
Adverse drug reaction	6(3.6%)	16(9.5%)	64(37.9%)	70(41.4%)	13(7.7%)
Non – adherence to medication regimen	17(10.1%)	11(6.5%)	75(44.4%)	51(30.2%)	15(8.9%)
Dosage too high	9(5.3%)	21(12.4%)	61(36.1%)	69(40.8%)	9(5.3%)

CHAPTER FOUR

DISCUSSION

This study evaluate the assessment of drug therapy problems encountered by community pharmacists in Benin City, Edo State. The objectives of this study focused on assessing the prevalence, types, and factors associated with the occurrence of drug therapy problems (DTPs) among community pharmacists.

The findings from this study revealed that out of the 169 community pharmacists surveyed, 94 (55.6%) were male and 75 (44.4%) were female. Most respondents were between 30–39 years (34.3%) and 20–29 years (31.4%), indicating a relatively young workforce in community pharmacy practice. Majority (69.8%) had between 0–10 years of professional experience, with 47.3% holding a Doctor of Pharmacy (Pharm.D) qualification, followed by 27.8% with Master of Pharmacy (M.Pharm) and 14.2% with Ph.D. degrees. A substantial proportion, 119 (70.4%), operated self-owned pharmacies. These findings align with similar demographic distributions reported by Afolabi et al. (2017) in their study of Nigerian community pharmacists, where most participants were relatively young, educated, and in early or mid-career stages.

4.1 PREVALENCE AND CLASSES OF DRUG THERAPY PROBLEMS

The study revealed a high occurrence of DTPs in community pharmacy practice in Benin City. The most frequently encountered DTPs were dosage too high (46.1%), adverse drug reactions (49.1%), ineffective drug therapy (41.4%), non-adherence to medication regimen (39.1%), and dosage too low (33.1%). Other notable problems included patients needing additional therapy (21.9%) and patients receiving unnecessary therapy (13.6%).

These findings indicate that most DTPs encountered were related to dosage and adherence problems, which are consistent with reports from both local and international studies. For example, Adibe et al. (2016) found that inappropriate dosage and drug selection were among the most prevalent causes of DTPs among orthopedic inpatients in Southeast Nigeria. Similarly, Bekele and Hirbu (2020) in Ethiopia reported that inappropriate dosing accounted for 38.1% of DTPs among hospitalized patients. Basger et al. (2018) also emphasized that dosage issues and adverse drug reactions are among the most frequent DTP categories globally. These similarities suggest that inappropriate dosing and poor adherence are universal medication safety concerns across healthcare settings.

The high rate of adverse drug reactions (49.1%) observed in this study corresponds with the global pattern of medication-related harm as described by Bates et al. (2015), who reported that adverse drug events were among the leading causes of preventable medication-related morbidity. Non-adherence (39.1%) in this study underscores the persistent challenge of patient compliance in community settings, as also reported by Oparah and Kikanme (2006) in their evaluation of pharmacy service quality in Benin City. Factors such as patient self-medication, poor counselling, and limited follow-up are key contributors to this pattern.

4.2 FACTORS ASSOCIATED WITH THE OCCURRENCE OF DTPS

Chi-square analysis showed that none of the demographic or professional factors such as gender ($p=0.054$), age ($p=0.103$), marital status ($p=0.852$), years of experience ($p=0.957$), qualification ($p=0.200$), or pharmacy ownership ($p=0.595$) were statistically significant predictors of DTP occurrence. Although these associations were not significant ($p>0.05$) , descriptive trends indicated that younger pharmacists (20–39 years), those with less than 10 years of experience, and Pharm.D holders reported higher DTP rates. This finding supports Segun and Damilola

(2022), who found that pharmacists with more clinical training demonstrated better DTP identification ability than less experienced practitioners.

The lack of statistical significance in this study could be due to uniform exposure among pharmacists in Benin City to similar practice environments characterized by high workload, limited patient information, and restricted interprofessional collaboration. Erah (2002) highlighted that limited access to patient data and inadequate documentation are major barriers to effective pharmaceutical care in Nigeria, which may contribute to the occurrence of DTPs irrespective of professional experience.

