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AN INVESTIGATION INTO FACTORS CONTRIBUTING TO NONADHERENCE OF PATIENTS COLLECTING MEDICINE FROM CENTRAL CHRONIC MEDICATION DISPENSING AND DISTRIBUTION PICK-UP POINTS IN THE TSHWANE DISTRICT

By

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DECLARATION

Student Number: 17313423

I, **Susan Lerato Kebapetse Mashilo**, declare that this dissertation, titled '**AN INVESTIGATION INTO FACTORS CONTRIBUTING TO NONADHERENCE OF PATIENTS COLLECTING MEDICINE FROM CENTRAL CHRONIC MEDICATION DISPENSING AND DISTRIBUTION PICK-UP POINTS IN TSHWANE DISTRICT,'** is my own work. All sources referenced and quoted have been mentioned and acknowledged in a complete reference list. Furthermore, I declare that this work has not been submitted for any other degree at any other institution.

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Researcher signature Date

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Witness signature Date

ABSTRACT

Abstract

Non-communicable diseases are the leading contributing factors to premature mortalities worldwide. Adherence to medication and sustained medication supply is critical for the control of non-communicable diseases and thus reducing mortality due to non-communicable diseases. Central Chronic Medication Dispensing and Distribution (CCMDD) is an out-sourced, public sector centralised dispensing strategy that has been operational in the eight Provincial Health Departments since 2014 (Western Cape Province initiated the strategy in 2005). The strategy aims to ensure medication availability, reduce overcrowding in the healthcare facilities and thus reduce patient waiting times. The study aim was to determine factors associated with the nonadherence of patients registered in CCMDD to collect medication from their chosen pick-up point.

Methods

A quantitative, descriptive non-experimental study using a survey method was implemented on patients registered with the CCMDD from 2014 to 2017. A self-developed questionnaire was utilised to collect data from volunteer respondents, to identify factors associated with the nonadherence of patients registered in CCMDD. Data from the questionnaires were captured into Microsoft Excel for analysis and results were descriptively reported.

The researcher discussed ethical considerations with respondents before the completion of the questionnaire, and informed consent signed by those who were willing to participate in this study.
Results from this study will assist the Tshwane District Health in strengthening this strategy by accelerating community-orientated approaches like adherence clubs and rolling it out to all facilities.

Analysis of data

Data were analysed using Statistical Analysis System (SAS) statistical software. Descriptive statistics, frequencies, and proportions (percentages) were applied to analyse categorical variables (e.g., gender, level of education, etc.). The Chi-square test (χ^2) for independence in a two-way contingency table was used to determine and describe the demographics, and other associated factors of patients who did not adhere to collection of medicine. Results were presented in terms of graphs, pie charts, and tables.

Results

The questionnaires were completed by 344 respondents yielding a response rate of 98.8% (344/348). The study revealed that 24% (82/344) of respondents failed to honour their appointments. A suggestive barrier in non-adherence is inaccessibility of pick-up points (PUP) 23% (n=79), with 79%

(n=232) using public transport to reach their chosen PUP and 17% (n=58) indicating that they stay 10km away from their PUP. Results further revealed the following reasons for missed appointments: late short message service (SMS), forgetfulness, travelling, no money for transport and work commitments.

Conclusion

The use of adherence clubs in the community and mobile trucks to reach out to patients at their outreach mobile points was recommended to increase accessibility to collect medication and thus decrease nonadherence. Further follow-up studies can be conducted in the district about the challenges facing adherence clubs and outreach services and to establish and monitor the impact and sustainability of adherence clubs.

Keywords:

Adherence, Central Chronic Medication Dispensing and Distribution, nonadherence, registered patients.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Ant-retroviral Therapy
CCMDD	Central Chronic Medication Dispensing and Distribution
CDU	Chronic Dispensing Unit
CD4	Cluster of Differentiation 4
CINAHL	Cumulative Index to Nursing and Allied Health Literature
DoH	Department of Health
EBSCohost	Elton B. Stephens Company
FPD	Foundation for Professional Development
GDoH	Gauteng Department of Health
HCT	HIV Counselling and Testing
HIV	Human Immunodeficiency Virus
HPRS	Health Patient Registration System
KM	Kilometre
MEDLINE	Medical Literature Online
NDoH	National Department of Health
NDP	National Development Plan
NGO	Non-Governmental Organisation
NHI	National Health Insurance
PHC	Primary Healthcare
PUP	Pick-up Point
P-VALUE	Probability Level
SABC	South African Broadcasting Cooperation
SA	South Africa
SAS	Statistical Analysis System
SD	Sub-District
SDG	Sustainable Development Goals
SMS	Short Message Service
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Sciences
TB	Tuberculosis
UN	United Nations
UNAIDS	United Nation AIDS
UTT	Universal Test and Treat

WBOT	Ward-Based Outreach Team
WHO	World Health Organization
X^2	Chi-Square

CONTENTS

1. CHAPTER ONE: OVERVIEW OF THE STUDY

1.1. INTRODUCTION AND BACKGROUND

Unlimited access to healthcare is a prerequisite to sustained drug or medicine supply to people diagnosed with chronic diseases. Medicine access is considered an integral part of Universal Health Coverage, and a key element for the delivery of quality care, especially for people diagnosed with chronic diseases (Steele, Subramanian & Tolani 2019:111). Compliance with medication sustains health and manages chronic diseases to prevent complications that might lead to negative health outcomes such as end-organ damage, resistance to medication due to non-compliance or death (Manobharathi, Kalyani and Arulmani 2017:787). According to the World Health Organization (WHO), about 42% of premature mortalities occurred globally before the age of 70 years. The leading causes of premature mortalities were the quadruple disease burden which includes cardiovascular diseases, cancers, chronic respiratory conditions (asthma and chronic obstructive airway disease) and diabetes mellitus which contributed to approximately 71% of non-communicable diseases deaths worldwide (WHO 2018:7). The main contribution to premature mortalities were non-communicable diseases ,such as hypertension and diabetes mellitus (WHO 2018:7), mostly complicated whereby one of the contributory factors is non-compliance on medication, related to poor access to healthcare services evidenced by overcrowding, long distance, and long waiting times (Munene & Ekman 2015:378).

Access to chronic medication and reduced long waiting time in healthcare facilities is among the six priority areas of the National Core Standards (National Core Standards 2011:7) in South Africa. It is estimated that a total of 12.3 million people will receive treatment for a chronic disease or will be living with Human Immunodeficiency Virus (HIV) by 2025 in South Africa (Sarkin, Machikicho, Barker, Coetzee, Coffee, Binen, et al 2014:3). Most of the people diagnosed with chronic diseases access medication from primary healthcare (PHC) facilities. For PHC facilities to provide medication to people diagnosed with chronic diseases, the National Department of Health (NDoH) adopted a strategy. The NDoH introduced the Central Chronic Medication Dispensing and Distribution (CCMDD) in 2014 as a national strategy to improve access of people diagnosed with chronic diseases to chronic medication (National Health Insurance (NHI) 2015:42).

Sustained and unlimited access to medication supply reduces mortalities among people diagnosed with chronic diseases. Medicine provision led to positive outcomes and contributed to increased life expectancy from 57.1% in 2009 to 62.2% in 2013 among people diagnosed with chronic diseases when access to antiretroviral therapy was introduced (Herbst 2016:1).

Access to medication in sub-Saharan Africa led to a decline in the high mortality rates due to Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS). Life expectancy increased from about 61.7 years in 1980 to 71.8 years of age in 2015 (Murray 2017:1459). In South Africa, health facilities have experienced an increase in people living with chronic diseases who require access to chronic medication since the introduction of antiretroviral therapy (ART) in 2012 (UNAIDS 2015:3). An estimated three million patients are registered for ARTs which necessitate unlimited access to medication without overcrowding the health services especially PHC facilities. In Gauteng province approximately 153 440 patients are registered for ARTs according to the Gauteng Department of Health (GDoH) annual report of 2015/2016 (GDoH annual report, 2016:22). According to Kettledas (2016:4), in Gauteng province, all PHC facilities make provision for access to chronic medication, for example, ARTs. Furthermore, it is indisputable, that the number of patients who access ART will even rise due to the new strategy of universal testing and treating (UTT), which started on the 1st of September 2016. The UTT strategy is a successor of the HIV counselling and testing (HCT) initiative launched in 2010 by President Zuma (South African Broadcasting Corporation [SABC] News, April 2010), which led to access to ARTs according to the criteria then (Colvin, Fairal and Lewin 2010:210). The United Nations AIDS (UNAIDS) 90-90-90 strategy, which was implemented in South Africa by the NDoH in 2015, also succeeded HCT and resulted in an increased number of patients accessing healthcare facilities for treatment and medication which is causing overcrowding in the healthcare facilities, and thus medicine shortage (Kettledas 2016:4). The 90-90-90 strategy aimed at providing 90% of population HCT, enrolling 90% on ARTs and ensuring that 90% are virally suppressed due to adherence on treatment (UNAIDS 2016:5). The UTT repeals ART guidelines adopted prior 2016 and aims to start patients on ART immediately after testing positive for HIV irrespective of their Cluster of Differentiation 4 (CD4) count and clinical HIV/AIDS staging (Pillay 2015:1-2). Therefore, unlimited access to medication for patients diagnosed with chronic diseases will be threatened. PHC facilities in Gauteng province will be equally burdened to provide care to an increasing number of people diagnosed with chronic diseases (Gauteng health turnaround strategy 2014:13).

The UTT strategy was also adopted, not only for testing and treating HIV and Aids patients, but also for non-communicable diseases conditions, such as hypertension and diabetes mellitus (Kettledas 2016:4). Subsequently, in line with the National Development Plan (NDP) 2030, United Nations (UN) Sustainable Development Goals and UNAIDS 90-90-90 targets of 2020, the Minister of Health in South Africa, announced scaling-up of National Health Insurance (NHI) decongestion strategy to reach about 800,000 patients and implement WHO evidence-based guidelines of (UTT) by the 1st of September 2016 (Pillay 2015:1). This approach downscaled most patients from the hospitals to PHC facilities.

The CCMDD strategy was implemented in 2014 to ensure access to medication for people using PHC facilities. The CCMDD strategy is envisioned to reduce long waiting hours, ensure the availability of medication, decongest the workload of PHC facilities and therefore improve service delivery and quality of care (Kettledas, 2016:13). According to the NHI White paper (2015:42), 260 000 patients have been registered in CCMDD strategy since May 2014. Some of the people diagnosed with chronic diseases are active in the labour market and need time off to collect their medication at the PHC facility which affects the labour industry due to structured monthly absenteeism. The introduction of the CCMDD strategy makes it possible for patients to collect medication from contracted pick-up points (PUP) located in their area of employment and during their lunch times, as such ensuring adherence (Liu, Christie, Munsamy, Roberts, Pillay, Sheela, et al 2021:8).

Patients who meet the criteria (these are HIV-positive patients with suppressed viral load, normal blood pressure for hypertensive patients (below 140/90), uncomplicated diabetes mellitus patients, patients diagnosed with epilepsy, asthma, and arthritis), are selected by the professional nurses for the CCMDD strategy. The patient registration form and repeat medication prescription for five months are submitted to the CCMDD service provider who has a contract with the GDoH. The contracted service provider for the GDoH is Pharmacy Direct. Pharmacy Direct then pre-packs the medication and distributes it to their contracted pharmacy companies like Clicks and MediRite pharmacies where patients can collect their pre-packed medication. These pharmacies serving as pick-up points are located within supermarkets in the residential areas of patients (Steel 2014:4). Pharmacy Direct inform patients three days before the scheduled appointment with a short message system (SMS) - is a text messaging service component of most telephone, internet, and mobile device systems. It uses standardised communication protocols that let mobile devices exchange short text messages, so that the pre-packed medication is ready for collection from the pick-up point. When a patient misses an appointment and does not collect the pre-packed medication within two days of the scheduled appointment, the pick-up point notifies Pharmacy Direct. Pharmacy Direct then will attempt to contact the patient. When this fails, the PHC facility is informed, and the Ward-Based Outreach Team (WBOT) is notified to trace the patient. The WBOTs are healthcare workers who deliver integrated healthcare services to communities, households, and individuals according to the re-engineering strategy for PHC strategy (Steel 2014:5). Patients who have missed their scheduled dates are then referred back to the PHC facility and subsequently the uncollected medicines are returned to Pharmacy Direct after fourteen days (Steel 2014:5).

The research on diabetes reiterates that compliance with medication is one of the components of management, and people diagnosed with diabetes need to have unlimited access to medication and comply with medication to avert possible complications (Manobharathi, et al 2017:790).

It is therefore envisioned that the CCMDD strategy will ensure unlimited access to medication by all patients diagnosed with chronic diseases.

1.2. PROBLEM STATEMENT

Even though the implementation of the CCMDD strategy aimed at ensuring unlimited access to medication, some patients registered under this strategy do not comply with collecting their medication from their self-chosen medicine pick-up points. Over the past decade, SA has experienced an unpredicted growth in patients requiring access to chronic medications. Not only has SA introduced universal-test-and-treat for patients living with HIV and AIDS, but there has also been a steady increase in the proportion of our population with non-communicable diseases requiring chronic medication (Kettledas 2016:3). The increased prevalence of non-communicable diseases globally and in SA are contributing to at least 33% of the burden of disease leading to overcrowding of PHC facilities and thus prolonged waiting time which depicts poor service delivery (Gray, Conradie, Crowley, Gaede, Gils, Shroufi et al 2015:638). This was among the reasons that led to non-compliance with medication collection from the PHC facilities.

According to a study, done in the Western Cape Province, the Province was the first to use Central Distribution Unit (CDU) to dispense medication to stable patients on chronic medication in 2005 which is similar to the CCMDD strategy (Magadzire, Marchal & Ward 2015:2). The actual distribution of medication occurred at alternative pick-up points or pharmacies, mobile clinics, community clubs, old age homes and workplaces, most of which are linked to the nearest PHC facility. However, it was found that about 8% to 12% of patients missed their appointments (Magadzire, et al 2015:4 - 6). The study of factors contributing to the nonadherence of patients collecting treatment through the CCMDD program was never done in Tshwane District, and the problem of nonadherence similarly exists in Tshwane District. It was found that non-compliance with collecting medication at pick-up points was associated with several critical impacts, including poor viral load suppression and hence complications like Tuberculosis (TB) occurred more frequently (Crawford, Sanderson and Thornton 2014:1394). Poor adherence to collection of medication has been suggested as a possible basis for the observed complications (Munene & Ekman 2012:378).

The adoption of the CCMDD strategy in 2014 aimed to curtail long waiting times at PHC facilities and promote adherence to medication by patients diagnosed with chronic diseases. The CCMDD strategy was implemented to enable unlimited access to medicine collection for repeat scripts to be dispensed and distributed by the contracted service provider. In Gauteng Province, the service provider is

Pharmacy Direct. People diagnosed with chronic diseases are involved in identifying a convenient medication pick-up point which is usually less than 5 km from the workplace or residential areas. Those people diagnosed with chronic diseases that are assessed to be stabilised and complying with their medication are registered in the CCMDD strategy. These registered patients will then collect their pre-packed medication at the pick-up points which are registered pharmacies contracted with Pharmacy Direct. They do so for five months and they are to return to the PHC facility during the sixth month for review and renewal of their prescription (Bogart, Shazi, MacCarthy, Mendoza-Graf, Wara, Zionts, et al 2022:2). Thus, the decongestion in PHC facilities might be attained as alternative medicine dispensing points are accessed under the CCMDD strategy.

Since the implementation of the CCMDD strategy, there has been a marked improvement in reducing congestion in PHC facilities and reduced waiting time (Cronje 2015:11). However, the researcher observed that there were still patients who missed their appointments and their uncollected pre-packed medicine were sent back to Pharmacy Direct. Approximately 1328 pre-packed medicine parcels from 2762 chronic patients registered on CCMDD had been sent back to the service provider because those parcels were not collected according to the reports from the Pharmacy Direct Tshwane District database.

1.3. RESEARCH QUESTION

An overall main question and sub-questions were formulated for this study:

1.3.1. MAIN QUESTION

The following main question was used to guide this study:

> What are the factors contributing to the nonadherence of patients to collect medicine from Central Chronic Medicine Dispensing and Distribution service providers' pick-up points in Tshwane District?

1.3.2. SUB-QUESTIONS

The following sub-questions were formulated to answer the main question and aligned with the objectives of this study.

- What are the service delivery factors contributing to adherence and nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in Tshwane District?
- Which accessibility factors contribute to adherence and nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in Tshwane District?
- How does waiting time at pick-up points contribute to nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in Tshwane District?
- Does the information given at pick-up points contributes to adherence and nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in Tshwane District?
- What are the prognosis, health problems and complications of patients who did not adhere to collection of medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.

1.4. AIM

The overall aim of this study was to determine and describe factors contributing to the nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in Tshwane District.

1.5. OBJECTIVES

The following were the objectives:

- To determine and describe the service delivery factors contributing to adherence and nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe the accessibility factors contributing to adherence and nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe how waiting time at pick-up points contributes to the nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in Tshwane District.

- To determine and describe if the information given at pick-up points contributes to adherence and nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe the prognosis, health problems and complications of patients who did not adhere to collection of medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
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1.6. IMPORTANCE AND BENEFITS OF THE PROPOSED STUDY

Despite the efforts from different stakeholders, there are still challenges in the district which hinder the optimal effectiveness of this CCMDD strategy. Among these challenges, the trend of missed appointments by patients diagnosed with chronic diseases is still a concern (non-collection of pre-packed medication by patients registered in the CCMDD strategy from their chosen pick-up points). The study might assist in identifying the contributing factors to this trend of missing appointments and can influence decision-making and planning in the district by the district management team (for example, by accelerating decentralisation of services, to bring them closer to people who need them and integrate community-centred approaches, that promote treatment adherence and retention) (view Chapter 4). This might enhance adherence to medication collection and prevent patients from complications. The (DoH) might benefit because the allocated budget for the CCMDD strategy will be optimally utilised and there will be no extra workload for the nurse by treating complications caused by nonadherence.

1.7. DELIMITATIONS

The following delimitations apply to this study:

The study was conducted in the Tshwane District using two PHC facilities in the Northern Tshwane region. The study included only patients eighteen years and older who were registered in the CCMDD from May 2014 to December 2017, and those who were already in the program for more than one year. The study focused on both adhering and non-adhering patients who were registered on CCMDD strategy. As this study was limited to investigating factors contributing to nonadherence in the context of two PHC facilities in the Tshwane Sub-District two, the findings of this study cannot be generalised to other facilities in the district with a different setting to these two facilities. The researcher conveniently identified the criteria for inclusion in the study and considered only CCMDD patients who visited the PHC facility for their six months review, patients who were lost to follow-up and never

pitched for their medication were not included in the study. This category of patients could have brought diverse reasons regarding the factors influencing their nonadherence.

1.8. DEFINITION OF A KEY CONCEPTS

The following key concepts were identified, defined and used consistently throughout the study:

- **Adherence:** The WHO defines adherence as 'the extent to which a person's behaviour, such as taking medications, following a prescribed diet, executing lifestyle changes, corresponds with agreed recommendations from a healthcare provider (Lam & Fresco 2015:1). In this study, adherence meant patients honouring their appointments to collect their pre-packed medication at their pick-up points within two days of receiving their message from Pharmacy Direct as the contracted service provider.
- **Central Chronic Medication Dispensing and Distribution (CCMDD)**: It is a chronic medication management system with extended task shifting, decentralisation and new approaches to the distribution of chronic medication, without huge increases in resources (Gray, et al 2015:638). In this study, it is a programme that creates a service delivery in terms of pick-up point for patients and enables medicine from repeat scripts to be dispensed and distributed every two months to an alternative pick-up point.
- **Medicine collection**: Implies collection of prescribed medication by patients diagnosed with chronic diseases as per the agreed appointment date given (patients are always involved when given their next appointment date, considering their availability to collect) (Magadzire et al 2015:2). In this study, medicine collection referred to collection of pre-packed patients' parcels by the patient on or closer (within two days of notification through SMS) to the scheduled date.
- **Nonadherence**: According to Standard Treatment Guidelines and Essential Medicine List, nonadherence results in less than optimal management and control of the illness and is often the primary reason for suboptimal clinical benefit. It can result in medical and psychosocial complications of the disease, reduced quality of patient's life and wasted healthcare resources (NDoH, 2014:xxiii). In this study, it referred to patients not honouring their appointments to collect their pre-packed medication at their chosen pick-up points within two days of receiving their message from Pharmacy Direct as the contracted service provider.
- **Registered patients**: Registered patient means a qualifying patient who has been captured in patient registration system and issued with a registration number. Patient registration is a system that will support and improve the quality of patient experience by improving the facility and patient management through the introduction and optimisation of patient administration

systems (Khalid, Afzaal, Hassan & Zafar 2017:492). In this study, registered patients were those people who have been registered to receive their chronic medication through CCMDD.

1.9. LITERATURE REVIEW

The literature review followed the stream of thoughts that provided the foundation of the study and described what is known by sharing the results of previous studies. Research is usually undertaken within an existing knowledge base, and there is a need for researchers to take cognisance of existing literature (Botma, Greeff, Mulaudzi & Wright 2010:63). Polit and Beck (2017:54), believe that a thorough literature review provides a foundation on which to base new findings. The issues covered in this literature review as part of the orientation to the study included: service delivery factors which include pick-up points accessibility, waiting times, the information provided and the outcome of the clinic's six months review.

1.9.1. ACCESSIBILITY OF MEDICINE PICK-UP POINTS AND/OR PHARMACIES

Access to chronic medication is a problem globally and nationally. In New York, adherence to medication for non-communicable diseases was 62.8%. The recognised adherence barriers in this study were regimen complexity and factors related to medication dispensing, such as the quantity of medication dispensed per pill and the number of pharmacy visits required monthly (Kyanko, Franklin, & Angell 2013:326). According to a study done in Nigeria, the clinic default rate was about 20.4% for mental health patients, especially those with schizophrenia. The nonadherence was significantly associated with demographic, clinical, and service-related factors. The study showed that respondents who resided more than 20 km away from the hospital where they collect their medication, were more likely to be defaulters than those residing less than 20 km (Adelufosi, Abayomi, Ogunwale & Adeponle 2013:285). This confirms that distance becomes a barrier to compliance with medication access.

1.9.2. FACTORS ASSOCIATED WITH PROLONGED WAITING TIMES AT PRIMARY HEALTHCARE FACILITIES

One of the challenges to unlimited access to medication is the increasing number of patients diagnosed with chronic diseases. The changing epidemiological profile of South Africa has placed an enormous strain on available resources and has contributed to medicine shortages and long waiting times. In a study which was conducted in South Africa in 2014 (Operation Phakisa), it was found that the patient satisfaction rate was about 34% for waiting time, of which some of the patients waited for

almost seven hours to be helped, and about 68% waited for two to six hours. The acceptable norm for waiting times is at least less than three hours (Fryatt & Hunter 2015:8). There is currently a quadruple burden of disease (which includes communicable diseases, non-communicable diseases, peri-natal and maternal and injury-related disorders) in SA (Phokojoe 2016:11). In SA, this quadruple burden of disease includes high numbers of people suffering non-communicable diseases and HIV who need chronic medication (Magadzire, Marchal & Ward 2016:1). There is overcrowding in PHC facilities leading to prolonged waiting times and medicine shortage which is due to the number of people diagnosed with chronic diseases (Kettledas 2016:3). Overcrowding in PHC facilities poses potential adherence barriers, which may lead to poor health outcomes, and places strain on the patient in terms of transport cost and loss of income (Du Toit 2014:38).

Reducing the number of patients at the PHC facility might, as envisaged, reduce the waiting time, thus improving patient health outcomes as they will access their medication with a shorter waiting time and reduced work absenteeism (Du Toit 2014:38).

1.9.3. CONTRIBUTION OF INFORMATION PROVIDED BY MEDICINE PICK-UP POINTS

Patients need to be provided information on the communication to happen between the CCMDD pick-up point and them in order to collect medication on time to ensure compliance. Missed appointments have serious clinical and economic impacts. It disrupts the continuity of patient care, delays treatment, affects nurse/doctor-patient relationships, and increases the cost of healthcare (Magadzire, et al 2017:2). The use of an SMS message to improve treatment adherence for chronic diseases, specifically in hypertensive patients, was found to be an effective intervention for most patients as it improves their adherence behaviour, and the intervention was found to be highly beneficial in South Africa (Leon, Surender, Bobrow, Muller & Farmer 2015:4). It is important that patients follow the advice on self-care management provided by their clinician or the doctor and adheres to their prescribed medication.

1.9.4. PROGNOSIS AND HEALTH PROBLEMS DUE TO NONADHERENCE TO MEDICINE COLLECTION

Failure to medication adherence may lead to complications like TB in patients who are HIV positive and end-organ damage in those who are diagnosed with hypertension and diabetes mellitus. Missed appointments have serious clinical and economic impacts. It disrupts the continuity of patient care and affects the nurse/doctor-patient relationship, and this may result in complications or multiple health problems and thus affects the patients' quality of life (Alhamad 2013:258). Nonadherence to prescribed treatment is associated with an increased risk of complications and treatment failure.

Diabetes mellitus, if not well controlled, may cause serious life-threatening complications like kidney failure, lower extremities amputations and cardiovascular accidents and may even lead to death (Jarab, Almrayat, Alqudah, Thehairat, Mukattash, Khdour, et al 2014:1).

1.10. RESEARCH DESIGN AND METHODS

Research methods refer to techniques researchers use to structure a study and to gather and analyse information relevant to the research questions (Polit & Beck 2017:11).

1.10.1. RESEARCH DESIGN

The research design refers to the plan and overall structure of an investigation used to obtain evidence to answer questions as it describes how, when and where data is collected and analysed (Mouton & Babbie 2014:72). This study followed a quantitative non-experimental approach, as this approach assisted the researcher to collect information from respondents without manipulating them (non-experimental) (Polit & Beck 2017:11).

The data were obtained through the use of questionnaires and numeric information formal measurement and analysed statistically. The quantitative research design combines the practices and norms of a natural scientific model and views social reality as an external objective reality. The quantitative research design can analyse data on a large scale for a limited period but still receives reliable data (Maree 2014:145).

A quantitative descriptive study was conducted among chronic patients registered in the CCMDD program to determine factors contributing to their non-adherence to medicine collection. The purpose of descriptive studies is to observe, describe and document aspects of a situation as it naturally occurs and sometimes to serve as a starting point for hypothesis generation or theory development (Polit & Beck 2017:206). The researcher used the quantitative design to determine and describe the factors contributing to non-adherence of patients registered in the CCMDD program in the Tshwane District to collect their medication (view Chapter 4).

1.10.2. STUDY SETTING

A study setting is described as a location in which data collection takes place (Polit & Beck 2017:744). The study was conducted in the Tshwane District, in Gauteng Province, South Africa. Two facilities were from the PHC setting in Sub-District two, in the Northern Tshwane District. These two facilities were referred to as Clinic A and Clinic B for the purpose of maintaining anonymity and confidentiality

(view Chapter 3). Preliminary statistics from Pharmacy Direct as a service provider were that about 2762 patients have been registered in the CCMDD program until July 2017 in these two facilities. Patients who are registered in the CCMDD program are mostly patients who are suffering from hypertension, diabetes mellitus and HIV-positive patients who are on ARTs. The distance from these two clinics to where the patients stay ranges between five (5km) being the nearest and 25km the furthest.

1.10.3. RESEARCH METHODS

Following is a description of the population, sampling, data collection and data analysis. View Chapter 3 for the in-depth discussion and application of the research methods.

1.10.3.1. STUDY POPULATION AND SAMPLING

The population is described as all the elements that meet certain criteria for inclusion in a study (Polit & Beck 2017:739). In this study, the population was all patients living with chronic diseases (like hypertension, diabetes mellitus, HIV/AIDS, asthma, arthritis and epilepsy) from two facilities in Sub District two who are registered in the CCMDD program. Approximately 2762 patients have been registered in these two clinics in July 2017. The sampled population included all patients registered in the CCMDD program in the Tshwane District (Gauteng). About 1328 returns of pre-packed medication have been reported in these two facilities (view Chapter 3, section 3.4.1).

1.10.3.2. SAMPLE SIZE

The sample size refers to the number of respondents who meet the inclusion criteria. According to Rudolf, Leedy and Ormrod (2015:184), for descriptive research, the sample should be 10% of the population, but if the population is small, then 20% may be required. For the purpose of this study, 15% of the population was used. The total sample size was 420 patients. The sample size comprised patients who honoured their appointments by collecting their pre-packed medication from their nearest pick-up points. The sample size also included patients who missed their appointments thus their pre-packed medications send back to Pharmacy Direct as a service provider to compare their contributing factors of non-adherence to those who are adhering (view Chapter 4).

1.10.3.3. SAMPLING METHOD

Sampling is the process of selecting cases to represent an entire population (Polit & Beck 2017:250). In this study, the sample included all the patients eighteen (18) years and older, who have been enrolled in the CCMDD program form May 2014 to 2017 including those who did not collect their pre-

packed medication. Convenience sampling was used, this sampling also known as accidental sampling makes no pretence of identifying a representative subset of a population, it uses subjects that are readily available and who fit the chosen sample profile (Paul, Leedy & Ormrod 2014:182). Creswell (2009:164) states that convenience samples are used when the researcher is limited to available groups. All patients registered on the CCMDD program, who came for their six-monthly clinical review were approached and those willing to participate after a thorough explanation of the study were included in the sample size. The researcher used this approach as only a few patients per day (10-15) had the characteristics of this sample, the following, N (2762) was the population and n (420) was the sample size. Selected patients were taken from general waiting area and placed in the provided space by the facility and the researcher explained everything in the information leaflet (Annexure C). Those who were willing to take part were then requested to remain behind and given a questionnaire to complete and they were requested to return it back to the researcher before they leave the facility

1.11. DATA COLLECTION

Data collection is the systematic gathering of information relevant to the research problem (Polit & Beck 2017:725). Based on a literature review, the researcher (view Chapter 2 and Annexure B) developed a questionnaire. View Chapter 3, section 3.4.4 for the discussion on data collection. Data collection commenced once approval from the Research Ethics Committee Faculty of Healthcare and permission from the relevant authorities were obtained (view Annexure D).

1.11.1. MEASURING TOOL

The researcher used a self-developed questionnaire; structured with closed and open-ended and a Lickert scale of 1 to 3 to select answers to questions (view Annexure B) to obtain data. A structured questionnaire was developed by the researcher after conducting a literature review and was based on the objectives of the study. A literature search was conducted to identify what are the views and assumptions made by various authors and researchers on contributing factors to non-adherence of patients registered on CCMDD. Discussions were also held with the supervisor of this research who had advised that if there were too many missing values from the questionnaire, this would affect the findings. All questions in the data collecting instrument were coded with the aid of the statistician for easier translation of data into numbers. In developing a questionnaire, an instrument test run was needed, the aim was to pre-test the feasibility of the questions to be used in a questionnaire and also

to identify possible problems with the questionnaire itself or the questions and refine it with an in-depth review for possible improvement. The questionnaire was sub-divided into four sections that included: Section A: Demographic information of the respondents; Section B: Factors that might contribute to adherence to the collection of medicine; Section C: Accessibility of their pick-up points by the respondents and Section D: General experience with pick-up point and information given during their biannual review consultation and at pick-up points. The respondents were given a questionnaire when they visit the clinic for their six-monthly reviews, which took approximately fifteen minutes to complete, and completed questionnaires were collected by the researcher before they left the facility. All patients who did not honour their appointments for their six-monthly reviews and were selected to be included in the study were traced by community healthcare workers and when willing to participate in this study, were brought back to the facility. The other group of selected respondents who were invited to participate in this study, was those who were accessible at the pick-up points or clinics and agree to be included in the study (view Chapter 3, section 3.4.5).

1.11.2 PRE-TESTING

Pre-test is the collection of data prior to the experimental intervention, sometimes called baseline data or the trial administration of a newly developed measure to identify flaws or to gain better understanding of how the construct in question is conceptualized by respondents (Polit & Beck 2017:740). Pre-testing is usually used by researchers who develops a new instrument so that it can be evaluated and refined, or to test the feasibility of the questions used in the questionnaire and to identify possible problems with the questionnaire itself or the questions (Polit & Beck 2017:268). In this study, ten participants were selected and invited to pre-test the questionnaire the first two weeks before the onset of actual data collection (view Chapter 3, section 3.4.6). Participants in the pre-test were not included in the data collection for the final study. This ensured that the instrument and data collection process were valid and reliable in line with the aim of the study.

1.12. QUALITY CONTROL, RIGOUR IN THIS STUDY

Rigour in this quantitative study was ensured through the application of:

1.12.1. CONTENT VALIDITY

Validity is a quality criterion referring to the degree to which inferences made in a study are accurate and well-founded, in measurement (inference is a conclusion drawn from the study evidence, taking into account the method used to generate that evidence) (Polit & Beck 2017:747), the degree to which an instrument measures what is intended to measure. Validity is important to ensure that there is a

relationship between independent and dependent variables that can be reliably detected (Polit & Beck 2017:221).

Content validity means the degree to which a multi-item instrument has an appropriate set of relevant items reflecting the full content of the construct domain being measured. The questionnaire was given to two PHC specialists, who were working with patients who are registered in the CCMDD program to assess if the questions were focused on the non-adherence to the collection of medicine by patients registered on CCMDD and to pre-test the usability of the questionnaire (view Chapter 3, section 4.1). The researcher obtained a degree of content validity through pre-testing of the audit tool, using a literature review and involving the statistician.

1.12.2. FACE VALIDITY

Face validity refers to the extent to which a measuring instrument looks as though it is measuring what it purposes to measure (Polit & Beck 2017:728). Face validity refers to the items on the questionnaire that needed to be clear and relevant and need to measure what it is intended to measure. Face validity was ensured during the pre-test of the questionnaire by using the tool and obtaining input from the statistician, the study supervisors and PHC specialists (view Chapter 3).

1.12.3. CONSTRUCT VALIDITY

Construct validity measures the relationship between the instrument and the related theory, that is how well you transformed a concept, idea, or behaviour that is a construct into a functioning and operating reality (Taherdoost 2016:31). In this study, the construct validity was enhanced by ensuring that the questionnaire was developed in such a way that the aspect to be answered were clear. The researcher requested experts to review the questionnaire (the statistician, experienced clinical nurses working in the PHC facility and supervisor of the study) to assess if the questionnaire will be able to answer the study objectives. Construct validity was also enhanced by pre-testing the questionnaire with ten (10) respondents from a sample of analysis.

1.12.4. RELIABILITY

Reliability is defined as the extent to which the measurement is free from measurement error, more broadly, the extent to which scores for people who have not changed are the same for repeated measurements, statistically, the proportion of total variances in a set of scores that is attributable to true differences among those being measured (Polit & Beck 2017:742). Data needs to be reliable in order to measure consistently, thus a pre-test of the questionnaire was conducted to ensure that reliable results would be yielded at the end of the study. Questions identified as ambiguous were changed.

1.13. DATA MANAGEMENT AND ANALYSIS

Data analysis is an orderly organisation and synthesis of research data. The collected data was captured into Microsoft Excel by the researcher. With the assistance of the statistician, data was analysed using the Statistical Analysis System (SAS) software. Descriptive statistics (frequencies and proportions (percentages) were used to analyse categorical variables (e.g. gender, level of education). The Chi-square test (χ^2) for independence in a two-way contingency table was used to determine and describe the demographics and other associated factors of patients who did not adhere to collection of medicine. Results were presented in terms of graphs, pie charts, and tables (view Chapter 4).

1.14. ETHICAL CONSIDERATIONS

Human beings as study participants need to be treated with dignity and respect, by ensuring that their rights are protected. In recognition of human rights violations and ethical dilemmas, codes of ethics were developed internationally like the Nuremberg Code and The Declaration of Helsinki. Ethical principles (Polit & Beck 2017:137), ethical principles that were observed in this study included beneficence, respect for human dignity and justice. Ethical clearance from the University of Pretoria Ethics Committee and the Tshwane District Research Committee was obtained prior to the collection of data. See Annexures F and G.

1.14.1. BENEFICENCE

Beneficence relates to the protection of participants from harm, discomfort and exploitation (Polit & Beck 2017:139). It is the researcher's duty to minimise harm and maximise benefits. In this study, it was predicted that there will be no cause of any harm. Respondents were selected and invited, and the study was explained as preparation for participation before completing the questionnaire. The researcher explained the aim and the objectives of the study and encouraged them to feel free to ask any question where they do not understand any information. Those who were willing to participate signed the informed consent (view Annexure C). The researcher is an experienced primary healthcare practitioner, and if during the completion of the questionnaire any one of the respondents experienced emotional discomfort, the researcher would intervene by counselling the patient or referring them when the need arose. If the patient decided to withdraw from the study, the decision would be honoured as long as the data from the completed questionnaire were not captured or handed over to the statistician for data analysis (view Chapter 4).

1.14.2. RESPECT FOR HUMAN DIGNITY

It includes protecting participants' right to self-determination and the right to full disclosure (Polit & Beck 2017:140). In this study, participants were informed that they have the right to participate or withdraw from the study at any point without giving any reason before handing over their completed questionnaire. Selected participants were also informed that there will be no penalty or discrimination against them when coming back to collect medication (view Annexure C).

1.14.3. JUSTICE

This principle includes the right to fair treatment and the right to privacy. The researcher ensured that all patients were treated fairly even if they did not agree to participate in the study. The procedures used in this study were aimed to avoid violation of confidentiality. Participants were informed about the possible publication of the research findings; however, they were reassured that their names would not be revealed as codes were assigned to questionnaires to ensure anonymity (view Annexure C).

1.15. LAYOUT OF THE STUDY

A particular layout for this study was followed. The below diagram summarises the layout.

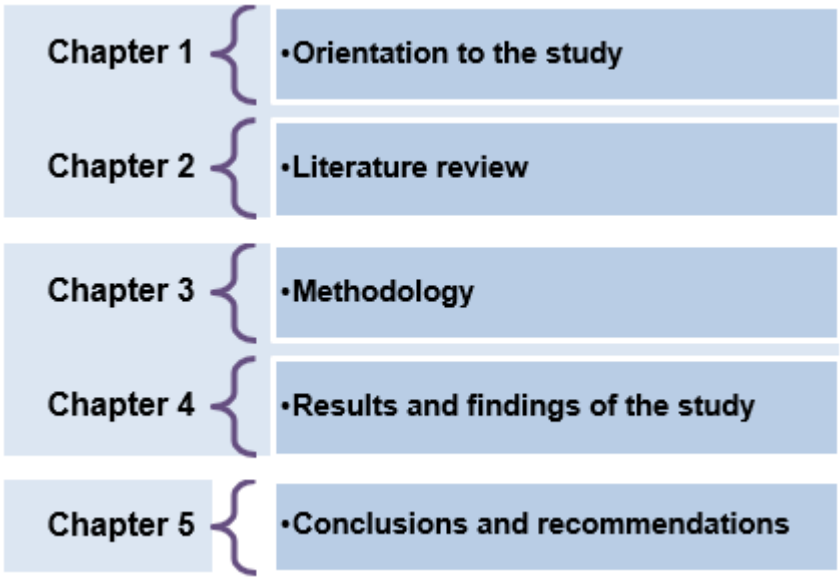

Figure 1.1: Layout of the Study

1.14. SUMMARY

In this chapter, the orientation to the study in terms of the introduction, problem statement and research question as discussed. An overview of the research methodology, data collection, sampling, population unit of analysis and data analysis during all phases of the study was provided. The next chapter discusses the literature reviewed for this study.

2. CHAPTER TWO: LITERATURE REVIEW

2.1. INTRODUCTION

In Chapter 1, an overview of the study was presented. This chapter presents a literature review of the Central Chronic Medicine Dispensing and Distribution (CCMDD) model and the known factors relating to nonadherence of patients registered on CCMDD. A literature review included the views and assumptions made by various authors and researchers (Rudolf, et al 2015:70). It describes what is known by sharing the results of previous studies. Research is usually undertaken within an existing knowledge base, and there is a need for researchers to take cognisance of existing literature (Botma, et al 2010:63). In this study the researcher used the literature reviewed to demarcate the study, formulate clear arguments and develop the questionnaire. According to Polit and Beck (2017:700), the purpose of a literature review is to convey to the reader what is currently known regarding a specific topic or problem. Furthermore, a literature review involves researching, reading and understanding relevant information about the study (Brink, et al 2012:55). It is essential for the researcher to conduct a literature review to locate existing similar studies that can serve as a basis for the study at hand (Polit and Beck 2017:54). In addition, it assists the researcher to comprehend and extend their knowledge of the phenomena under study (Polit & Beck 2017:55).

The literature presented in this chapter was obtained from the literature available in accredited journals. The initial electronic search was conducted on the 22nd of March 2017 and the literature search included the following computer-assisted databases and bibliographies: Medline (Medical Literature Online), EBSCOhost, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Google Scholar and E-journal (academic search) using ‘the searching terms ‘adherence to chronic medication‘, dispensing‘ and medicine distribution‘, CCMDD‘ as the keywords. Furthermore, websites were used to source policy documents of organisations such as the National Department of Health in South Africa and the World Health Organization. The search string started from universal literature and then narrowed down to SA. The reason for creating the search strings for a final search in these selected databases was to ensure a comprehensive and thorough search. The following table depicts a summary of the literature search.

Table 2.1: Summary of Literature Search

Central Chronic Medication Dispensing and Distribution AND ‘’non-adherence ‘OR ‘missed appointments ‘ AND ‘non-communicable ‘ AND ‘quadruple disease burden ‘ AND ‘challenges ‘OR ‘limitations ‘OR ‘restrictions ‘OR ‘barriers ‘to adherence AND ‘Central Chronic Medicine Dispensing and Distribution (CCMDD) model’ AND ‘Service delivery factors which include accessibility of medicine at pick-up points’ AND ‘Prolonged waiting times at the facilities or pick-up points’ AND ‘Information provided at pick-up points’ AND ‘Reminder or recall system for collection of medication’ AND ‘Prognosis and health problems due to poor adherence’

2.2. OBJECTIVES OF THIS STUDY

The following objectives were identified for the study and used to guide the literature review:

- To determine and describe the service delivery factors contributing to adherence and non-adherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe the accessibility factors contributing to adherence and non-adherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe how waiting time at pick-up points contributes to the non-adherence of patients collecting medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe if the information given at pick-up points contributes to adherence and non-adherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe the prognosis, health problems and complications of patients who did not adhere to collection of medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.

2.3. FOCUS OF THE LITERATURE SEARCHED

The literature review in this study focused on:

- Central Chronic Medicine Dispensing and Distribution (CCMDD) model.
- Service delivery factors which include accessibility of medicine at pick-up points.
- Prolonged waiting times at the facilities or pick-up points.
- Information provided at pick-up points.
- Reminder or recall system for collection of medication.
- Prognosis and health problems due to poor adherence.

Each one of the aspects will be discussed in the sections below.

2.3.1. CENTRAL CHRONIC MEDICINE DISPENSING AND DISTRIBUTION MODEL

Most of the people diagnosed with chronic diseases access medication from primary healthcare facilities. For primary healthcare facilities to provide medication to people diagnosed with chronic diseases; a strategy was adopted by the NDoH. The NDoH introduced the CCMDD in 2014 as a national strategy to improve access of people diagnosed with chronic diseases to chronic medication (Dumisani, 2018:2). The CCMDD strategy was implemented in 2014 to ensure access to medication for people using PHC facilities. The CCMDD strategy is envisioned to reduce long waiting hours, ensure the availability of medication, decongest the workload of PHC facilities and therefore improve service delivery and quality of care (Kettledas 2016:3). According to the NHI White paper (2015:42) 260 000 patients have been registered in CCMDD strategy by May 2014. Some of the people diagnosed with chronic diseases are active in the labour market and need time off to collect their medication at the PHC facility, which affects the labour industry due to structured monthly absenteeism. The introduction of the CCMDD strategy makes it possible for patients to collect medication from contracted PUP located in the area of employment and during their lunch times, as such ensuring adherence (Smith and Nicol, 2020:2).

Patients who meet the criteria (these are patients who are HIV positive and have a suppressed viral load; hypertensive patients with normal blood pressure below 140/90 mmHg and patients with uncomplicated Diabetes mellitus) are selected by professional nurses for the CCMDD strategy. The category also makes provision for the inclusion of patients diagnosed with epilepsy, asthma and arthritis. The registration form of the patient and prescription for medication repeat for five months are submitted to the CCMDD service provider which has a contract with the GDoH.

The contracted service provider for the GDoH is Pharmacy Direct. Pharmacy Direct, then pre-packs the medication and distributes it to their contracted pharmacy companies such as Clicks and MediRite where patients can collect their pre-packed medication. These pharmacies serve as PUPs and are located within supermarkets in the residential areas of patients (Steel 2014:4). Pharmacy Direct informs patients via SMS three days before the scheduled appointment that the pre-packed medication is ready for collection from the PUP. When a patient misses an appointment and does not collect the pre-packed medication within two days of the scheduled appointment, PUP notifies Pharmacy Direct. Pharmacy Direct then will attempt to contact the patient. When this fails, the PHC facility is informed and the WBOT is notified to trace the patient. The WBOT are healthcare workers who deliver integrated healthcare services to communities, households and individuals according to the re-engineering strategy for PHC strategy (Steel 2014:5). Patients who have missed their scheduled dates are then referred back to the PHC facility and subsequently the uncollected medicines are returned to Pharmacy Direct after 14 days (Steel 2014:5).

The following figure is a summary of the process flow that is followed for Centralised Chronic Medication Dispensing and Distribution (CCMDD) (Kettledas 2016:27).