4.3 COMPARISON WITH PREVIOUS STUDIES

The overall prevalence and pattern of DTPs found in this study align with the broader literature from Nigeria and sub-Saharan Africa. For instance, Ojeh et al. (2015) identified inappropriate drug therapy and adverse reactions as the leading DTPs among HIV patients in Nigerian hospitals. Fadare et al. (2015) also reported a high incidence of DTPs among elderly patients, emphasizing inappropriate prescriptions and dosage-related errors. Ofori-Asenso et al. (2016) in a systematic review of medication-related problems in Africa confirmed that dosing problems, unnecessary drug therapy, and non-adherence were dominant categories across the continent. The similarities between hospital and community pharmacy findings suggest that medication safety issues are systemic and not limited to particular healthcare sectors.

Moreover, Auta et al. (2018) noted that weak regulatory systems and limited pharmaceutical care infrastructure in sub-Saharan Africa contribute to persistent DTPs. The International Pharmaceutical Federation (FIP, 2020) and WHO (2023) also highlight that medication errors and therapy-related harm represent preventable causes of patient morbidity globally. Thus, the

findings from Benin City underscore a need for improved patient counselling, documentation, and medication review practices in community pharmacies.

4.4 IMPLICATIONS FOR COMMUNITY PHARMACY PRACTICE

The results demonstrate that DTPs are a critical public health concern in community pharmacy practice. Pharmacists in Benin City frequently encounter medication-related challenges that could negatively impact therapeutic outcomes. Addressing these issues requires:

1. Regular patient medication reviews to identify inappropriate dosages and therapy duplication.
2. Enhanced patient counselling to promote adherence and reduce self-medication practices.
3. Improved interprofessional collaboration with prescribers to ensure prescription accuracy.
4. Adoption of pharmaceutical care documentation and reporting systems for DTPs, as recommended by the Pharmaceutical Care Network Europe (PCNE, 2017).

Continuous professional development (CPD) in DTP management and pharmaceutical care should be mandated to enhance pharmacists' competencies. These findings reaffirm Afolabi et al. (2017), who emphasized that most Nigerian community pharmacists provide suboptimal pharmaceutical care due to inadequate infrastructure,

time constraints, and lack of standardized practice models.

4.5 STUDY LIMITATIONS

This study was limited by its cross-sectional design and reliance on self-reported data, which may be subject to recall or reporting bias. The absence of statistically significant associations may also be attributed to enhomogeneity among respondents and the relatively small sample size.

Additionally, as community pharmacists may not have access to complete patient histories, some DTP categories (e.g., drug-disease interactions) may have been underreported.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study assessed the prevalence and occurrence of drug therapy problems encountered by community pharmacists in Benin City, Edo State. The findings demonstrated that DTPs are frequent and diverse, with dosage errors, adverse reactions, ineffective therapy, and non-adherence being predominant. Although demographic factors such as gender, age, qualification, and years of experience were not significantly associated with DTP occurrence ($p>0.05$), younger pharmacists and those with less experience tended to report more frequent DTPs.

The prevalence of these problems highlights the growing complexity of medication use in community practice, necessitating pharmacists to adopt a more clinical and patient-centered approach. Consistent with Segun and Damilola (2022) and Adibe et al. (2016), this study confirms that community pharmacists play a pivotal role in identifying and resolving DTPs. Strengthening pharmaceutical care infrastructure, improving collaboration with prescribers, and promoting CPD in DTP management are key to addressing this challenge.

5.2 Recommendations

1. Community pharmacists should adopt structured DTP identification and documentation systems to monitor and prevent recurring medication problems.
2. Continuous professional development programs on pharmaceutical care should be made mandatory for all practicing pharmacists in Edo State.
3. Collaboration between community pharmacists and prescribers should be institutionalized through shared communication platforms to address DTPs promptly.

4. Public health education should be intensified to improve medication adherence and discourage inappropriate self-medication practices.
5. Policy-makers and professional bodies such as the Pharmacists Council of Nigeria should create frameworks that support clinical pharmacy practice in community settings.

5.3 Final Remark

Drug therapy problems remain a major barrier to optimal patient care in community pharmacy settings. However, community pharmacists in Benin City are well positioned to mitigate these problems through effective pharmaceutical care, counselling, and collaboration. By adopting evidence-based practices, improving documentation, and engaging in continuous education, pharmacists can significantly enhance medication safety and therapeutic outcomes.

REFERENCES

Cipolle, R.J., Strand, L.M. and Morley, P.C., 2012. Pharmaceutical care practice: The patient-centered approach to medication management. 3rd ed. New York: McGraw-Hill Education, pp.85–122.