Figure 2.1: Process flow for patients registered on CCMDD program

Listed below are the activities included for each step in the process:

- **Registration**
  - Patient enrolment and consent
  - Dispense first issue of repeat
  - Prescription authorisation
- **Dispensing**
  - Prescription capture
  - Dispense subsequent months
- **Distribution**
  - Distribute to a pick-up point
  - Send an SMS to the patient
- **Collection**
  - Receipt and management of parcels
  - Identify patients and issues
  - Notify the facility if uncollected
  - Return uncollected parcels
- **Tracing**
  - Defaulter tracing
  - Provide feedback to the facility

Below is a process map explaining the detailed process flow for the CCMDD discussed in section 2.3.1 and depicted in Figure 2.2

Figure 2.2: Process map process flow for Centralised Chronic Medication Dispensing and Distribution (CCMDD) (Kettledas 2016:28)

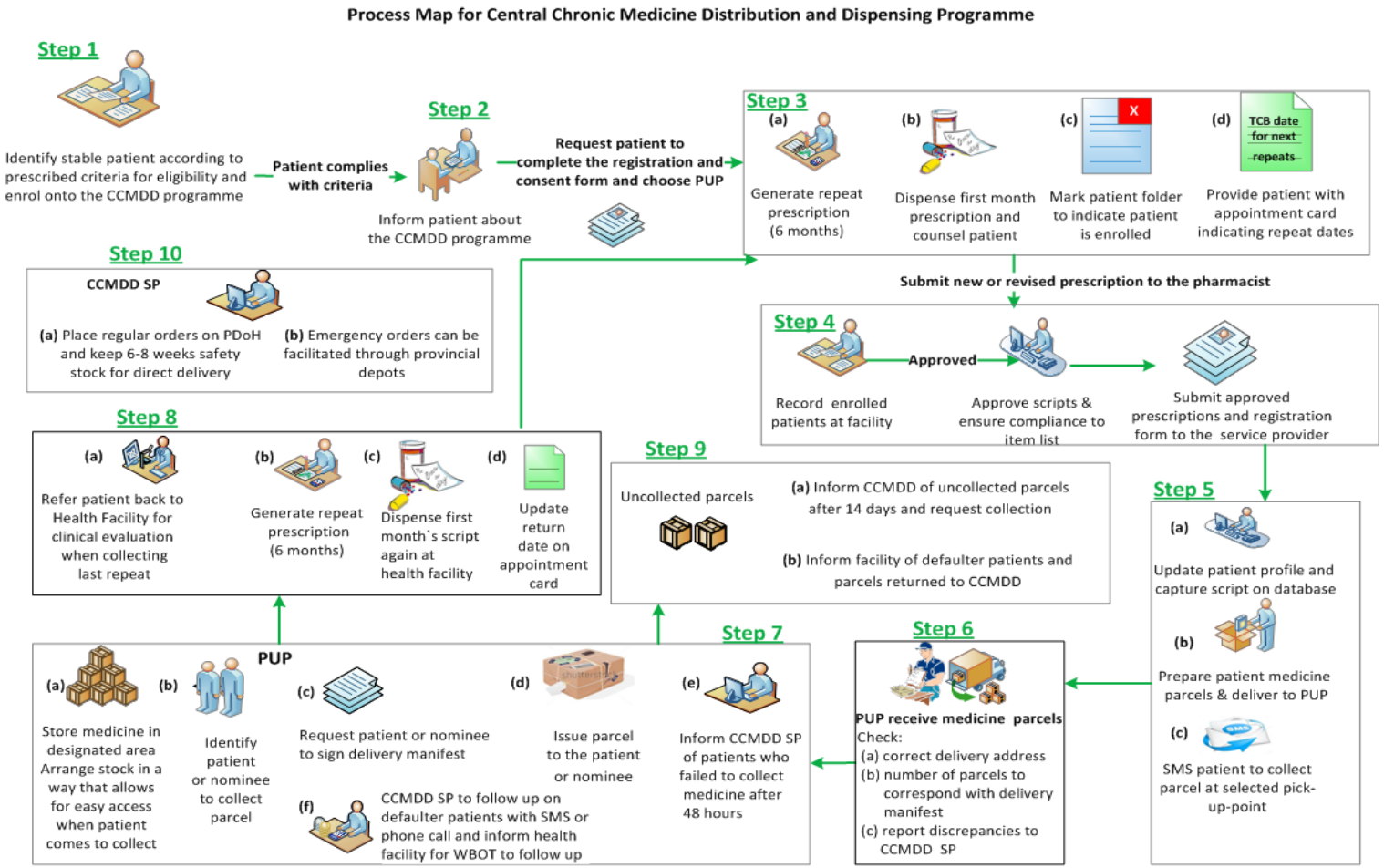

Figure 2.2: Detailed process map for CCMDD program

According to the National Health Insurance (2015:42), the implementation of the CCMDD system encompassed all stable patients who have chronic conditions but are stable (who meet the criteria as discussed above), whose management consists of bi-annual (six months) clinical visits and check-ups at PHC settings. Over 260,000 patients have been registered on the program and assisted in improving access to chronic medications for this group of patients (National Health Insurance, 2015:42)

2.3.2. SERVICE DELIVERY FACTORS

Service delivery factors are factors which influence the mutual trust between patients and health providers, outcomes and goals (which include access and responsiveness to community demands), and the context which is influenced by social determinants, evolutions and political decision-making bodies (Van Olmen, Criel, Bhojani, Marchal, Van Belle, Chenge, et al 2012:5-7). Health Service delivery means to provide healthcare services to patients, their families and communities at large and this includes availability of medicines, accessibility and reasonable waiting times. The key element of improving service delivery is to ensure that the full range of essential medicines and other medical supplies are available in all public healthcare facilities (Steele, et al 2019:111).

2.3.3. ACCESSIBILITY OF MEDICINE PICK-UP POINTS

Accessibility of PUPs refers to a collection of chronic medication. Medicine access is considered an integral part of Universal Health Coverage and a key element for the delivery of quality care, especially for people diagnosed with chronic diseases (Bigdeli, Laing & Tomson 2015:1). Access to chronic medication is a global and national challenge due to the increasing number of patients diagnosed with chronic diseases (Munene & Ekman 2015:378). It is therefore necessary to ensure unlimited access to chronic medication through accessible pick-up points that are convenient to and within reach of patients (Steele, et al 2019:114)

Alhamad (2013:264) found that long distances and factors such as unavailability of transportation and financial difficulties were some of the reasons for nonadherence in the study conducted in Saudi Arabia. The transportation system in Saudi Arabia is based on private vehicle transportation, driving and driver's license are limited to males who are eighteen years of age or older. This limits the females' options for transportation to personal drivers and taxis, which are relatively expensive (Alhamad, 2013:262). Alhamad (2013:262) also revealed that these are some of the facts that could explain why the majority (78%) of patients with transportation difficulties are unemployed female patients.

The UN identified that access and availability to essential medicines in developing countries as one of the indicators of the Millennium Development Goal Eight. The UN established that developing systems that are innovative and responsive to the needs of patients and medicine accessibility is considered fundamental to guaranteeing adequate healthcare and safeguarding human rights (WHO, 2014:8-9). Chronic medication, therefore, needs to be accessible to the population through pick-up points of not more than a 5km radius.

According to a study done in Nigeria, the nonadherence rate for mental health patients and especially patients with schizophrenia was about 20.4% and associated with demographic, clinical, and service delivery-related factors (Adelufosi, et al 2013:28). Adelufosi, et al (2013:285) further showed that respondents who resided more than 20km away from the facility where they collected their medication, were more likely to be defaulters than those residing less than 20km. This indicates that distance from the medicine PUP may impede accessibility and this may result in nonadherence to the scheduled collection of medication.

The WHO also recognises the importance of strengthening the provision and availability of medicines which is more accessible and affordable worldwide (Wirtz, Hogerzeil, Gray, Bigdeli, de Joncheere, Ewen, et al 2017:404).

A 2012 assessment of the SA health system identified limited access to and availability of essential medicines; long-waiting times and poor service delivery as a national problem and underscored the need to give higher priority status to medicines supply chains as they affect various dimensions of access to medicines and healthcare utilisation in general (Fryatt & Hunter 2015:10).

In SA, interventions such as CCMDD are being assessed and initiated to improve the distribution of medicines, including direct delivery by suppliers to chosen pick-up points since 2014 (Dlamini 2018:2). To improve patient access to needed medicines, especially for patients on chronic medication, as well as to assist with decongesting public health facilities, the NDoH introduced the CCMDD program in 2014 (Meyer, Schellack, Stokes, Lancaster, Zeeman, Defty, et al 2017:6). The program comprised of two program components, namely the CCMDD and PUP, and patients are in liberty to choose their PUPs closest to their homes or workplace (Du Toit 2014:38).

The study done in KwaZulu Natal (SA) suggested that poverty affected adherence negatively as lack of money for transport to the clinic to collect medicine is difficult, thus making treatment inaccessible (Cele and Riet, 2017:60). Therefore, an easily accessible location of a healthcare facility or PUP is particularly important part of access to care.

In another study conducted in SA, it was found that inflexible facility opening on working days (weekdays) only, clashed with the participant's family responsibilities and their employment opportunities, resulting in the inaccessibility of healthcare facilities (Dorward, Msimango, Gibbs, Shozi, Tonkin-Crine, Hayward, et al 2020:6). Similarly, a study conducted in Mpumalanga (SA) revealed that opening and closing times of healthcare services offered at the healthcare facilities contribute to non-adherence because the participants only had 'enough time' on weekends due to work or other commitments during the week (Mahlalela 2014:46).

The norm for accessibility is to travel less than a 5km radius and waiting times of not more than three hours (Fryatt & Hunter 2015:8). There are various interventions that are more efficient than the use of public PHC facilities and hospitals as primary dispensing and collection points of chronic medication by patients, and this includes the use of chronic medicine pre-dispensing and delivery to a point closest to the patient (Kettledas 2016:3). These alternatives are already being piloted in all the provinces in SA, and the findings are that so far yielded that these new models have positive results with regard to the delivery of chronic medication (Dlamini 2018:1).

In this section, the literature reviewed confirmed that distance becomes a barrier to compliance with medication access and therefore, the CCMDD strategy needs to ensure that chronic medications are more accessible to the population through pick-up points of not more than a 5km radius.

2.3.4. WAITING TIMES AT PICK-UP POINTS

Access to chronic medication and reduced long waiting times in healthcare facilities are amongst the six priority areas identified in the National Core Standards (National Core Standards, 2011:7) for SA. There are certain factors that are associated with prolonged waiting time at the PUP. The changing epidemiological profile indicates a steady increase in patients with chronic diseases like HIV/AIDS in SA. This contributed to a strain on public healthcare facilities' resources and has added to medicine shortages and long waiting times leading to poor service delivery (Kettledas 2016:3).

The number of patients who are included in the quadruple burden of disease (namely communicable diseases, non-communicable diseases, peri-natal and maternal factors and injury-related disorders) in SA (Phokojoe 2016:11) increases the need for chronic medication (Magadzire, et al 2016:1), result in overcrowding of PHC facilities and lead to prolonged waiting times and medicine shortage (Kettledas 2016:3).

Magadzire, et al (2017:6) not only found that one of the reasons for nonadherence was the dissatisfaction of patients due to long waiting times, but the study further revealed that long waiting times might affect the rate of keeping appointments and most of the patients did not realise that prolonged waiting time is further compromised by missing appointments and disrupting of the clinic schedule.

According to a study done in Namibia, participants indicated that factors like overcrowding, long queues and ultimately prolonged waiting times were affecting their adherence negatively (Bauleth, Wyk & Ashipala 2016:95).

In a study done in SA, the patient satisfaction rate was about 34% for waiting times; some patients waited for almost seven hours to be helped and about 68% waited for two to six hours (Fryatt & Hunter 2015:8). The acceptable norm for waiting time is less than three hours (Fryatt & Hunter 2015:8).

In response to continuous challenges, poor health services and dissatisfaction of patients, out-of-stock medicine, long waiting times and staff attitudes across the country, the SA Ministry of Health called in all provinces for a review of the National Health Act (Act no 61 of 2003 as amended), to make provision for the establishment of the Office of Health Standards Compliance (Fryatt & Hunter 2015:34). The function of the Office is, amongst others, to develop National Health Standards and all healthcare facilities will have to comply in providing quality healthcare services (Gray, et al 2015:7). These standards have been developed and include the standard for the availability of medicine as a vital measure of quality and identified as a priority area (Gray, et al 2015:7).

Overcrowding in PHC facilities poses potential adherence barriers, which may lead to poor health outcomes, and places strain on the patient in terms of transport costs and loss of income (Du Toit 2014:38).

The CCMDD strategy was implemented in 2014 to ensure that people using PHC healthcare facilities have unlimited access to essential chronic medication through contracted pharmacy-dispensing units (Maharaj 2018:1). Reducing the number of patients (overcrowding) at the PHC facility might, as envisaged, reduce the waiting time and ultimately increased adherence to the CCMDD strategy, thus improving patient health outcomes as they will access their medication with a shorter waiting time and reduced work absenteeism (Du Toit 2014:38). The CCMDD strategy is envisioned to reduce long waiting hours, ensure availability of medication, decongest workload at PHC facility level, and therefore improve service delivery and quality of care (Kettledas 2016:3). The introduction of the CCMDD strategy makes it possible for patients to collect medication from contracted pick-up points

located in the area of employment during their lunch times, and therefore ensuring adherence (Steel 2014:9).

2.3.5. INFORMATION PROVIDED AT PICK-UP POINTS

Nonadherence has serious clinical and economic impacts as it disrupts the continuity of patient care, delays positive treatment outcomes, and increases the cost of healthcare due to complications. Patients need to be provided with the following information: adherence information, side effects information regarding treatment and nonadherence, resistance building information and when to return immediately to the PHC facility, complications or consequences of nonadherence, and what communication is required between the CCMDD PUP and the patient (like reminder SMS messages) in order to collect medication on time to ensure adherence. This information must be given every time when patients visit any healthcare facility to collect their medication (Dorward, et al 2020:5).

A study conducted in Brazil indicated that ineffective communication regarding patient follow-up treatment and well-being and lack of patient education and proper counselling during the dispensing process were some of the factors identified to have an effect on healthcare service delivery and ultimately, the non-adherence by patients (Maharaj 2018:2).

Usherwood conducted a study in Australia and stated that it is important to ask patients about adherence at every visit, and a poor response to treatment should always prompt detailed enquiry to encourage adherence (Usherwood 2017:148). The study further indicated that patient-centred counselling on adherence has shown improved behaviour changes and ultimately improved adherence (Usherwood 2017:148).

In Sub-Saharan Africa, the study conducted in Namibia indicated that a lack of understanding of the importance of treatment adherence contributed to non-adherence (Bauleth, et al 2016:94). Bauleth, et al (2016:19) further revealed that participants indicated that they discontinued taking their medication due to side effects and this was because they were not informed of what to expect and what to do when they experience side effects.

According to Dorward, et al (2020:5), poor communication between healthcare workers and patients, due to workload pressures in healthcare facilities, led to inadequate information sharing in managing their health when having side effects and ultimately resulted in nonadherence.

In SA, Dorward, et al (2020:5) show the importance of communicating well with patients to ensure that they report immediately to the healthcare facility or any other healthcare service when feeling

unwell. Patients should be informed to seek help immediately and not to wait for their next appointment date to prevent complications and to adhere to their medication (Dorward, et al 2020:5). In the Western Cape in SA, Magadzire, et al (2016:5, 28) found that due to workload pressures, pharmacist counselling to patients in most cases is impractical, although necessary to ensure adherence. Cele and Riet, (2017:98) reported that in KwaZulu Natal (SA) there is still a big gap in the healthcare services regarding counselling and the provision of adherence information and support to patients who receive ART.

It is important that patients follow the advice on self-care management provided by their clinician or doctor and adhere to their prescribed medication to avoid negative health outcomes. This is only possible when patients receive information timeously and regularly at PUPs.

2.3.6. REMINDER OR RECALL SYSTEM FOR COLLECTION OF MEDICATION

Usherwood (2017:149) suggested that unplanned nonadherence by a patient can be due to forgetfulness and misunderstanding. These authors further suggested that regular reminders are an effective way of improving adherence. According to Bauleth, et al (2016:94), several participants cited forgetfulness as a factor that contributed to poor adherence to medications, especially when concentrating on work-related tasks, while Dorward, et al (2020:7) believe that delays in receiving reminder SMSs in some participants contributed to their nonadherence to their appointment for medication collection.

Leon, et al (2015:4) raised the fact that the use of an SMS to support patients in sharing information and reminding them of their appointment date, allows them to have improved levels of knowledge and control of their care and ultimately treatment adherence. Magadzire, et al (2017:6) confirmed that an SMS appointment reminder is a strategy to mitigate patients' challenges of non-adherence due to forgetfulness.

The use of the SMS system, according to the literature, was found to be an effective intervention for most patients in improving their adherence behaviour, highly beneficial in South Africa (Leon, et al 2015:4).

2.3.7. PROGNOSIS AND HEALTH PROBLEMS DUE TO NON-ADHERENCE TO MEDICINE COLLECTION

Missed appointments have serious clinical and economic impacts as it disrupts the continuity of patient care and affects the nurse/doctor-patient relationship, this may result in complications or multiple health problems, and that affects the patient's quality of life (Alhamad 2013:258). Failure to medication adherence may lead to complications such as end-organ damage and resistance to some medications such as the ARVs. Poor adherence to the collection of medication has been suggested as a possible basis for the observed complications (Munene & Ekman 2012:378) and is attributed to a lack of awareness of how a missed appointment affects the service and patient prognosis.

According to the WHO, Diabetes mellitus is a chronic condition if not well controlled, may cause serious life-threatening complications such as kidney failure due to end-organ damage, lower extremities amputations and cardiovascular accidents and may even lead to death (WHO, 2016:30).

Crawford, et al (2014:1394) believe that increased drug resistance due to poor adherence to collecting medication at PUPs was associated with negative impacts such as poor viral load suppression in patients living with HIV and resulting in complications such as the development of TB, which occurred more frequently in patients living with HIV.

In the United Kingdom, non-adherence was associated with a significantly higher rate of psychiatric hospitalisation due to impaired mental functioning (Haddad, Brain & Scott 2014:46)

According to Magadzire, et al (2017:3) patients who had to return to their PHC facilities were those who were clinically unstable according to diabetes and hypertensive guidelines and could relate to poor adherence to medications.

In Southeast Asia, Manobharathi, et al (2017:787) found in their study that adequate adherence to medication will sustain health and manages chronic diseases to prevent complications that might lead to negative health outcomes such as end-organ damage, resistance to medication due to non-compliance or death. Manobharathi, et al (2017:790) further reiterate the fact that adherence to medication by patients who have Diabetes mellitus is one of the components of management, and that people diagnosed with Diabetes need to have unlimited access to medication and comply with medication use to avert possible complications.

Thus, according to the literature, the CCMDD strategy needs to ensure unlimited access to medication by all patients diagnosed with chronic diseases.

2.4. SUMMARY

This chapter discussed the literature concerning the CCMDD and the known factors relating to the nonadherence of patients registered on the CCMDD system. Literature has revealed that nonadherence is a common problem in healthcare facilities and this is attributed to a number of factors ranging from social determinants to service delivery factors. Based on the literature reviewed and the findings discussed in this chapter, a questionnaire was compiled (view Annexure B). The next chapter will present the research methodology.

3. CHAPTER THREE: METHODOLOGY

3.1. INTRODUCTION

The previous chapter, chapter 2, discussed the literature reviewed for this study. Chapter 2 focused on literature that explained the views made by various authors and researchers on contributing factors to nonadherence of patients registered on CCMDD model.

Research methodology directs a research project, is the general approach the researcher takes in carrying out the research project and dictates and controls the collection of data (Rudolf, et al 2015:26), and thus the methodology used in this study is described in detail in this chapter in terms of the research design, research setting, the instrument used for data collection, population, sampling method, data collection method and the research methods used to meet the study objectives.

The overall aim of this study was to determine and describe factors associated with the nonadherence of patients to collect medicine from the CCMDD service providers in the Tshwane District. In view of chapter 1 (sub-section 1.10.1), the research design was, quantitative descriptive non-experimental enabling the researcher to determine and describe what are the factors associated with nonadherence of patients registered in CCMDD to collect their pre-packed medication. In this chapter detail of the pre-testing of the questionnaire is explained and will be followed by data collection and analysis. Discussions on reliability, validity, bias and ethical considerations for the study conclude chapter 3.

3.2. STUDY DESIGN

Babbie (2020:88) explained the study design as the overall structural plan of investigation to obtain evidence in order to answer research questions and describe how, when and where data are to be collected and analysed. The research design is the blueprint intended to provide an appropriate framework for conducting a study (Sileyew 2019:28). This study followed a quantitative non-experimental descriptive design, as this approach assisted the researcher to determine and describe the factors contributing to the nonadherence of patients to collect medicine from the CCMDD service providers in Tshwane District. Information from the respondents was collected utilising a self-developed questionnaire.

A quantitative research design combines the practices and norms of a natural scientific model and views social reality as an external objective reality (Babbie 2020:88). According to Polit and Beck (2017:741), quantitative research aims at describing rather than explaining social phenomena, it uses a rigorous and controlled design to examine phenomena using precise measurement. Maree (2014:145) is of the view that a quantitative research design is helpful in analysing data on a large scale for a limited period but still receives reliable data. In this study the researcher used self-developed questionnaires to know factors from patients with chronic conditions that contribute to nonadherence to collect their pre-packed medication from their chosen PUPs.

The quantitative research in this study as explained in chapter 1 (sub-heading 1.7.2.3), brought about deductive reasoning. When using deductive reasoning, the researcher focused on the problem and followed the following steps (Polit & Beck 2017:8):

STEP1: The CCMDD strategy aimed to ensure medication availability, reduce overcrowding in the healthcare facilities and thus reduce patient waiting times to ensure adherence. The researcher observed that, although the CCMDD strategy in Tshwane District is planned and implemented, patients are still missing their appointment dates to collect their pre-packed medication from their self-chosen PUP.

STEP 2: To find answers to the above problem, the following research question was formulated:
What are the factors contributing to the nonadherence of patients to collect medicine from CCMDD service provider's PUPs in Tshwane District?

STEP 3: Central Chronic Medication Dispensing and Distribution is a management strategy for patients who have chronic diseases and are stable on treatment. The strategy followed extended task shifting, decentralisation and new approaches to the distribution of chronic medication, without huge increases in resources (Gray, et al 2015:638). In this study, CCMDD is a program that creates a service delivery in terms of PUPs for patients and enables medicine from repeat scripts to be dispensed and distributed every two months to respondents chosen PUP.

STEP 4: A self-developed questionnaire was developed by the researcher based on the literature reviewed (view chapter 2) and was used to obtain information from respondents (view Annexure B).

STEP 5: Lastly was to decide in consultation with the statistician and supervisors what type of statistics are required to obtain scores or numeric data, which are based on the results or findings of the questionnaire (obtained data).

The purpose of descriptive studies' is to observe, describe and document aspects of a situation as it naturally occurs and sometimes to serve as a starting point for hypothesis generation or theory development (Polit & Beck 2017:206). A descriptive design yields quantitative information that can be summarised through statistical analysis (Paul, et al 2014:190). Data in the descriptive study is obtained systematically and in a standardised manner to yield information that is objective and can be statistically summarised in a meaningful way (Mishra, Pandey, Singh, Gupta, Sahu & Keshri 2019:71).

In a descriptive design, some variables enable the researcher to answer the research question (Polit and Beck 2017:48). According to Babbie (2020:28), variables are logical groupings of attributes like, the variable gender comprises attributes of males and females. Variables in this study were in a self-administered structured questionnaire (Annexure B) and included a demographic data questionnaire (Section A), recording age, gender, nationality, level of education, employment and respondents' diagnosis. The demographic data were used to assist in describing the socioeconomic and educational levels of the respondents. The next section in the questionnaire focused on service delivery (Section B) which included, pick-up points (B1), accessibility (B2) (distance, operational hours of pick-up points), waiting times (B3) and information given at pick-up points (B4). Questions for follow-up at the PHC facility (Section C), were used to determine the prognosis, health problems and complications of the patients who did not adhere to collection of medicine.

A non-experimental descriptive survey was conducted by employing the self-developed questionnaire, to collect data from patients with chronic conditions and who are registered on the CCMDD program to determine factors contributing to their nonadherence to medicine collection. Based on the views of Polit and Beck (2017:1), the researcher regarded a non-experimental approach as an approach that will help the researcher to acquire information from respondents without manipulating them.

The study aimed to identify factors contributing to nonadherence by patients registered in the CCMDD program in Tshwane District, thus, the chosen approach was followed. In this study, the design was appropriate as the researcher could collect data from patients registered in the CCMDD program in Tshwane Sub-District 2, coded into numerical form and statistically analysed to determine factors contributing to nonadherence by chronic patients enrolled on the CCMDD program in Tshwane District (view Chapter 4).

3.3. STUDY SETTING

The study setting describes the location in which data collection takes place (Polit & Beck 2017:744). The study took place in Gauteng Province, South Africa. Gauteng Province is the smallest Province

with the highest population. The Tshwane District is one district located in the northern part of Gauteng province and was selected for this study because this type of study was never done in Tshwane and the problem of non-adherence to the collection of medicine from pick-up points exists.

The Tshwane District is divided into seven sub-districts, namely sub-districts 1, 2, 3, 4, 5, 6 and 7, with health facilities distributed throughout all sub-districts (this is illustrated in Table 3-1 below). The district has a total number of sixty-six health facilities including, community health centres, of which twenty-three health facilities fall under the management of the City of Tshwane metropolitan municipality. Two facilities were selected from the PHC setting in Sub District two, in the Northern Tshwane District. Sub-District 2 has twelve PHC facilities. These two PHC facilities are referred to as Clinic A and Clinic B in this study to maintain anonymity and confidentiality. Preliminary statistics from Pharmacy Direct as a service provider stated that in these two PHC facilities, 2762 patients have been registered in the CCMDD program until July 2017. Patients who are registered in the CCMDD program are mostly patients who are suffering from hypertension, diabetes mellitus and HIV-positive patients who are on antiretroviral therapy (ART) as suggested by Steel (2014:4). The distance from these two PHC facilities to where the patients stay ranges between five (5km) being the nearest and 25km the furthest.

PHC facilities of Tshwane District according to Sub-Districts (SDs)

(Chosen sites highlighted in Pink, City of Tshwane facilities highlighted in green)

Table 3.1: PHC Facilities of Tshwane District

SD 1	SD 2	SD 3	SD 4	SD 5	SD 6	SD 7
Boekonhout Clinic	Adelaide Tambo Clinic	Bophelong Clinic	Laudium Clinic (COT)	Refilwe Clinic	Eerterus CHC	Zithobeni Clinic
Boikhutsong Clinic	Dilopye Clinic	Laudium CHC	Lyttelton Clinic	Rayton Clinic	Holani Clinic	Dark City CHC
Jack Hindon Clinic	Gateway Clinic	Skinner Clinic	Olivenhoutbosch Clinic	Stanza Bopape 2 Clinic	Stanza Bopape CHC	Ekangala Clinic
K.T Motubatse Clinic	Kekana Gardens Clinic	Attridgeville Clinic	Rooihuiskraal Clinic	Eastlyne Clinic	Nellmapius Clinic	Kanana Clinic
Kgabo CHC	Kekana Stad Clinic	Danville Clinic	Eldoraigne Clinic	Onverwagt Clinic	Phahameng Clinic	Rethabiseng Clinic
Zamile Clinic	Kameeldrift	FF. Ribeiro Clinic			Pretorius Park Clinic	Sokhulumi Clinic
Maria Rantho Clinic	Mandisa Shiceka Clinic	Hercules Clinic			Silverton Clinic	Bronkhorstspruit Clinic
Phedisong 4 CHC	New Eersterus Clinic	Phomolong Clinic			Mamelodi West Clinic	Ubuntu Clinic
Phedisong 6 Clinic	Ramotse Clinic	Folang Clinic				Gazankulu Clinic
Sedilega Clinic	Refentse Clinic					
Soshanguve 2 Clinic	Suurman Clinic					
Soshanguve Block JJ Clinic	Temba CHC					
Soshanguve Block TT Clinic	Doornpoort Clinic					
Soshanguve CHC						
Tlamelong Clinic						
Winterveldt Clinic						
Karen Park Clinic						
Rosslyn Clinic						

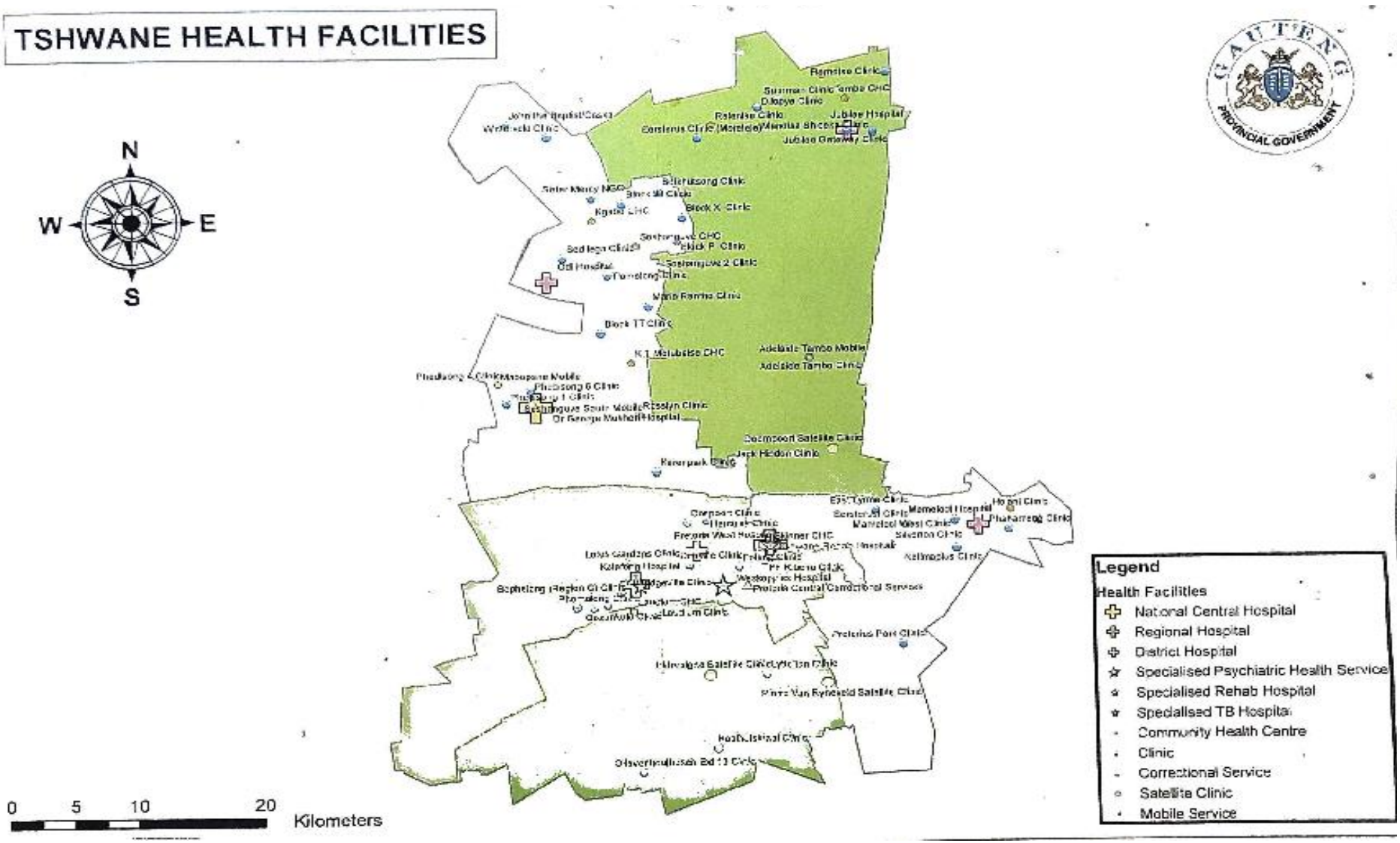

Figure 3.1: Map of Tshwane Sub-District 2 Facilities

3.4. RESEARCH METHODS

These are the techniques researchers use to structure a study, to gather and analyse information relevant to the research question (Polit & Beck 2017:11). Selection of a research method is always dependent on study aims and objectives and the application of those methods and techniques in research involves a variety of assumptions (Babbie 2020:88). In this study, the researcher followed the positivism paradigm (view chapter 1, sub-heading 1.7.2), with the belief that by following the steps of research, the research question of determining factors contributing to nonadherence by patients registered in the CCMDD strategy may be answered. The following will be discussed, namely the population, sampling, data collection and data analysis.

3.4.1. STUDY POPULATION AND SAMPLING

The population is described as all the elements that meet certain criteria for inclusion in a study (Polit & Beck 2017:739). It is a larger pool from which sampling elements are drawn and to which findings are generalised (Mouton & Babbie 2014:174). In this study, the population consisted of all patients living with chronic diseases such as hypertension, diabetes mellitus, HIV/AIDS, asthma, arthritis and epilepsy, from two PHC facilities in Sub District two and who were registered in the CCMDD program. Patients who meet the criteria as explained in chapter 1 (sub-heading 1.11.1), were selected by clinical nurses and doctors from PHC facilities and hospitals to be registered in the CCMDD programme. All selected patients are then involved in identifying convenient medication pick-up points which are usually less than 5km from their workplace or residential areas. The patient registration form and repeat medication prescription for five months are submitted to the CCMDD service provider which has a contract with the Gauteng Department of Health. Approximately 2762 patients had been registered in these two PHC facilities in July 2017. The sample population included all patients registered in the CCMDD program in the Tshwane District (Gauteng). In these two PHC facilities 1328 pre-packed medicine parcels from 2762 chronic patients registered on CCMDD have been sent back to the service provider because patients did not collect those parcels according to reports obtained from the Tshwane District Pharmacy Direct database during 2017.

3.4.2. SAMPLE SIZE

The sample size refers to the number of respondents in a study, who meet the inclusion criteria (Polit & Beck 2017:743). The sample size should be large enough to have a high probability to be statistically significant, so the number of subjects should not be too small to have a chance of detecting the meaningful effects and producing reliable results for the research hypothesis tested (Polit &Beck

2017:258). According to Pratiwi, Furuya, and Sulistyantara (2014:248), Gay and Diehl (1992) pioneered the method of determining sample size for descriptive research.
Based on their work the sample size should be 10% of the population but if the population is small, 20% may be required. Up to date, current studies still base their sample size on their work (Pratiwi, et al 2014:247-253)

For the purpose of this study and in consultation with the statistician, 15% of the population was used (view Annexure H). The total sample was 420 patients, reconfirmed by the statistician to be at least 80% of this sample size. The sample size comprised patients who honoured their appointments by collecting their pre-packed medication from their chosen pick-up points. The sample size also included patients who missed their appointments thus their pre-packed medication was sent back to the service provider, to compare their contributing factors of non-adherence to those who are adhering.

In this study convenience sampling was used, also known as accidental sampling as this method makes no pretence of identifying a representative subset of a population and uses subjects that are readily available and who fit the chosen sample profile (Paul, et al 2014:182). Garg (2016:643) also states that convenience samples are used when the researcher is limited to available groups. All patients registered on the CCMDD program, who came for their six monthly clinical reviews were approached and those willing to take part after a thorough explanation of the study were included in the sample. The researcher used this approach because only a few patients per day (10-15) met the characteristics and inclusion criteria for the sample.

3.4.2.1. INCLUSION CRITERIA

There are elements that the subjects must possess to be part of the target population and assist in identifying the study population in a consistent, reliable, uniform and objective manner (Garg 2016:642). The following inclusion criteria were considered in this study:

- Respondents to be patients from the two selected facilities in Sub-District 2.
- Respondents who were registered in the CCMDD programme between February 2014 and December 2017.
- Respondents were to be 18 years and older.
- Included respondents who signed informed consent.
- Respondents to be registered in the CCMDD programme for more than one year.

3.4.2.2. EXCLUSION CRITERIA

Exclusion criteria are the elements that may cause a person to be excluded from the target group (Garg 2016:642, 32). The following exclusion criteria were considered in the study:

- All patients who are less than one year in the CCMDD programme.
- Patients who did not sign the informed consent form.
- Patients younger than 18 years of age were not included.

3.4.3. SAMPLING METHOD

Sampling is the process of selecting cases to represent an entire population (Polit & Beck 2017:250). In this study, the sample was all patients who were registered in the CCMDD program from May 2014 to December 2017, including those who did not collect their pre-packed medication who came for their six months review. The researcher collected all patients on CCMDD, (their files were identified by a blue Pharmacy Direct sticker) waiting for a clinical Nurse or doctor to either collect blood samples or a script review. Selected patients were taken from the general waiting area and placed in the provided space by the facility and the researcher explained everything in the information leaflet (view Annexure C).

Those who were willing to participate were then requested to remain behind and given a questionnaire to complete and they were requested to return it to the researcher before they leave the facility. All information required was explained so that patients understand the reason for completing the questionnaire. Those who were not taking part were assured that they are not going to be discriminated against in any way (sub-heading 1.16 – Ethical consideration). In this study, N (2762) was the population and n (420) was the sample size.

3.4.4. MEASURING TOOL

The research tool is an instrument the researcher uses to collect, manipulate or interpret data (Rudolf, et al 2015:7). A structured questionnaire was developed by the researcher after conducting a literature review and was based on the objectives of the study. The aim of the literature review was to find out what can be the variables or items to be included in the self-developed questionnaire.

The advantages of using a questionnaire as a tool in this study are that it is self-administered with a little help, and it will cover a large number of respondents. The other advantage of using a self-developed questionnaire was that it is a standardised measuring instrument because the questions were always phrased exactly in the same way for all respondents. Polit and Beck (2017:293),

mentioned that questionnaires are planned tools, developed before the commencement of data collection to ensure that all respondents answered the same set of questions. The self-developed questionnaire was also the preferred method to collect research data because the application was economic and convenient as it included a large number of respondents per day over a short period of time.

The disadvantage is that respondents may return incomplete questionnaires if they did not understand the purpose of the study or the questions. Despite this disadvantage, the researcher selected the questionnaire method, because she believed that this type of data collection method will meet the research aims and outcomes.

The questionnaire was developed during the phase of the study when the research proposal of the study was established. The questionnaire (view annexure B) included six pages and consisted of a participant information leaflet, informed consent (view annexure C) and a set of questions, which were divided into three sections, as follows:
Section A: Demographic information.
Section B: Service delivery.
Section C: Follow-up at PHC facility.

Section A: Demographic information

This section highlighted the demographic and personal information regarding gender, age, employment status, educational level, citizenship, residential area and diagnosis of respondents. The demographic data collected was used to assist in describing the socioeconomic and educational levels of the respondents but was not used as a formal objective of the study**.**

Section B: Service delivery

This section focused on service delivery factors which include information on pick-up points, accessibility factors of pick-up points, waiting times at pick-up points, general experience with pick-up points, the information given when they collect their medication, respondents' support system and type of reminder to collect medication. These questions were used to identify factors that might contribute to adherence to the collection of chronic medications at chosen PUPs.

Section C: Follow-up at PHC facility

In this section, the activities during the biannual follow-up visit at the PHC facility were used to determine the prognosis, health problems and complications of the patients who did not adhere to collection of medicine. Monitoring the overall well-being of patients remains an important aspect to prevent fatal complications hence these activities were included (view section C, items C1 – C6). The researcher

used the self-developed questionnaire, structured with closed, open-ended and a Likert scale to grade the choices (see annexure B) to obtain data. According to Rudolf, et al (2015:161), Likert scales or rating scales are more useful, when a behaviour or attitude needs to be evaluated on a continuum of: never, sometimes or always (view Annexure B in items B4.1 – B4.5, C1, C2, C3, C5 and C6). In this study, the researcher used this scale to identify if patients were given information on adherence and management during their six-month review. An open-ended question was also asked in Section B, item B1.4, because the researcher wanted to know for those patients who did not honour their appointment, what was the reason if they answered no.

This can be time-consuming and exhausting to both researcher and respondent hence only one question of this type was included in this questionnaire (Rudolf, et al 2015:167). Polit and Beck (2017:293) observed that structured self-administered questionnaires include a fixed set of questions that were answered in a specified sequence and with pre-determined responses such as yes or no which is a closed-ended question.

Discussions were also held with the supervisor of this research who had advised that if there were too many missing values from the questionnaire, this would affect the findings. The supervisor also noted that if there were too many terms that the respondents did not understand, there was a possibility that they would not pursue answering the questionnaire. All questions in the data collecting instrument were coded with the aid of the statistician for easier translation of data into numbers.

The respondents were given a questionnaire when they visit the clinic for their six-monthly reviews, which took approximately 15 minutes to complete, and completed questionnaires were collected before they left the facility. All patients who did not honour their appointments for their six-monthly reviews and were included in the study were traced by community healthcare workers. Patients who did not collect their pre-packed medication are reported monthly to the District pharmacy, and that list was given also to healthcare workers to trace the patients, and if found to be requested to report to the facility immediately, those who were willing were brought back to the facility, and those who were accessible and agreed to be included in the study, were given the questionnaire to be completed.

In view of chapter 1 (sub-heading 1.6) and annexure C, the researcher discussed ethical considerations with respondents before completion of the questionnaire, and informed consent was signed by those who were willing to participate in this study.

3.4.5. PRE-TESTING OF DATA COLLECTION INSTRUMENT (QUESTIONNAIRE)

Pre-test is the collection of data prior to the experimental intervention, sometimes called baseline data or the trial administration of a newly developed measure to identify flaws or to gain better understanding of how the construct in question is conceptualized by respondents (Polit & Beck 2017:740). Pre-testing is usually used by researchers who develops a new instrument so that it can be evaluated and refined, or to test the feasibility of the questions used in the questionnaire and to identify possible problems with the questionnaire itself or the questions (Polit & Beck 2017:268). In this study, ten participants were selected and invited to pre-test the questionnaire the first two weeks before the onset of actual data collection

In developing a questionnaire, an instrument test run was needed, the aim was to pre-test the feasibility of the questions to be used in a questionnaire and also to identify possible problems with the questionnaire itself or the questions and refine it with an in-depth review for possible improvement. Ten respondents (n=10), patients with chronic conditions and registered on CCMDD from the sample of the main study were invited to pre-test the questionnaire from the 6th to 8th of August 2018, before the onset of actual data collection. A total of ten questionnaires were distributed to the respondents and ten completed questionnaires were received back for evaluation. The pre-testing aimed to check relevance (if answers to the questionnaire is what the researcher wanted to find out), if allocated time of ten to fifteen minutes will be enough to complete the questionnaire, if respondents understand the questions, and to check if there is a need to adjust the questionnaire.

3.4.5.1. DISCUSSION OF THE RESULTS OF THE PRE-TESTING

The results are presented under the following sections: demographic data, service delivery (which includes pick-up points, accessibility, waiting times, information given at pick-up points and reminders) and follow-up at the PHC setting.

- **DEMOGRAPHIC DATA**

Of these ten respondents (n=10) who participated in the pre-test, six 60% (n=6) were males and four 40% (n=4) were females. The mean age was 43.8 years. In the group of respondents, 60% (n=6) were employed whereas 40% (n=4) were unemployed. Seventy per cent (n=7) of the respondents were South African citizens residing in Gauteng province, foreign nationals from Zimbabwe were 20% (n=2) and the 10% (n=1) from another Province (Mpumalanga). Most respondents in the pre-testing group obtained an educational level of Grade 11 60% (n=6), while 20% (n=2) had matric, 10% (n=1) had tertiary education, whereas 10% (n=1) did not attend school at all. Majority of respondents were

diagnosed with HIV 80% (n=8), 10% (n=1) with Diabetes mellitus, 10% (n=1) did not disclose the diagnosis.

- **SERVICE DELIVERY**

Of the ten respondents (n=10), only four chose external pick-up points and the majority 60 % (n=6) were collecting their pre-packed medication from the internal pick-up points. 80% (n=8) were adherent to their scheduled collection whereas 20% (n=2) were non-adherent and were employed and both males, 60% (n=6) were staying far from the pick-up point (between 5 and 10km). All ten participants indicated that the waiting time was less than one hour and there was always a queue of fewer than ten people.

The time it took the respondents to complete the questionnaire during the pre-test was to reduce completion time error during the main study data collection (Joubert, Ehrlich, Katzenellenbogen, & Karim 2007:116).

Pre-testing data showed the data collection instrument pre-test results in the dashboard. The feedback analysis showed that the data collection instrument was 80% relevant, the language 70% clear, 60% clearly structured and took respondents thirteen minutes on average to complete the questionnaire (view Annexure B).

The results showed that there was no need for adjustment of the questionnaire. Respondents in the pre-test were not included in the data collection for the final study. This ensured that the instrument and data collection process were valid and reliable in line with the aim of the study. The researcher was confident that the constructed self-developed questionnaire would measure contributory factors to the nonadherence of chronic patients on CCMDD in Tshwane District.

3.5. QUALITY CONTROL

The study followed a quantitative approach, using a self-developed questionnaire. The following quantitative control measures were adhered to, namely validity and reliability.

3.5.1. VALIDITY

Validity is a quality criterion referring to the degree to which inferences made in a study are accurate and well-founded, in measurement (inference is a conclusion drawn from the study evidence, taking into account the method used to generate that evidence) (Polit & Beck 2017:747), the degree to which an instrument measures what is intended to measure.

Validity is important in order to ensure that there is a relationship between independent and dependent variables that can be reliably detected (Polit and Beck 2017:221). Validity refers to the extent to which a measurement instrument (questionnaire) measures accurately what it is supposed to measure (Rudolf, et al 2015:114). In this study, content validity, face validity and construct validity were ensured.

3.5.1.1. CONTENT VALIDITY

Content validity refers to the degree to which an instrument covers the completed and appropriate set of relevant items reflecting the full content of the constructed domain being measured (Polit & Beck 2017:724). To ensure content validity the researcher checked and verified if the aspects of the tool were addressing the objectives of the study by discussing the questionnaire with research supervisors. Content validity starts when the supervisor assisted the researcher to develop a questionnaire based on literature to ensure that its content will in fact measure the factors contributing to the nonadherence of patients collecting medication from the CCMDD pick-up points in Tshwane District.

3.5.1.2. FACE VALIDITY

Face validity is the extent to which on the surface, an instrument appears to measure what it is supposed to measure; the instrument should be validated by experts in the field (Maree 2016:240). During the development of the questionnaire, it was given to two PHC specialists, who are working with patients who are registered in the CCMDD program to assess if the questions are focused on the nonadherence to collection of medicine by patients registered on CCMDD. Data capturing was done by a volunteer data-capturer and the captured data was then cross-checked and proofread by the researcher.

3.5.1.3. CONSTRUCT VALIDITY

Construct validity measures the relationship between the instrument and the related theory, that is how well you transformed a concept, idea, or behaviour that is a construct into a functioning and operating reality (Taherdoost 2016:31). In this study, the construct validity was enhanced by ensuring that the questionnaire was developed in such a way that the aspect to be answered were clear. The researcher requested experts to review the questionnaire (the statistician, experienced clinical nurses working in the PHC facility and supervisor of the study) to assess if the questionnaire will be able to answer the study objectives. Construct validity was also enhanced by pre-testing the questionnaire with ten (10) respondents from a sample of analysis.

3.5.2. RELIABILITY

Reliability is the consistency with which a measure gives the same results that are accurate and stable over repeated observations, that is the stability of the measuring instrument (Polit & Beck 2017:742). According to Neuman (2014:212-213), measurement reliability suggests that there is no variation in the numerical results as a result of the characteristics of the measurement process or the measurement instrument. Data need to be reliable to measure consistently thus, pre-testing was conducted to ensure that the same results are yielded at the end of the study.

Contamination is a factor that also needs to be taken into consideration as a questionnaire could be completed by someone other than the respondent due to illiteracy, and these could have pressurised and influenced the respondent. This was reduced by encouraging and allowing the respondent to ask a question where there is a misunderstanding.

A number of measures were taken to ensure data reliability and validity, and to minimise bias. Microsoft Excel™ was used to capture the data, after which it was analysed with Statistical Package for the Social Sciences (SPSS) version 24.

3.6. DATA COLLECTION

Data collection is the systematic gathering of information relevant to the research problem (Polit and Beck 2017:725). Data collection aims to measure the variables numerically, clearly and accurately so that they can be statistically described and analysed (Rudolf, et al 2015:99). The quantitative research paradigm chosen required data to be collected in a structure-controlled manner to ensure that there was a consistency in what was asked and how answers were reported to enhance objectivity, reduce biases and facilitate data analysis (Polit & Beck 2017:293). The data collection method used was a self-developed questionnaire. A literature search was conducted to identify what are the views and assumptions made by various authors and researchers on contributing factors to the non-adherence of patients registered on CCMDD. The questionnaire was developed by the researcher (view Chapter 2).

Data collection only commenced after obtaining approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria (49/2018) (view Annexure F). This was followed by obtaining permission from the relevant authorities, the provincial Department of Health, the Tshwane District Research Committee and the managers of the two PHC facilities where the study was done (view Annexures D, E and G).

The data collection method involves acquiring information about one or more groups of people by asking a series of close-ended and open-ended questions to the respondents, tabulating and summarising the answers with percentages, frequency tables and statistical indexes and then drawing inferences about the population (view Chapter 4). The goal is to learn about a large population by surveying a sample of that population (Rudolf, et al 2015:195). The survey method provides quantitative descriptions of a population by studying the sample of that population to generalise (Mouton & Babbie 2014:152). In this study, primary data were collected from a sample of patients with chronic conditions from two selected PHC facilities situated in Sub-District 2 and registered in the CCMDD programme from May 2014 to December 2017 to identify information and factors contributing to nonadherence by patients registered in CCMDD program in Tshwane District. The Tshwane District office sent the approval of the study to both facilities selected and as a result thereof, selected facilities knew about the study before the researcher visited the facilities.

An information sheet was distributed to the respondents, which informed them about the study and their rights while still in the waiting area and this was done from August 2018 to February 2019. Respondents were required to sign at the bottom of the information sheet if they agree to participate in the survey. Thereafter questionnaires were distributed to respondents who gave written consent to fill in questionnaires. The researcher went through the questionnaire with the respondents beforehand for them to understand the tool clearly. Respondents were advised not to discuss the questionnaires to ensure fairness and honesty in responding to questions to minimise biases. Lastly, the respondents answered the questionnaires after being familiarised with them by the researcher. In cases where respondents did not understand the questions, the researcher explained the question in a language they understood. A trained volunteer assisted those who could not read or write by asking those respondents questions as they are in the questionnaire and completed the form on their behalf.

Table 3.2: Data Collection

Data collection tool used	Period data collected	Sample size	Number of respondents who participated
Self-developed questionnaire	15th August 2018 to 7th February 2019	420 participants	344 participants responded

3.7. ETHICAL CONSIDERATIONS

It is generally accepted that since researchers in the behavioural sciences typically conduct research that involves human subjects, ethical considerations are the responsibility of the researcher (Rudolf, et al 2015:120). Ethics is a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal and social obligations to study respondents (Polit & Beck

2017:727). The Belmont report articulate three fundamental ethical principles that should guide researchers. They are: beneficence, respect for human dignity and justice. These principles are based on any individual ‘s human rights and the researcher needs to protect these rights during research. These human rights include the right to self-determination, to anonymity and confidentiality, to fair treatment, to privacy and to be protected from discomfort and harm (Polit & Beck 2017:139).

View Chapter 1 for the discussion on Ethical considerations. The following ethical considerations were taken out for discussion in this Chapter due to their importance:

3.7.1. BENEFIFICENCE

This ethical principle imposes a duty on the researcher to minimise harm but contribute to the well-being of others (Polit & Beck 2017:139). Respondents who participated in the study were not harmed in any way as there was no experiment carried out. Instead, this may benefit Tshwane District and the respondents. Only questions on factors contributing to nonadherence to medicine collection were included in the questionnaire.

In this study, the researcher asserted that the ethical considerations concerning respondents and good data management were maintained throughout the study (see Annexure C).

During the conduct of this research ethical clearance certificates were obtained from the University of Pretoria, clearance no 49/2018 before data collection and the Tshwane District Department of Health (Annexures F and G).

3.7.2. RESPECT FOR HUMAN DIGNITY - INFORMED CONSENT

According to Rudolf, et al (2015:121), ethical norms of voluntary participation by respondents have become formalised in the concept of informed consent. In this study, respondents who meet the inclusion criteria were invited to participate and those who indicated their willingness to participate in the study voluntarily and were granted written permission in the form of signed consent forms before the commencement of the study were included as respondents. Those who could not write their names on the space provided due to their inability to write were encouraged to mark an ‘X‘ next to the space allocated for the signature in the informed consent form. Respondents were encouraged to ask questions that they do not understand, and they were also informed of their rights regarding participation and their freedom to terminate the interview at any given stage. Informed consent also provided the right to withdraw from the study without any consequences or penalty for the respondent.

3.7.3.JUSTICE - RIGHT TO PRIVACY

Unique study identification numbers were used for each respondent and all information remained confidential. Confidentiality can be considered a continuance of privacy by making an agreement that limits others access to a person ‘s private information. All information and data were managed in a strictly professional and confidential manner. Therefore, the respondents ‘confidentiality was ensured. All data (completed questionnaires) had been locked away with access only to the researcher and the supervisors. The data will be stored for a period of fifteen years (See Annexure I - Storage).

3.8. LIMITATIONS

Limitations are weaknesses that might cast shadows of doubts on results and conclusions (Polit & Beck 2017:12). It is important for the researcher to acknowledge that the research project might have certain limitations and that no research project is perfect.

The following limitations were identified during data collection in this study:

COOPERATION AND ATTRITION

Not everyone invited to participate in a study agrees to do so (Polit & Beck 2017:260). In this study, the challenge was that during data collection few eligible patients (between 10 to 15) who met the sample criteria arrived at the pick-up points for the day at the selected facility. The prospective participants were only available between 7 am and 10 am in the two selected facilities, and the researcher was only able to collect data from about ten respondents per day at a facility. Hence data collection took almost five months and again patients were not given return dates for December, resulting in data collection only being resumed from 15th January 2019.

The researcher recognised the fact that the study was only conducted in one sub-district of the Tshwane District and respondents were selected conveniently, which might have compromised the generalisability of the findings to the entire country.

3.9. SUMMARY

This chapter discussed the research methodology employed in this study. The quantitative descriptive design was explained and the use of questionnaires to collect the numeric data for interpretation and statistical analysis was explained. The results of the pre-test study were also explained. The next chapter will discuss the research results and findings that will address the objectives of the stud

4. CHAPTER FOUR: RESULTS AND FINDINGS

4.1. INTRODUCTION

The previous chapter outlined the methodology used in the study. The purpose of the study was to determine and describe factors contributing to the nonadherence of patients to collect medicine from the CCMDD service providers in the Tshwane District. In this chapter, the researcher discussed data analysis, presented, and described the research findings of the collected data.

4.2. APPROACH TO DATA ANALYSIS

A self-developed questionnaire was used to collect data from conveniently selected respondents from the two sampled PHC facilities (view chapter 3). The calculated sample size who was invited to participate in the study included 420 respondents, of which a total of 358 consented to participate in this study. Out of the 358 respondents, ten were invited to pre-test the questionnaire and were excluded from the main study (view chapter 3 sub-heading 3.4.6). A total of 348 questionnaires were distributed to eligible respondents who consented to participate in the study, and only 344 (N) questionnaires were returned completed which yielded 98.8% response rate.

According to Rudolf, et al (2015:389) a response rate is a percentage of people agreeing to participate in a survey, whereas Babbie (2020:572) are of the view that the response rate (using a self-developed questionnaire) is a percentage of a number of the people participating in a survey divided by the number selected in the sample. Low response rates can introduce bias, however, if the researcher personally distributes questionnaires in a clinical setting the response rate tends to be high due to personal contact (Polit & Beck 2017:276). The response rate for this study was from three hundred forty-four (344) patients who responded out of the targeted three hundred and forty-eight (348), yielding a response rate of 98.8% (344/348). This study yielded a good response rate of 98.8% and this has been envisaged to yield reliable and valid data. In this chapter N=344, which is the sample size for this study (those respondents who returned the completed questionnaire), and n= is the respondents who completed a particular question in this study. Other descriptions that were used to establish and verify data included the following expressions and terminologies: percentage, probability and Chi-squared value (χ^2).

Percentage figures are derived by dividing one quantity by another with the latter rebased to 100. Percentages are symbolised by %. A percentage is equal to the proportion times 100. A percentage frequency distribution is a display of data that specifies the percentage of observations that exist for each data point or grouping of data points (Polit & Beck 2017:359).

It is a particularly useful method of expressing the relative frequency of survey responses and other data (percent means ‘out of every 100‘). In this study, percentages were used to express a proportion of responses frequency distribution against the sample size N=344 or responses frequency distribution of a question for a particular variable, divided by 100. Any answer with a decimal above five (5) was rounded up to the next number.

Probability means the possibility of any outcome of any random event, or the extent to which something is likely to happen, it can range from zero to one, where zero denotes the event to be impossible and one indicates a certain event (Maity 2018:11). In this study, statistical significance was set at a probability level (p-value) of ≤0.05.

The Chi-square value is a statistical test used in various contexts, most often to assess differences in proportions (Polit & Beck 2017:721). The Chi-square test (χ^2) for the equal proportion technique was performed on the data to analyse the closed-ended questions (quantitative data).

The self-developed questionnaire consists of three sections and forty-seven questions. (View Chapter 3 sub-heading 3.4.5 for a discussion of the questionnaire). In Chapter 1 (sub-heading 1.3, 1.4 and 1.5), the research results are presented based on the aim, objectives, research questions for the study and references to the literature review. The results are categorised according to the items of the questionnaire which include, in chronological order, demographic information, service delivery factors (which include pick-up points, accessibility and waiting time), and the information given during the collection of pre-packed medication and management during follow-up at PHC facility (view annexure B - for the questionnaire).

For the data analysis, the data collected were coded by a statistician from the Agriculture Research Council Biometry unit and the statistical package for the Social Sciences was used (view annexure H - for the evidence of statistical support).

In this chapter, descriptive and inferential statistics were used to present the results as findings in the form of text, tables, figures, graphs and supportive literature. Results reporting, interpretation and discussions are based on the questionnaire sections and questions (view Annexure B).

- **The following research question was formulated to guide the study:**

What are the factors contributing to the non-adherence of patients to collect medicine from Central Chronic Medicine Dispensing and Distribution service provider’s pick-up points in Tshwane District?

To answer the research question, the following objectives were set for the study:

To determine and describe factors contributing to the nonadherence of patients collecting medicine from the Central Chronic Medicine Dispensing and Distribution service providers in Tshwane District. Objectives include:

- To determine and describe the service delivery factors contributing to adherence and nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe the accessibility factors contributing to adherence and nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe how waiting time at pick-up points contributes to nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe if the information given at pick-up points contributes to adherence and the nonadherence of patients to collect medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.
- To determine and describe the prognosis, health problems and complications of patients who did not adhere to collection of medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.

4.3. RESEARCH RESULTS AND DISCUSSION

To present the research results and findings in a meaningful manner, the presentation will be guided by the headings of the self-administered questionnaire (view Annexure B). The first section to be discussed is in Section A: Demographic information

4.4. SECTION A: FINDINGS OF DEMOGRAPHIC INFORMATION OF RESPONDENTS

Section A reflected on demographics and general information of the respondents. Each item is discussed individually in Sections 4.3.1 to 4.3.8. In the discussions of this section, graphs and figures will be presented to explain the demographic information of respondents.

A Chi-square test was used to determine if there is any relation between the demographics and the adherence of patients in the collection of their parcels at pick-up points.

4.4.1. SEX/GENDER OF RESPONDENTS (A1)

A total of N=344 questionnaires were distributed, and findings were calculated from n=342 respondents. During pre-testing, both the supervisor and researcher decided to use the word gender rather than the word sex, and thus the word gender will be used in this study (view attached working copy Annexure J). Question A1 focused on the gender of the respondents. In the discussions of this section, tables will be presented to explain the gender distribution of respondents in the first table, followed by another table to explain the relationship between gender and adherence**.**

Of the respondents (N=344), 1% (n=2) omitted completing the question, thus 99% (n=342) for this question. One hundred and thirty 38% (n=130) of the respondents were males and 62% (n=212) were females as reflected in Table 4.1 below.

Table 4.1: Gender Distribution of Respondents (n=342)

Demographics		Frequency	Percentage
Gender (n=342)	Male	n=130	38%
	Female	n=212	62%

SIGNIFICANCE

There is a significant relationship (p=0.01) between gender and patients who honoured their appointments and collected their medication with a chi-squared value of 6.57. The results indicate a high percentage for both female 81% (n=171) and male 68% (n=89) patients who honour their appointments as compared to less than 35% (n=41) of both genders who do not honour their appointments as shown in Table 4.2 below.

Table 4.2: Association Between Gender Distribution and Adherence

Gender	Always honour appointment	% (n)	χ2-value	Probability
Male	Yes	68% (n=89)	6.57	0.01
	No	32% (n=41)		
Female	Yes	81% (n=171)		
	No	19% (n=41)		

⇒ DISCUSSION

In a study conducted in Australia, it was found that females accounted for the larger proportion of those who were scheduled for appointments at 53.3% (Nancarrow, Bradbury & Avila 2014:325). In Saudi

Arabia, male participants in the non-adherence group were significantly lower than females, 23.1% vs 76.9% respectively (Alhamad 2013:742).

In addition, it was found in Canada that even when accounting for increased healthcare needs unique to women (e.g., pregnancy and related care), the evidence demonstrated that women visit healthcare facilities more often than men (Thompson, Anisimowicz, Miedema, Hogg, Wodchis, & Aubrey-Bassler 2016:2).

In the Sub-Saharan region, in the study conducted in Kenya, females accounted for 68.9% of respondents to determine the association between patients' engagement in HIV care and ART medication adherence (Munene & Ekman 2015:380).

In SA, according to Magadzire, et al (2015:513), the Western Cape Centralised Dispensing Unit (CDU) that is a similar model to CCMDD used in this study 34% males and 66% females constituted their 2015 cohort which is also consistent with the results of the other mentioned studies in this discussion. The sample for the study done in SA that focused on differentiated service delivery models was predominantly females at 72%, with their male counterparts at 28% (Fox, Pascoe, Huber, Murphy, Phokojoe, Gorgens, et al 2019:8).

Table 4.1 shows that in this study, the majority of the respondents who attended the clinic were females 62% (n=212) as opposed to their male counterparts at 38% (n=130) and thus, there is a correlation with literature that previous studies evidenced female's attendance to healthcare facilities are higher than males.

4.4.2. AGE OF RESPONDENTS (A2)

Question A2 was an open-ended question that required respondents to enter their age. All the respondents completed this question thus, n=344 for this question. The question was open-ended, but the statistician compiled different age categories in groups to ease reflection and interpretation. Seventy-one, 20% (n=71) of the respondents were younger than thirty-six years of age, two hundred and forty-three 71% (n=243) of the respondents were between thirty-six years and fifty-nine years of age, while thirty 9% (n=30) of the respondents were sixty years and older as indicated in Table 4.3 below.

Table 4.3: Age Distribution of Respondents (n=344)

Demographics	Frequency		Percentage
Age group (n=344)	<=35	n=71	20%
	36-59	n=243	71%
	>=60	n=30	9%

SIGNIFICANCE

The age of respondents was grouped into three categories ≤35 years (youth), 36-59yrs (adults) and ≥60yrs (pensioners) to analyse who adheres most in these three categories.

Similarly, the percentage of patients who did not adhere to collecting their medication was almost the same across all age categories. More than 70% across all age categories (≤35yrs (n=58), 36-59yrs (n=179) and ≥ 60yrs (n=25)) indicated that they adhere to their appointments as indicated in Table 4.4 below. Results in Table 4.4 below reflect on respondents' different age groups and their relationship to their adherence to medicine collection at their chosen PUP, and it shows that there was no relationship ($p>0.05$ and chi-square value of 2.55) between adherence and all age group categories. This implies that the age group did not play any role in determining whether the patients will collect their medication or not.

Table 4.4: Association Between Age of respondents and Adherence

Age group	Always honour appointment	% (n)	X^2-value	Probability
≤ 35	Yes	82% (n=58)	2.55	0.24
	No	18% (n=13)		
36-59	Yes	74% (n=179)		
	No	26% (n=64)		
≥60	Yes	83% (n=25)		
	No	17% (n=5)		

⇒ DISCUSSION

A study conducted in New York indicated that poor adherence to medications is unfortunately widespread across all ages (Stirratt, Dunbar-Jacob, Crane, Simoni, Czajkowski, Hilliard, et al 2015:471).

In Kenya, a study shows that the mean age of patient engagement in HIV care and ART medication adherence was 41.4 years (Munene & Ekman 2015:380), while according to a study done in KZN (SA) 60 % of respondents interviewed were between ages of 30-35 years and age did not have any significant role in non-adherence to their antiretroviral treatment (Cele & Riet 2017:44), and is consistent with the findings in this study. Results of the study done in the Western Cape show that more than 80

% of participants were over the age of 40 years, illustrating that the CDU served a predominantly adult population (Magadzire, et al 2015:5).

As represented in Table 4.4 above, the majority of respondents were between the ages 36 to 59 group 71% (n=243) in this study. The age group below 35 years was at 20% (n=71) and the least was the age group of 60 years and above. Findings in Table 4.4 also indicate that there is no relationship between age and non-adherence in this study.

4.4.3. EMPLOYMENT STATUS OF RESPONDENTS (A3)

A total of N=344 questionnaires were distributed to respondents and all the respondents completed the question and thus n=344.

Table 4.5 below reflects that the majority of respondents were employed 65% (n=224), as opposed to the unemployed at 35% (n=120)

Table 4.5: Employment Status (n=344)

Demographics		Frequency	Percentage
Employment status (n=344)	Employed	n=224	65%
	Unemployed	n=120	35%

SIGNIFICANCE

More than 70% of patients irrespective of their employment status, 74% (n=166) for the employed and n=96 (81%) for the unemployed, indicated that they adhere to their appointment for collecting medication at their pick-up points while 26% (n=59) of employed and 19% (n=23) of the unemployed did not honour their appointment as reflected in Table 4.6 below.

The employment status did not have any effect on patient's decision to honouring their appointments with a Chi-square value of 2.04 and p>0.05 (Table 4.6), probably because patients are given an option to choose pick-up points which is more convenient to them or close to their workplace to collect their medication even during their break times.

Table 4.6: Association between the employment status of respondents and adherence

Employment status	Always honour appointment	% (n)	X^2 value	Probability
Employed	Yes	74% (n=166)	2.04	0.15
	No	26% (n=59)		
Unemployed	Yes	81% (n=96)		
	No	19% (n=23)		

⇒ **DISCUSSION**

In the Sub-Saharan region, the study conducted in Namibia indicated that unemployment was a key factor that caused nonadherence. Factors such as lack of transport money and work-related migration also contributed to poor adherence (Bauleth, et al 2016:96).

A study done in Western Cape included unskilled workers such as domestic workers and found that they faced the greatest challenge of not honouring their appointments which are associated to their work commitments, and the possibility of limited flexibility (Magadzire, et al 2017:82).

Contrary to the above studies, in this study, there was no evidence of association between the employment status and respondents' adherence to honour their appointments.

4.4.4. CITIZENSHIP OF RESPONDENTS (A4)

This question was answered by n=342 respondents and only two (n=2) omitted answering the question. The majority of respondents are South African citizens, 85% (n=291), and non-South Africans accounted for 15% (n=51) (Figure 4.1).

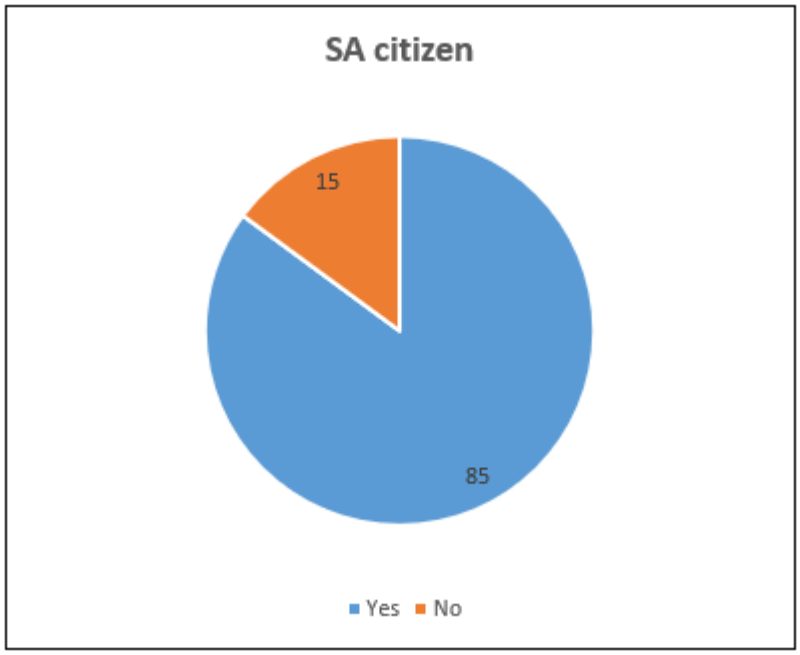

Figure 4.1: Citizenship of Respondents (n=342)

SIGNIFICANCE

The results show that there is no association (p>0.05) between citizenship and adherence with a Chi-square value of 2.88 as shown in Table 4.7.

Table 4.7: Citizenship and association with adherence

South African citizen	Always honour appointment	% (n)	X^2-value	Probability
Citizen	Yes	78% (n=226)	2.88	0.09
	No	22% (n=65)		
Non-citizen	Yes	67% (n=34)		
	No	33% (n=17)		

⇒ DISCUSSION

The findings of a study which was done in China demonstrated that non-adherence was common among internal migrants in China and was consistent with their previous studies to indicate that nonadherence is a serious problem among migrant patients with Tuberculosis (TB) (Tang, Zhao, Wang, Gong, Yin, et al 2015:2).

According to the study done in Namibia, some of the participants who did not honour their appointment indicating that they could not find employment in Namibia and ended up working in a neighbouring country such as Angola, hence they cannot afford to return regularly for their monthly follow-ups (Bauleth, et al 2016:96).

According to the study done in the Western Cape, the most common reason for missed appointments was mobility and temporary migration, especially as the Western Cape is an economic base for people from other South African provinces (Magadzire, et al 2017:82). The findings in this study indicate otherwise, there is significant evidence that citizenship affect adherence p> 0,05 as shown in Table 4.7 above.

4.4.5. RESIDENTIAL PROVINCE (A5)

Question A5 was answered by 97% (n=334) of respondents, with ten, 3% (n=10) respondents omitting to answer the question. Table 4.8 reflect that most of the respondents were from Gauteng province, 90% (n=300). Respondents from other countries like Lesotho 3% (n=1), Mozambique 0,3% (n=1) and Zimbabwe 5% (n=17) also responded to this question, although the questionnaire was about the Province.

Table 4.8: Residential Province of Respondents (n=334)

Province	Frequency	Per cent
Gauteng	300	89,82
Kwa Zulu Natal	2	0,6
Lesotho	1	0,3
Limpopo	5	1,5
Mozambique	1	0,3
Mpumalanga	5	1,5
Northwest	3	0,9
Zimbabwe	17	5,09

SIGNIFICANCE

There is no significant evidence ($p>0.05$) that province is associated with adherence with a Chi-square value of 6.52, even Gauteng with the largest number of respondents 90% (n=300), did not have any effect on the significance of the results as illustrated in Table 4.9 below

Table 4.9: Residential Province and Association with Adherence

Province	Always honour appointment	% (n)	X^2-value	Probability
Gauteng	Yes	77% (n=230)	6.52	0.26
	No	23% (n=70)		
Kwa-Zulu Natal	Yes	0% (n=0)		
	No	100% (n=1)		
Limpopo	Yes	60% (n=3)		
	No	40% (n=2)		
Mpumalanga	Yes	100% (n=5)		
	No	0% (n=0)		
North-West	Yes	100%(n=3)		
	No	0% (n=0)		
Non-citizen	Yes	75% (n=15)		
	No	25% (n=5)		

DISCUSSION

The study done in Kwa-Zulu Natal found that patients who are taking ARVs are mostly from poverty-stricken rural areas and had to travel far from their homes to seek jobs and this affected their access to treatment and therefore, adherence (Cele & Riet 2017:85), whereas in this study there is no correlation between the residential province and adherence as shown in Table 4.9 above.

4.4.6. EDUCATIONAL LEVEL (A8)

Question A8 was answered by 99% (n=341) respondents, 1% (n=3) omitted answering the question. Most of the respondents, 58% (n=197) as illustrated in Table 4.10 below obtained grade 12 as the highest level of education.

Table 4.10: Educational Level of respondents (n=341)

Demographics		Frequency	Percentage
Educational Level	Degree	n=24	7%
	Diploma	n=89	26%
	Grade 12	n=197	58%
	<Grade 12	n=31	9%

SIGNIFICANCE

As illustrated in Table 4.11. the association was not significant (p>0.05), thus educational level in this study has no significant role in adherence to treatment collection with a Chi-square value of 1.35.

Table 4.11: Educational level and its association with Adherence

Educational level	Always honour appointment	% (n)	X^2-value	Probability
Degree	Yes	67% (n=16)	1.35	0.72
	No	33% (n=8)		
Diploma	Yes	76% (n=68)		
	No	24% (n=21)		
Grade 12	Yes	77% (n=152)		
	No	23% (n=45)		
<Grade 12	Yes	74% (n=23)		
	No	26% (n=8)		

⇒ DISCUSSION

According to a study done in Shenzhen, China, patients with lower educational levels had higher rates of non-adherence (Tang, et al 2015:3). In this study as indicated in Table 4.11 it is evident-that even though more than 60% of the respondents honoured their appointment irrespective of their educational level, the association was not significant (p>0.05), thus educational level in this study has no significant role in adherence to treatment collection.

4.4.7. RESPONDENTS DIAGNOSIS (A8)

Question A9 was answered by 95,9% (n=330) respondents and 4% (n=14) omitting this question, probably because in the information leaflet (annexure C, heading 9 - Information), respondents were

given an option not to disclose their diagnosis if not feeling comfortable. They also had the option to choose more than one condition, and 15 respondents 4,3% (n=15) chose more than one diagnosis in this study.

Majority of respondents are HIV positive 81% (n=266), followed by hypertension at 22% (n=74), then Diabetes mellitus at 2% (n=6), Tuberculosis at 1% (n=3), asthma 1% (n=3) and epilepsy and arthritis at 1% both having (n=1) as shown in Table 4.12 below.

Table 4.12: Respondents Diagnosis (n=330)

Diseases	Diabetes Mellitus	Hypertension	HIV positive	Heart disease	Asthma	Epilepsy	Arthritis	Tuberculosis
No	98% (n=324)	78% (n=256)	19% (n=64)	99% (n=327)	99% (n=327)	99% (n=329)	99% (n=329)	99% (n=327)
Yes	2% (n=6)	22% (n=74)	81% (n=266)	1% (n=3)	1% (n=3)	1% (n=1)	1% (n=1)	1% (n=3)

⇒ **DISCUSSION**

It was found in a study conducted in New York that poor adherence to medications is unfortunately widespread in overall health conditions and medication regimens (Stirratt, et al 2015:471). According to Magadzire, et al (2017:82), the majority of patients who missed appointments were females (66%), with a median age of fifty-six, suffering from mainly, diabetes and/or hypertension, while in this study majority of respondents are HIV positive 81% (n=266), the limitation is that association between diagnosis of the patient and adherence was not measured, due to omitted data from statistician.

4.5. SECTION B: SERVICE DELIVERY

Section B reflected on service delivery factors, outlined as follows B1 = Pick-up points, B2 Accessibility of PUP, B3 Waiting time and B4 Information given to patients during their visits at their chosen PUP. Health service Delivery means the provision of healthcare services to patients, their families and the community at large and this includes the availability of medicines, accessibility and reasonable waiting time in this study.

In the discussions of this section, graphs and figures will be presented to explain service delivery factors, followed by another table to explain the relationship between these factors and adherence.

4.5.1. PICK-UP POINT (B1)

Under pick-up points, four items are included, namely: name of the chosen pick-up point, location of chosen pick-up point, type of pick-up point, if respondents were able to honour their appointment date and if not, what were the reasons. Each one of the items is discussed in the next sections.

4.5.1.1. NAME OF THE CHOSEN PICK-UP POINT (B1.1)

All the respondents completed this question, thus n=344 for this question. Respondents were allowed to choose the pick-up point which is more convenient for them and the following were the results. From Table 4.13 and Figure 4.2 below, most of the respondents 49% (n=167) indicated that they collect their medication from Adelaide Tambo (internal) PUP or from Clicks as an external PUP 49% (n=168) in different locations, while a total of 3% (n=9) indicated that they collect medication from Mandisa Shiceka and other facilities (Dischem, MediRite, Wingtip Clicks and Doctor Mohlolo).

Table 4.13: Name of the Pick-up Point (n=344)

Pick-up point name	Frequency	Percent
Adelaide Tambo	n=167	49%
Clicks (different locations)	n=168	49%
Dischem Jubilee mall	n=2	1
Dr Mohlolo	n=1	0,3%
Mandisa Shiceka	n=4	1%
MediRite	n=1	0,3%
Wingtip	n=1	0,3%

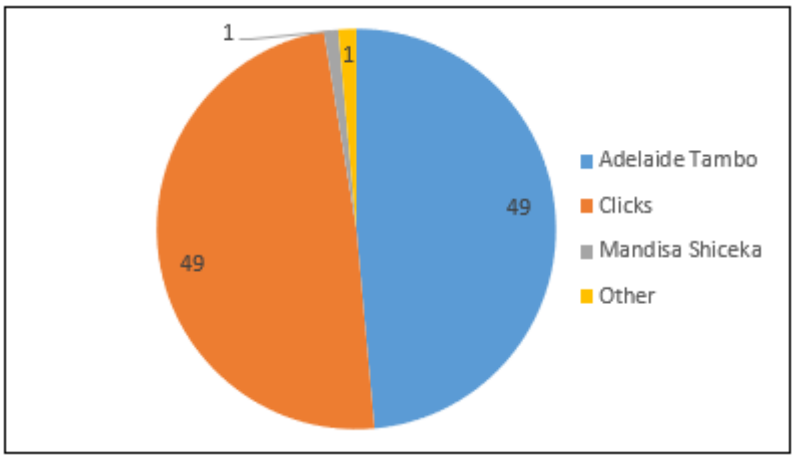

Figure 4.2: Name of Pick-up Point

SIGNIFICANCE

Table 4.14 shows evidence of the association between pick-up point name and medicine collection adherence with a probability value of 0.008 and a Chi-square value of 11.79. Out of 262 respondents who honoured their appointments, a majority 83% (n=140) were collecting medication from Clicks, whereas 45% (n=117) were collecting from Adelaide Tambo clinic, the least 1% (n=3) collecting from Mandisa Shiceka Clinic and 1% (n=3) collecting from other facilities. From eight-two respondents who indicated that they did not adhere to their appointments of collecting medicine, the highest percentage 61% (n=50) was collecting medication from Adelaide Tambo, followed by 17% (n=28), 4% (n=3) and 1% (n=1) from Clicks, other PUP facilities and Mandisa Shiceka, respectively.

Table 4.14: Association between Adherence and Pick-up Point

PUP name	Honour appointments	Do not honour appointments	X^2- value	Probability
Adelaide Tambo	70% (n=117)	30% (n=50)	11.79	0.008
Clicks	83% (n=140)	17% (n=28)		
Mandisa Shiceka	1% (n=3)	1% (n=1)		
Other	1% (n=2)	4% (n=3)		
Total	262	82		

⇒ DISCUSSION

It is difficult to assimilate information from previous studies as there is currently no available literature about adherence to pick-up points. Adelaide Tambo Clinic is located in an agricultural farming area with no malls (malls are more than 20km away) and patients residing on small holdings/plots in the surrounding area. They have no choice but to use the Adelaide Tambo Clinic internal PUP, which accounted for the 49% (n=167) whereas, with Mandisa Shiceka Clinic 1,2% (n=4), there is a mall less than 5km with Clicks, Dischem and Doctor's surgery acting as PUP for 49% (n=168) of respondents as reflected in Table 4.13 and Figure 4.2 above.

4.5.1.2. LOCATION OF PICK-UP (B1.12)

Question B1.2 was completed by 99% (n=342) and 1% (n=2) omitting the question. Most of the respondents 49% (n=167) are collecting their medication at Adelaide Tambo Clinic as their internal pick-up point, which is situated in Pyramid area, and as earlier indicated, there is no mall near to the Pyramid area. Jubilee Mall which is located in Temba and had 42% (n=146) of respondents collecting medication there (Clicks, Dischem, and MediRite) as shown in Table 4.15 below.

Table 4.15: Pick-up Point Location (n=342)

Pick-up point location	Frequency	Per cent
Centurion	n=1	0.3%
Fairyella	n=1	0.3%
Hammanskraal	n=2	0.6%
Kolonnade	n=1	0.3%
Mabopane	n=1	0.3%
Mandela	n=2	1%
Mayville	n=2	1%
Menlyn	n=2	1%
Midrand	n=1	0.3%
Montana	n=3	1%
Pretoria CBD	n=5	2%
Pretoria North	n=3	1%
Pyramid	n=166	49%
Silver lakes	n=1	0.3%
Soshanguve	n=1	0.3%
Temba	n=146	43%
Faerie glen	n=1	0.3%
Winterveldt	n=1	03%
Wonderboom	n=2	1

4.5.1.3. TYPE OF PICK-UP POINT USED BY RESPONDENT (B1.13)

All respondents completed the question, thus n=344. Respondents chose both external and internal pick-up points which are more convenient to them: 51% (n=176) collect their medication from an external PUP, mostly being Clicks in different locations, and 49% (n=168) collect from internal PUP and these respondents are primarily using Adelaide Tambo Clinic as discussed above.

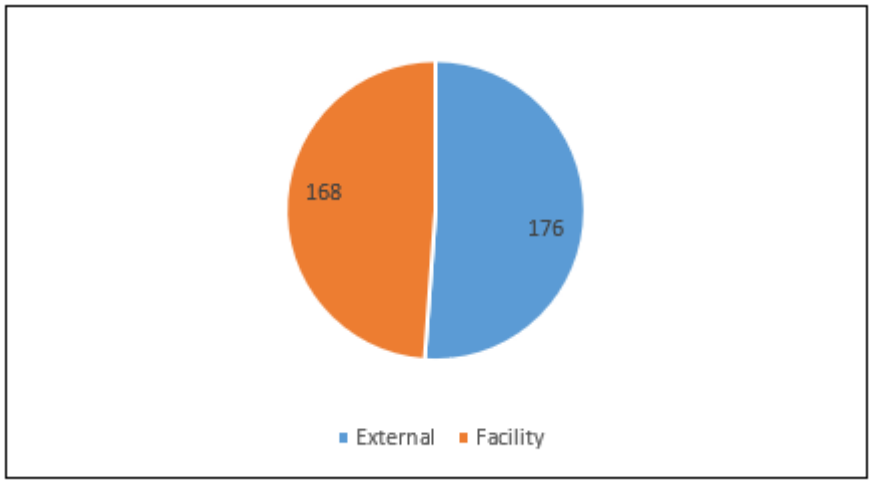

Figure 4.3: Type of Pick-up Point (n=344)

Out of 168 respondents who collected their medication at Adelaide Tambo, 99% (n=166) regard it as an internal PUP facility, while only 50% (n=2) of respondents regard Mandisa Shiceka as an internal PUP facility. Clicks, other PUP and 50% (n=2) of Mandisa Shiceka are regarded as external PUP facilities, probably because there is an Adherence Club at Mandisa Shiceka clinic and patients regard that as an external PUP (Table 4.16).

Table 4.16: Association between the name of pick-up point and type of pick-up point

Pick-up point name	External	Internal	X^2- value	Probability
Adelaide Tambo	1% (n=2)	99% (n=166)	336	<0.001
Clicks	100% (n=168)	0		
Mandisa Shiceka	50% (n=2)	50% (n=2)		
Other	100% (n=4)	0		
Total	176	168		

⇒ **SIGNIFICANCE**

There is a significant association (p=0.01) between the type of pick-up point used and honouring the appointment with an X^2-value of 6.34. More than 70% of respondents in both facility (internal) PUP 70% (n=118) and external PUP 82% (n=144) always honour their appointments of collecting medications as compared to 30% (n=50) and 18% (n=32) of respondents respectively from facility (internal) and external PUP, respectively, who did not honour their appointments (Table 4.17 below).

Table 4.17; Association between the type of pick-up point and adherence

Pick-up point type	Always honour appointment	% (n)	X^2-value	Probability
Facility (Internal)	Yes	70% (n=118)	6.34	0.01
	No	30% (n=50)		
(External)	Yes	82% (n=144)		
	No	18% (n=32)		

⇒ **DISCUSSION**

The number of respondents who used internal, 49% (n=168) and external 51% (n=176) pick-up points was almost the same, as depicted in Figure 4.3 above. This would imply that respondents use the pick-up point that is more convenient for them. No literature could be found to support the fact in this discussion.

4.5.1.4. HONOURING OF APPOINTMENT AT PICK-UP POINT (B1.4)

Questionnaires were distributed to N=344 respondents, and all of the respondents completed the questions, thus n=344.

Table 4.18 below shows that most of the respondents 76% (n=262) honoured their appointments whereas, 24% (n=82) of the respondents failed to honour their appointments.

Table 4.18: Honouring appointment (n=344)

Always honour appointment	Frequency	Per cent
No	n=82	24%
Yes	n=262	76%

SIGNIFICANCE

The results show a significant difference ($p<0.001$) between respondents who honoured their appointment 76% (n=262) and respondents who did not honour their appointment 24% (n=82), with an X^2-value of 94.19 (Figure 4.4 below).

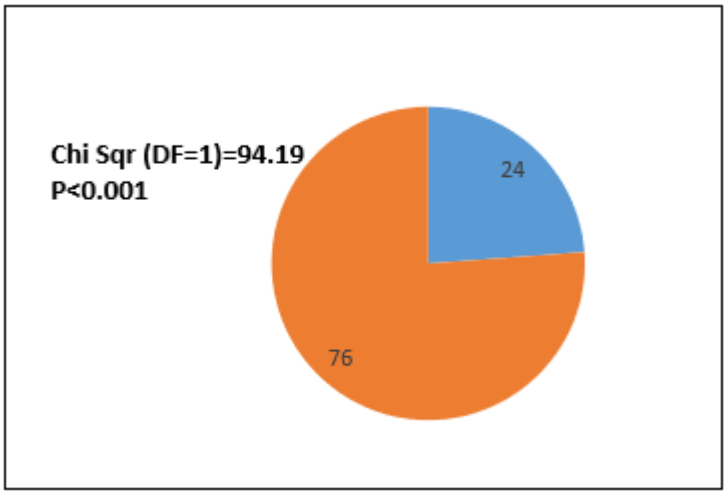

Figure 4.4: Honour appointment at pick-up point

⇒ **DISCUSSION**

A study done in India has revealed that failure to keep scheduled appointments and non-adherence is a common problem in healthcare facilities (Hegde, Fathima, Agrawal & Misquith 2015:2). Adelufosi, et al (2013:285) alluded that non-adherence of patients with schizophrenic in Nigeria is about 20,4%. In two studies from Saudi Arabia, the results found rates of non-adherence at 23.7% and 30% (Zahi 2013:258). According to a study done in New York, adherence to medication for non-communicable diseases (NCDs) was 62,8% (Kyanko, et al 2013:326), while a study done in the Eastern Cape (SA) by Katende-Kyenda (2018:1014) revealed an adherence rate of 56.6%.

The above literature is consistent with this study and shows that nonadherence of 24% (n=82) is a problem.

4.5.1.5. REASONS FOR NOT HONOURING APPOINTMENT (B1.4.B)

From 24% (n=82) respondents who did not honour their appointment, only 91% (n=75) respondents completed the question, and 9% (n=7) omitted the question as it was an open-ended question whereby respondents were requested to elaborate or explain their reasons for not honouring their appointments.

Figure 4.5 and Table 4.19 below reflect that 76% (n=262) of respondents honoured their appointments. The 11% (n=39) of respondents who missed their appointments for collecting their medication indicated that they were at work at the time of their appointments, while 3% (n=10) received a late SMS alert, and 3% (n=12) were travelling. Two per cent (n=6) indicated that they did not have money to go for their appointments while the other 2% (n=6) said they had just forgotten and others just missed their appointments which corresponds to the 1% (n=2) who had no reason for missing appointments.

Table 4.19: Reasons for not honouring the appointment (n=75)

Why did you miss the appointment	Frequency	Per cent
Late SMS	n=10	3%
Forgot	n=6	2%
NA (Honoured their appointment)	n=262	76%
No money	n=6	2%
No reason	n=2	1%
Travelling	n=12	3%
At work	n=39	11%

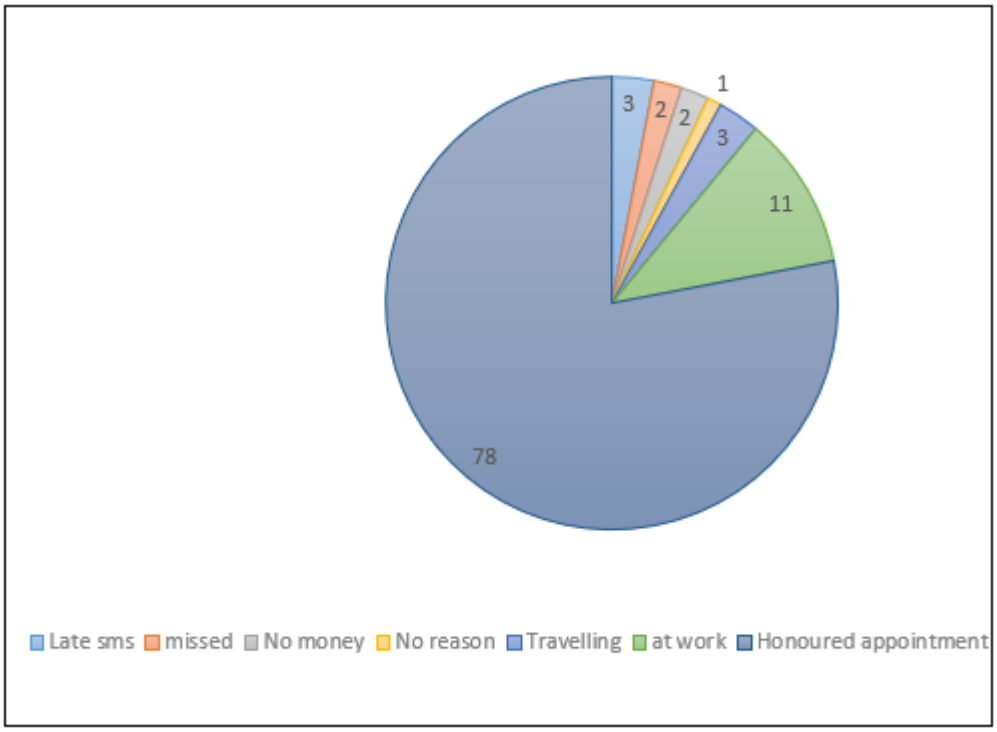

Figure 4.5: Reasons for not honouring Appointment

SIGNIFICANCE

The association between the pick-up point facility and the reason for not collecting medicine was evident with a probability value of <0.001 and an X^2 value of 54.90. The respondents indicated that reasons for not adhering to medical collection range from getting a late notification or did not have money to go for their appointments, others were travelling or at work at the time of collection, while others said that they had no reason for missing the appointment (Table 4.20).

Table 4.20: Reasons for nonadherence and association with pick-up point

PUP name	Honour appoint	Late SMS	Missed appointment	No money	No reason	Travel	At work	X^2-value	Probability
Adelaide Tambo	72% (n=120)	5% (n=8)	3% (n=5)	2% (n=4)	0% (n=0)	6% (n=10)	12% (n=20)	54.9	<0.001
Clicks	86% (n=144)	1% (n=2)	1% (n=1)	1% (n=2)	1% (n=1)	1% (n=2)	9% (n=16)		
Mandisa Shiceka	75% (n=3)	0% (n=0)	0% (n=0)	0% (n=0)	0% (n=0)	0% (n=0)	25% (n=1)		
Other	40% (n=2)	0% (n=0)	0% (n=0)	0% (n=0)	20% (n=1)	0% (n=0)	40% (n=2)		

⇒ DISCUSSIONS

According to Magadzire, et al (2017:5), missed appointments, mobility and temporary migration, forgetting or mixing up appointments, and especially work commitments are some of the reasons for nonadherence and these were some of the reasons found in the current study.