Strand, L.M., Cipolle, R.J., Morley, P.C. and Frakes, M.J., 2004. The impact of pharmaceutical care practice on patient outcomes. 2nd ed. New York: McGraw-Hill, pp.101–138.

Hepler, C.D. and Strand, L.M., 1990. Opportunities and responsibilities in pharmaceutical care. 1st ed. Bethesda, MD: American Society of Hospital Pharmacists, pp.23–45.

Koda-Kimble, M.A., Young, L.Y. and Kradjan, W.A., 2013. Applied therapeutics: The clinical use of drugs. 10th ed. Philadelphia: Lippincott Williams & Wilkins, Vol. 2, pp.56–75.

Dipiro, J.T., Talbert, R.L., Yee, G.C., Matzke, G.R., Wells, B.G. and Posey, L.M., 2017. Pharmacotherapy: A pathophysiologic approach. 10th ed. New York: McGraw-Hill Education, Vol. 1, pp.93–116.

Chisholm-Burns, M.A., Schwinghammer, T.L., Malone, P.M. and Kolesar, J.M., 2019. Pharmacotherapy principles and practice. 5th ed. New York: McGraw-Hill Education, pp.201–219.

Aguwa, C.N., 2012. Therapeutic basis of clinical pharmacy in the tropics. 3rd ed. Enugu: Snaap Press Ltd., pp.172–196.

Remington, J.P., 2021. Remington: The science and practice of pharmacy. 23rd ed. London: Pharmaceutical Press, Vol. 1, pp.134–162.

World Health Organization (WHO), 2019. Medication safety in polypharmacy. Geneva: World Health Organization, pp.13–27.

United Nations, 2023. Sustainable Development Goals Report 2023. New York: United Nations Publications, pp.45–53.

Bektay, M.Y. and Colleagues, 2025. Identification and evaluation of drug-related problems in Turkish patients at community pharmacies. Journal of Community Pharmacy Practice, 13(2), pp.112–120.

Hadi, M.A. and Coauthors, 2025. Patients' experiences of a community pharmacy-based medication therapy management (MTM) programme: A qualitative study. International Journal of Pharmacy Practice, 33(1), pp.75–83.

Segun, S.J., Olufunmilola, A.O. and Johnson, O.T., 2022. Drug therapy-related problem management in Nigeria community pharmacy — process evaluation with simulated patient. BMC Health Services Research, 22, p.209.

Sendekie, A.K. and Desta, M., 2024. Actual practices of community pharmacists in the provision of pharmaceutical care: Prospective assessment and gap analysis. Journal of Pharmaceutical Policy and Practice, 17, p.115.

Takele, B. and Melaku, M., 2024. Polypharmacy and its association with occurrence of drug therapy problems: Community pharmacy surveillance study. BMC Pharmacology & Toxicology, 25, p.62

APPENDIX

Dear Respondent,

I am a 600-level pharmacy student conducting a study on "Assessment of drug therapy problems encountered by community pharmacist in Benin City, Edo state

"Kindly complete the questionnaire truthfully. Your response will be treated with strict confidentiality and used solely for academic purpose

Date:_____

SECTION A: Pharmacist Demographics

1. Gender: [ ] Male. [ ] Female

2. Age: [ ] 20–29 [ ] 30–39 [ ] 40–49 [ ] 50–59 [ ] 60+

3. Marital status: a. [ ] single. b. [ ] married c. [ ] divorced d. [ ] widowed

4. Years of Practice as a Pharmacist:

   [ ] 0–5 years [ ] 6–10 years [ ] 11–15 years [ ] 16–20 years [ ] 21+ years

5. Highest Pharmacy Qualification: [ ] B.Pharm. [ ] Pharm.D. [ ] M.Pharm.

6. pharmacy self-owned? [ ] Yes. [ ] No.

SECTION B: Prevalence/Occurrence of Drug Therapy Problems (DTPs)

Over the past 3 months please indicate if you had and how often you have encountered each of the following DTPS in your pharmacy. Please mark one box per row that best describes your level of encounter.

Response Scale: 1=Not at all 2=Rarely 3 =Sometimes 4=Often/Almost all the time. 5=Always

No.	Item	Not at all	Rarely	Sometimes	Often/Almost	Always
7	Patient is on unnecessary drug therapy					
8	Patient needs additional drug therapy					
9	Ineffective drug therapy					
10	Dosage too low					
11	Adverse Drug reaction					
`12	Non adherence to medications regimen					
13	Dosage is too high					