4.5.2. ACCESSIBILITY (B2)

This section deals with accessibility of the pick-up Point, which covers the distance from PUP, whether they can walk to their PUP or they are to use transport, and if the latter is the case, do they have money for transport, operational days and hours of their chosen PUP and if there is someone to collect their medication on their behalf. Each item from B2.1 – B2.12 is discussed in this section.

4.5.2.1. DISTANCE FROM PICK-UP POINT (B2.1)

Question B2.1 was completed by all respondents n=344.

As shown in Table 4.21 below, the majority of respondents 55% (n=191) live less than 5km away from their pick-up points, followed by 28% (n=95), who stay 5-10km away from their chosen pick-up point, whereas the least proportion of respondents 17% (n=58) stay more than 10km away from their pick-up point (Figure 4.6 below).

Table 4.21: Pick-up point distance (n=344)

Pick-up point distance	Frequency	Per cent
<5km	n=191	55%
5-10km	n=95	28%
>10km	n=58	17%

SIGNIFICANCE

The results show a significant difference ($p<0.001$) between the distance respondents travel to their PUPs (<5 km, 5km-10km and >10km) with an X^2-value of 82.19 (Figure 4.6 below), and the majority of respondents 55% (n=191) indicated that PUPs are accessible < 5km.

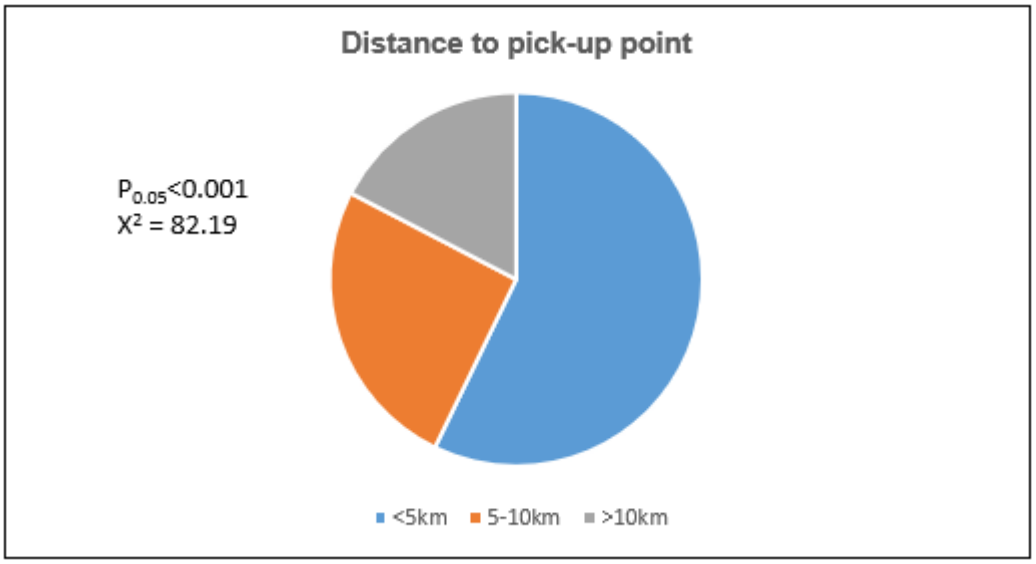

Figure 4.6: Distance to Pick-up point

SIGNIFICANCE

The external PUP shows that it is more accessible 67%-(n=118) with low kilometres (<5km) to travel. This might be attributed to the fact that patients choose a PUP closer to their residential areas. Internal PUPs are more than 26% (n=43) over 10km, probably because as discussed under item B1.1 above, most of the respondents who have chosen the internal PUP are mostly from Adelaide Tambo Clinic and they do not have any other alternative (Table 4.22 above) and Figure 4.7 below.

The results show a significant difference (p<0.001) between the PUP type (internal or external) and the distance respondents travel to their PUP (<5km, 5km-10km and >10km) with an X^2-value of 24.80 (Figure 4.7 below).

Table 4.22: Pick-up point type and distance

Pick-up point distance	<5km	5-10km	>10km
External	67% (n=118)	24% (n=43)	9% (n=15)
Internal	43% (n=73)	31% (n=52)	26% (n=43

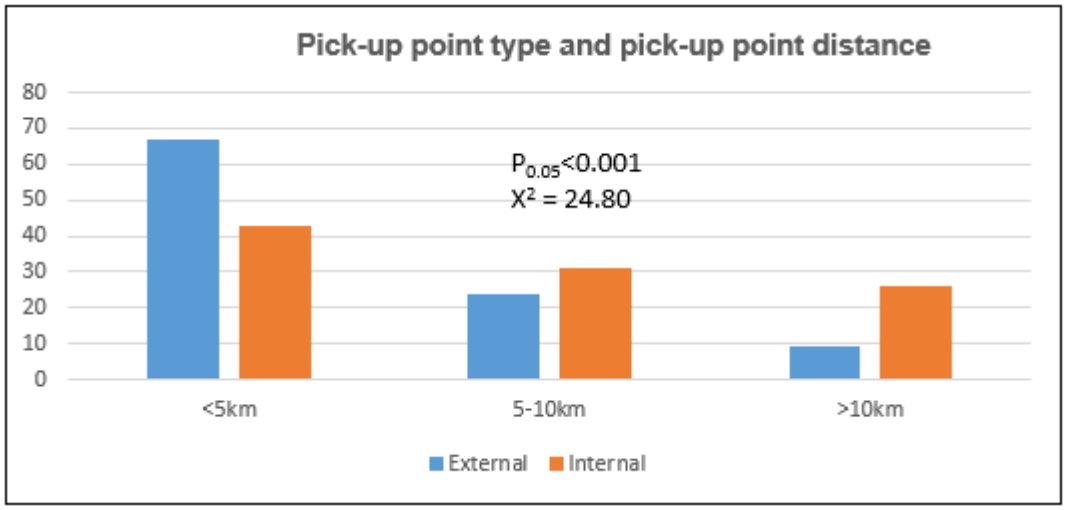

Figure 4.7: Pick-up point type and distance

Table 4.23 shows that Adelaide Tambo clinic is the highest with 26% (n=43) of respondents stating that they travel more than 10km, this is attributed to the fact that there is no mall around the area and thus no alternative for an external PUP, whereas Mandisa Shiceka clinic had no one staying >10km away from their PUP.

Table 4.23: Distance from different pick-up points (name)

Pick-up point distance	<5km	5-10km	>10km
Adelaide Tambo	43% (n=72)	31% (n=52)	26% (n=43)
Clicks	67% (n=113)	24% (n=40)	9% (15)
Mandisa Shiceka	75% (n=3)	25% (n=1)	0
Other	60% (n=3	40% (n=2)	0

SIGNIFICANCE

The results show a significant difference (p<0.0002) between PUPs (Adelaide Tambo Clinic, Clicks, Mandisa Shiceka Clinic and others) and the distance respondents travel to those PUPs (<5km, 5km-10km and >10km) with X^2-value of the 26.62 (Figure 4.8 below). Adelaide Tambo clinic is the highest, with 26% (n=43) of respondents stating that they travel more than 10km this is attributed to the fact that there is no mall around the area and thus no alternative for an external PUP.

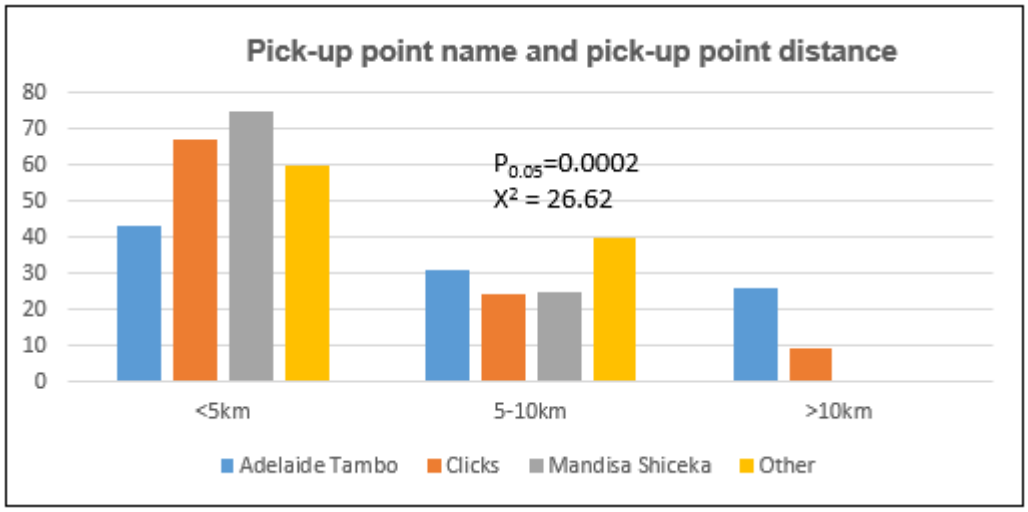

Figure 4.8: Comparison between Pick-up point name and pick-up point distance

Table 4.24 shows that 59% (n=155) of those staying less than 5km away from the facility, honour their appointment schedules, whereas 44% (n=36) of the same group do not honour their appointments.

Table 4.24: Association of distance and nonadherence

Pick-up point distance	<5km	5-10km	>10km
Do not honour appointments	44% (n=36)	38% (n=31)	18% (n=15)
Always honour appointments	59% (n=155)	25% (n=65)	16% (n=43)

Figure 4.9 below reflects that a smaller proportion 16% (n=43) of those staying more than 10km away from their PUP always honour their appointments, whereas 18% (n=15) do not honour their appointments

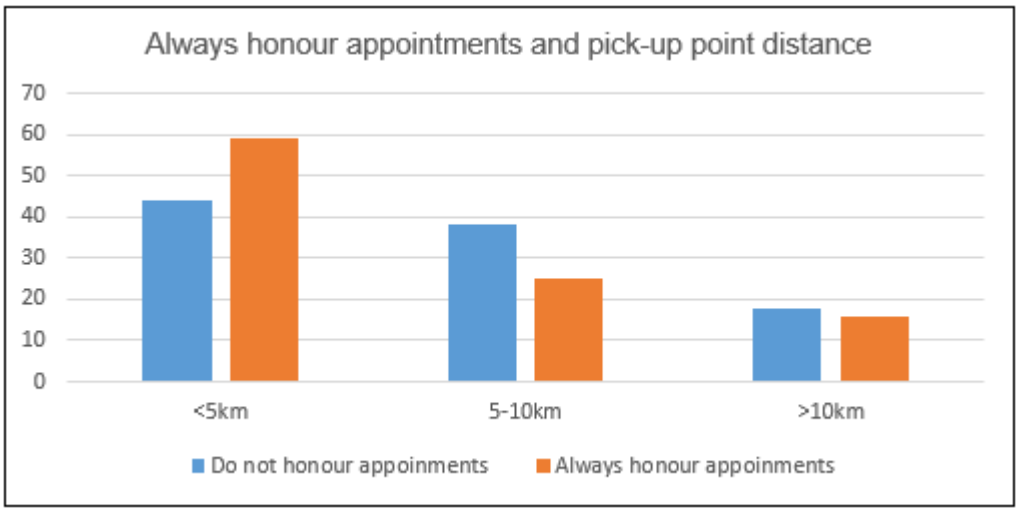

Figure 4.9: Association of distance and adherence

⇒ **DISCUSSION**

According to Tang, et al (2015:4), in a study done in China, patients who needed longer travel time to the nearest healthcare facility were more likely to miss their medication than those who took less than 15 minutes.

Participants from the study done in Namibia highlighted that distance to the healthcare facility and not having money for transport is a major problem in adhering to follow-up appointments (Bauleth, et al 2016:96).

Findings from this study align with the above-mentioned studies that staying far from healthcare facility/PUP is a significant predictor of nonadherence.

4.5.2.2. ABLE TO WALK TO THEIR CHOSEN PICK-UP POINT (B2.2)

All respondents completed the question n=344. Table 4.25 below shows that 51% (n=174) are able to walk to their chosen PUP, while 49% (n=170) were unable to walk to the PUP for the collection of their medication.

Table 4.25: Able to walk to the pick-up point (n=344)

Walk to Pick-up point distance	Frequency	Per cent
Yes	n=174	51%
No	n=170	49%

Figure 4.10: Able to walk to pick-up point

Table 4.26: Adherence and being able to walk to pick-up point

Able to walk to the Pick-up point distance	Yes	No
Do not honour appointments	46% (n=38)	54% (n=44)
Always honour appointments	52% (n=136)	48% (n=126)

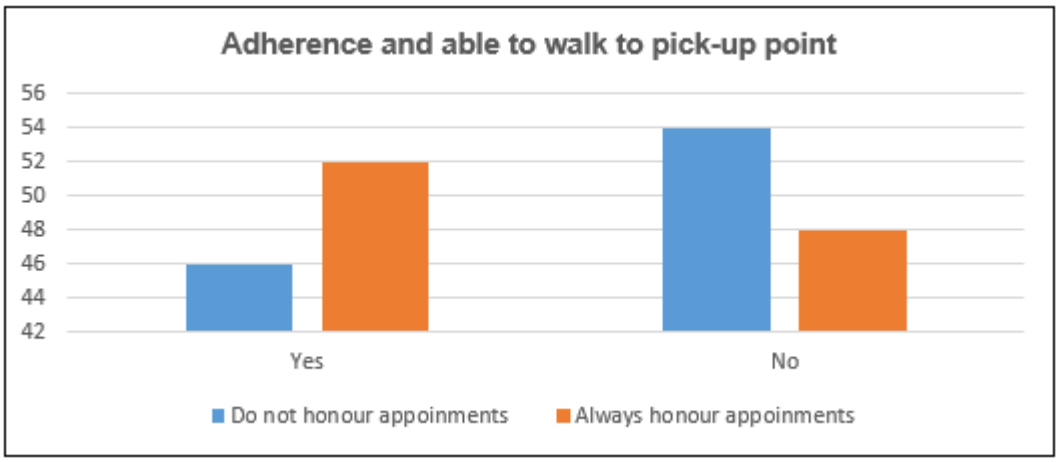

Figure 4.11: Association between adherence and being able to walk to the pick-up point

⇒ **DISCUSSION**

Table 4.26 and Figure 4.11 above show that being able to walk to a PUP is not a significant factor in adherence to the collection of medication. No literature could be found to support this point.

4.5.2.3. PICK-UP POINT ACCESSIBLE (B2.3)

All respondents completed the question, thus n=344 for question B2.3. The majority of respondents, 77% (n=265), stated that their chosen PUP is accessible, while 23% (n=79) said the PUP is not accessible, as indicated in Table 4.27 and Figure 4.12 below.

Table 4.27: Pick-up point accessible (n=344)

Pick-up point distance accessible	Frequency	Per cent
Yes	n=265	77%
No	n=79	23%

SIGNIFICANCE

Figure 4.12 illustrates a significant difference ($p<0.001$) between PUP and accessibility with an X^2-value of 100.57. The number of respondents who indicated that PUP is accessible, 77% (n=265), is equivalent to the number of respondents who indicated that they always honour their appointments, 76% (n=262), with a difference of 1% (n=3). Respondents who did not honour their appointment 24% (n=82) closer

to the number of respondents who indicated that their PUP is not accessible (view Table 4.18 and Table 4.27).

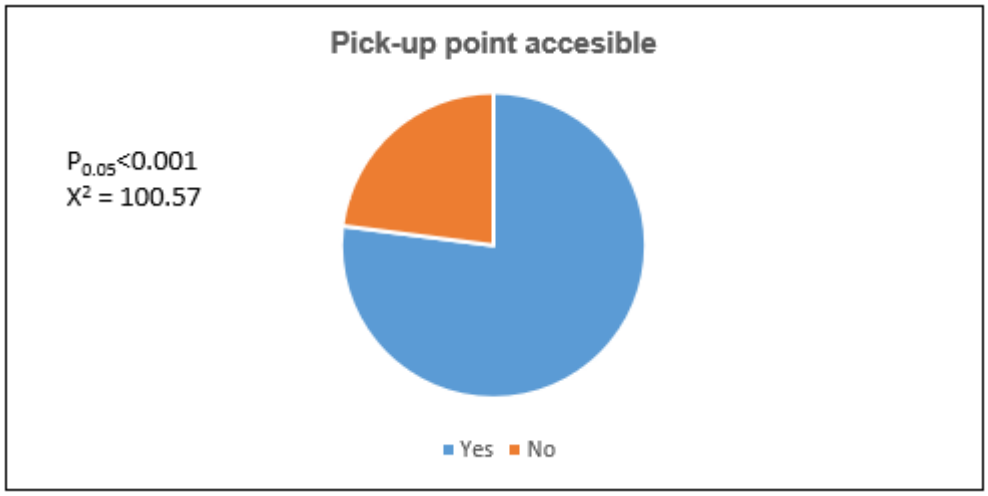

Figure 4.12: Pick-up point accessible

SIGNIFICANCE

Table 4.28 and Figure 4.13 shows that 81% (n=212) of respondents who always honour their appointments indicated that their chosen PUP is accessible, whereas 35% (n=29) of those who indicated their PUP is not accessible did not honour their appointment. Meaning that in this study there is a relationship between adherence and accessibility.

Table 4.28: Relationship between accessibility and adherence

Pick-up point Accessible	Yes	No
Do not honour appointments	65% (n=53)	35% (n=29)
Always honour appointments	81% (n=212)	19% (n=50)

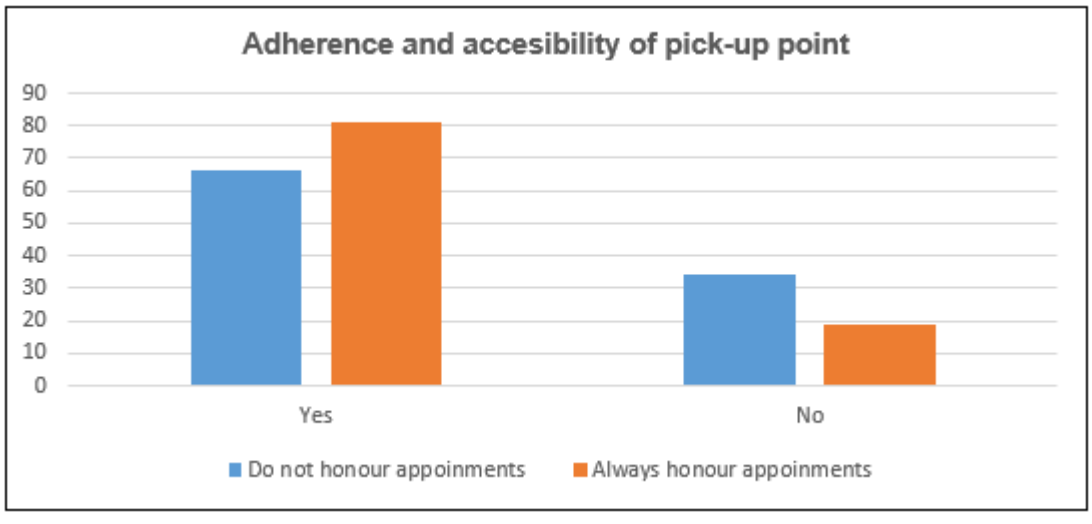

Figure 4.13: Relationship between accessibility and adherence

⇒ **DISCUSSION**

In a study conducted in India, it was identified that the predominance of restricted access to healthcare systems is the main cause of non-adherence (Medi, Mateti, Kandur & Konda 2015:26-29). The United Nations (UN) identified that chronic medication needs to be accessible and available to the population through pick-up points of not more than a 5km radius (United Nations [UN] 2011:51).

Findings in this study, according to Table 4.28 and Figure 4.13, affirm the above previous studies, reflecting that 35% of respondents who did not honour their appointment were in the group which said PUP is not accessible, meaning that accessibility of PUP is a significant factor in patients adhering to their medication.

4.5.2.4. USE PUBLIC TRANSPORT TO PICK-UP POINT (B2.4)

All respondents answered the question n=344. The majority of respondents, 67%(n=232), use transport to their PUPs, whereas 33%(n=112) are not using transport to collect their medication at their chosen PUP (Table 4.29 and Figure 4.14).

Table 4.29: Use of public transport to pick-up point (n=344)

Use transport to Pick-up point distance	Frequency	Per cent
Yes	n=232	67%
No	n=112	33%

SIGNIFICANCE

There is a significant difference ($p<0.001$) between the use of transport to a PUP with an X^2 value of 41.86 as illustrated in (Figure 4:14).

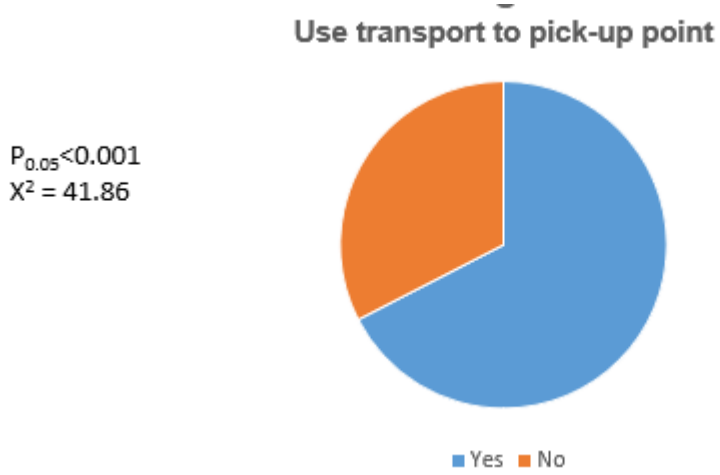

Figure 4.14: Use of public transport to a pick-up point

Table 4.30: Association between using transport and adherence

Use transport to a pick-up point	Yes	No
Do not honour appointments	68% (n=56)	32% (n=26)
Always honour appointments	67% (n=176)	33% (n=86)

⇒ **DISCUSSION**

Results from a study by Bauleth, et al (2016:97) indicated that patients who relied on transportation provided by other villagers to collect their medication had challenges in honouring their appointments as there was a lack of public transport in that area and patients had to wait for public transport availability.

Table 4.30 shows that 68% (n=56) of respondents who did not honour their appointment used public transport to collect their medication from PUPs, and this is consistent with the above study reflecting the results of patients who rely on public transport to collect medication poses challenges of adherence.

4.5.2.5. HAVE MONEY FOR TRANSPORT TO PICK-UP POINT (B2.5)

Question B2.5 was completed by 98% (n=338) and 2% (n=6) respondents omitted the question. Table 4.31 shows that 57% (n=193) had transport money to collect their medication, whereas 43% (n=145) did not have transport money to a PUP.

Table 4.31: Have money for transport (n=338)

Have transport money to go to pick-up point	Frequency	Per cent
Yes	n=193	57%
No	n=145	43%

SIGNIFICANCE

The results show no significant relationship ($p<0.0090$) between having transport money and adherence with an X^2-value of 6.82 (Figure 4.15 below), indicating, as illustrated in Table 4.32 and Figure 4.16, that transport money is not a significant factor for adhering.

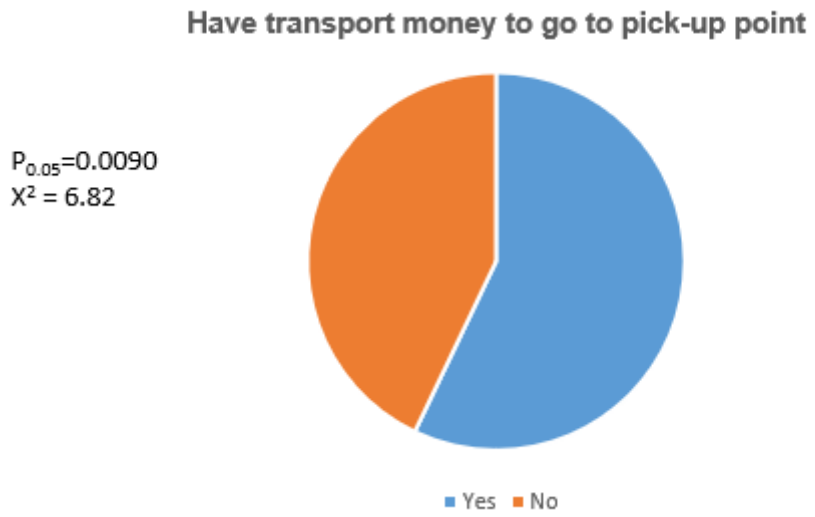

Figure 4.15: Have money for transport

Table 4.32: The relationship between having transport money and adherence

Having transport money	Yes	No
Do not honour appointments	50% (n=41)	50% (n=41)
Always honour appointments	59% (n=154)	41% (n=108)

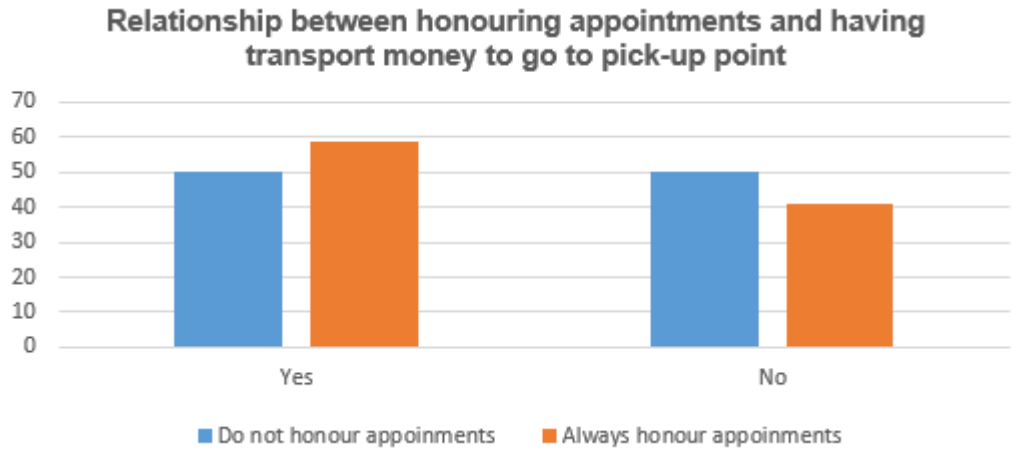

Figure 4.16: Relationship between having transport money and adherence

⇒ **DISCUSSION**

In a study done in Australia, Usherwood (2017:148), stated that out-of-pocket money appeared to be a barrier to accessing medicine, and further showed that it was even worse in disadvantaged areas. According to the study done at Western Cape, only a few patients reported reduced travelling costs and this was attributed to the fact that their sample only consisted of patients who collected medicines from the healthcare facility and not from alternative sites in the community (Magadzire, et al 2015:6). In KwaZulu-Natal it was found that poverty affected adherence negatively through lack of transport money to the clinic to collect their medicine, thus making treatment inaccessible (Cele and Riet, 2017:60).

In this study, there is no evidence of an association between having transport money and the adherence of patients as illustrated in Table 4.32 and Figure 4.16, meaning transport money is not a significant factor for adhering.

4.5.2.6. PICK-UP POINT OPERATIONAL DAYS (B2.6)

All respondents completed the question, n=344. The majority of respondents, 72% (n=246), indicated that their chosen PUPs are open Mondays to Fridays, whereas 23% (n=79) said that their PUPs are open Mondays to Saturdays, and smaller proportion, 5% (n=19), said PUPs open Monday to Sunday (Table 4.33)

Table 4.33: Operational days for pick-up points (n=344)

Pick-up points operational days	Frequency	Per cent
Mon-Fri	n=246	72%
Mon-Sat	n=79	23%
Mon-Sun	n=19	5%

SIGNIFICANCE

The results show a significant difference ($p<0.001$) between PUP operational days with an X^2 value of 241.33, as illustrated in Figure 4.17 below.

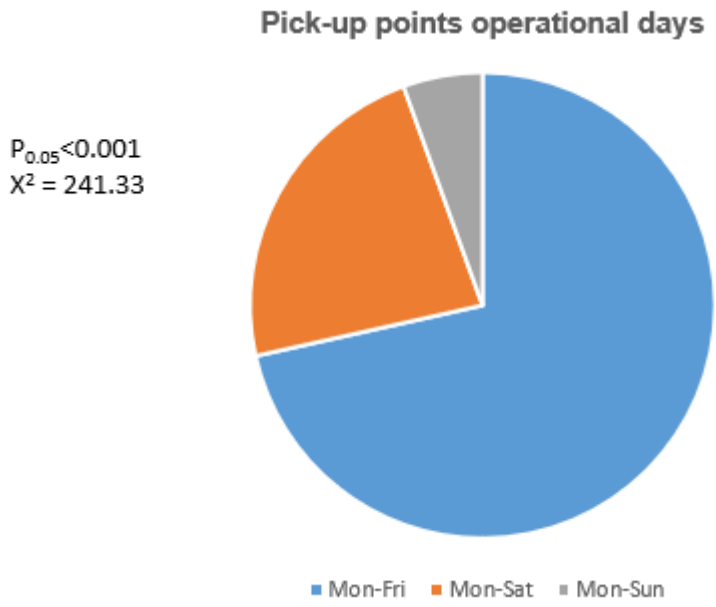

Figure 4.17: Operational days for pick-up points

Table 4.34 illustrates that 65% (n=53) of respondents who indicated that their PUP is operational Monday to Friday, 30% (n=25), Monday to Saturday, and 5% (n=4) who said PUP opens Monday to Sunday, did not honour their appointments. Whereas 74% (n=194) of respondents who indicated that their PUP operates from Monday to Friday honoured their appointments, meaning operational days have no influence on whether patients honour their appointments or not.

Table 4.34: Association between operational days and adherence

Pick-up point operational days	Mon-Fri	Mon-Sat	Mon-Sun
Do not honour appointments	65% (n=53)	30% (n=25)	5% (n=4)
Always honour appointments	74% (n=194)	20% (n=52)	6% (=16)

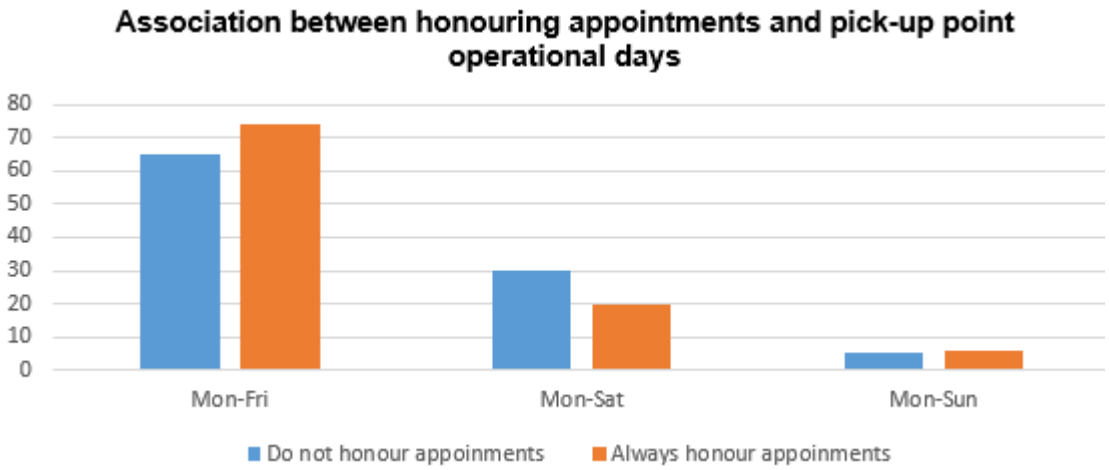

Figure 4.18: Association between operational days and adherence

⇒ **DISCUSSION**

A study conducted in South Africa found that inflexible facility opening working days (weekdays) clash with participant's family responsibilities and their employment opportunities (Dorward, et al 2020:6).

Findings in this study concur with the above literature that operational days have a relationship with adherence (Table 4.34 and Figure 4.18), with a P-value of <0.001 and an X^2 value of 241.33 Figure 4.17.

4.5.2.7. PICK-UP POINT OPERATIONAL HOURS (B2.7)

This question was completed by all respondents thus, n=344. Table 4.35 illustrates that the majority 74% (n=253) of respondents indicated that their PUPs are open between 8 am and 4 pm, 25% (n=87) indicated that PUPs are open between 7 am and 7 pm and 1% (n=4) specified open PUPs between 8 am and 8 pm.

Table 4.35: Pick-up point operational hours (n=244)

Pick-up point operational hours	Frequency	Per cent
8 am to 4 pm	n=253	74%
7 am to 7 pm	n=87	25%
8 am to 8 pm	n=4	1%

SIGNIFICANCE

Figure 4.19 below, shows no evidence of an association between pick-up point operational hours and medicine collection adherence with a probability value of > 0.001 and a Chi-square value of 280.37. Out of 253 respondents who indicated that their PUP opens between 8 am and 4 pm, adherence was 73% (n=193) and non-adherence at 74% (n=60), and for those who indicated that their PUP opens between 8 am and 7 pm, adherence was at 25% (n=65) and 27%(n=22) for nonadherence.

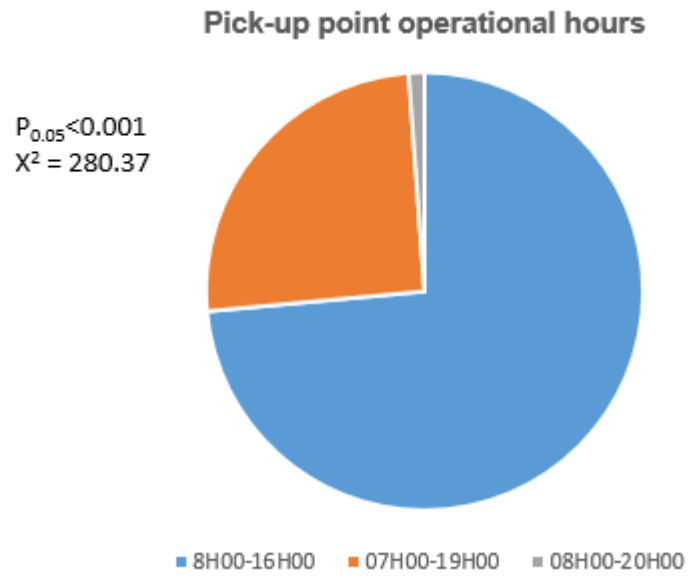

Figure 4.19: Pick-up point operational hours and adherence

Table 4.36: Association between operational hours and adherence

Pick-up point operational hours	8 am to 4 pm	7 am to 7 pm	8 am to 8 pm
Do not honour appointments	73% (n=60)	27% (n=22)	0
Always honour appointments	74% (n=193)	25% (n=65)	1% (n=3)

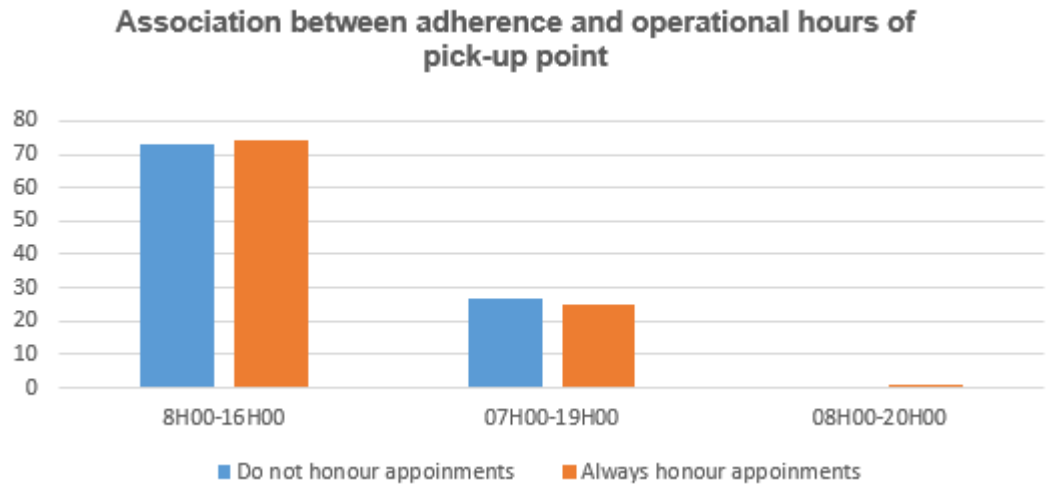

Figure 4.20: Association between operational hours and adherence

⇒ DISCUSSION

The study conducted in Mpumalanga, South Africa revealed that inflexible operating hours at healthcare facilities contribute to nonadherence because patients who work during the week, only have time during weekends (Mahlalela 2014:46). Contrary to that, respondents in this study are of the view that working hours of the facility do not contribute to nonadherence, meaning there is no association between pick-

up point operational hours and medicine collection adherence with a probability value of > 0.001 and a Chi-square value of 280.37 (Table 4.36, Figure 4.19 and Figure 4.20).

4.5.2.8. SOMEONE COLLECTING MEDICATION FOR RESPONDENT (B2.8)

All respondents completed the question, thus n=344. Of the total number of respondents who answered this question, 79,1% (n=272) stated that no one collects medication for them, while 20,9% (n=72) agreed that there is someone collecting medication for them (Table 4.37 and Figure 4.21).

In the discussions of this section, graphs and figures will be presented to explain whether there is someone collecting medication for the respondents and if there is a relationship between this and adherence.

Table 4.37: Someone collects for you (n=344)

Someone collects for you	Frequency	Per cent
Yes	n=72	21%
No	n=272	79%

SIGNIFICANCE

The association between someone collecting medicine on behalf of the respondents was evident with a probability value of <0.001 and an X^2 value of 116.28. The majority of respondents, 79% (n=272) indicated that there is no one collecting medication on their behalf, and out of 272 respondents, 81% (n=219) adhered to their appointments for medication collection (Table 4.38 and Figure 4.21).

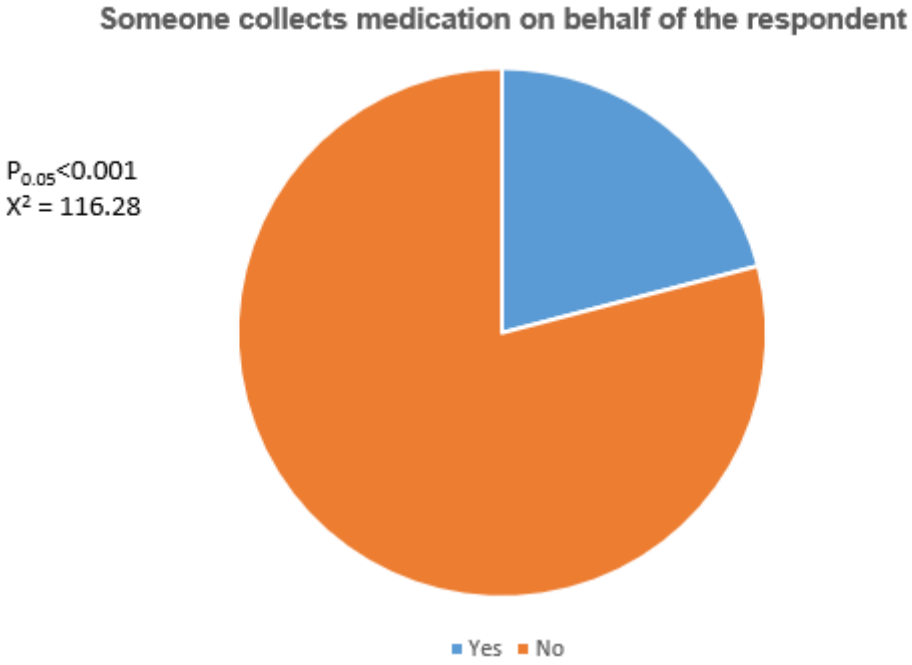

Figure 4.21: Someone collects for you

Table 4.38: Relationship between adherence and someone collecting medication for a patient

Someone collecting for you	Yes	No
Do not honour appointments	26% (n=21)	74% (n=61)
Always honour appointments	19% (n=51)	81% (n=211)

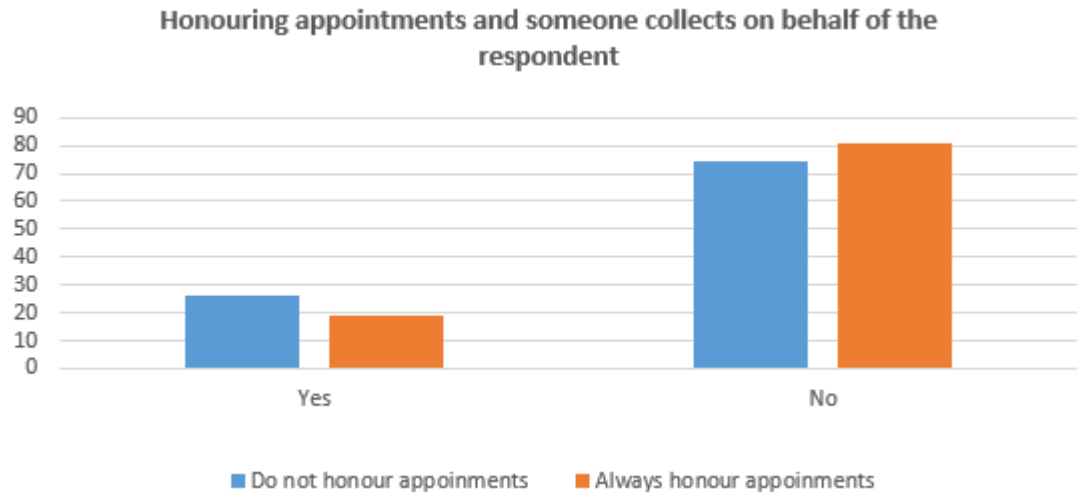

Figure 4.22: Relationship between adherence and someone collecting medication for patient

⇒ **DISCUSSION**

According to a study done in the Sekhukhune District (Limpopo Province) in SA, most of HIV positive patients were taking their ART treatment alone without support from anyone, and this was attributed to non-disclosure due to fear of being stigmatised, which in turn affected their adherence to treatment (Makgato 2018:65).

Findings in this study indicate that the majority of respondents, 79 (n=272) Table 4.38, are not having anyone to collect their medication from PUP with a probability value of 0.001 and an X^2 value of 116.28 (Figure 4.21), probably fearing stigmatisation, and this can be attributed to the fact that the majority of respondents in this study are HIV positive on ART 81% (n=266) (Table 4.12), and contrary to the above adherence is not affected by someone collecting medication for the patient (Table 4.38).

4.5.2.9. THE PERSON WHO COLLECTS MEDICATION FOR RESPONDENTS FROM THE PICK-UP POINT (B2.9)

From the N=344 questionnaires distributed, only 96% (n=331) completed the question and 4% (n=13) omitted the question. Most of the respondents, 82% (n=272), stated that no one collects medication for them, the highest of those who have someone to collect medication on their behalf, 7% (n=23),

indicated that their spouses collect medication for them, followed by the respondent's children at 5% (n=16) and the least being the employer at 1% (n=3) Table 4.39.

Table 4.39: Who Collects for respondents (n=331)

Who collects medication for the respondent	Frequency	Per cent
Spouse	n=23	7%
Children	n=16	5%
Sibling	n=8	2%
Employer	n=3	1%
Other	n=9	3%
No one collects for me	n=272	82%

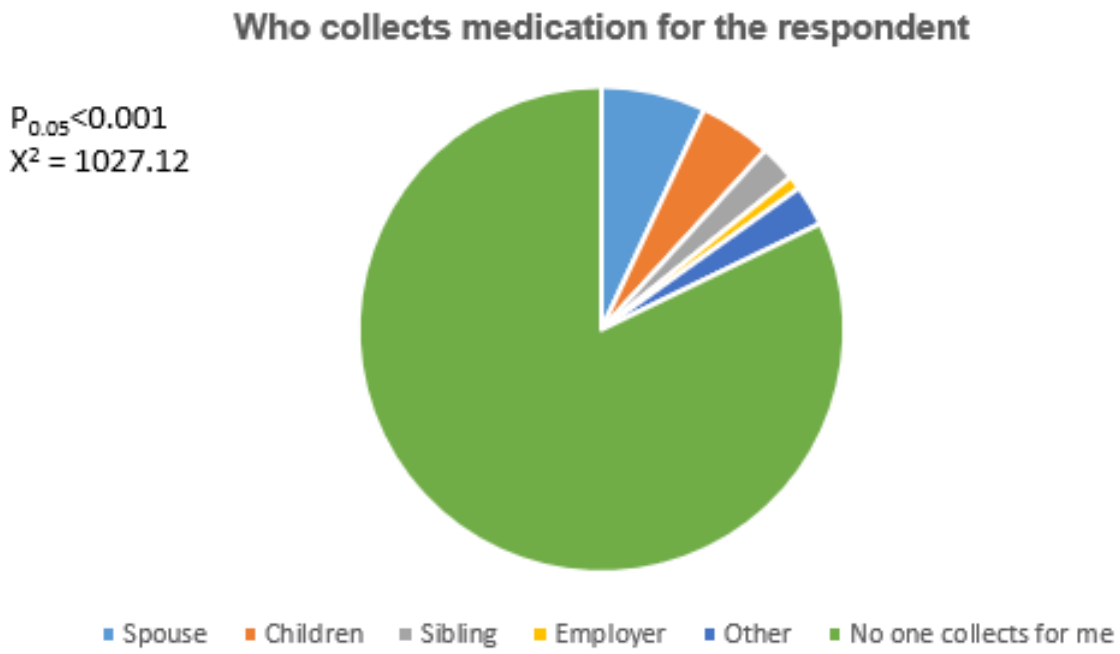

Figure 4.23: Who collects for the respondents

SIGNIFICANCE

There is a significant relationship between those who collect medication for the respondents and adherence with a probability value of 0.0066 and an X^2 value of 16.07 (Figure 4.24), and for those who stated that there is someone collecting medication on their behalf 7% (n=23) indicated that their spouse collect medication for them and 15% of 23 respondents did not honour their appointment and (Table 4.40). Furthermore, 76% (n=62) of respondents who stated that no one collects medication, did not honour their appointments.

Table 4.40: Association between who collects the medication and adherence

Who collects medication for the respondent?	Spouse	Children	Sibling	Employer	Other	No one
Do not honour appointments	15% (n=12)	4% (n=3)	0%	0%	5% (n=4)	76% (n=62)
Always honour appointments	5% (n=13)	5% (n=13)	3% (n=8)	1%(n=3	2% (n=5)	84% (n=210)

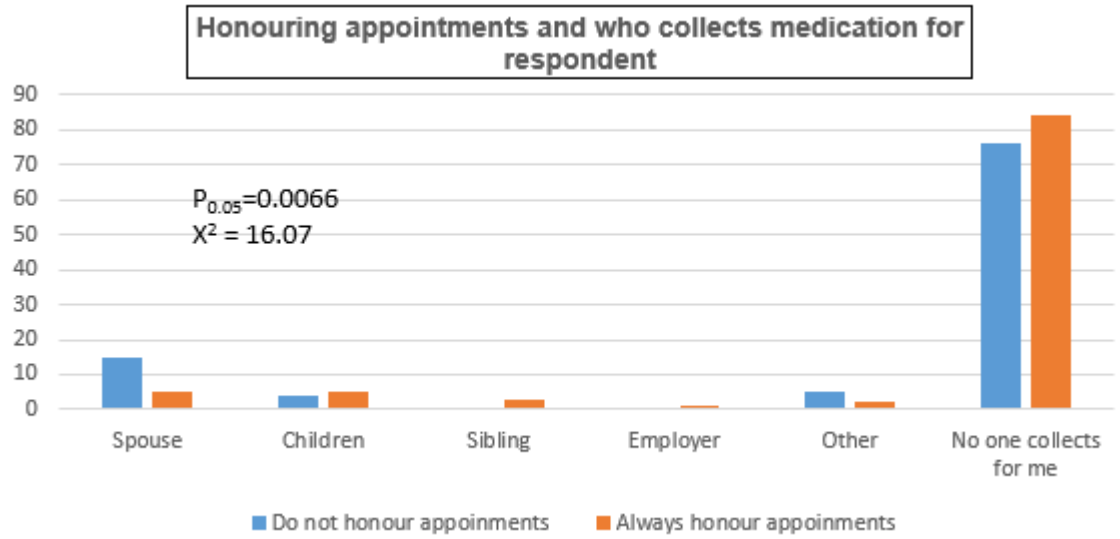

Figure 4.24: Association between who collects the medication and adherence

⇒ DISCUSSION

According to a study done in Sekhukhune District (Limpopo Province) in SA, most of HIV positive patients were taking their ART treatment alone without support from anyone and this was attributed to non-disclosure due to fear of being stigmatised, which in turn affected their adherence to treatment (Makgato 2018:65).

Similarly, findings in this study indicate that the majority of respondents 82% (n=272) (view Table 4.37) are not having anyone to collect their medication from PUP probably fearing stigmatisation, and this can be attributed to the fact that the majority of respondents in this study are HIV positive on ART 81% (n=266) (view Table 4.12), consequently, a lack of support may lead to poor adherence 76% (n=62) with a P-value of 0.006 and an X^2 16.07 (Table 4.40 and Figure 4.23, Figure 4.24).

4.5.2.10. RESPONDENTS HAVE TO BE ABSENT FROM WORK TO COLLECT MEDICATION (n=344)

Table 4.41: Respondents have to be absent from work to collect medication (n=344)

Respondents are absent from work while collecting medication	Frequency	Per cent
Yes	n=144	42%
No	n=80	23%
NA	n=120	35%

SIGNIFICANCE

As illustrated in Figure 4.25 below, it is evident that majority of respondents, 42% (n=144), have to absent themselves from work to collect medication with P value of 0. 0001 and X^2 value of 18.23.

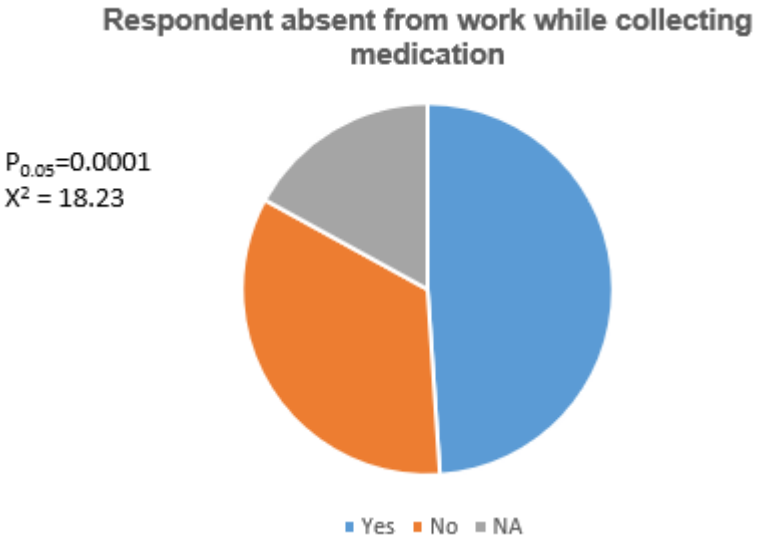

Figure 4.25: Respondent absent from work while collecting medication

⇒ **DISCUSSION**

According to Makgato (2018:65), patients working far from their workplace had to be absent themselves to collect their medication and this contributed to patients not honouring their appointments sometimes. Similarly, in this study for employed respondents, 42% (n=144) stated that they have to be absent from work to collect medication and the association of this factor with adherence was not measured in this study.

4.5.2.11. RESPONDENTS GET SICK NOTES WHEN COLLECTING THEIR MEDICATION (B2.12)

A total of N=344 questionnaires were distributed, and findings were calculated from 67% (n=231), indicating that 35% (n=120) respondents are not employed (Table 4.4) and therefore will not need a sick note, meaning that 6% (n=7) of the unemployed respondents completed the question although it was not meant for them.

According to Table 4.42, the majority of respondents, 68% (n=156), did not receive a sick note from their chosen PUPs, while a proportion of 32% (n=75) received sick notes from their PUPs when collecting their medication.

Table 4.42: Respondents get sick notes when collecting their medication (n=344)

Get sick note after collecting medication	Frequency	Per cent
Yes	n=75	32%
No	n=156	68%

SIGNIFICANCE

Figure 4.26 reflect that majority of respondents 68% (n=156) with P value of <0.001 and an X^2 = 28.40 did not receive sick note although working, probably because patients choose PUP closest to their workplace and thus can collect their medication during their break times.

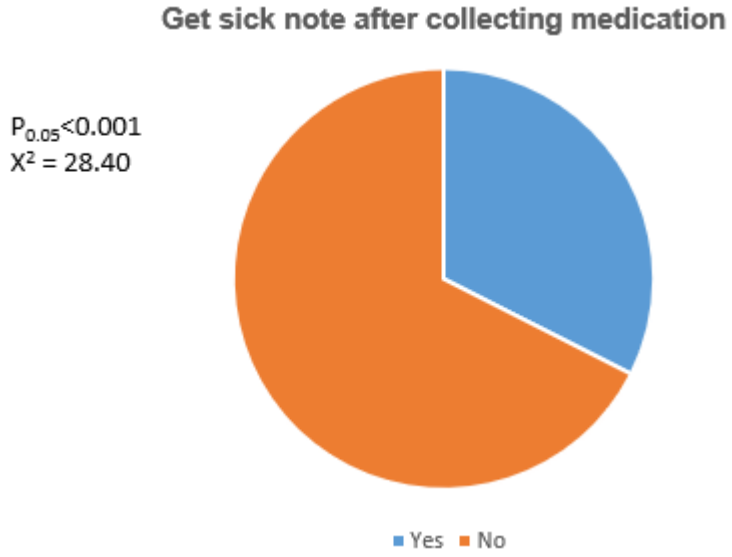

Figure 4.26: Get sick note after collecting medication

DISCUSSION

Table 4.4. depicts that 35% (n=120) of respondents are not employed and therefore will not need a sick note. It was revealed in this study that majority of respondents 68% (n=156) with P value of <0.001 and

an X^2 = 28.40 did not receive sick note although working, probably because patients choose PUP closest to their workplace and thus can collect their medication during their break times (Figure 4.26). No literature available to support this factor.

4.5.3. SECTION B3 WAITING TIMES

In this section, the aim is to determine and describe the contribution of waiting time at PUPs to the non-adherence of patients in collecting medicine from the CCMDD service providers in the Tshwane District. In the discussions of this section, graphs and figures are presented to explain the use of an appointment system and waiting time at PUP, followed by another table and a figure to explain the relationship between waiting times and adherence**.**

4.5.3.1. SYSTEM USED FOR APPOINTMENT SYSTEM AT PICK-UP POINTS (B3.1)

Question B3.1 was completed by all respondents n=344. Table 4.43 below shows that 99% (n=342) of respondents indicated that they use the appointment system that enables them to collect medications at the respective pick-up points.

Table 4.43: Use of appointment system (n=344)

Appointment system used	Frequency	Per cent
Yes	n=342	99%
No	n=2	1%

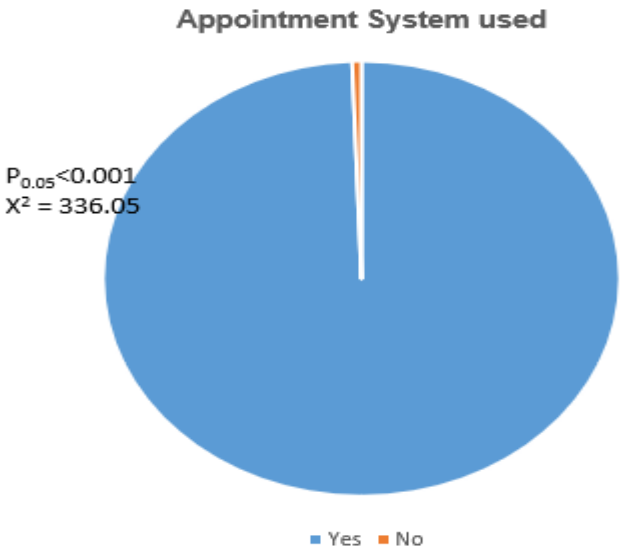

Figure 4.27: Association between use of appointment system and adherence

SIGNIFICANCE

There is no significant relationship (p>0.05) between using the appointment system and adherence to medication collection with an X^2 value of 336.05. 99% (n=342) of the respondents who agreed that the PUP they use for the collection of medication, uses an appointment system, and 100% (n=2) of respondents who indicated that there is no appointment system at PUP (Table 4.44 and Figure 4.28 below) honoured their appointments.

Table 4.44: Association between using appointment system and adherence

Appointment System used	Yes	No
Do not honour appointments	n=2 (100%)	n=0 (0%)
Always honour appointments	n=340 (99%)	n=2 (1%)

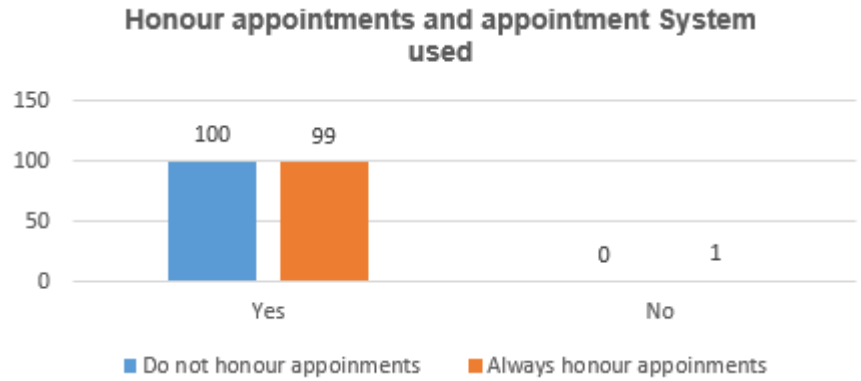

Figure 4.28: Honouring appointments and appointment system used

⇒ DISCUSSION

According to the study done in Canada most of the participants (92.3%) visited healthcare facilities on an appointment basis and the most commonly endorsed reasons for their visits were routine medical check-ups of their chronic conditions (drawing of blood or analysis of blood results) and renewing of a prescription (Thompson, et al 2016:4). The findings in this study are consistent with the study findings of Thompson, et al (2016:4) reflecting that the majority 99% (n=342) of respondents agreed that their PUPs use the appointment system as shown in Table 4.43. It was revealed in this study that the use of an appointment system has no significant relationship to adherence with P-value of < 0. 001 and an X^2 value of 336.05 (Figure 4.27 and Figure 4.28).

4.5.3.2. PEOPLE WAITING AT THE PICK-UP POINT (B3.2)

All the respondents completed the question n=344. The majority of the respondents, 95% (n=327), indicated that they always wait at the PUP, while 5% (n=17) said there are always no people waiting at the PUP (Table 4.45).

Table 4.45: People waiting at the pick-up point (n=344)

People waiting at pick-up point	Frequency	Per cent
Yes	n=327	95%
No	n=17	5%

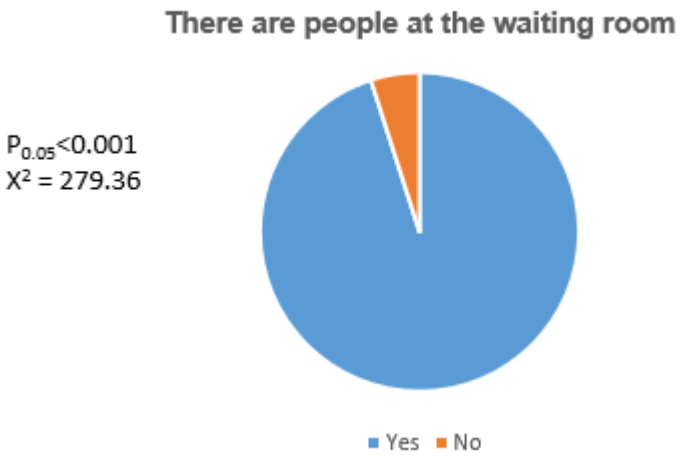

Figure 4.29: There are people at the waiting room

SIGNIFICANCE

Table 4.46 and Figure 4.30 below illustrate that there is no significant difference of patients waiting at the PUP type with P Value =0.008 and X^2 of 6.96, indicating that there are always patients waiting at PUP whether internal 98% (n=321) or external 92% (n=302)

Table 4.46: Type of pick-up point and people waiting

Pick-up point Type	people waiting at pick-up point	
	Yes	No
External	92% (n=162)	8% (n=14)
Internal	98% (n=165)	2% (n=3)

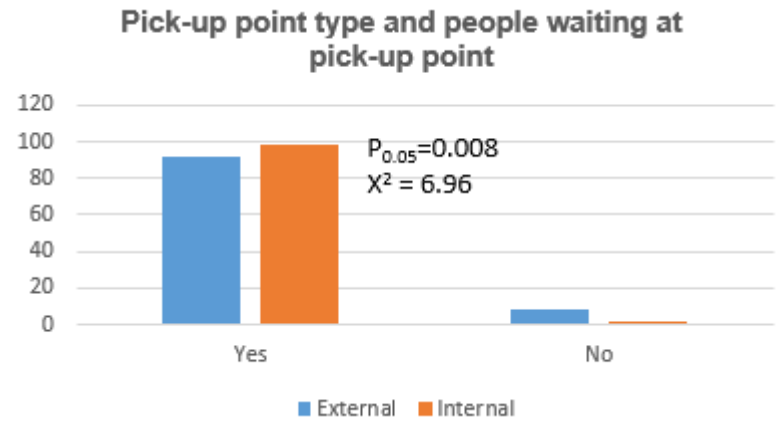

Figure 4.30: Pick-up point type and people waiting at pick-up point

From the results below, more than 95% of respondents from Adelaide Tambo 98% (n=163) as an internal PUP, Clicks and unknown PUPs 92% (n=154) as an external facility, stated that there are people always waiting in the waiting room.

Table 4.47: Waiting times at different the pick-up points

Pick-up point name	People waiting at the pick-up point	
	Yes	No
Adelaide Tambo	98% (n=163)	2% (n=3)
Clicks	92% (n=154)	8% (n=14)
Mandisa Shiceka	100% (n=4)	0%
Other	100% (n=4)	0%

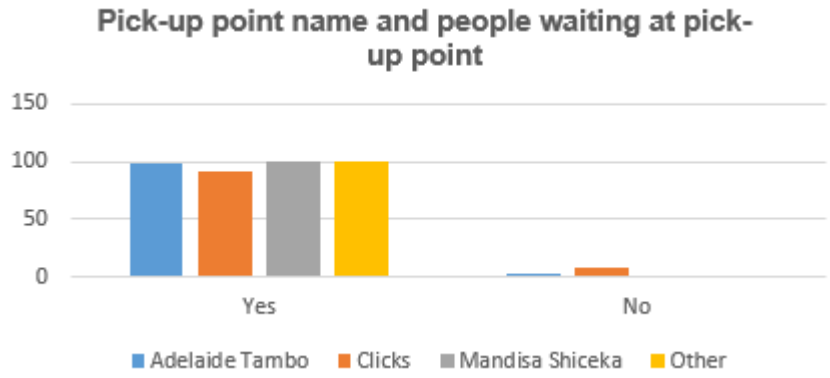

Figure 4.31: Pick-up point names and people waiting at pick-up points

SIGNIFICANCE

Table 4.48 below, shows no evidence of an association between people waiting at the PUP and medicine collection adherence, with a probability value of > 0.001 and a Chi-square value of 280.37.

Table 4.48: Association between adherence and people waiting

People waiting at the pick-up point	Yes	No
Do not honour appointments	98% (n=80)	2% (n=2)
Always honour appointments	99% (n=260	1% (n=2)

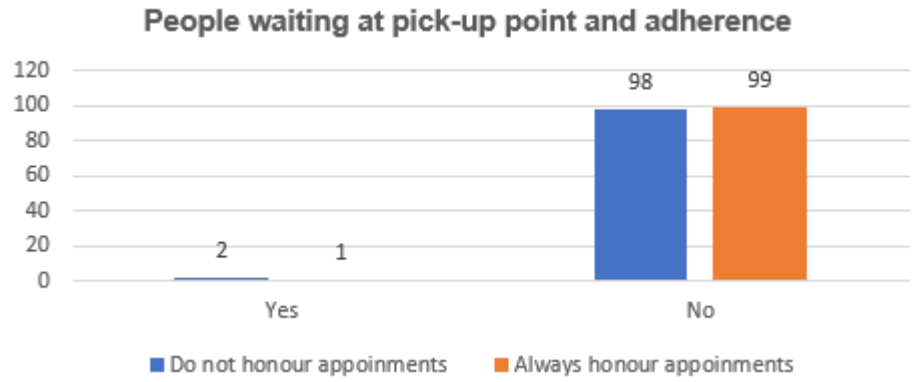

Figure 4.32: Association between adherence and people waiting

⇒ **DISCUSSION**

According to a study done in Namibia, participants indicated that factors like overcrowding and long queues were affecting their adherence negatively (Bauleth, et al 2016:95).

This study reflects that there are always people at PUPs for the collection of their medication and this has no significant relationship with their adherence as illustrated in (Table 4.48 and Figure 4.32). In this study, 98% (n=80) of respondents who indicated that there are people always waiting at PUP did not honour their appointments and 99% (n=260) of the same group honoured their appointments.

4.5.3.3.HOW MANY PEOPLE WAITING AT PICK-UP POINT (B3.3) n=331

Questionnaires were distributed to N=344 respondents and the question was completed by 96% (n=331) with 4% (n=13) respondents omitting the question.

Table 4.49 illustrated that 91% (n=301) majority of respondents indicated that at the waiting rooms of the PUPs, they always find 10 – 19 people waiting, 5% (n=17) indicated that there are 20 - 29 people always waiting at PUP, 1% (n=4) said they always find 30 -39 people waiting while 1% (n=3) specified

that there are more than 40 people waiting at the waiting room and 2% (n=6) were not sure of the number waiting.

Table 4.49: Number of people waiting at pick-up point (n=331)

How many people are in a waiting room	Frequency	Per cent
10-19	n=301	91%
20-29	n=17	5%
30-39	n=4	1%
>=40	n=3	1%
not sure	n=6	2%

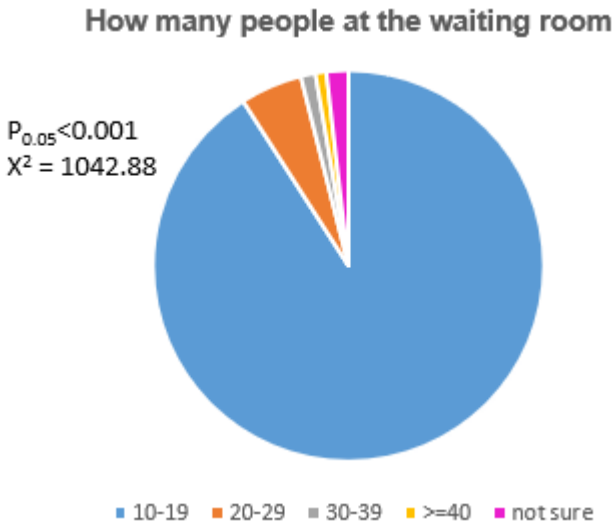

Figure 4.33: Number of people waiting at the pick-up points

Table 4.50: Pick-up point type and number of people waiting

Pick-up point Type	How many people are waiting at a pick-up point				
	10-19	20-29	30-39	>=40	Not sure
External	92% (n=155)	5% (n=8)	1% (n=2)	1% (n=2)	1% (n=2)
Internal	90% (n=146)	5% (n=8)	1% (n=2)	1% (n=2)	3% (n=4)

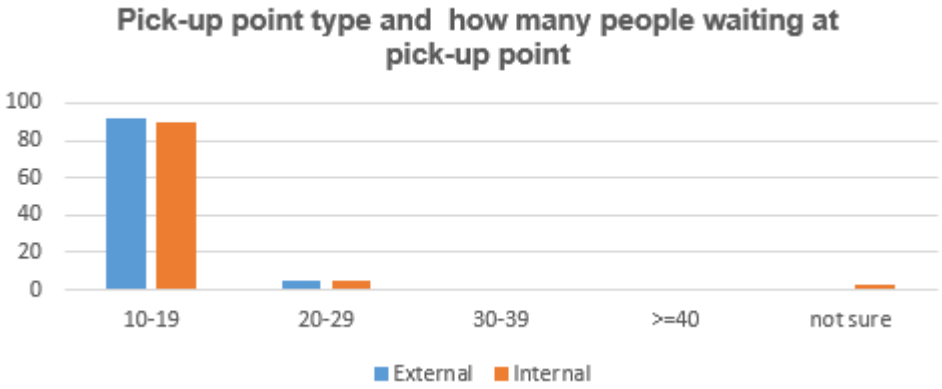

Figure 4.34: Pick-up point type and number of people waiting

SIGNIFICANCE

Figure 4.35 illustrates that there is a significant relationship ($p<0.05$, $X^2 = 44.98$) between the PUP facility and the number of people waiting at the PUP facilities, with more than 90% (n=143) of respondents from Adelaide Tambo (Table 4.51) as an internal 90% (n=146) PUP (Table 4.50). At Clicks and other PUPs as an external PUP, it was indicated that there are fewer than 20 people in the waiting room as compared to 50% (n=2) of respondents from Mandisa Shiceka. Similarly, 25% (n=1) of respondents from Mandisa Shiceka indicated that more than 40 people are always in the waiting room as compared to less than 10% of respondents from Adelaide Tambo, Clicks and unknown PUP. This also includes the other 25% (n=1) of respondents from Mandisa Shiceka who were not sure about the number of people in the waiting room.

Table 4.51: Pick-up point name and number of people waiting

Pick-up point name	How many people are waiting at a pick-up point				
	10-19	20-29	30-39	>=40	not sure
Adelaide Tambo	90% (n=143)	6% (n=10)	1% (n=2)	0%	3% (n=5)
Clicks	92% (n=151)	6% (n=7)	1% (n=2)	1% (n=2)	0%
Mandisa Shiceka	50% (n=2)	0%	0%	25% (n=1)	25% (n=1)
Other	100% (n=5)	0%	0%	0%	0%

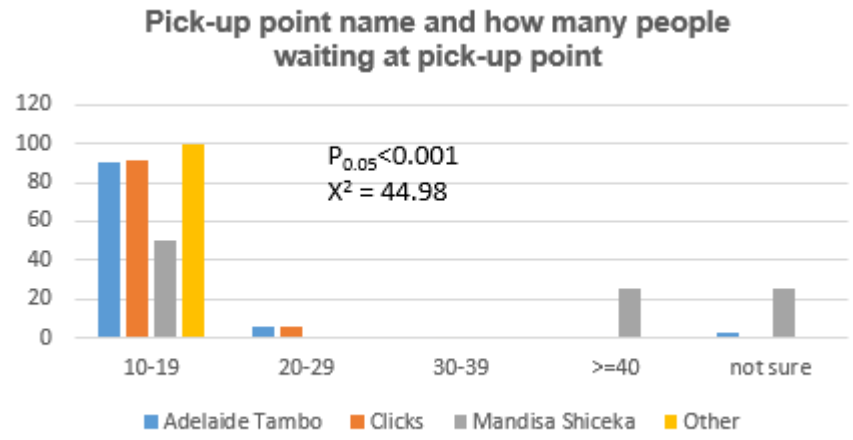

Figure 4.35: Pick-up point name and number of people waiting

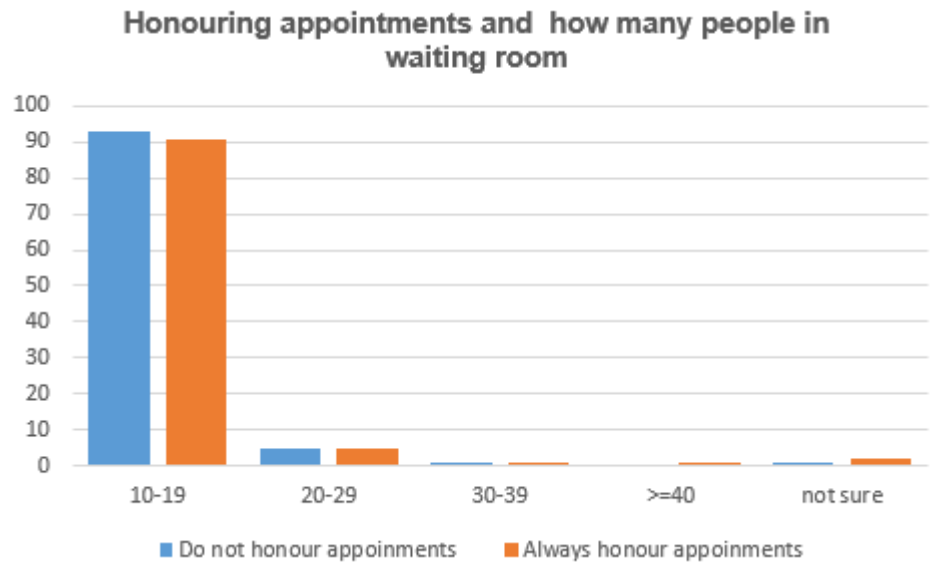

Figure 4.36: Association between number of people waiting and adherence

SIGNIFICANCE

Table 4.52 shows no significant relationship (p>0.05) between adherence and the number of people in the waiting room. 91% (n=231) of those who always honour their appointments and 93% (n=70) of those who do not honour appointments indicated that 10-19 people are waiting, furthermore 1% (n=3) of respondents who always honour appointments indicated that more than 40 people are waiting at PUP facilities during their visit to collect medication.

Table 4.52: Association between the number of people waiting and adherence

How many people are in the waiting room					
	10-19	20-29	30-39	>=40	not sure
Do not honour appointments	93% (n=70)	5% (n=4)	1% (n=1)	0%	1% (n=1)
Always honour appointments	91% (n=231)	5% (n=13)	1% (n=3)	1% (n=3)	2% (n=5)

⇒ DISCUSSION

In the study conducted in the Western Cape (SA), complaints from local healthcare centres included prolonged waiting time at PUPs or pharmacies due to an increase in patients' numbers and being a contributory factor to non-adherence (Magadzire, et al 2017:6). Contrary to the study of Magadzire, et al (2017), the above results indicated that the number of the people at the waiting rooms and the period they wait at the waiting room of the PUP facilities did not have any effect in determining whether the respondents will adhere to honouring their appointment at their respective PUPs. Thus, there is no significant relationship (p>0.05) between adherence and the number of people in the waiting room and the period they wait at the waiting room of the PUP facilities (Table 4.52)

4.5.3.4. WAITING PERIOD AT A PICK-UP POINT (B3.4)

All respondents completed the question n=344. In Table 4.53 below, 92% (n=318) of respondents indicated that they wait less for than one hour to receive their medication, 5% (n=16) indicated that they wait for one hour to receive their medication, while 2% (n=6) said they waited for two hours and 1% (n=4) specified that they waited for three hours to receive their medication at PUPs.

Table 4.53: Waiting period at pick-up point (n=344)

Waiting period at a pick-up point	Frequency	Per cent
<1hr	n=318	92%
1hr	n=16	5%
2hrs	n=6	2%
3hrs	n=4	1%

SIGNIFICANCE

Figure 4.37. below illustrates that there is a significant difference between the waiting period of respondents with P-value of <0.001 and an X^2 = 835.44, the majority of respondents 92% (n=318), do not wait more than one hour and the least 1% (n=4) indicating that they wait for three hours (Table 4.53).

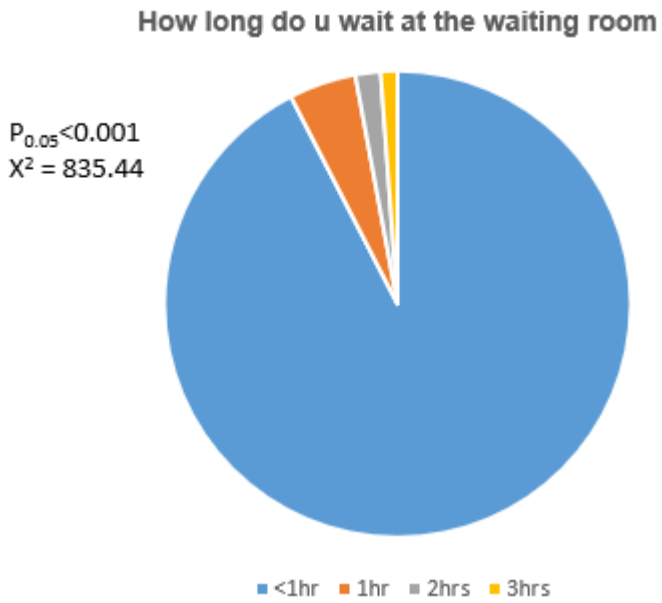

Figure 4.37: Waiting period at pickup point?

Table 4.54: Type of pick-up point and waiting period

Pick-up point Type	Waiting period at a pick-up point			
	<1 hr	1 hr	2 hrs	3 hrs
External	93% (n=164)	6% (n=10)	1% (n=2)	0%
Internal	92% (n=154)	4% (n=6)	2% (n=4)	2% (n=4)

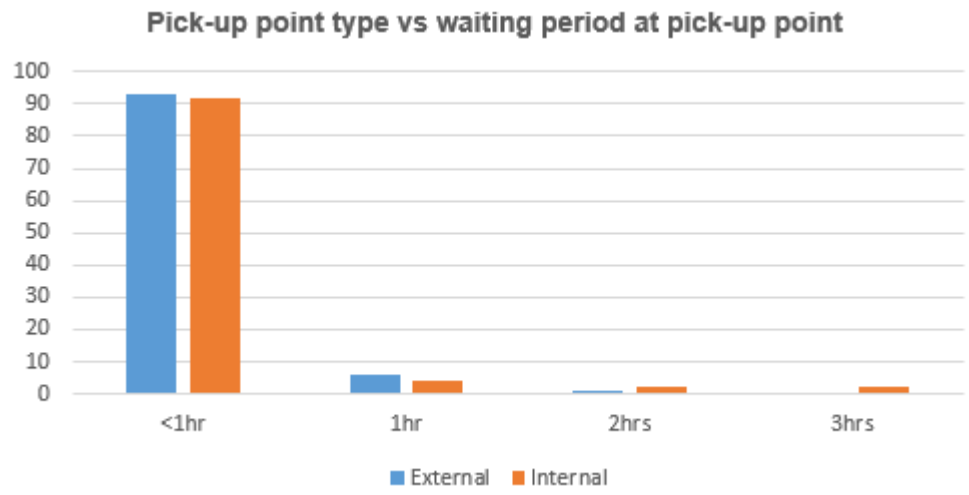

Figure 4.38: Pick-up point type Vs. waiting period

SIGNIFICANCE

From the results below, more than 90% of respondents from Adelaide Tambo 92% (n=154) as an internal PUP, Clicks and unknown PUPs 93% (n=164) as an external PUP facility, indicated that they wait for less than one hour at the waiting room before collecting their medication, as compared to 75% (n=3) of respondents from Mandisa Shiceka. Similarly, 25% (n=1) of respondents from Mandisa Shiceka indicated that they wait for 2 hours in the waiting room to collect their medication as compared to less than 10% of respondents from Adelaide Tambo, Clicks and unknown PUP (Table 4.55). Thus, there is a significant relationship ($p<0.05$, $X^2 = 20.03$) between the PUP name and the waiting period in the PUP waiting room. The results also indicate no significant difference between type of PUP and the waiting period in the PUP waiting room (Figure 4.39).

Table 4.55: Name of pick-up point and waiting period

Pick-up point name	Waiting period at the pick-up point			
	<1hr	1hr	2hrs	3hrs
Adelaide Tambo	92% (n=151)	4% (n=6)	2% (n=4)	2% (n=4)
Clicks	93% (n=156)	6% (n=10)	1% (n=1)	0%
Mandisa Shiceka	75% (n=3)	0%	25% (n=1)	0%
Other	100% (n=5)	0%	0%	0%

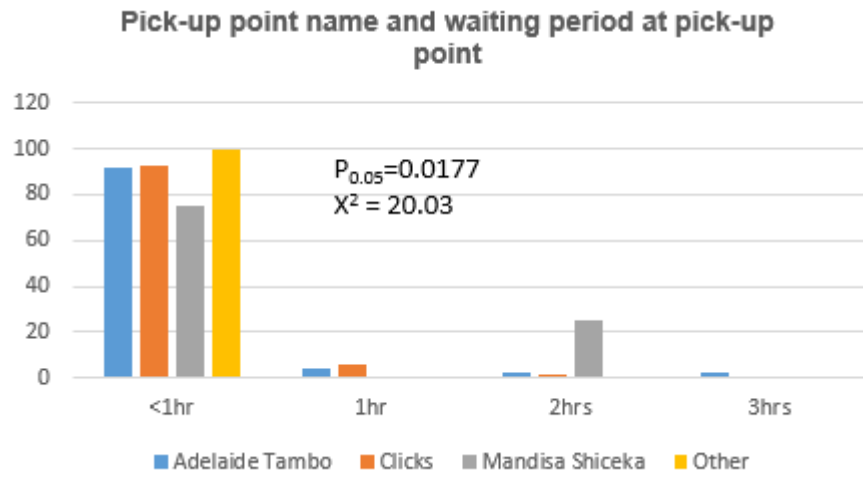

Figure 4.39: Pick-up point name and waiting period at pick-up point

SIGNIFICANCE

Results indicated that the number of people in the waiting room and the period they wait in the waiting room of the PUP facilities did not have any effect in determining whether the respondents will adhere to honouring their appointment at the respective PUPs. Thus, there is no significant relationship (p>0.05) between people who honour their appointments or do not honour appointments with the number of people in the waiting room and the period they wait in the waiting room of the PUP facilities (Table 4.56 and Figure 4.40).

Table 4.56: Association between waiting period and adherence

Waiting period at a pick-up point	<1hr	1hr	2hrs	3hrs
Yes	93% (n=243)	5% (n=13)	2% (n=6	0%
No	92% (n=75)	5% (n=4)	2% (n=2)	1% (n=1)

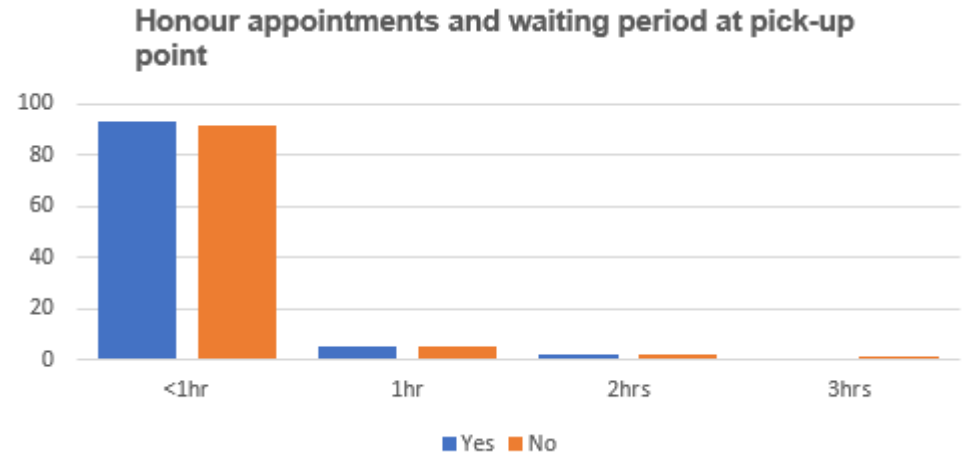

Figure 4.40: Association between waiting period and adherence

⇒ **DISCUSSION**

The study conducted in the Western Cape (SA) suggests that to some degree their-CDU objectives for reducing waiting times lead to patients' improved experiences with healthcare services and this motivated patients to adhere to their chronic medication and thus remain stable on their chronic conditions (Magadzire, et al 2015:6). A study conducted in Namibia suggested that defaulters raised complaints of long waiting period at health facilities which frustrated them and contributing to their non-adherence (Bauleth, et al 2016:9). Whereas in the study conducted in 2017, Magadzire, et al (2017:6) concurred with Bauleth, et al (2016) that one reason for patients missing their appointments was due to prolonged waiting times.

Contrary to the above, in this study, there is no significant relationship ($p>0.05$) between people who honour their appointments or not honouring appointments with the number of people in the waiting room and the period they wait at the waiting room at the PUP facilities.

4.5.4. SECTION B4 INFORMATION GIVEN AT PICK-UP POINTS AND SUPPORT SYSTEM OF RESPONDENTS

This section determines and describes information given at PUPs and how it contributes to adherence and non-adherence of patients in the collection of their medicine from the CCMDD-service providers in Tshwane District. Items to be discussed are adherence information, side effects information, resistance building information, return immediately information and complications information (B4.1 – B4.5) and respondents' support system under question (B4.6). Tables, graphs and figures will be presented to explain the information given at PUP. The support system of respondents, followed by another table and figure to explain if these factors have any relation to patient adherence.

4.5.4.1. RECEIVED INFORMATION TO ENSURE ADHERENCE (B4)

Table 4.57 below reflected that, more than 55% of the respondents ($p<0.05$) indicated that they always receive information at their pick-up points. This information received includes the importance of adhering to medicine collection, the complications of not adhering to the appointments and the information about your next appointment. They also indicated that they are given information about the side effects of the chronic medication they are taking which also include information on resistance built for not taking the medication properly.

Table 4.57: Information is given to patients to ensure adherence

Information given to patients	Always	Sometimes	Never	X^2-value	p-value
Do you receive information on adherence?	n=230(67%)	n=35(10%)	n=79(23%)	182,45	<0.001
Do you receive information on the side effects of medication?	n=199(58%)	n=45(13%)	N100(=29%)	106,23	<0.001
Do you receive information on resistance building towards medication if not taken properly?	n=194(56%)	n=45(15%)	n=100(29%)	91,56	<0.001
Do you receive information on when to return immediately?	n=212(62%)	n=35(10%)	n=97(28%)	140,69	<0.001
Do you receive information on complications of non-adherence?	n=201(59%)	n=49(14%)	n=94(27%)	106,33	<0.001

4.5.4.1.1. RECEIVED INFORMATION ON ADHERENCE FROM PICK-UP POINT (B4.1)

All respondents completed the question n=344. Most of the respondents 67% (n=230) stated that they always receive information on adherence, 10% (n=35) said they receive information sometimes, while 79% (n=23) stated that they never received information on adherence (view Table 4.58).

Table 4.58: Received information of adherence (n=344)

Received information on		Per cent	Frequency
Adherence	Always	67%	n=230
	Sometimes	10%	n=35
	Never	23%	n=79

Table 4.59 and Figure 4.43 illustrate that there is no significant difference between the type of PUP and giving of adherence information (Table 4.59 and Figure 4.41), with 66% (n=115) – external and 68% (n=115) – internal of respondents stating that they always receive information on adherence at PUP.

Table 4.59: Type of pick-up point and adherence information given

Pick-up point type	Receive adherence information at a pick-up point		
	Always	Sometimes	Never
External	66% (n=115)	11% (n=20)	23% (n=41)
Internal	68% (n=115)	9% (n=15)	23% (n=38)

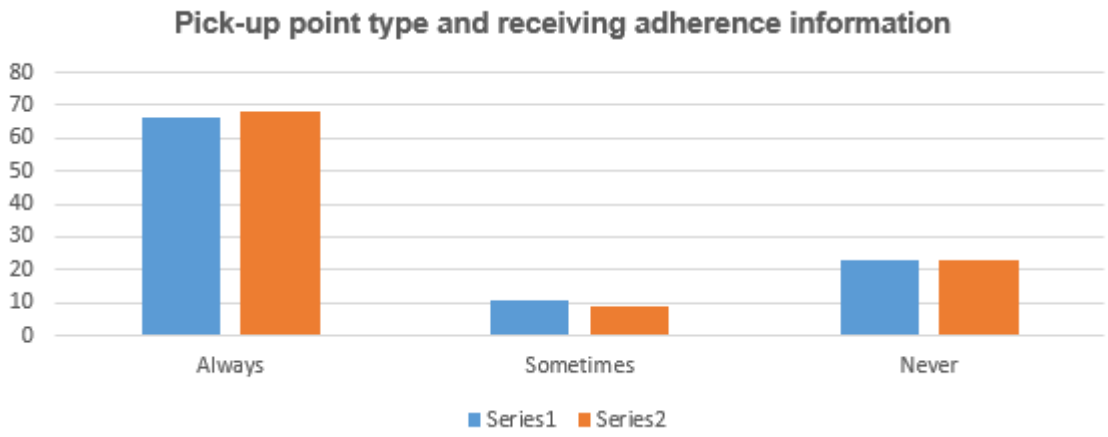

Figure 4.41: Pick-up point type and receiving adherence information

Table 4.60: Name of pick-up point and adherence information given

Pick-up point name	receive adherence information at a pick-up point		
	Always	Sometimes	Never
Adelaide Tambo	68% (n=113)	9% (n=15)	23% (n=39)
Clicks	66% (n=111)	11% (n=19)	23% (n=39)
Mandisa Shiceka	75% (n=3)	25% (n=1)	0%
Other	80% (n=4)	0%	20% (n=1)

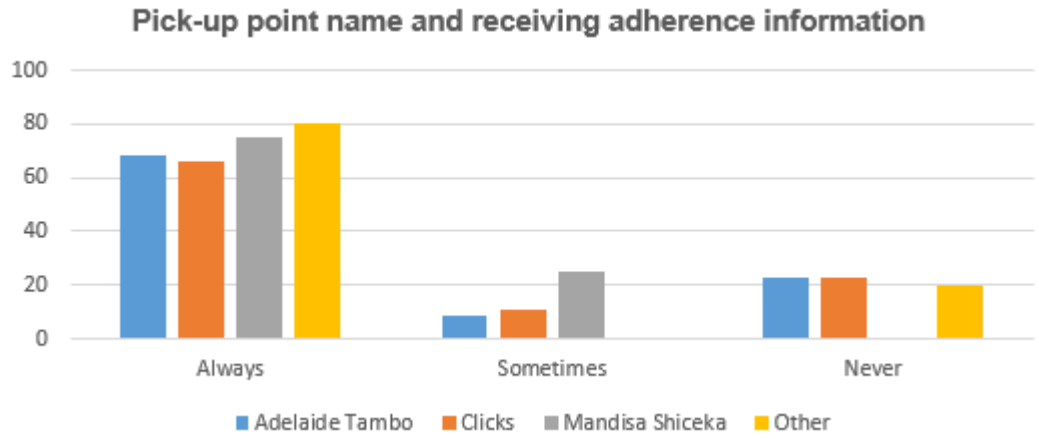

Figure 4.42: Pick-up point name and receiving adherence information

SIGNIFICANCE

Table 4.61 shows that 70% (n=184) of respondents who always received adherence information honoured their appointments, while 56% (n=46) who always received adherence information did not honour their appointments. Thirty-three percent (n=27) of respondents who said they never received adherence information missed their appointments, while 20% (n=52) of those who said they never received information honoured their appointments. Figure 4.43 reflects that there is significant relationship between giving information on the importance of adherence and respondents adhering, with P value of 0.0371 and X^2 value of 6.49 (Figure 4.43).

Table 4.61: Adherence information given and adherence

Received information from pick-up point	Always	Sometimes	Never
Do not honour appointments	56% (n=46)	11% (n=9)	33% (n=27)
Always honour appointments	70% (n=184)	10% (n=26)	20% (n=52)

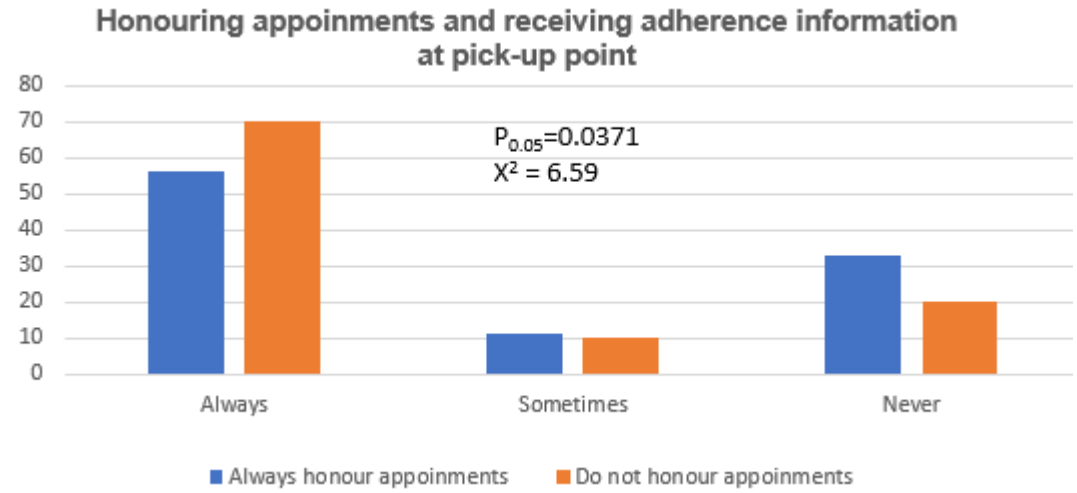

Figure 4.43: Honouring appointments and receiving adherence information at pick-up point

⇒ **DISCUSSION**

According to the study done in Australia, Usherwood (2017:148) stated that it is important to ask patients about adherence at every visit, and a poor response to treatment should always prompt detailed enquiry to encourage adherence. In Sub-Saharan, a study conducted in Namibia, indicated that a lack of understanding in the importance of treatment adherence contributed to non-adherence (Bauleth, et al 2016:94). A study conducted in the Western Cape in SA by Magadzire, et al (2016:5), suggested that due to workload pressures, pharmacist counselling to patients in most cases is impractical although necessary to ensure adherence. The study conducted in KwaZulu Natal (SA) also found that there is still a big gap in the healthcare services regarding counselling and provision of adherence information and support for clients on ART (Cele and Riet, 2017:98).

This study suggest that the more patients receive information on the importance of adherence, the more they adhere (Table 4.61). This is consistent with (Usherwood 2017; Bauleth, et al 2016; Magadzire, et al 2016, Cele and Riet, 2017) that adherence information is important for patients' adherence with the P-value of 0.0371 and an X^2 value of 6.49 (Figure 4.43)

4.5.4.1.2. RECEIVED INFORMATION ON SIDE EFFECTS AT PICK-UP POINT (B4.2)

All respondents completed the question, thus n=344. Table 4.62 shows that majority of respondents, 58% (n=199), indicated that they always receive information on medication side effects, 13% (n=45) said they received information sometimes, while 29% (n=100) said they never received information on side effects.

Table 4.62: Received information on medication side-effects

Received information on		Per cent	Frequency
Medication side effects	Always	58%	n=199
	Sometimes	13%	n=45
	Never	29%	n=100

Table 4.63. shows that 60% (n=106) of respondents who indicated that their PUP is an external one said that they always receive information on side effects and these patients are mostly from Mandisa Shiceka clinic 100% (n=4), Clicks and other PUP 60% (n=104) (Table 4.64), while internal PUP respondents who are mostly from Adelaide Tambo Clinic 55% (n=93) indicated that they always receive information on side effects at their respective PUP, (view Table 4.16)

Table 4.63: Type of pick-up point and receiving information on medication side -effects

	Receive side effects information at a pick-up point		
Pick-up point type	**Always**	**Sometimes**	**Never**
External	60% (n=106)	13% (n=22)	27% (n=48)
Internal	55% (n=93)	14% (n=23)	31% (n=52)

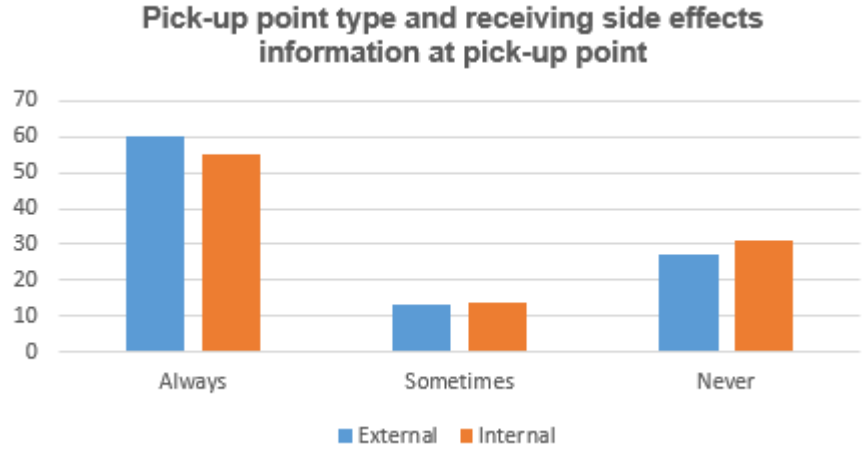

Figure 4.44: Pick-up point type and receiving side-effects information at pick-up points

All the respondents from Mandisa Shiceka 100% (n=4) indicated that they always receive information on medication side effects, followed by Clicks and other PUP at 60% (n=104), while 54% (n=91) of respondents from Adelaide Tambo said they always receive information (Table 4.62 and Figure 4.44).

Table 4.64: Pick-up point name and received information on medication side effects

	Receive side effects information at a pick-up point		
Pick-up point name	**Always**	**Sometimes**	**Never**
Adelaide Tambo	54% (n=91)	14% (n=23)	32% (n=53)
Clicks	60% (n=101)	13% (n=21)	27% (n=46)
Mandisa Shiceka	100% (n=4)	0%	0%
Other	60% (n=3)	20% (n=1	20% (n=1)

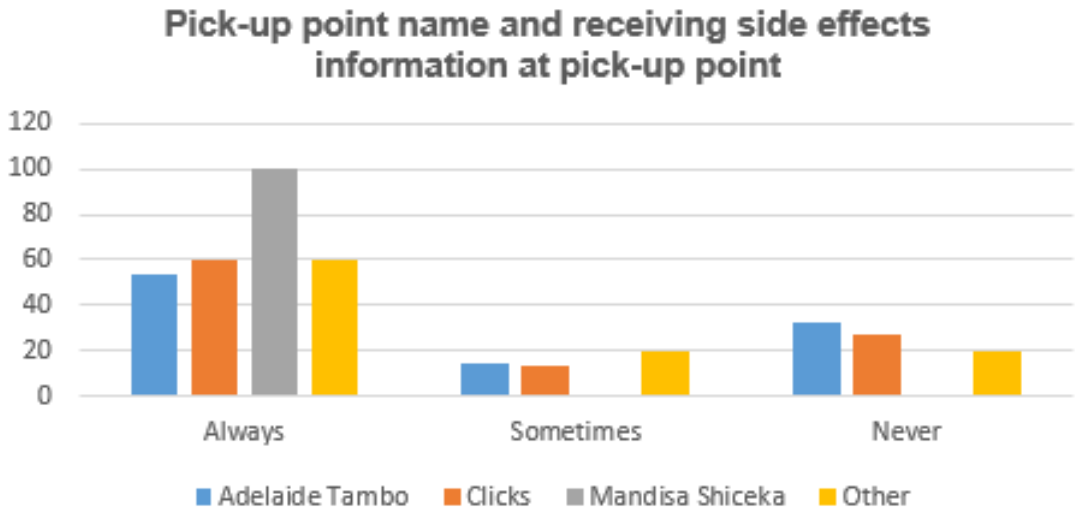

Figure 4.45: Pick-up point name and receiving side-effects information

SIGNIFICANCE

Table 4.65 below, illustrated that 62% (n=163) of respondents who always receive information regarding side effects of their chronic medication use, always honour their appointments as compared to 11% (n=29) who sometimes receive side effects information and 27% (n=70) who never receive side effects information. Furthermore, 44% (n=36) who always receive side effects information of their chronic medication indicated that they do not honour their appointments as compared to 19% (n=16) who sometimes receive side effects information and 37% (n=30) who never receive side effects information. Therefore, there is significant association ($p<0.05$) between respondents honouring their appointments with receiving side effects information with X^2 of 9.12 (Figure 4.46).

Table 4.65: Adherence and receiving side-effects information

Receive side effects information from a pick-up point	Always	Sometimes	Never
Do not honour appointments	44% (n=36)	19% (n=16)	37% (n=30)
Always honour appointments	62% (n=163)	11% (n=29)	27% (n=70)

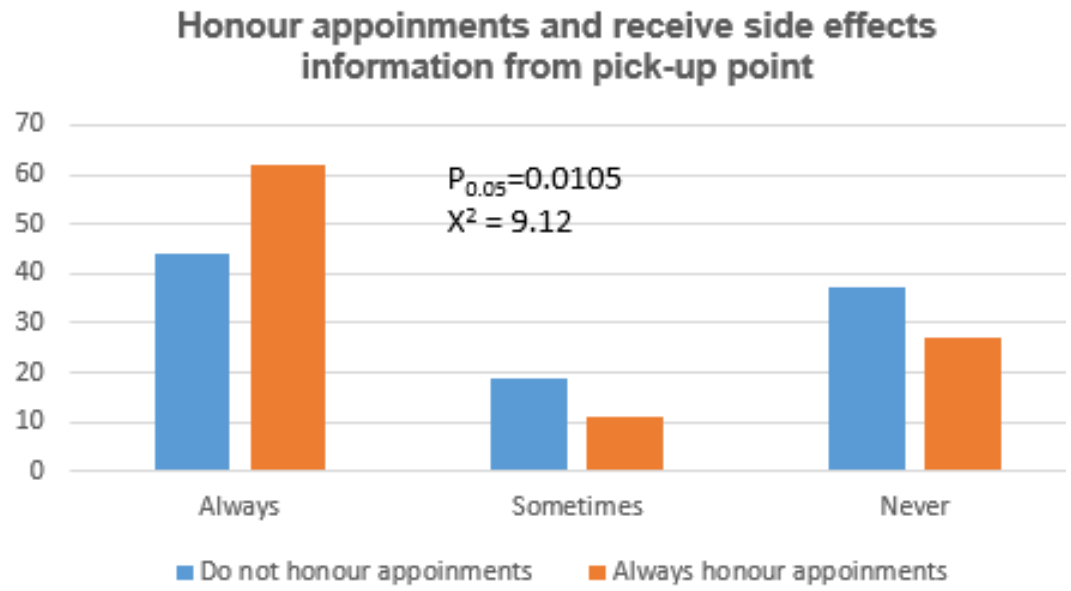

Figure 4.46: Honour appointments and receive side-effect information from pick-up point

⇒ **DISCUSSION**

Bauleth, et al (2016:97) revealed that participants discontinued taking their medication due to side effects, and similarly, they were not informed of what to expect and to do when they experienced side effects. According to Dorward, et al (2019:5), poor communication between healthcare workers and patients, due to pressures in healthcare facilities led to inadequate information sharing in managing their health when side effects occur and, ultimately, nonadherence.

Similarly, this study also reflected a significant association ($p<0.05$) between respondents honouring their appointments and receiving information on what side effects to expect and how to manage them.

4.5.4.1.3. RECEIVED INFORMATION ON RESISTANCE BUILDING FROM PICK-UP POINT (B4.3)

All respondents completed the question, thus n=344. The majority of respondents, 56% (n=194), stated that they always receive information on resistance building if not adhering to their chronic medication, 15% (n=52), said they receive information sometimes, and 28% (n=98) said they never received that information from their chosen PUP (view Table 4.66).

Table 4.66: Receiving information on resistance building from pick-up point (n=344)

Received information on		Per cent	Frequency
Resistance building towards medication if not taken properly	Always	56%	n=194
	Sometimes	15%	n=52
	Never	28%	n=98

Table 4.67 below illustrates that 58% (n=102) of respondents who always receive resistance-building information when not taking medication properly indicated that their PUP is an external one and is

discussed in Table 4.16 above. These patients are from Clicks 57% (n=96), Mandisa Shiceka 100% (n=4) and other PUP 80% (n=4), whereas 55% (n=92) of those respondents who indicated they always receive resistance building information are from internal PUP and this patients are mostly from Adelaide Tambo Clinic 54% (n=89) Table 4.68.

Table 4.67: Pick-up point type and receiving resistance-building information

	Receive resistance-building information at a pick-up point			
Pick-up point type	**Always**	**Sometimes**	**Never**	
External	58% (n=102)	15% (n=27)	27% (n=47)	
Internal	55% (n=92)	15% (n=25)	30%(n=51)	

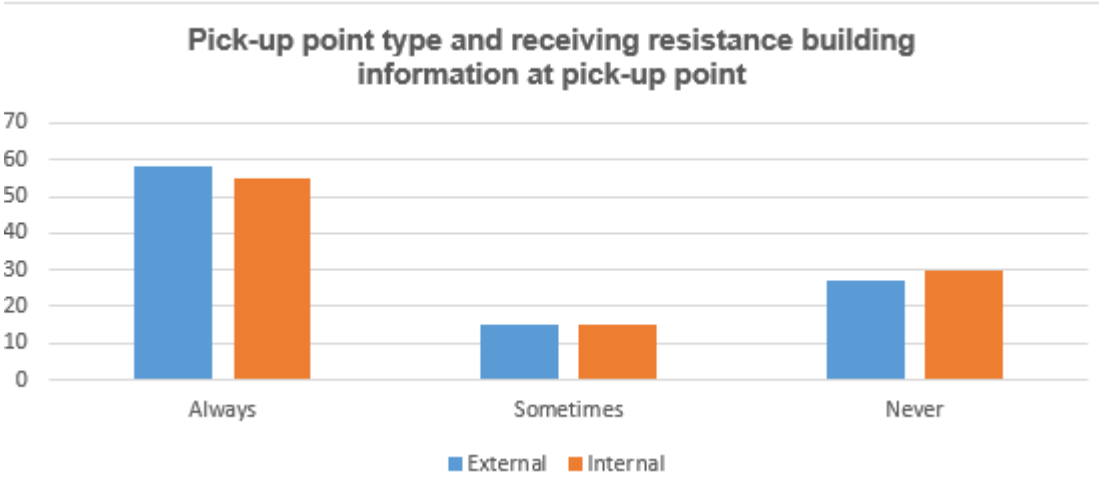

Figure 4.47: Pick-up point type and receiving resistance building information at a pick-up point

Table 4.68: Pick-up point name and receiving resistance building information

Pick-up point Name	Always	Sometimes	Never
Adelaide Tambo	54% (n=89)	15% (n=25)	31% (n=51)
Clicks	57% (n=96)	16% (n=27)	27% (n=46)
Mandisa Shiceka	100% (n=4	0%	0%
Other	80% (n=4)	0%	20% (n=1)

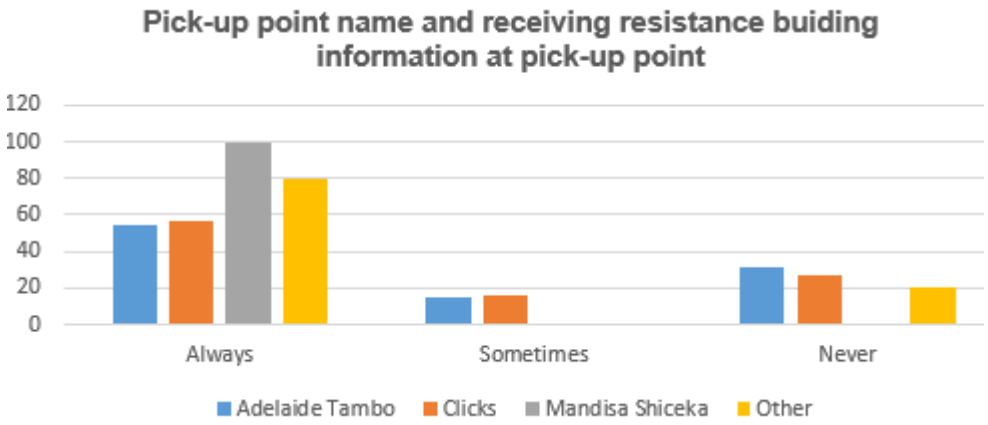

Figure 4.48: Pick-up point name and receiving resistance building information

SIGNIFICANCE

Table 4.69 illustrates that 60% (n=158) of respondents who stated that they always received information on consequences of nonadherence (i.e. the building of resistance) indicated that they always honour their appointments as compared to 14% (n=37) who receive information on resistance building sometimes and 26% (n=67) who never received information at all. Furthermore, 44% (n=36) of respondents who always receive information on resistance building due to nonadherence indicated that they do not honour their appointments as compared to 18% (n=15) who sometimes receives resistance building information and 38% (n=31) who never received information at all. Therefore, there is a significant association ($p<0.05$) between respondents honouring their appointments with receiving information on resistance building due to non-adherence with P-value of 0.0306 and an X^2 of 6.99 (Figure 4.49).

Table 4.69: Adherence and receiving resistance building information

Receive resistance information from pick-up point	Always	Sometimes	Never
Do not honour appointments	44% (n=36)	18% (n=15)	38% (=31)
Always honour appointments	60% (n=158)	14% (n=37)	26% (n=67)

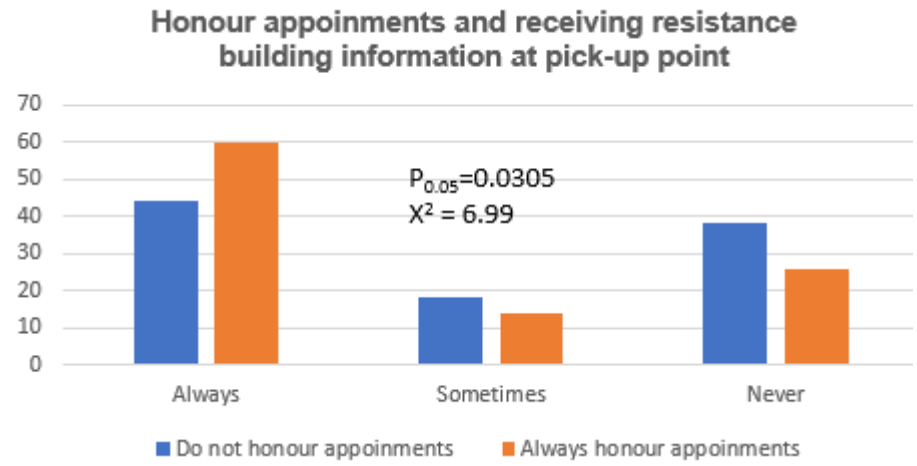

Figure 4.49: Honour appointment and receiving resistance building information at pick-up point

⇒ **DISCUSSION**

Bauleth, et al (2016:94) indicated that some participants affirmed that they did not have adequate knowledge about the importance of taking medications regularly, thus leading to poor adherence. Similarly, this study reflects that giving information on the importance of adherence and encourages patients to adhere to their medication to avoid complications or consequences of nonadherence and shows that providing information is a significant factor in adherence with a P-value of 0.0305 and an X^2 of 6.99 (Figure 4.49).

4.5.4.1.4. RECEIVED INFORMATION ON WHEN TO RETURN IMMEDIATELY (B4.4)

All respondents completed the question thus, n=344. Table 4.70 Illustrates that majority of respondents, 62% (n=212), said they always receive information on when to return immediately, 10% (n=35) said they sometimes receive the information, while 28% (n=97) stated that they never received information on when to return immediately.

Table 4.70: Received information on when to return immediately (n=344)

Received information on	Per cent	Frequency	
When to return immediately	Always	62%	n=212
	Sometimes	10%	n=35
	Never	28%	n=97

Table 4.71. and Figure 4.50 show that 64% (n=112) of respondents who stated that their PUP is external, indicated that they always receive information on when to return immediately and these patients are mostly from Clicks 64% (n=107), Mandisa Shiceka 100% (n=4) and other PUP (Table 4.72 and Figure 4.53). Furthermore, those who stated that their PUP is an internal one with 60% (n=100) are mostly from Adelaide Tambo Clinic 59% (n=98).

Table 4.71: Type of pick-up point and received information on when to return immediately

Pick-up point Type	Received information on when to return immediately		
	Always	Sometimes	Never
External	64% (n=112)	13% (n=23)	23% (n=41)
Internal	60% (n=100)	7% (n=12)	33% (n=56)

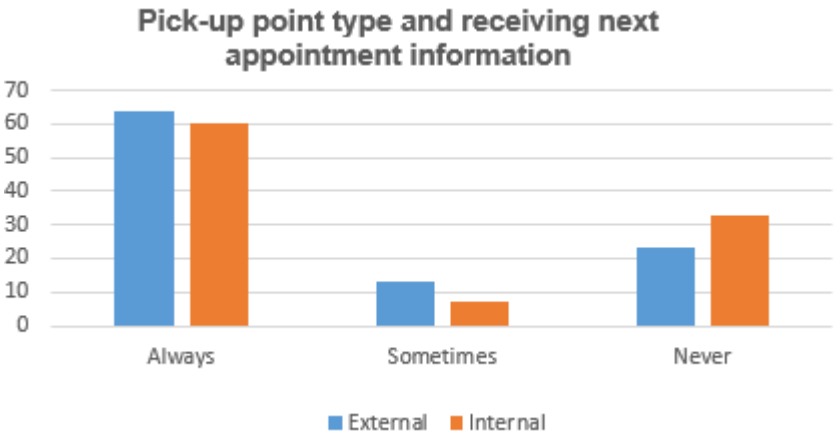

Figure 4.50: Pick-up point and received information on when to return immediately

Table 4.72: Name of pick-up point and received information on when to return immediately

Pick-up point name	Received information on when to return immediately		
	Always	Sometimes	Never
Adelaide Tambo	59% (n=98)	7% (n=12)	34% (n=56)
Clicks	64% (n=107)	13% (n=22)	23% (n=40)
Mandisa Shiceka	100% (n=4	0%	0%
Other	60% (n=3)	20% (n=1)	20% (n=1)

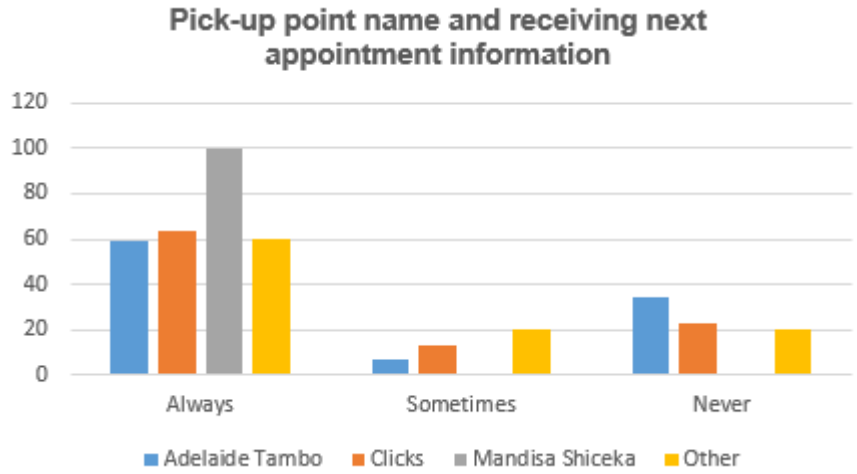

Figure 4.51: Pick-up point name and receiving next appointment information

SIGNIFICANCE

Majority of respondents, 64% (n=167), who always honour their appointments indicated that they always receive information on when to return immediately as compared to 11% (n=30) who sometimes receive that information and 25% (n=65) who never receive information on when to return immediately. While 55% (n=45) of the respondents who do not honour their appointments indicated that they always receive information on when to return immediately as compared to 6% (n=5) who sometimes received that information and 39% (n=32) who never receive information. Therefore, there is significant association ($p<0.05$) between honouring medical appointments and receiving information about when to return back immediately with a P-value = 0.0297 and an X^2 value of 7.03 (Figure 4.52). (Table 4.73 and Figure 4.52 below).

Table 4.73: Received information on when to return immediately and adherence

Received information on when to return immediately	Always	Sometimes	Never
Do not honour appointments	55% (n=45)	6% (n=5)	39% (n=32)
Always honour appointments	64% (n=167)	11% (n=30)	25% (n=65)

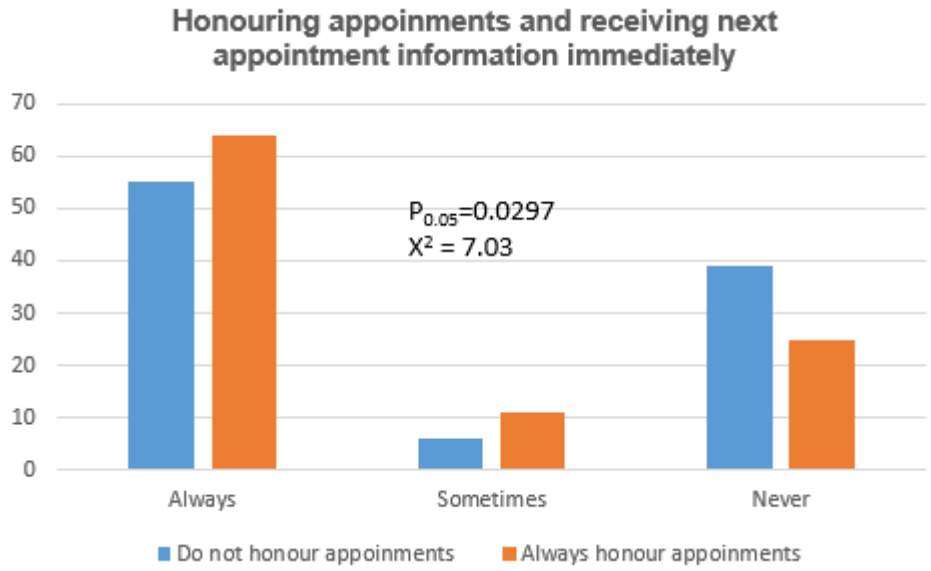

Figure 4.52: Honouring appointment and receiving next appointment information immediately

⇒ DISCUSSION

Dorward, et al (2019:5) indicated the importance of communicating well with patients to ensure that they report immediately to the healthcare facility when feeling unwell or for any other healthcare service, and not to wait for their next appointment date to prevent complications and to adhere to their medication. Similarly, in this study there is significance association ($p<0.05$) between honouring medical appointments and receiving information about when to return back immediately with P value = 0.0297 and X^2value of 7.03 (Figure 4.52).

4.5.4.1.5. RECEIVED INFORMATION ON COMPLICATIONS OF NONADHERENCE (B4.5)

All respondents completed the question therefore, n=344. Most of the respondents, 58% (n=201), stated that they always receive information on complications of non-adherence as compared to 14% (n=49) who sometimes receive information and 27% (n=94) who never receive information about complications of nonadherence (view Table 4.74).

Table 4.74: Received information on complications of non-adherence (n=344)

Received information on		Percentage	Frequency
complications of non-adherence	Always	58%	n=201
	Sometimes	14%	n=48
	Never	28%	n=95

SIGNIFICANCE

Table 4.75 below illustrates that there is no significant difference between external and internal PUP concerning whether respondents received information about complications due to nonadherence. Respondents from Adelaide Tambo Clinic as an internal PUP have 60% (n=99) stating that they always receive information on complications of nonadherence, compared to 12% (n=20) who stated that they receive information sometimes and 28% (n=46) indicating that they never received information (Table 4.76). Furthermore, Clicks 57% (n=96), Mandisa Shiceka 75% (n=3) and other PUP 60% (n=3) as an external PUP stated that they always receive information on complications of nonadherence.

Table 4.75: Received information on complications and type of pick-up point

	Receive complications of non-adherence information at a pick-up point		
Pick-up point type	**Always**	**Sometimes**	**Never**
External	57% (n=101)	16% (n=28)	27% (n=48)
Internal	60% (n=100)	13% (n=21)	27% (n=46)

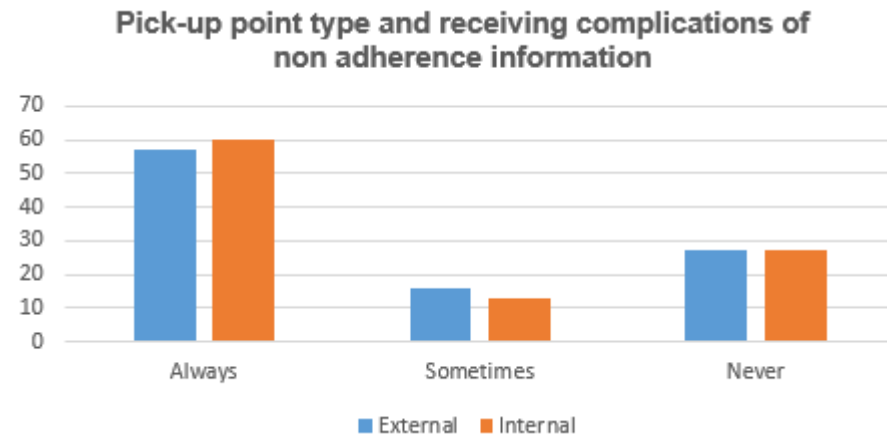

Figure 4.53: Pick-up point type and receiving complications of nonadherence information

Table 4.75: Received information on complications and name of pick-up point

Pick-up point Name	Received information on complications of non-adherence at a pick-up point		
	Always	**Sometimes**	**Never**
Adelaide Tambo	60% (n=99)	12% (n=20)	28% (n=46)
Clicks	57% (n=96)	16% (n=27)	27% (n=45)
Mandisa Shiceka	75% (n=3)	25% (n=1)	0%
Other	60% (n=3)	20% (n=1)	20% (n=1)

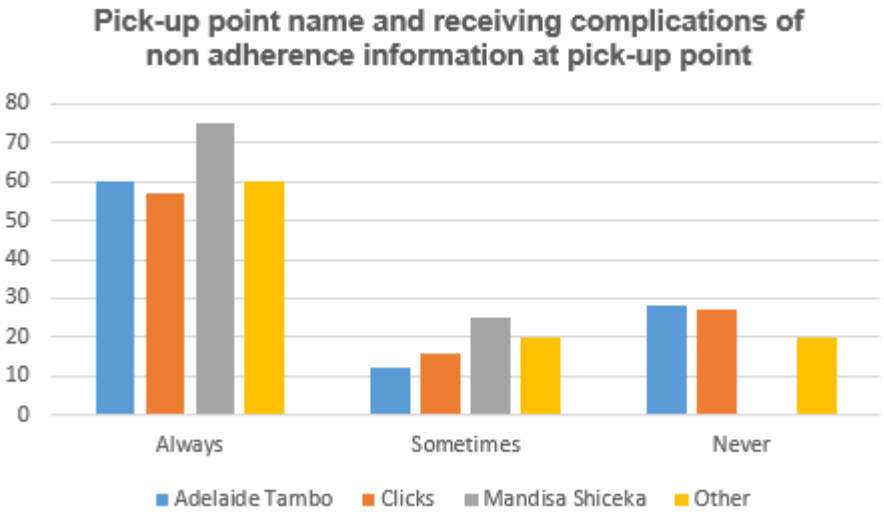

Figure 4.54: Pick-up point name and receiving complications of non-adherence information at pick-up point

SIGNIFICANCE

Table 4.77 below, illustrates that 61% (n=161) of respondents who always receive information on complications of nonadherence, always honour their appointments as compared to 51% (n=42) who do not honour appointments. Furthermore, 12% (n=10) who received information, indicated that they do not honour their appointments as compared to 15% (n=38) who sometimes received information and 37% (n=30) of respondents, who never received complications of nonadherence information, did not honour appointments as compared to 24% (n=64) who honoured appointments. Therefore, there is no

significant association (p<0.05) between respondents honouring their appointments with receiving complications of nonadherence information (Figure 4.55).

Table 4.76: Received information on complications and adherence

Receive non-adherence information	Always	Sometimes	Never
Do not honour appointments	51% (n=42)	12% (n=10)	37% (n=30)
Always honour appointments	61% (n=161)	15% (n=38)	24% (n=64)

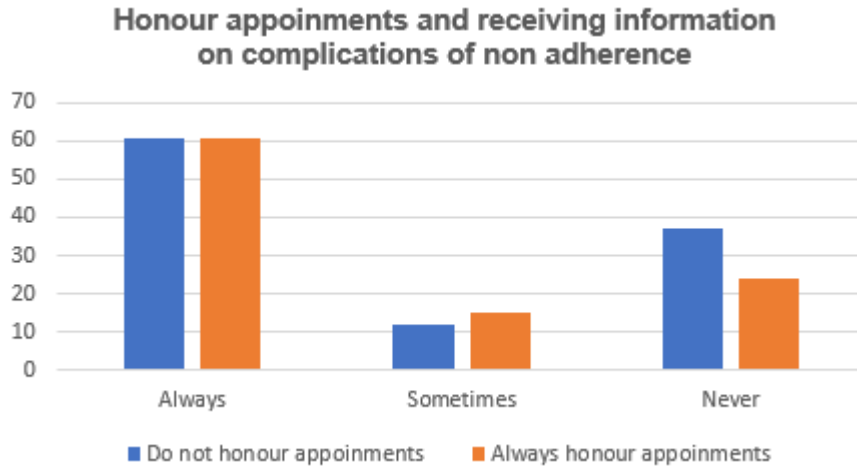

Figure 4.55: Honour appointments and receiving information on complications of non-adherence

⇒ **DISCUSSION**

According to Usherwood (2017:148), patient-centred counselling on adherence has shown improved behaviour changes and ultimately improved adherence. The study done at Umlazi township in KwaZulu-Natal (SA) indicated that above 80% of the participants in the public health sector were informed about complications of hypertension such as 'stroke' (Simamane 2018:36).

The findings in this study do not reflect any relationship between whether the respondents received information on complications due to nonadherence and adherence (Table 4.77 and Figure 4.55), with the P-value of <0.001 and an X^2 value of 106.33 (Table 4.57).

4.5.4.1.6. SUPPORT SYSTEM ON TAKING MEDICATION EVERY DAY (B4.6)

A total of N=344 questionnaires were distributed and the calculation for this question was from 89% (n=305), 11% (n=39) did not complete the question. Table 4.78 shows that the majority of respondents, 41% (n=125), indicated that they are supported by their spouse, 19% (n=56) by their children, 16% (n=50) by their sibling, 1% (n=4) by their employer, while 23% (n=70) indicated that they are supported by other people.

Table 4.77: The person who supports you in taking your medication (n=305)

Who supports you with taking your medication adherence	Frequency	Percentage
Spouse	n=125	41%
Children	n=56	19%
Sibling	n=50	16%
Employer	n=4	1%
Other	n=70	23%

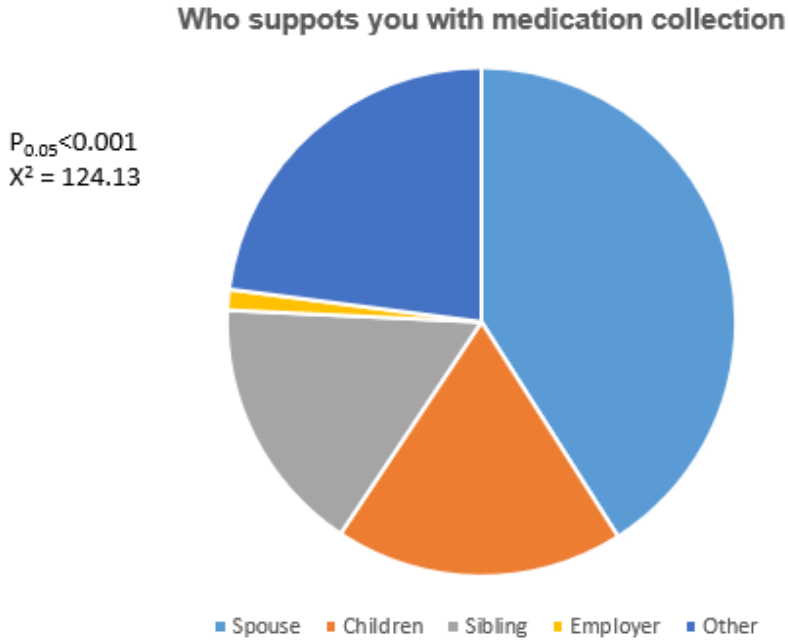

Figure 4.56: Who supports you with medication collection

Respondents from Adelaide Tambo Clinic as an internal PUP 52% (n=78) have 52% (n=71) stated that their spouse is their support system in taking their medication, 13% (n=20) stated that their children are their support system and 5% (n=8) indicated that their siblings are supporting them in taking their medication (Table 4.79). Furthermore, Clicks 31% (n=52), Mandisa Shiceka 25% (n=1) and other PUP 33% (n=1) as an external 31% (n=47) PUP stated that their spouse is their support system in taking their medication.

Table 4.78: Pick-up point type and who supports you with taking your medication?

Pick-up point Type	Who supports you with medication collection				
	Spouse	Children	Sibling	Employer	Other
External	31% (n=47)	23% (n=36)	27% (n=42)	2%(n=3)	17% (n=26)
Internal	52% (n=78)	13%(n=20)	5% (n=8)	1%(n=1)	29% (n=44)

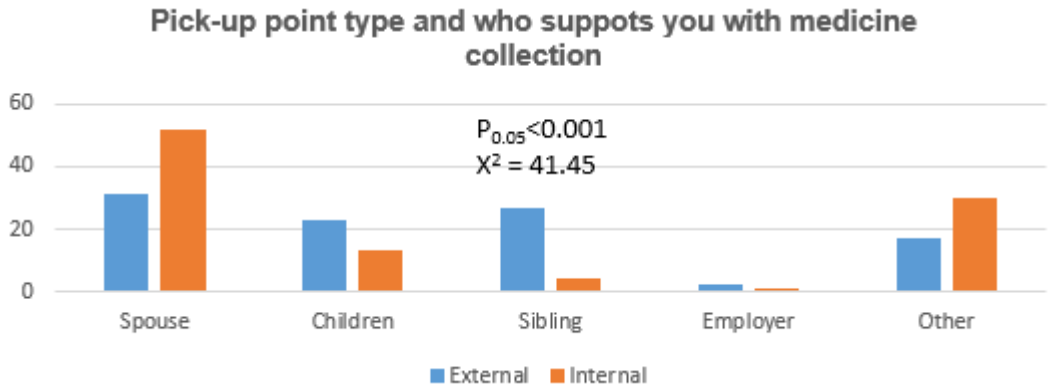

Figure 4.57: Pick-up point type and who supports you with medicine collection

Table 4.79: Name of pick-up point and who supports you with taking your medication

Pick-up point Name	Who supports you with medical collection				
	Spouse	Children	Sibling	Employer	Other
Adelaide Tambo	52% (n=71)	13% (=21)	4% (n=5)	1% (n=1)	30% (n=51)
Clicks	31% (n=52)	24% (n=34)	28% (n=44)	2% (n=3)	15% (n=16)
Mandisa Shiceka	25% (n=1)	25% (n=1)	25% (n=1)	0%	25% (n=1)
Other	33% (n=1)	0%	0%	0%	67% (n=2)

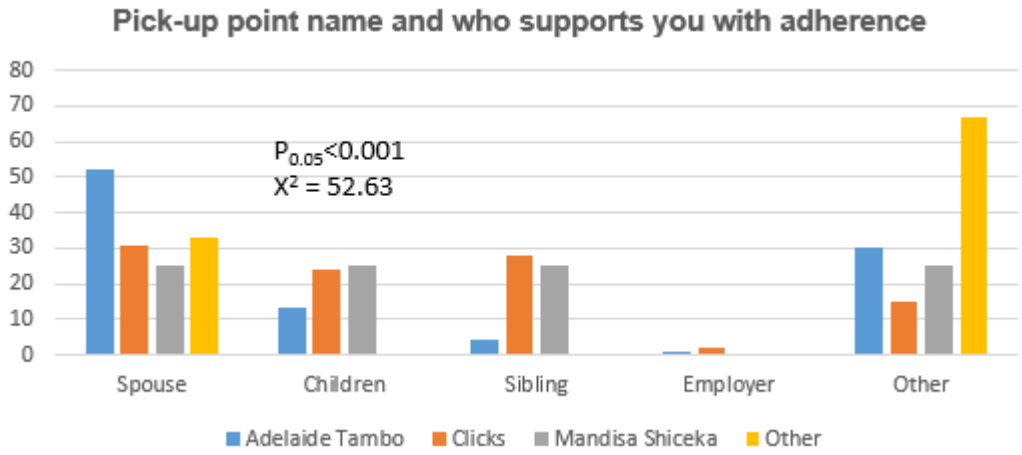

Figure 4.58: Pick-up point name and who supports you with adherence

Table 4.81 illustrates that the majority of respondents who did not honour appointments were supported by their spouses 45% (n=29) and other support system 37% (n=24), whereas those who were supported by their children 20% (n=48) and siblings 20% (n=47) honoured appointments, and this reflects that there is a significant relationship between adherence and who supports patients for their treatment collection with P-value 0,0014 and an X^2 of 17.08 (Figure 4.59).

Table 4.80: Association between adherence and support in medication taking

Who supports you with medication	Spouse	Children	Sibling	Employer	Other
Do not honour appointments	45% (n=29)	13% (n=8)	5% (=3)	0%	37% (n=24)
Always honour appointments	40% (n=96)	20% (n=48)	20% (n=47)	1% (n=4)	19% (n=46)

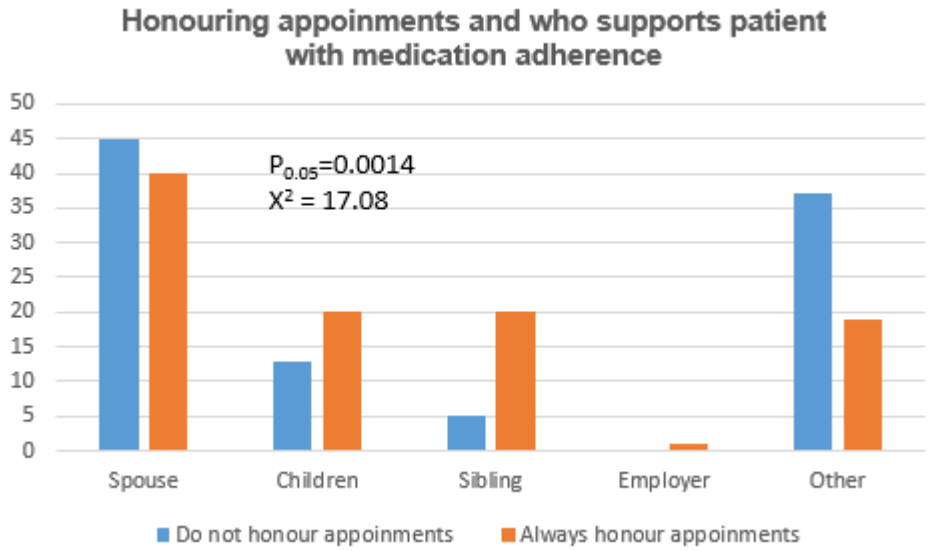

Figure 4.59: Honouring appointments and who supports patients with medication adherence

⇒ DISCUSSION

Tang, et al (2015:5)-suggested that family members, especially the spouse, played an important role in treatment supervision to ensure adherence. Bauleth, et al (2016:94) revealed that factors contributing to non-adherence are lack of support from family members, which discouraged HIV-positive patients to disclose their HIV status while (some of the participants also cited lack of encouragement from their bosses and work-related travel as factors that affected their adherence to medication.

Makgato (2018:71) reflected that patients received support from their families for their adherence, and due to stigma other community members were not involved as their support system.

According to Kgotle (2017:53), in a study conducted in the Tshwane District in Gauteng Province (SA), patients who are HIV-positive find it difficult to disclose their status even to their partner due to discrimination or stigma, meaning these patients will keep their diagnosis to themselves and would not even seek support from their family members and this may result into poor adherence, especially for those respondents who are working.

Similar findings in this study as shown in Table 4.81, is having someone who supports patients in taking their medication have a significant relationship with adherence P value of 0,0014 and an X^2 of 17.08 (Figure 4.59).

4.5.5. TYPE OF REMINDER TO COLLECT YOUR MEDICATION AT THE PICK-UP POINT

This section aims to determine if illiteracy, having no cell phone and not receiving an SMS as a reminder will contribute to nonadherence of the collection of medication from a chosen PUP. These items will be discussed under B5.1 to B5.3

In the discussions of this section, graphs and figures are presented to explain if illiteracy, having no cell phone and not receiving an SMS has any relation to the adherence of respondents.

4.5.5.1. CELLPHONE AVAILABLE AS A REMINDER (B5.1)

Questionnaires were distributed to N=344 respondents, and 99% (n=342) completed the question with 1% (n=2) omitting the question.

A high percentage of the respondents, 99% (n=341), indicated that they have cell phones that can be used for receiving the next appointment dates and reminder information about their medicine collection (view Table 4.78).

Table 4.81: Reminder to collect your medication (n=342)

Have a cell phone?	Frequency	Percentage
Yes	n=341	99%
No	n=1	1%

Table 4.83 illustrates that respondents who indicated their PUP is an external one all have a cell phone 100% (n=175), and these respondents are from Clicks 100% (n=169), Mandisa Shiceka 50% (n=2) and other 100% (n=4) PUP. 99% (n=166) who indicated that their PUP is an internal one has a cell phone are from Adelaide Tambo 99% (n=164) and 50% (n=2) of Mandisa Shiceka clinic (Table 4.84).

Table 4.82: Reminder to collect your medication and pick-up point type

Pick-up point type	Have cell phone	
	Yes	No
External	100% (n=175)	0%
Internal	99% (n=166)	1% (n=1)

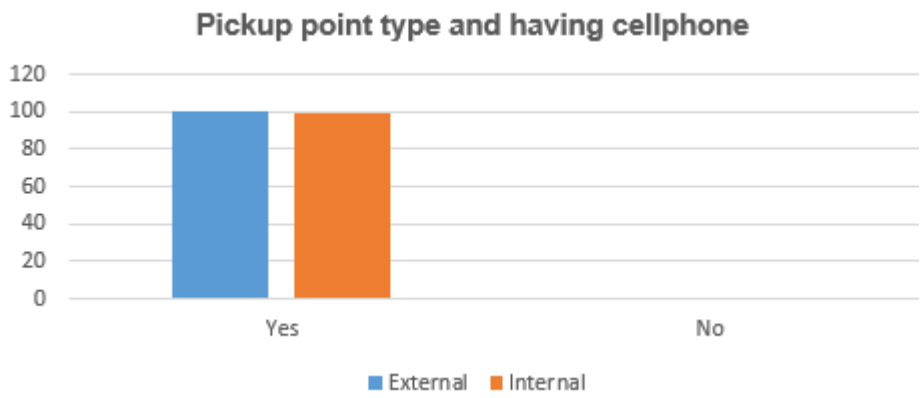

Figure 4.60: Pick-up point type and having a cell phone

Table 4.83: Pick-up point name and a reminder to collect your medication

Pick-up point name	Have a cell phone	
	Yes	No
Adelaide Tambo	99% (=164)	1% (n=1)
Clicks	100% (n=169)	0%
Mandisa Shiceka	100% (n=4	0%
Other	100% (n=4)	0%

SIGNIFICANCE

The results indicated that having a cell phone does not determine if the patients will honour their appointment of collecting their medication from the PUPs. Out of the 100% (n=260) respondents honour their appointments only 99% (n=258) indicated that they have cell phones while all respondents 100% (82=) who do not honour their appointments own cell phones. Thus, there is no significant relationship with P-value of 0.001 and an X^2 of 338.01 (Figure 4.61) between having a cell phone and adhering to medicine collection appointments (Table 4.85 and Figure 4.62).

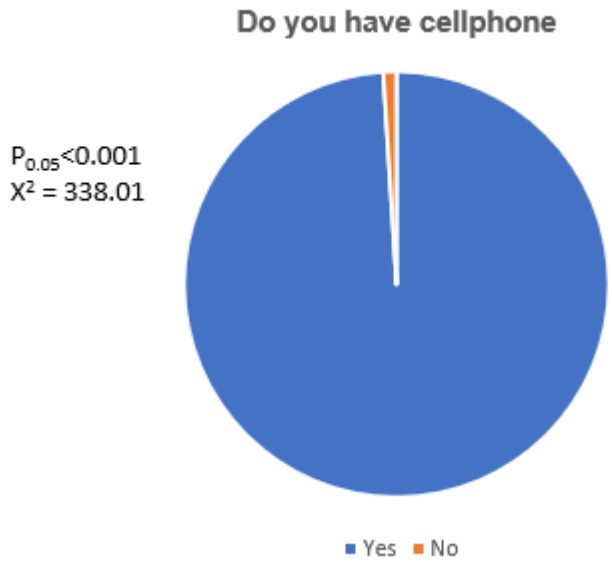

Figure 4.61: Cell phone available as a reminder

Table 4.84: Relationship between adherence and having a cell phone

Have cell phone	Yes	No
Do not honour appointments	100% (n=82)	0%
Always honour appointments	99% (n=258)	1% (n=2)

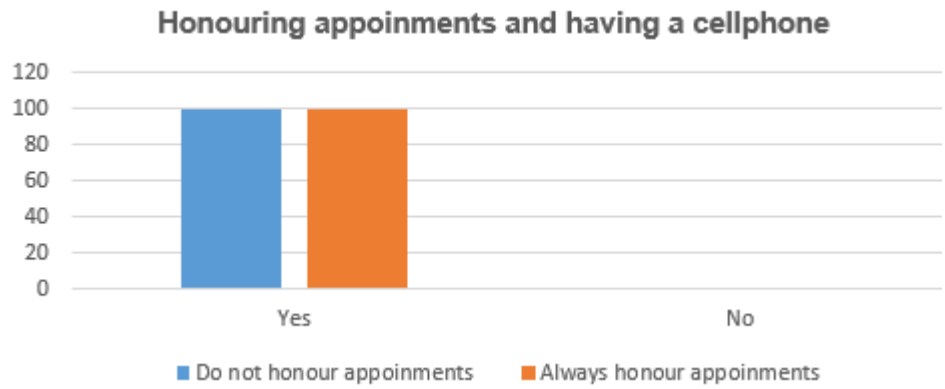

Figure 4.62: Honouring appointments and having a cell phone

⇒ DISCUSSION

Usherwood (2017:149) suggested that unplanned non-adherence by a patient can be due to forgetfulness and misunderstanding. These authors further suggested that regular reminders are an effective way of improving adherence. According to Bauleth, et al (2016:94), several participants cited forgetfulness as a factor that contributed to poor adherence to medications, especially when concentrating on work tasks. Dorward, et al (2019:7), found that delays in receiving reminder SMSs in some participants contributed to their nonadherence to their appointment for medication collection. In their study, Magadzire, et al (2017: 6) suggested that an-SMS appointment reminder is a strategy to mitigate patient challenges of nonadherence due to forgetfulness.

In contrast, this study's findings reflect no significant relationship between adherence and regular reminders like cell phone SMSs with a P-value of 0.001 and an X^2 of 338.01 (Figure 4.61).

4.5.5.2. ABILITY TO READ MESSAGES FROM CELL PHONE (B5.2)

The question was completed by 99% (n=343) respondents with 1% (n=1) omitting the question. Table 4.86 indicates that the majority of respondents 92% (n=314) can read SMS, while 8% (n=29) indicated that they cannot read an SMS from their cell phone.

Table 4.85: Ability to read messages from cell phone (n=343)

Message information		Frequency	Percentage	Chi-squared value	Probability
Can you read messages	Yes	n=314	92%	236,81	<0.001
	No	n=29	8%		

SIGNIFICANCE

Table 4.87 shows that most of the respondents who said their PUP type is external, 94% (n=165), indicated that they can an SMS as compared to 6% (n=11), who said they cannot read an SMS. Whereas 89% (n=149) who indicated that their PUP type is internal said they can read an SMS and 11% (n=18) cannot read an SMS.

Table 4.86: Pick-up point type and being able to read messages

Pick-up point type	Can read messages	
	Yes	No
External	94% (n=165)	6% (n=11)
Internal	89% (n=149)	11% (n=18)

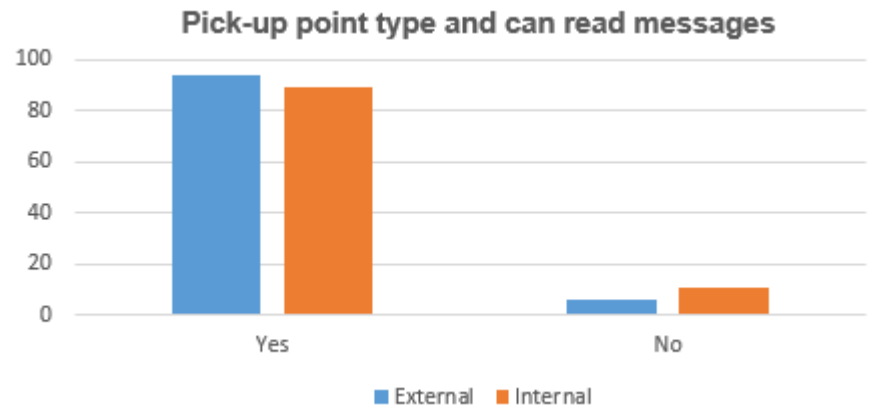

Figure 4.63: Pick-up point type and can read messages

According to Table 4.88 and Figure 4.64. below, the majority of respondents indicated that they could read, 90% (n=151) from Adelaide Tambo Clinic as an internal PUP and 94% (n=156) from Clicks as an

external PUP, indicated that they can read an SMS reminder, while 75% (n=3) from Mandisa Shiceka said the same and 80% (n=4) from other PUP.

Table 4.87: Pick-up point name and being able to read messages

Pick-up point name	Can read messages	
	Yes	No
Adelaide Tambo	90% (n=151)	10% (n=16)
Clicks	94% (n=156)	6% (n=11)
Mandisa Shiceka	75% (n=3)	25% (n=1)
Other	80% (n=4)	20% (n=1)

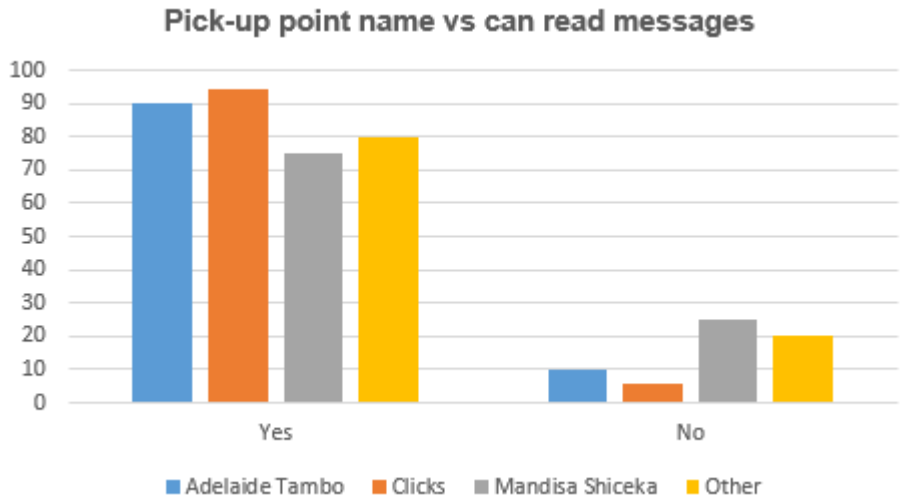

Figure 4.64: Pick-up point name Vs. Can read messages

Table 4.88: Relationship between adherence and being able to read messages

Can read messages	Yes	No
Do not honour appointments	94% (n=76)	6% (n=5)
Always honour appointments	91% (n=238)	9% (n=24)

Figure 4.65: Honouring appointments Vs. can read messages

⇒ **DISCUSSION**

Ninety-four percent 94% (n=76) of respondents who do not honour their appointments indicated that they could read messages on their cell phones while 91% (n=238) of respondents who honour appointments indicated that they are also able to read messages sent on their cell phones (view Table 4.89 and Figure 4.65 above). And therefore, there is no significant relation between honouring appointments and being able to read messages on cell phones with a P-value of >0.001 and an X^2 of 236.81. No recent literature could be found to support this item.

4.5.5.3. ALWAYS RECEIVE A MESSAGE AS A REMINDER TO COLLECT YOUR MEDICATION (B5.3)

The question was completed by 99% (n=342) and omitted by 1% (n=2). Of the respondents, 61% (n=209) indicated that they received a reminder message, while 39% (132) said they did not receive an SMS to remind them to collect their medication from their chosen PUP (Table 4.90).

Table 4.89: Always receive a reminder (n=342)

Always find reminder messages on your cell phone	Frequency	Percentage
Yes	n=209	61%
No	n=132	39%

Figure 4.66: Always find reminder messages on your cell phone

Table 4.91 and Figure 4.67 illustrate that majority of respondents, 71% (n=124), collecting medication from an external PUP said they always receive a reminder SMS, while 29% (n=51) said no. On the other hand, almost half, 51% (n=85) of respondents from an internal PUP indicated that they received a reminder SMS, while 49% (n=81) said no.

Table 4.90: Pick-up point type and receiving a reminder

Pick-up point type	Always receive reminder	
	Yes	No
External	71% (n=124)	29% (n=51)
Internal	51% (n=85)	49% (n=81)

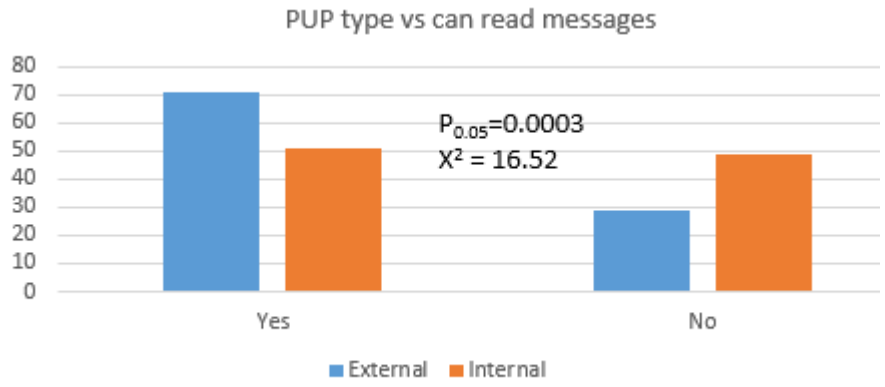

Figure 4.67: Pick-up point type and whether you can read messages

The majority of respondents, 72% (n=120) and 75% (n=3) from Clicks and Mandisa Shiceka, respectively, said they received a reminder SMS, almost half 51% (n=85) of the respondents from Adelaide Tambo (internal PUP received an SMS, and the least being 20% (n=1) from other PUP indicated that they received an SMS (Table 4.92).

Table 4.91: Name of pick-up point and receiving a reminder

Pick-up point name	Always receive reminder	
	Yes	No
Adelaide Tambo	51% (n=85)	49% (n=81)
Clicks	72% (n=120)	28% (n=46)
Mandisa Shiceka	75% (n=3	25% (n=1
Other	20% (n=1)	80% (n=4)

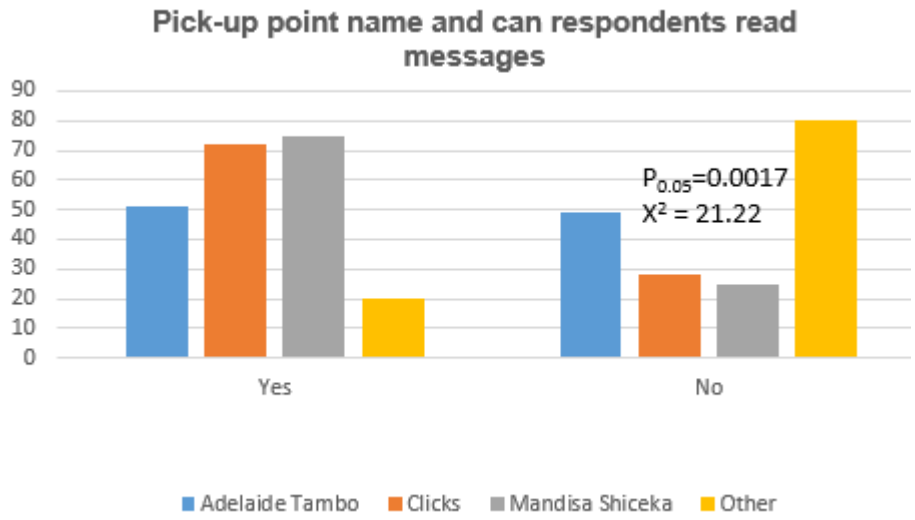

Figure 4.68: Pick-up point name and whether respondents can read messages

SIGNIFICANCE

Table 4.93 illustrate that majority of respondents 65% (n=170) who always received an SMS reminder always honoured their appointment, whereas 52% (n=42) of those who said they only received an SMS reminder sometimes did not honour their appointments. And this shows a significant relationship between adherence and receiving an SMS reminder regularly with a P-value of 0.0178 and an X^2 of 8.06 (Figure 4.69).

Table 4.92: Always receive reminders and adherence

Always receive reminders	Always	Sometimes	Never
Do not honour appointments	48% (n=39)	52% (n=42)	0%
Always honour appointments	65% (n=170)	34% (n=89)	1% (n=2)

Figure 4.69: Honouring appointments and always receiving reminders

⇒ **DISCUSSION**

According to Magadzire, et al (2017:7), an SMS appointment reminder system was designed to mitigate the challenges of forgetfulness. However, the study of Magadzire, et al (2017) did not establish whether patients who were subscribed to the SMS reminder system adhered to their appointments better than those who were not. What was clear in the study (Magadzire, et al 2017) was, the SMS reminder service benefited only a small number of patients.

In this study, 65% (n=170) of those who always received an SMS reminder honoured their appointment, whereas 48% (n=39) of those who did not honour their appointment also indicated that they always receive a reminder SMS, and this shows that receiving an SMS as a reminder is a significant factor in patients adhering to their medication collection appointment date with a P-value of 0.0178 and an X^2 of 8.06 (Table 4.93 and Figure 4.69).

4.6. SECTION C: FOLLOW-UP AT PRIMARY HEALTHCARE SETTING

This section aims to determine and describe the prognosis, health problems, and complications of patients during follow-up at PHC facilities that relate to non-adherence of patients to collect medicine from the CCMDD service providers in the Tshwane District. Items to be discussed in this section are: whether the full assessment was done during the visit, whether annual blood was taken, blood results interpreted, whether the medication was changed, whether the script was renewed, the place of the next appointment and if it is at the PHC facility when was the next appointment and this will be discussed under C1 to C8.

In the discussions of this section tables, graphs and figures will be presented to explain activities during the follow-up visit (full assessment done, annual blood taken, blood results interpreted, medication

changed, or whether the script was renewed and place of follow-up visit), followed by another table and figure to explain if these activities have any relationship with patient's adherence.

Table 4.93: Follow-up at primary healthcare setting

Follow-up at primary healthcare facility	Always	Sometimes	Never	X^2-value	p-value
Was full assessment carried out?	83%	13%	4%	377,17	<0.001
Was the blood drawn from you at least once a year?	95%	4%	1%	588,32	<0.001
Were the results interpreted to you?	86%	8%	6%	423,61	<0.001
Was your medication changed?	2%	16%	82%	373,69	<0.001
Was the script renewed?	90%	8%	2%	499,69	<0.001

4.6.1. WHETHER FULL ASSESMENT WAS DONE (C1)

Questionnaires were distributed to N=344 respondents and 99% (n=343) completed the question. Table 4.95. shows that 83% (n=283) of respondents indicated that full assessment is always carried out during their follow-up visit, 13% (n=45) said it is done sometimes, while 4% (n=5) stated that full assessment was never carried out during their follow-up at PHC facility.

Table 4.94: Full assessment is done and follow-up visit (n=343)

Follow-up at Primary Healthcare facility	Always	Sometimes	Never	X^2-value	p-value
Was full assessment carried out?	83% (n=283)	13% (n=45)	4% (n=15)	377,17	<0.001

Table 4.96 and Table 4.97 below illustrate that respondents from Adelaide Tambo Clinic as an internal 81% (n=142) PUP have 83% (n=140) stating that full assessment is always carried out, compared to 12% (n=21) who stated its done sometimes and 7% (n=12) indicating that full assessment was never done (Figure 4.70 and Figure 4.71). Furthermore, Mandisa Shiceka 100% (n=4) for both internal and external PUP, Clicks 82% (n=136) and other PUP 60% (n=3) as an external PUP stated that full assessment is always carried out during their follow-up visit at PHC facilities.

Table 4.95: Full assessment is done and pick-up point type

Was a full assessment carried out?			
Pick-up point type	**Always**	**Sometimes**	**Never**
External	81% (n=142)	12% (n=21)	7% (n=12)
Internal	84% (n=141	14% (n=24)	2% (n=3)

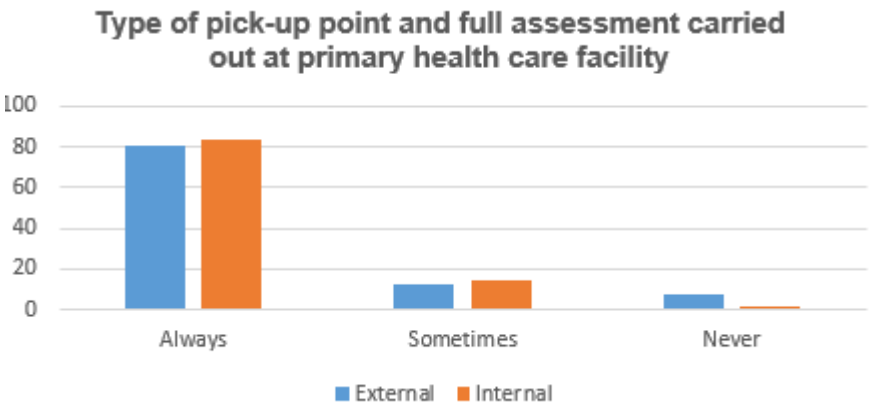

Figure 4.70: Type of Pickup point and full assessment carried out at primary care facility

Table 4.96: Pickup point name and full assessment done

Was full assessment carried out?			
Pick-up point name	**Always**	**Sometimes**	**Never**
Adelaide Tambo	83% (n=140)	15% (n=24	2% (n=3)
Clicks	82% (n=136)	11% (n=19)	7% (n=12)
Mandisa Shiceka	100% (n=4)	0%	0%
Other	60% (n=3)	40% (n=2)	0%

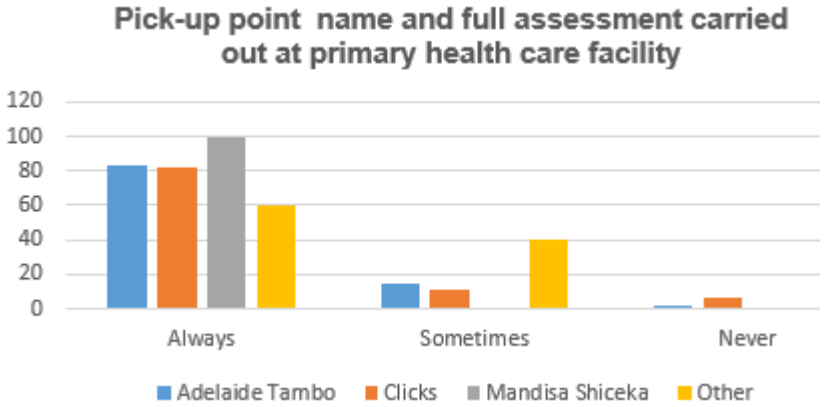

Figure 4.71: Pick-up point name and full assessment carried out at primary healthcare facility

SIGNIFICANCE

Results show that 78% (n=64) of respondents who did not honour appointments indicated that a full assessment is always done during their follow-up visit and 84% (n=219) of those who honour their appointment also said full assessment is always done during their follow-up visit and there is no significant relationship between adherence and full assessment during a follow-up visit with P-value of <0.001 and an X^2 of 377.17 (Table 4.95 and 4.98).

Table 4.97: Full assessment is done and adherence

Was a full assessment carried out?	Always	Sometimes	Never
Do not honour appointments	78% (n=64)	17% (n=14)	5% (n=4)
Always honour appointments	84% (n=219)	12% (n=31)	4% (n=11)

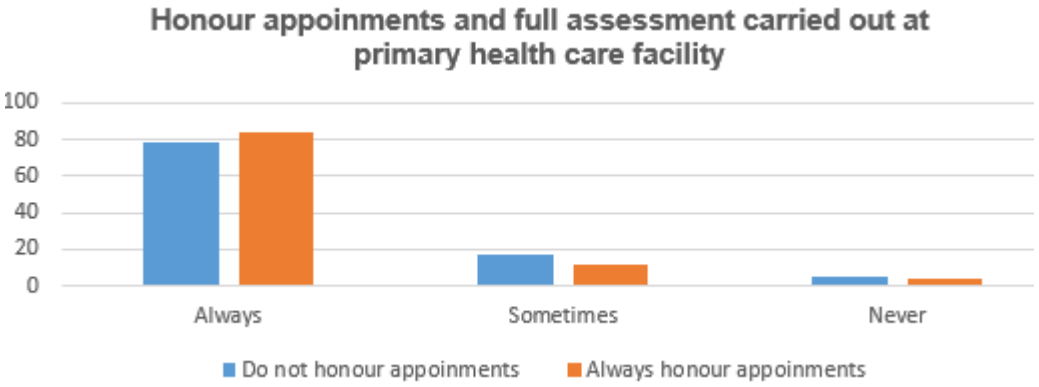

Figure 4.72: Honour appointments and full assessment carried out at primary healthcare facility

⇒ **DISCUSSION**

Manobharathi, et al (2017:787) indicated in the study conducted in India, that adherence to medication sustains health and manages chronic diseases to prevent complications that might lead to negative health outcomes and in this study full assessment during follow-up visit is carried out to exclude complications like end-organ damage, and there is no significant relationship between adherence and whether the full assessment was done during the follow-up visit with a P-value <0.001 and an x^2 of 377.17 (Table 4.95 and Table 4.98).

4.6.2. WAS BLOOD DRAWN DURING YOUR FOLLOW-UP VISIT? (C2)

Question C.2 was completed by 99% (n=343) respondents. Table 4.99 reflects that 95% (n=327) of respondents stated that blood was always drawn annually during their follow-up visit, while 5% (n=16) stated otherwise.

Table 4.98: Annual blood drawn during follow-up visit (n=343)

Follow-up at primary healthcare facility	Always	Sometimes	Never	X^2-value	p-value
Was the blood drawn from you at least once a year?	95% (n=327)	4% (n=14)	1% (n=2)	588,32	<0.001

Table 4.100 and Table 4.101 below illustrate that respondents from Adelaide Tambo Clinic an internal 81% (n=142) PUP (n=140) stating that annual blood was always drawn, compared to 12% (n=21) who stated its done sometimes and 7% (n=12) indicating that annual blood was never taken (Figure 4.73 and Figure 4.74). Furthermore, Mandisa Shiceka has 100% (n=4) for both internal and external PUP,

Clicks 82% (n=136) and other PUP 60% (n=3) as an external PUP stated that annual blood was always drawn during their follow-up visit at PHC facilities.

Table 4.99: Type of pick-up point and whether blood was drawn during follow-up visit

Was the blood drawn from you at least once a year?			
Pick-up point type	**Always**	**Sometimes**	**Never**
External	93% (n=164)	6% (n=10)	1% (n=1)
Internal	97% (n=163)	2% (n=4)	1% (n=1)

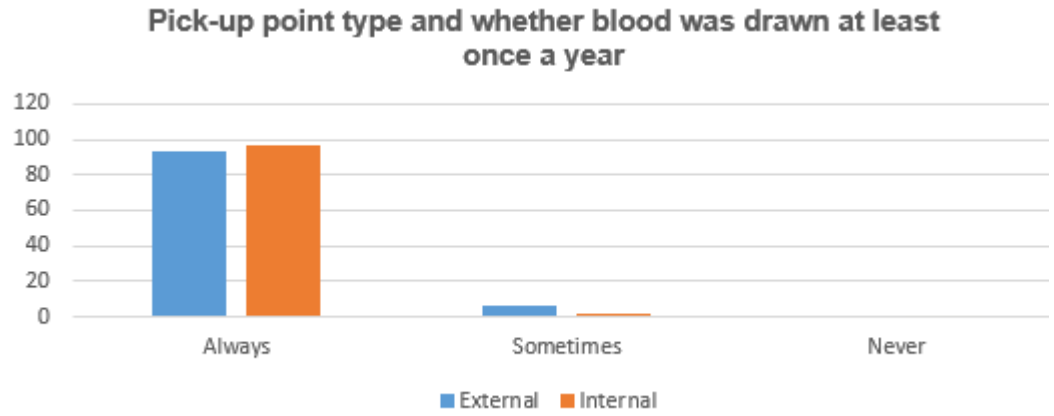

Figure 4.73: Pick-up point type and whether blood was drawn at least once a year

Table 4.100: Pickup point name and whether blood was drawn during a follow-up visit

Was the blood drawn from you at least once a year?			
Pick-up point name	**Always**	**Sometimes**	**Never**
Adelaide Tambo	96% (n=160)	3% (n=5)	1% (n=1)
Clicks	94% (n=159)	5% (n=8)	1% (n=1)
Mandisa Shiceka	100% (n=4)	0%	0%
Other	80% (n=4)	20% (n=1)	0%

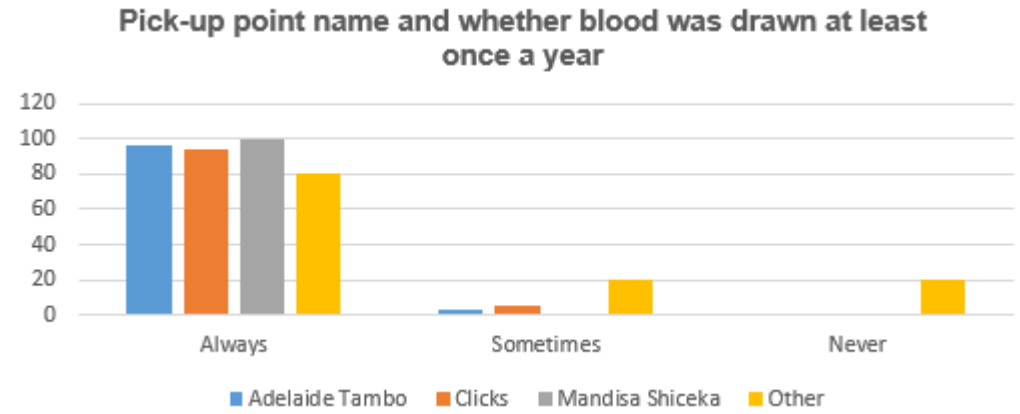

Figure 4.74: Pickup point name and whether blood was drawn at least once a year

SIGNIFICANCE

Results show that 95% (n=250) of the respondents in this study indicated that blood is always drawn during their follow-up visits and this group always honour their appointments, and 94% (n=77) of those who do not honour their appointments also indicated that annual blood is always drawn, thus reflecting that whether annual blood is drawn or not, does not have a significant relationship in them honouring their appointments (Table 4.102 and Figure 4.75).

Table 4.101: Blood drawn during follow-up visit and adherence

Was the blood drawn from you at least once a year	Always	Sometimes	Never
Do not honour appointments	94% (n=77)	5% (n=4)	0%
Always honour appointments	95% (n=250)	4% (=10)	1% (n=2)

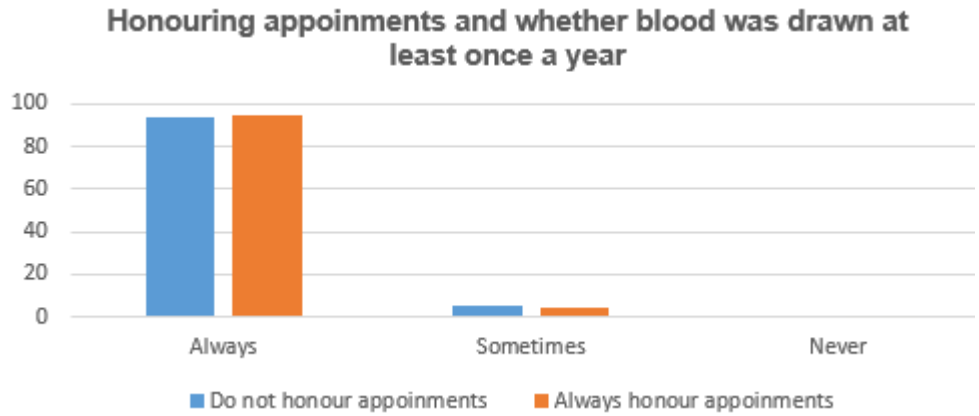

Figure 4.75: Honouring appointments and whether blood was drawn at least once a year

⇒ **DISCUSSION**

Crawford, et al (2014:1394) stated that non-adherence in collecting medication at PUPs was associated with negative impacts such as poor suppression of viral load in patients living with HIV, and this resulted in complications such as the development of Tuberculosis. The viral load suppression will only be identified after drawing annual blood from patients who are HIV positive. In this study (>90%) of the respondents who honour 95% (n=250) and who do not honour 94% (n=77) indicated that blood is always drawn annually, meaning this does not have any association with them honouring their appointments with a P-value <0.001 and an X^2 of 588.34 (Table 4.99).

4.6.3. RESULTS INTERPRETED DURING RESPONDENTS FOLLOW-UP VISIT (C3)

Question C3 was completed by 99% (n=343) of respondents with 1% (n=1) omitting the question. Table 4.103 shows that 86% (n=295) of the respondents indicated that results are always interpreted when patients come for their follow-up visit subsequent to the visit where blood was drawn.

Table 4.102: Results interpreted during a follow-up visit (n=343)

Follow-up at a primary healthcare facility	Always	Sometimes	Never	X^2-value	p-value
Were the results interpreted?	86% (n=295)	8% (n=27)	6% (n=21)	423,61	<0.001

Table 4.104 and Figure 4.76 illustrates that 82% (n=143) of respondents from an external PUP stated that results are always interpreted, compared to 9% (n=16) who stated its done sometimes and 9% (n=16) indicating that full assessment was never done. Furthermore, for internal PUP 90% (n=152) stated that results are always interpreted during their follow-up visit at PHC facilities - mostly internal PUP are Adelaide Tambo Clinic patients with 89% (n=148) (Table 4.105 and Figure 77).

Table 4.103: Pickup point type and whether results were interpreted

Were the results interpreted to you?			
Pick-up point type	**Always**	**Sometimes**	**Never**
External	82% (n=143)	9% (n=16)	9% (n=16)
Internal	90% (n=152)	7% (n=11)	3% (n=5)

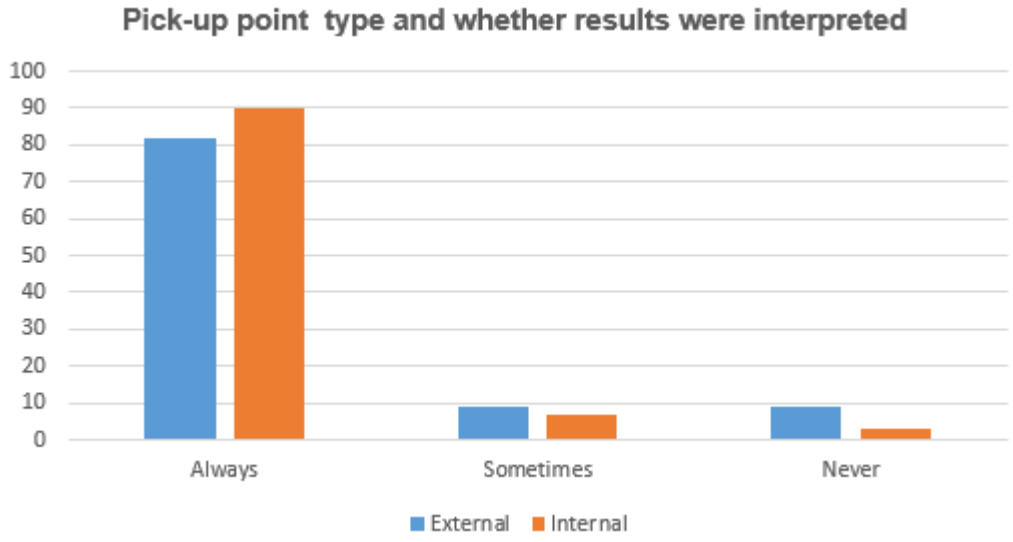

Figure 4.76: Pick-up point type and whether results were interpreted

Table 4.104: Pickup point name and whether results were interpreted

Were the results interpreted to you?			
Pick-up point name	**Always**	**Sometimes**	**Never**
Adelaide Tambo	89% (n=147)	7% (n=11)	4% (n=8)
Clicks	84% (n=141)	8% (n=14)	8% (n=13)
Mandisa Shiceka	100% (n=4)	0%	0%
Other	60% (n=3)	40% (n=2)	0%

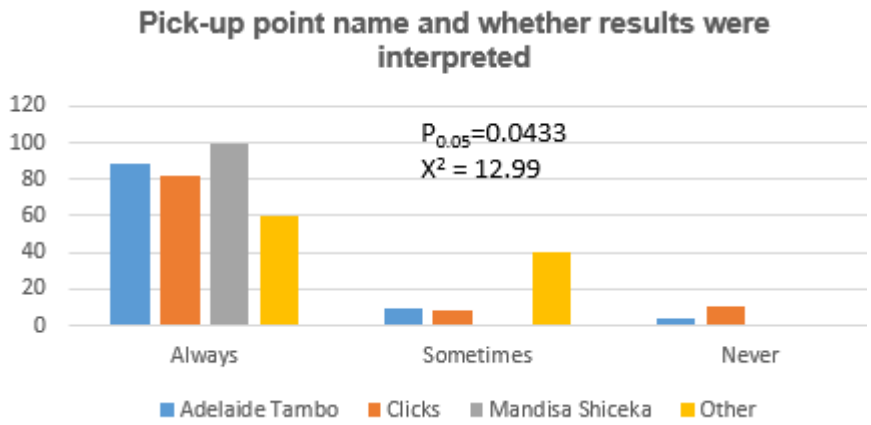

Figure 4.77: Pick-up point name and whether results were interpreted

SIGNIFICANCE

Results show that 85% (n=223) of respondents who always honour appointments, indicated that results are always interpreted during their follow-up visits, whereas 88% (n=72) of those who did not honour appointments also indicated that annual blood is always drawn, thus reflecting that whether results are interpreted or not, does not have a significant relationship in patients honouring appointments (Table 4.106 and Figure 4.78) with P value <0.001 and 423.61 (Table 4.103).

Table 4.105: Association between adherence and if results were interpreted

Were the results interpreted to you?	Always	Sometimes	Never
Do not honour appointments	88% (n=72)	10% (n=8)	2% (n=2)
Always honour appointments	85% (n=223)	7% (n=19)	8% (n=19)

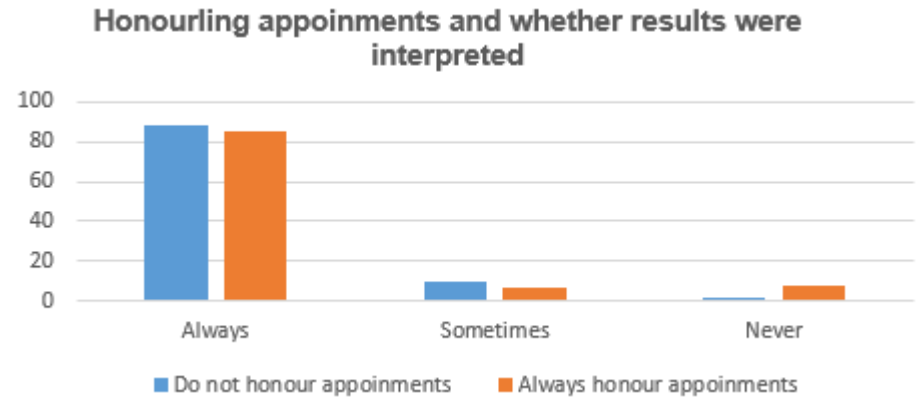

Figure 4.78: Honouring appointments and whether results were interpreted

⇒ **DISCUSSION**

Bauleth, et al (2016:94) suggested that inadequate information sharing with patients including their blood results and the consequences of not taking their chronic medication regularly, leads to poor adherence. In this study, the interpretation of results as part of sharing information has no relationship with the adherence of respondents with a P-value <0.001 and 423.61 (Table 4.103).

4.6.4. MEDICATION CHANGED DURING FOLLOW-UP VISIT (C5)

Questionnaires (N=344) were distributed and 99% (n=343) completed this question. And 82% (n=282) of the respondents who completed the question indicated that their medication was never changed during their follow-up visit, meaning that they responded to the treatment given and thus their chronic conditions remained stable with no complications, therefore there was no need to change their medication. Whereas 16% (n=54) of respondents indicating that their medication was changed sometimes, while 2% (n=7) stated that medication was always changed during their follow-up visit, and probably these are those patients who are not responding well to their chronic medication and needed regular monitoring by the doctor or clinician (Table 4.107).

Table 4.107: Medication changed during a follow-up visit (n=343)

Follow-up at a primary healthcare facility	Always	Sometimes	Never	X^2-value	p-value
Was your medication changed?	2% (n=7)	16% (n=54)	82% (n=282)	373,69	<0.001

Table 4.108 and Table 4.109 below illustrate that respondents from Adelaide Tambo Clinic as an internal 84% (n=142) PUP have 82% (n=136) stating that medication was never changed, compared to 12% (n=21) who said it was changed sometimes and 2% (n=4) indicating that their medication was always changed during their six-month follow-up (Figure 4.79 and Figure 4.80). Furthermore, Mandisa Shiceka with 100% (n=4) for both internal and external PUP, Clicks 82% (n=138) and other PUP 80% (n=4) as an external PUP stated that medication was never changed during their follow-up visit at PHC facilities.

Table 4.108: Pickup point type and whether the medication was changed during the follow-up visit

Was your medication changed?			
Pick-up point Type	**Always**	**Sometimes**	**Never**
External	2% (n=4)	18% (n=31)	80% (n=140)
Internal	3% (n=3)	13% (n=23)	84% (n=142)

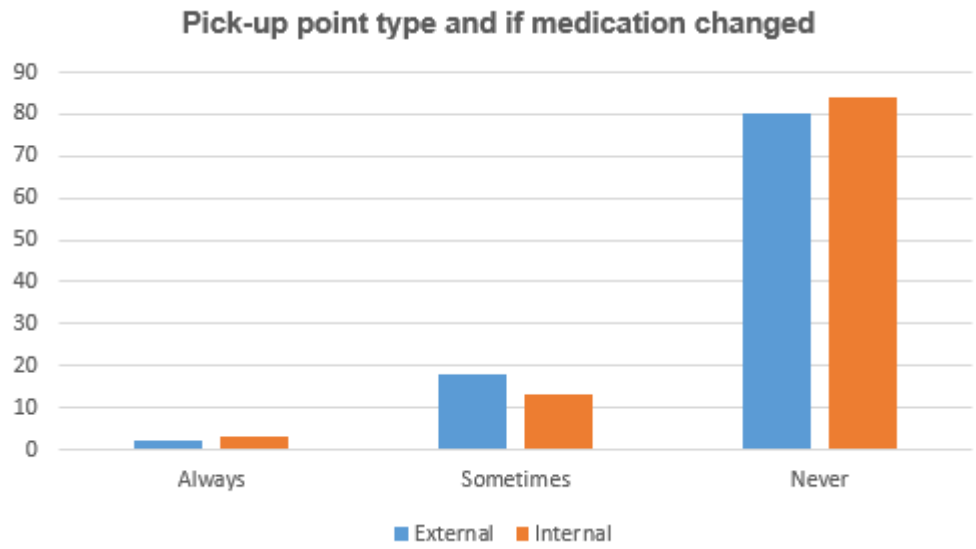

Figure 4.79: Pick-up point type and if medication changed

Table 4.109: Pick-up point name and whether the medication was changed during a follow-up visit

Was your medication changed?			
Pick-up point name	**Always**	**Sometimes**	**Never**
Adelaide Tambo	3% (n=5)	15% (n=25)	82% (n=136)
Clicks	1% (n=2)	17% (n=28)	82% (n=138)
Mandisa Shiceka	0%	0%	100% (n=4)
Other	0%	20% (n=1)	80% (n=4)

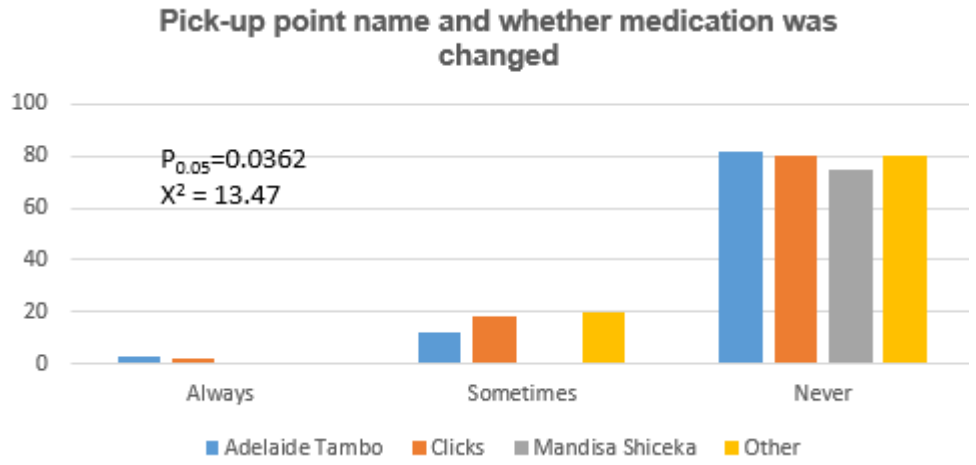

Figure 4.80: Pick-up point name and whether the medication was changed

SIGNIFICANCE

Results show that 82% (n=215) of the respondents in this study indicated that their medication was never changed during their follow-up visit at PHC facilities and this group always honour their appointments, and 83% (n=67) of those who do not honour appointments also indicated that medication was never changed during their follow-up visit.

And this reflects that, whether the medication was changed or not, it does not have significant relationship to adherence to medication collection with a P-value of <0.001 and an X^2 of 373.69 (Table 107, Table 4.110 and Figure 4.81).

Table 4.110: Relationship between adherence and whether the medication was changed during a follow-up visit

Was your medication changed?	Always	Sometimes	Never
Do not honour appointments	2% (n=3)	15% (n=12)	83% (n=67)
Always honour appointments	2% (4)	16% (n=42)	82% (215)

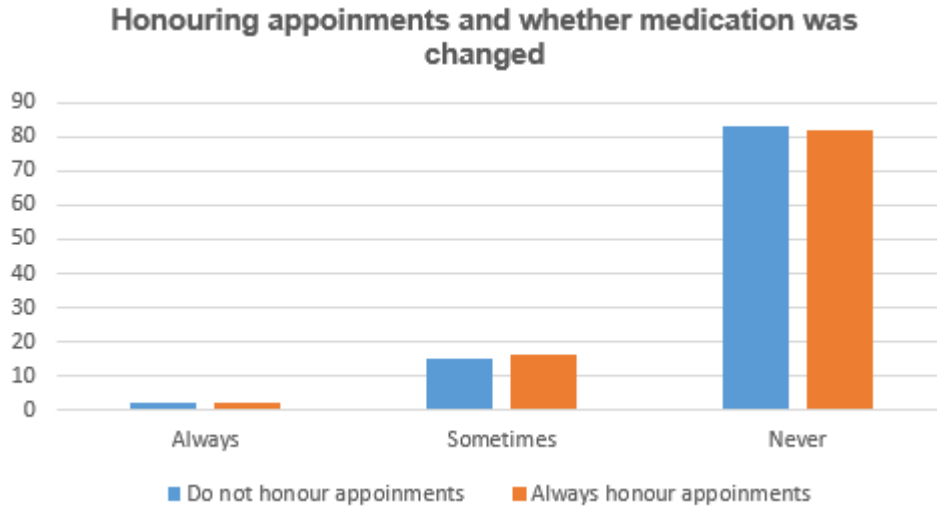

Figure 4.81: Honouring appointments and whether medication was changed

⇒ **DISCUSSION**

According to Manobharathi, et al (2017:790), based on the results and findings of the study conducted in India, an increase in the number and doses of drugs is one of the main factors contributing to nonadherence. However, there was no significant association found between nonadherence and change of medication in this study with a P-value of <0.001 and X^2 of 373.69 (Table 4.110 and Figure 4.81).

4.6.5. SCRIPT RENEWED DURING FOLLOW-UP VISIT (C6)

The question was completed by 99% (n=343). Table 4.111 below illustrates that 90% (n=309) of respondents indicated that their script was renewed, whereas 8% (n=28) said the script was renewed sometimes and 2% (n=6) indicated that the script was never renewed during their follow-up visit at PHC facility.

Table 4.111: Script renewed during a follow-up visit (n=343)

Follow-up at a primary healthcare facility	Always	Sometimes	Never	X^2-value	p-value
Was the script renewed?	90% (n=309)	8% (n=28)	2% (n=6)	499,69	<0.001

Table 4.112 and Table 4.113 reflect that respondents from Adelaide Tambo Clinic as an internal 87% (n=146) PUP have 87% (n=144) stating that their scripts were always renewed, while 11% (n=19) stated it was changed sometimes and 2% (n=3) indicating that renewal of script was never done (Figure 4.82 and Figure 4.83). Furthermore, Mandisa Shiceka 100% (n=4) for both internal and external PUP, Clicks 94% (n=158) and other PUP 60% (n=3) as an external PUP stated that their scripts were always renewed during their follow-up visit at PHC facilities.

Table 4.112: Pick-up point type and whether script was renewed during follow-up visit

Was the script renewed?			
Pick-up point type	**Always**	**Sometimes**	**Never**
External	93% (=163)	6% (n=10)	1% (n=2)
Internal	87% (n=146)	11% (n=18)	2% (n=4)

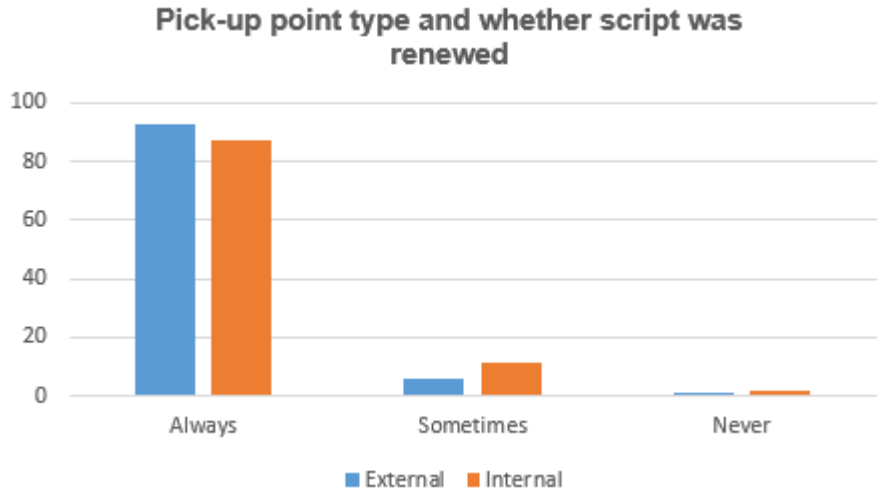

Figure 4.82: Pick-up point type and whether script was renewed

Table 4.113: Pick-up point name and whether script was renewed during follow-up visit

Was the script renewed?			
Pick-up point name	**Always**	**Sometimes**	**Never**
Adelaide Tambo	87% (n=144)	11% (n=19)	2% (n=3)
Clicks	94% (n=158)	5% (=8)	1% (n=2)
Mandisa Shiceka	100% (n=4)	0%	0%
Other	60%(n=3)	20% (n=1)	20% (n=1)

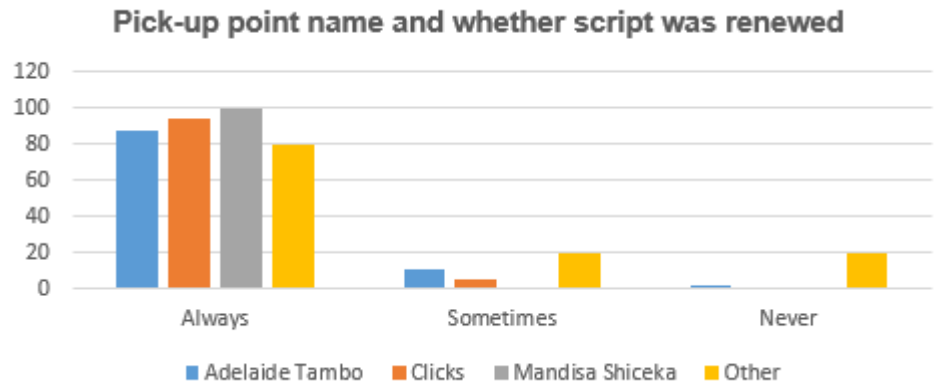

Figure 4.83: Pick-up point Name and whether script was renewed

SIGNIFICANCE

Table 4.114 and Figure 4.84 illustrate that 89% (n=233) of the respondents who honour appointments stated that their scripts are always renewed during their follow-up visits, whereas 93% (n=76 of those who do not honour appointments also indicated that their scripts are always renewed, reflecting that whether the script is renewed or not, it does not have significant relationship in them honouring their appointments as indicated by a P-value of <0.001 and an X^2 of 499.69 (Table 4.111)

Table 4.114: Adherence and script renewed during follow-up visit

Was the script renewed?	Always	Sometimes	Never
Do not honour appointments	93% (n=76)	5% (n=4)	2% (n=2)
Always honour appointments	89% (n=233)	10% (n=24)	1% (n=4)

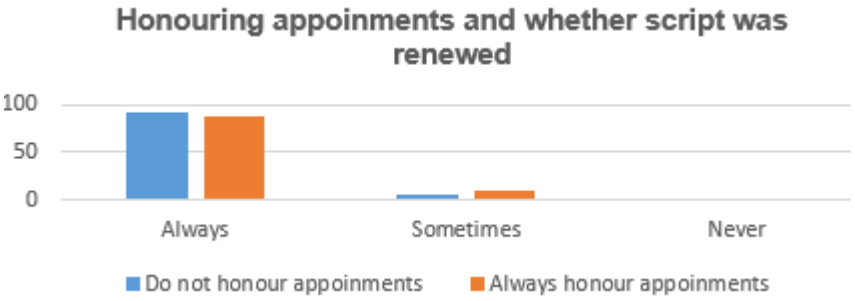

Figure 4.84: Honouring appointments and whether script was renewed

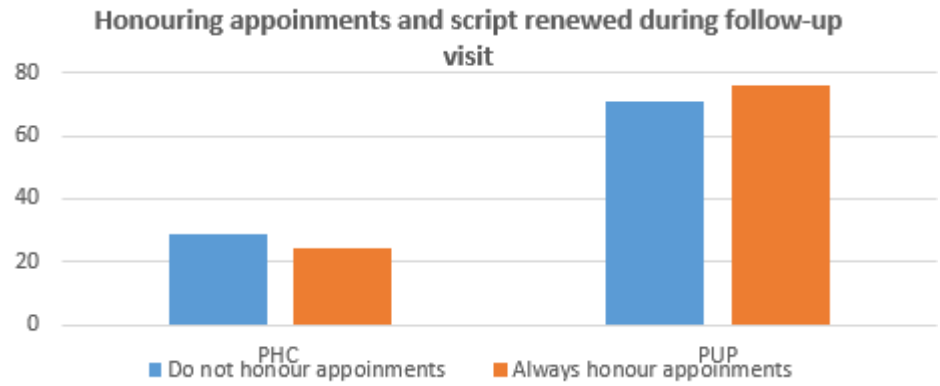

Figure 4.85: Honouring appointments and script renewed during follow-up visit

⇒ **DISCUSSION**

The medication scripts of patients are to be renewed by either a doctor or nurse clinician every six months when they visit the healthcare facility for their follow-up (Maharaj 2018:13). Those patients who are not stable or not responding to the treatment prescribed, medication will be changed, and adherence emphasised (Fox, et al 2019:4).

This study reflected that there is no association between adherence and whether the script was renewed with a P-value of <0.001 and an X^2 of 499.69 (Table 4.111).

4.6.6. PLACE OF NEXT APPOINTMENT AFTER A MONTH (C7)

Questionnaires were distributed to N=344 respondents and 99% (n=343) completed question C7. The majority of respondents 75% (n=257) indicated that their next appointment was at their chosen external PUP, while 25% (n=86) responded that their next appointment was at the PHC setting, probably because their condition has deteriorated or that they have to go for their blood results (Table 4. 115).

Table 4.115: Place of appointment after a month (n=343)

Place of next appointment	Frequency	Percentage
PHC setting clinic	n=86	25%
PUP	n=257	75%

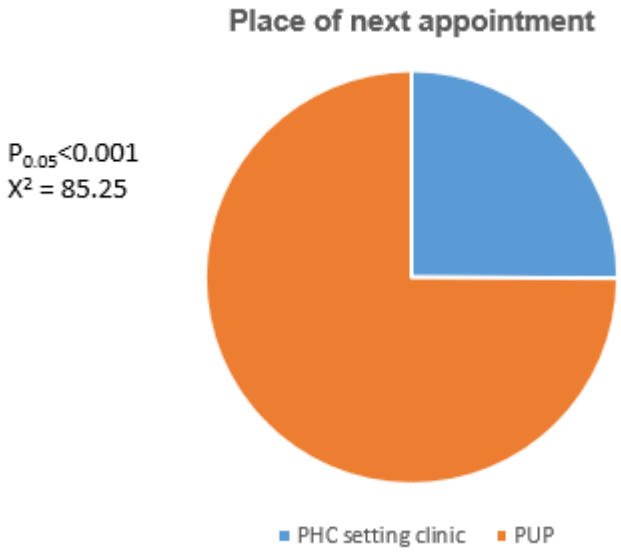

Figure 4.86: Place of next appointment

Table 4.116 and Table 4.117 below show that 82% (n=144) of respondents from an external PUP which are mostly from Clicks 83% (n=139) indicated that their next appointment was at PUP(external), and 18% (n=31) said their next appointment is at PHC facility(internal). Whereas 67% (n=112) from Adelaide Tambo Clinic indicated that their next appointment was at PUP and 33% (n=54) said they had to attend the PHC facility.

Table 4.116: Pick-up point type and place of next appointment

Pick-up point type	Place of next appointment	
	PHC	PUP
External	18%(31)	82%(n=144)
Internal	33%(n=55)	67%(n=113)

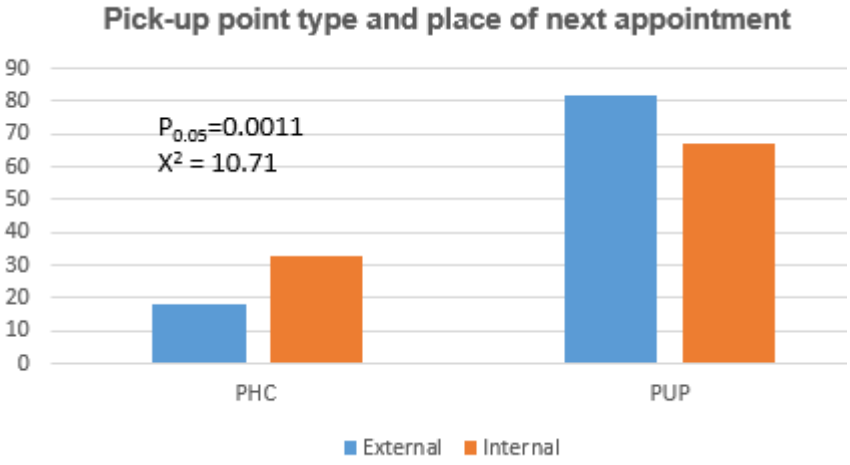

Figure 4.87: Pick-up point type and place of next appointment

Table 4.117: Pick-up point name and place of next appointment

Pick-up point name	Place of next appointment	
	PHC	PUP
Adelaide Tambo	33% (n=54)	67% (n=112)
Clicks	17% (n=29)	83% (n=139)
Mandisa Shiceka	25% (n=1)	75% (n=3)
Other	40% (n=2)	60% (n=3)

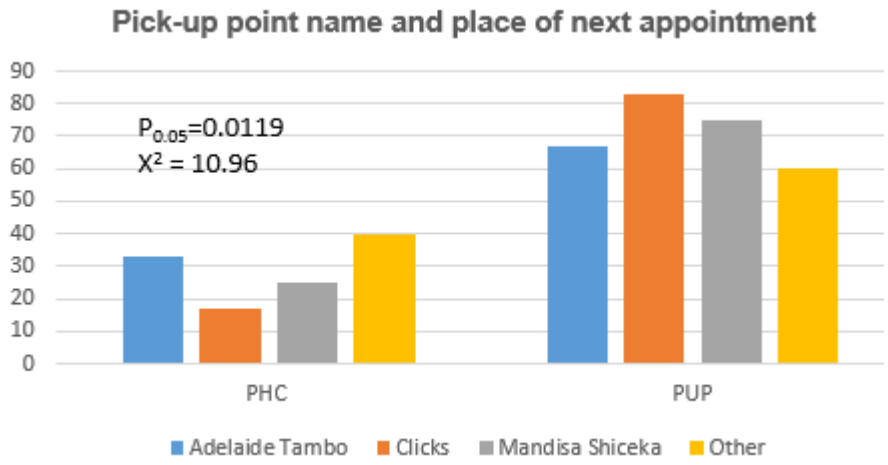

Figure 4.88: Pick-up point name and place of next appointment

SIGNIFICANCE

Table 4.118 illustrates that 76% (n=199) of respondents who honoured their appointments, indicated that their next appointment was at PUP and even those who did not appointment, their majority 71% (n=58) said their next appointment was at PUP. This shows that there is no significant relationship between the place of the next appointment of respondents and their adherence to the collection of their medication by the P-value of 0.0119 and an X^2 of 85.25.

Table 4.118: Association between the place of next appointment and adherence

Place of next appointment	PHC	PUP
Do not honour appointments	29% (n=24)	71% (n=58)
Always honour appointments	24% (n=62)	76% (n=199)

⇒ DISCUSSION

Haddad, et al (2014:46) indicated that non-adherence was associated with a significantly higher rate of psychiatric hospitalisation due to poorer mental functioning. Magadzire, et al (2017:3) found that patients who had to return to their PHC facilities were those who were not clinically stable according to guidelines on the management of Diabetes mellitus and hypertension and this was attributed to poor adherence to medications sometimes.

In this study, the place of the next appointment is determined by the clinical condition of the patient compared to the last PHC visit and whether blood results are available if taken at their last visit. Those patients who are clinically stable according to their blood results will be asked to go back to their chosen PUPs. In contrast, this study shows that the place of the next appointment is not a significant factor in adherence with a P-value of <0.001 and an X^2 of 588.34 (Table 4.99).

4.6.7. NEXT APPOINTMENT DATE AT PRIMARY HEALTHCARE SETTING (C8)

A total of N=344 questionnaires were distributed, and the question was completed by 98% (n=336) while 2% (n=8) of respondents omitted to answer the question.

From Table 4.119 and Figure 4.92 21% (n=69) of the respondents' next appointment dates were scheduled in a month, while 2% (n=7) of respondents were to follow up in two weeks. Several patients, 1% (n=3), were scheduled to come within a week, probably because their conditions were no longer clinically stable or needed to come back to the PHC health facility for their blood results if it was taken on their last visit. Of the n=336 respondents, 76% (n=257) indicated that their next appointment date was at their PUPs and not at the PHC facility.

Table 4.119: Next appointment date at primary healthcare setting (n=336)

Next appointment date at primary healthcare	Frequency	Percentage
One week	n=3	1%
Two weeks	n=7	2%
One Month	n=69	21%
No appointment at PHC	n=257	76%

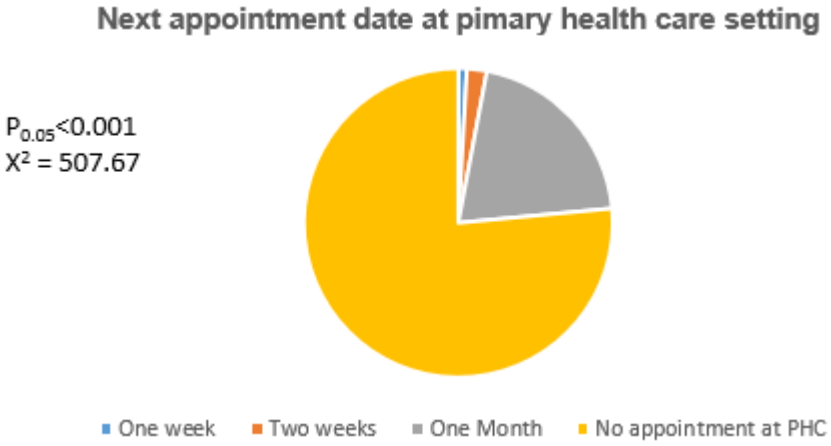

Figure 4.89: Next appointment date at primary healthcare setting

SIGNIFICANCE

Table 4.120 illustrates that majority of respondents from external PUP 84% (n=144) and to a lesser degree from internal 68% (n=113) indicated that their next appointment date was not at PHC level meaning they will only attend the PHC facility at six (6) month for their normal follow-up as they are stable or responding well to their treatment. Furthermore, the least, 2% (n=3) from internal and none from external PUP indicated that their next appointment was in one week, probably because there is a need to review their blood results as they are not responding to the treatment given or there are complications to be reviewed by the Doctor.

Table 4.120: Pick-up point type and next appointment date at a primary healthcare setting

Pick-up point type	Next appointment date at a primary healthcare setting			
	One week	Two weeks	One Month	No appointment at PHC
External	0%	2% (n=3)	14% (n=24)	84% (n=144)
Internal	2% (n=3)	2% (n=4)	28% (n=45)	68% (n=113)

SIGNIFICANCE

Adelaide Tambo Clinic as an internal PUP have 69% (n=110) and Clicks 84% (n=141) as an external PUP indicated that their next appointment date was at PUP level (Table 4.121 and Figure 4.91) and this data shows a significant relationship between external and internal PUP and their place of next appointment with a P-value of 0.0035 and an X^2 of 13.59 (Figure 4.90).

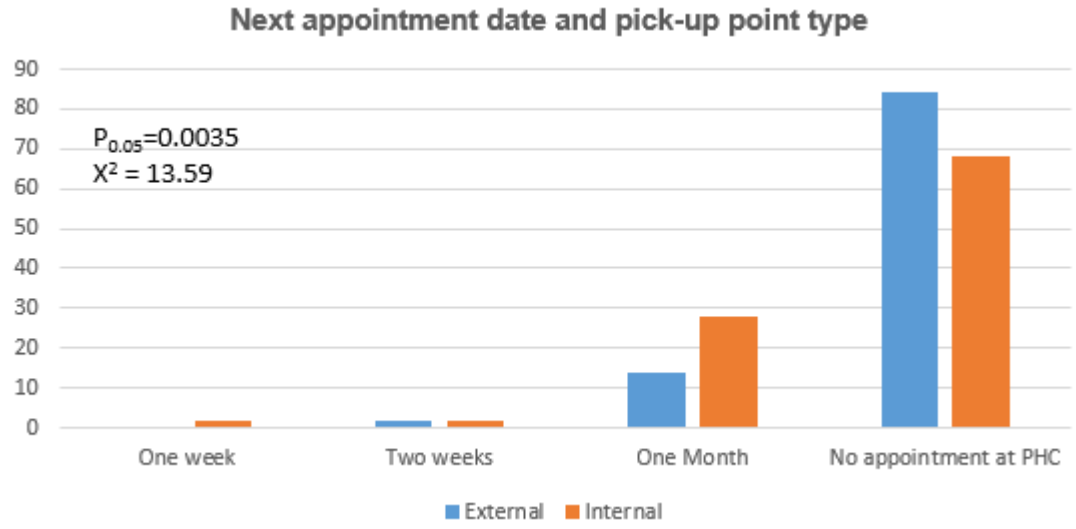

Figure 4.90: Next appointment date and pick-up point type

Table 4.121: Pick-up point name and next appointment date at primary healthcare setting

Pick-up point name	Next appointment date at primary healthcare setting			
	One week	Two weeks	One Month	No appointment at primary healthcare setting
Adelaide Tambo	2% (n=3)	2% (n=4)	27% (n=44)	69% (n=110)
Clicks	0%	2% (n=3)	14% (n=23)	84% (n=141)
Mandisa Shiceka	0%	0%	25% (n=1)	75% (n=3)
Other	0%	0%	25% (n=1)	75% (n=3)

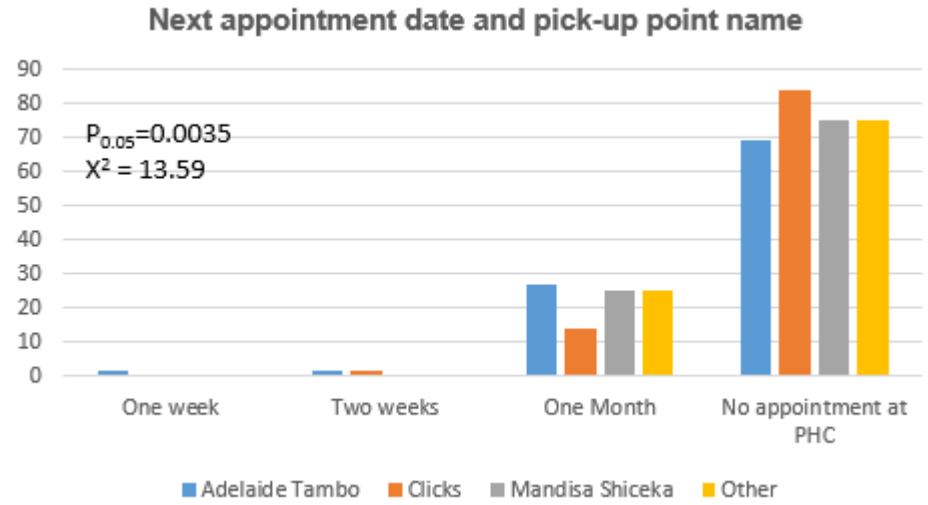

Figure 4.91: Next appointment date and pick-up point name

SIGNIFICANCE

Results show that 78% (n=201) of the respondents indicated that their next appointment date will not be at a PHC facility but at a PUP, and this group always honour their appointments, whereas 72% (n=56) of those who do not honour their appointments also indicated that their next appointment date will be at PUP and not PHC level, thus reflecting that there is no significant relationship between adherence and date of next visit, (Table 4.122 and Figure 4.92).

Table 4.122: Next appointment date at primary healthcare setting and adherence

Next appointment date at primary healthcare setting	One week	Two weeks	One Month	No appointment at PHC
Do not honour appointments	1% (n=1)	3% (n=2)	24% (n=19)	72% (n=56)
Always honour appointments	1% (n=2)	2% (n=5)	19% (n=50)	78% (n=201)

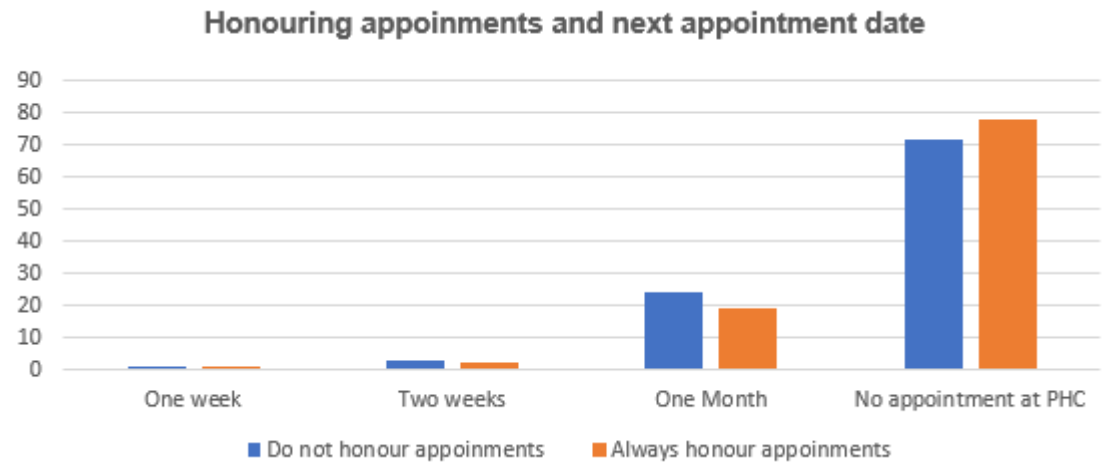

Figure 4.92: Honouring appointments and next appointment date

⇒ **DISCUSSION**

Crawford, et al (2014:1394) are of the opinion that increased drug resistance is due to poor adherence among some patients and the subsequent negative effect on health outcomes which may be poor suppression of viral load in patients living with HIV and resulting in complications such as the development of Tuberculosis. The results from this study show that there is no significant relationship between adherence and the date of the next visit, the majority of respondents 76% (n=257) are responding well to their treatment and thus do not have a need to report sooner than six months to be reviewed at PHC level. The P value of <0.001 and $X^2 = 507.67$ (Figure 4.92) indicated that there is no significant relationship between adhering to appointment date and the next appointment date.

4.7. SUMMARY

This chapter presented the analysis of the data and discussed the results of the study. The following chapter will conclude the study and will focus on the recommendations for this study based on the findings, and limitations.

5. CHAPTER 5: RECOMMENDATIONS AND LIMITATIONS

5.1. INTRODUCTION

Data analysis and interpretation of the results of this study were presented in Chapter 4. The previous chapter also described the factors contributing to the non-adherence of patients collecting medicine from the CCMDD pick-up points in the Tshwane District. This chapter focuses on the recommendations based on the results, limitations of the study and concluding remarks. Research objectives were used to guide the conclusions and recommendations of this study.

This study was motivated by concerns about the number of returns of medication parcels due to the non-adherence of patients to collect medication parcels at the various PUPs by patients registered on the CCMDD program in the Tshwane District during the period May 2014 to December 2017. The CCMDD programme aims to provide relief for overcrowded facilities and make medication accessible to the nearest point to patients' homes or workplaces.

5.2. OBJECTIVES OF THE STUDY

The following objectives were used to determine and describe the outcomes and guide the recommendations for this study to meet the aim of the study:

- The service delivery factors contributing to adherence and nonadherence of patients to collect medicine from the CCMDD service providers in the Tshwane District.
- The accessibility factors contributing to adherence and the nonadherence of patients to collect medicine from the CCMDD service providers in the Tshwane District.
- The contribution of waiting times at pick-up points to nonadherence of patients to collect medicine from the CCMDD service providers in the Tshwane District.
- If the information given at PUP contributes to adherence and nonadherence of patients to collect medicine from the CCMDD service providers in the Tshwane District
- The prognosis, health problems and complications of patients who did not adhere to collection of medicine from the Central Chronic Medicine Dispensing and Distribution service providers in the Tshwane District.

5.3. GENERAL RECOMMENDATIONS

Factors such as demographic background, service delivery factors (which include pick-up points, accessibility and waiting time), the information given during the collection of pre-packed medication and management during follow-up at the PHC facility) were discussed in Chapter 4. It was found in this study that inaccessibility and staying far from PUP contributed to the nonadherence of patients collecting medication from the CCMDD PUPs in the Tshwane District. One way to reduce mortality among people diagnosed with chronic diseases is to sustain and ensure unlimited access to medication supply. From the findings, the researcher recommended that diversification and looking beyond the conventional PHC facility and community pharmacy-based approach to consider the inclusion of community-based outreach programs (mobile clinics, community adherence clubs and use of community healthcare workers in WBOT). This recommendation will ensure that identifiable links are maintained with the healthcare system, increase the trust of users and ultimately reduce nonadherence of patients collecting medication from the CCMDD PUPs in the Tshwane district.

5.3.1. RECOMMENDATIONS FOR SERVICE DELIVERY FACTORS

Factors such as socioeconomic status and staying far from PUP are interrelated and for the most part, have a negative impact on the quality of care and therefore negative health outcomes. For service delivery factors that contribute to the inaccessibility of PUP, the researcher recommends the introduction of community adherence clubs to facilities where there are no shopping malls around.

In this study, the researcher concludes by recommending that it is important to bring PUP services closer to the community in a form of adherence clubs, especially for those staying in Pyramid (agricultural area). This may benefit the community, as socio-economic factors that have emerged from the study and negatively affected adherence were long distance to PUP and lack of transport.

5.3.2. RECOMMENDATIONS FOR ACCESSIBILITY FACTORS

Recommendations for accessibility factors contributing to adherence and nonadherence of patients to collect medicine from the CCMDD service providers in the Tshwane district:

- Access to essential medicine has been cited as a key element of service delivery and quality care and forms a fundamental part of universal health coverage. For accessibility factors that contribute to adherence and nonadherence, the researcher formulated the following recommendations:

- The adherence clubs' model has to be introduced in all facilities. The introduction of this model in the Tshwane District was spearheaded by a non-governmental organisation (NGO) as a supporting partner - Foundation for Professional Development (FPD), which has since terminated its technical support in the Tshwane Sub District 2 and introduction of adherence clubs was not done in all the facilities. If this can be fast-tracked to all the facilities, this could make a significant difference in terms of access and thus reducing nonadherence.
- Enhance accessibility by an increase in medicine distribution points by using mobile points available and the use of community healthcare workers. This recommendation will result in well-planned and organised mobile facilities that will benefit those patients who cannot afford to visit a facility or PUP.
- A need to increase PUP by approval to add medical consultation rooms around, especially in the Pyramid area, to be distribution points for easier access.

5.3.3.RECOMMENDATIONS FOR CONTRIBUTION OF WAITING TIME

Recommendations for the contribution of waiting time at pick-up points for patients to adhere to collection of medication from the CCMDD service providers in the Tshwane District, the researcher formulates the following recommendations:

- An intervention that shortens waiting times for clients on chronic medication at the facilities is recommended by the researcher, this recommendation will allow for re-arrangements of return dates according to mobile points and each patient will be assigned to a healthcare worker especially those around the neighbouring plots, not only will this recommendation assist in the mobile outreach services to be done daily but, will also enable the outreach service to take along some pre-packed chronic medication to be distributed at mobile points.
- A motivation to increase the number of community health workers needs to be written and submitted to Tshwane District health services, increasing the number of community health workers will ensure that adherence is attained, as well as to conduct their outreach services and mending of community adherence clubs.

5.3.4.RECOMMENDATIONS FOR INFORMATION GIVEN AT PICK-UP POINTS

Recommendations for information given at pick-up points that contributes to adherence of patients to collect medicine from the CCMDD service providers in Tshwane District. For this, the researcher formulates the following recommendations:

- By providing information to patients about their chronic conditions, how to best manage their conditions and medication on a day-to-day basis as well as the required skills to make decisions about their own health. This recommendation will empower patients, ensure a patient-centred approach and enable patients to make informed decisions about their own health. This recommendation may subsequently improve their healthcare experience.
- Support groups at a community level can be started to ensure psychosocial support and sharing of relevant information among patients with chronic conditions. In these support groups, continuous screening for side effects and ongoing counselling for all patients using chronic medication can be included.
- Training and mentorship are recommended to empower healthcare workers to deal with challenges and counsel their clients about the side effects of chronic medication to ensure that patients are not ignored when complaining about side effects, as it impacts adherence to their treatment.
- Relevant posters with clear and understandable information can be used in healthcare facilities and PUPs to assist in providing patient information and result in adherence.

5.3.5. RECOMMENDATIONS TO IMPROVE HEALTH OUTCOMES AND PROGNOSIS OF PATIENTS

To improve health outcomes and prognosis of patients who collect their medication from the CCMDD service providers in the Tshwane District, the researcher formulates the following recommendation:

- Implement monitoring systems for all patients with chronic diseases and not only for patients with HIV and TB. A monitoring system where patient outcome are analysed monthly, routinely, and periodically at the healthcare facility to facilitate timely interventions where needed or required

5.3.6. RECOMMENDATIONS FOR REMINDER OR RECALL SYSTEM

For a reminder or recall system on the collection of medication that contribute to adherence and nonadherence of patients to collect medicine from the CCMDD service providers in Tshwane District, the researcher formulates the following recommendations:

- Healthcare workers need to regularly update patients' personal information and contact details at every visit, as patients change phone numbers and sometimes have more than one number, to ensure that the data source is always updated with new information to use should the reminder for a collection need to be sent.
- A two-way open communication system should be established between the patient and the facility. If the patient cannot collect medication the use of reliable SMS messaging to convey

any important information will contribute to adherence. The calls centre supporting SMS functionality will be a successful application in this situation

- The provision of a free call centre number is recommendable, and patients should be informed that the number is a 'toll free 'service, and this fact should be clearly stated when marketing the CCMDD service, because when patients think that they must pay to use the service, it will be a constraint resulting in nonadherence.

5.4. FURTHER RECOMMENDATIONS

Further recommendations are discussed next.

5.4.1. CLINICAL PRACTICE

The researcher formulated the following recommendations for clinical practice:

- Monthly in-service training to ensure that quality care is not compromised by capacitating community healthcare workers who will be responsible for handing out medicine parcels at the community under adherence clubs and outreach mobile points.
- Use of clear Standard Operating Procedures (SOPs) on dealing with stranded patients and feedback to the PUP where patients have to collect their medication. Application of SOPs will result in prompt updating of call systems and prevent patients be labelled as defaulters.

5.4.2. TSHWANE DISTRICT

Recommendations for the Tshwane District are the following:

- Facilities that were not included in the first stage of the implementation phase during the introduction of the adherence club model, to go ahead in implementing community-based adherence clubs and a follow-up study to be done to assess the effectiveness thereof.
- Establishment of a task team in the District that will help with follow up on the progress made in this specific area.
- Recommending that a quick baseline survey need to be done to identify the availability of infrastructure in the community and the use of community halls and churches as adherence clubs.
- Start an appropriate communication strategy for the buying-in by the community leaders to use resources available in the community. Community support will also improve adherence.
- When community base clubs are selected, the following criteria should be considered: spacious area (for social distancing and to avoid congestion), easily accessible within walking distance or easily accessible with public transport

- Health Patient Registration System (HPRS) interprovincial linkage, integrated information system to be fast tracked, to easily identify patients who collected from other facilities and ensure that circular migrants have continuous access to medication through CCMDD and thus reducing non-adherence.

5.4.3. RESEARCH

The following recommendations are formulated for research:

- Future studies including other PHC facilities in the Tshwane District and focusing on patients who were classified as '*loss to follow-up'* to be included to gain insight into the broader picture on the factors that are contributing to their non-adherence.
- A follow-up study can be conducted in the district about the challenges facing adherence clubs and outreach services and to establish and monitor the impact and sustainability of adherence clubs.
- Findings of the study may assist future researchers in identifying the challenges and barriers in effectiveness of adherence clubs for people on chronic medications.
-

5.4.4. TRAINING

The following recommendations focus on training:

- The study's findings may be included in WBOT future trainings by the Department of Health.
- Developing and presenting a short course for healthcare workers on the establishment and running of adherence clubs for patients with chronic diseases will be an added advantage.
-

5.5. LIMITATIONS OF THE STUDY

Data were collected from August 2018 to February 2019 at the two PHC facilities (Adelaide Tambo Clinic and Mandisa Shiceka Clinic). Collection of data was prolonged because the two PHC facilities were far apart (25km) and the researcher could only collect completed questionnaires from between five to ten respondents in a day, and could not visit both facilities the same day as patients prefers coming early to the facility to be done by at least 12 pm. Due to the fact that during December a decreased number of patients visited these two facilities and activities were minimal during this period, collection of data was resumed mid-January 2019.

An external statistician had to assist with data and at times there were delays in receiving feedback due to other work commitments.

As this study was limited to investigating factors contributing to non-adherence in the context of two PHC facilities in Tshwane Sub-District two and both facilities operate from 7 am to 4 pm, Monday to Friday. This means that the findings of this study cannot be generalised to other facilities in the district with a different setting and time frame of operating than these two facilities.

The researcher conveniently identified the criteria for inclusion in the study and considered only CCMDD patients who visited PHC facility for their six months' review. The researcher is aware of the fact that patients who were lost to follow-up and never pitched for their medication were not included in the study. This category of patients could have brought diverse reasons regarding the factors influencing their non-adherence.

5.6. REFLECTIONS OF THE RESEARCHER

In reflection of this study as a researcher, I realised that choosing PHC facilities that are far apart affected my timelines during data collection and thus leave days taken for this exercise was a waste of time. Use of an external statistician was a barrier sometimes, as it was difficult to discuss issues that needed clarity during data analysis and this delayed completion of data analysis chapter.

During the study, the researcher became aware that some patients could not just miss their appointment date and thus this study was a necessity to identify their obstacles/barriers in reaching their chosen PUP. Although this was a quantitative study, during a briefing done to explain purpose of the study before obtaining consent from the respondents to take part in the study, some respondents expressed their optimism about change that this study may bring.

The knowledge acquired during the study is perceived important by the researcher as the study emphasised the importance of reaching out to people by bringing services closer to the community.

The challenges experienced during this study was that, as a researcher and newly appointed facility manager there were times where it was difficult to set boundaries when on leave and collecting data at the facility the I was managing, and thus would find myself being on duty, orientating the person delegated to remain with the facility and thus not collecting data, and this affected the researcher completing the study in time.

A self–administered structured questionnaire was developed by the researcher with the assistance of her supervisor. The experience of using the self–administered structured questionnaire was that the

researcher reached her set objectives. The researcher managed to identify factors contributing to patient's non-adherence in the two chosen PHC facilities.

During this study, the researcher realised that there is a need to capacitate community healthcare workers about their role in informing chronic patients the importance of adherence and consequences of non-adherence. Use of mobile truck to deliver patients pre-packed medication from CCMDD service provider will benefit patients who cannot access the facility due to distance and lack of transport where they reside or work.

5.7. SUMMARY

This chapter dealt with the synthesis of the results of the study. The aim of this study was to determine and describe factors contributing to non-adherence by patient registered in CCMDD program in Tshwane District. The researcher deemed use of adherence clubs in the community and mobile truck to reach out to patients at their outreach mobile points will increase accessibility to collect medication and thus decrease non-adherence and subsequently increasing positive health outcomes for patients diagnosed with chronic diseases and even decreased mortality rate.

5.8. FINAL CONCLUSION

The study determined and described the contributing factors to non-adherence of patients collecting medication from CCMDD pick-up points in Tshwane district. A quantitative approach was followed, and a self-administered questionnaire was developed to assist in answering the research question and in order to achieve the intended objectives.

The continuous process of collecting and presentation of data started with pilot study, done by the researcher to refine the feasibility of the questionnaire to ascertain its significance and relevance in accordance with the research topic. The crafting of the questionnaire, guided by the objectives, made it possible to answer the research topic and thus this approach was aligned to the research question.

Statistical analysis was done correctly, and thus reliable and valid data was produced, the results thereof suggesting that inaccessibility of pick-up points is the main issue. The findings of this study further confirm that the implementation of the adherence clubs and use of neighbouring mall (Click's pharmacy) improved patients' adherence at Mandisa Shiceka clinic as compared to Adelaide Tambo Clinic where there are no malls around and no adherence clubs in the community.

The researcher is of the view like other researchers that bringing community-based adherence clubs to the communities will increase accessibility as community members will view the program as part of their own. The benefits thereof being reduction in waiting time, convenience, reduction in defaulter rate, improvement in adherence, and finally positive health outcomes.

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ANNEXURES

ANNEXURE A – DECLARATION REGARDING PLAGIARISM

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

DECLARATION REGARDING PLAGIARISM

RESEARCH TITLE: AN INVESTIGATION INTO FACTORS CONTRIBUTING TO NON-ADHERENCE OF PATIENTS COLLECTING MEDICINE FROM CENTRAL CHRONIC MEDICATION DISPENSING AND DISTRIBUTION PICK UP POINTS IN TSHWANE DISTRICT

FULL NAMES: Susan Lerato Kebapetse Mashilo

STUDENT NUMBER: 17313423

Declaration

1 I understand what plagiarism is and am aware of the University's policy in this regard.

2 I declare that this research proposal is my own original work. Where other people's work has been used (either from a printed source, internet or any other source, this has been properly acknowledged and referenced in accordance with department requirements.

3 I have not used work preciously produced by another student or any other person to hand in as my own.

4 I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

SIGNATURE OF STUDENT: .....

SIGNATURE OF SUPERVISOR .....

ANNEXURE B – QUESTIONNAIRE

PATIENT OR PARTICIPANT'S INFORMATION & INFORMED CONSENT DOCUMENT
Questionnaire

Researcher's name: Susan Lerato Kebapetse Mashilo
Student Number: u17313423
Department of Health (Nursing)
University of Pretoria

Dear Patient / Participant

You are invited to volunteer to participate in my research project. I am a Master's student in Faculty of Health Sciences in the Department of Nursing, University of Pretoria.

STUDY TITLE: An investigation into factors contributing to non-adherence of patients collecting medication from Central Chronic Medication Distribution and Dispensing pickup points in Tshwane District.

This letter gives information to help you to decide if you want to take part in this study. Before you agree you should fully understand what is involved. If you do not understand the information or have any other questions, do not hesitate to ask me. You should not agree to take part unless you are completely happy about what we expect of you.

The purpose of the study is to identify barriers for your adherence of medicine collection

I would like you to complete a questionnaire. This may take about **10 to 15** minutes. I will collect the questionnaire from you before you leave the clinic. The filled questionnaire will be kept in a safe place to ensure confidentiality. Please do not write your name on the questionnaire. This will ensure confidentiality. I will be available to help you with the questionnaire or to fill it in on your behalf.

The Research Ethics Committee of the University of Pretoria, Faculty of Health Sciences, telephone numbers (012 356 3084 / 012 356 3085) granted written approval for this study.

Your participation in this study is voluntary. You can refuse to participate or stop at any time without giving any reason. As you do not write your name on the questionnaire, you give us the information anonymously. Once you have given the questionnaire back to us, you cannot recall your consent. We will not be able to trace your information. Therefore, you will also not be identified as a participant in any publication that comes from this study.

In the event of questions asked, which will cause emotional distress, then the researcher is able to refer you to a competent counselling.

Note: The implication of completing the questionnaire is that informed consent has been obtained from you. Thus any information derived from your form (which will be totally anonymous) may be used for e.g. publication, by the researchers.

We sincerely appreciate your help.

Yours truly

S L K Mashilo

Page 1 of 5

QUESTIONNAIRE

SECTION A: DEMOGRAPHIC INFORMATION

Please mark relevant answer with an X or complete in the space provide.

A1	Sex	Male	1	Female	2
A2	What is your age?	..... years			
A3	Are you employed?	Yes	1	No	2
A4	Are you a South African citizen?	Yes	1	No	2
A5	Do you reside in Gauteng Province	Yes	1	No	2
A6	If no, from which province?				
A7	Are you a scholar	Yes	1	No	2
A8	What is your educational level	Tertiary	1	Matric	2
		Grade 1-11	3	None	4

A8. What is the relevant Chronic Condition (you are suffering from/ diagnosed with)? You may choose more than one

1	2	3	4	5	6	7	8
Sugar diabetes	High blood pressure	HIV+	Heart Disease	Asthma	Epilepsy	Arthritis	TB

SECTION B.SERVICE DELIVERY

B1. PICK UP POINT

B1.1	Name your chosen pick up point		
B1.2	What is the location of your chosen pick up point?		
B1.3	Type of pick up point	Facility/clinic	External (clicks; MediRite, etc.)
		1	2
B1.4	Are you able to pick up your medication at regular times as arranged If no. Explain why?		

Page 2 of 5

B2. ACCESSIBILITY

This section is about accessibility of your pick up point, please tick only one relevant answer

B2.1Distance from pick up point	<5km	1	5-10 km	2	>10km	3
B2.2 Are you able to walk to the pickup point?	Yes	1	No	2		
B2.3 Is the location accessible?	Yes	1	No	2		
B2.4 Do you use public transport	Yes	1	No	2		
B2.5 Do you always have enough money for transport	Yes	1	No	2		
B2.6 Operational days of pick up point	Monday - Friday		Monday–Saturday		Monday– Sunday and Public Holidays	
	1		2		3	
B2.7 Operational hours of pick up point	8H00 – 16H00	1	07H00 – 19H00	2	08H00– 20H00	3
B2.8 Is there any person who collects medication on your behalf?	Yes	1		No	2	
B2.9If the answer is yes, indicate who is the person?	Spouse	Child	Sibling	Employer		Other
	1	2	3	4		5
B2.10Do you have to absent yourself from work to collect medication?	Yes	1	No	2	N/A	3
B2.11 If yes, Does the employer agree to this?	Yes	1		NO		2
B2.12 Do you get a sick note from your pick up point as evidence of collecting medication?	Yes	1		No		2

B3. WAITING TIMES

B3.1 What system is used for your appointment at your chosen pick up point?

Appointment system	Yes	1	No	2
Any other system	Yes	1	No	2
If any other indicate what				

B3.2 Are there always people waiting at your pick up point?	Yes	1	No	2	
B3.3 If yes, estimate how many people wait at pick up point	Less than > 10	10-19	20-29	30-39	40 and above
	1	2	3	4	5

B3.4. What is the waiting period to collect medication?

< 1Hour	1
2Hours	2
3Hours	3
Longer than 3Hours	4

B4. INFORMATION GIVEN TO PATIENTS AT PICK UP POINTS AND DURING CLINIC VISIT TO ENSURE ADHERENCE/ TAKING OF MEDICATION AS PRESCRIBED

B4.1. Do you receive information on adherence?	Always	1	Sometimes	2	Never	3
B4.2 Do you receive information on side effects of medication?	Always	1	Sometimes	2	Never	3
B4.3 Do you receive information on resistance building towards medication if not taken properly?	Always	1	Sometimes	2	Never	3
B4.4. Do you receive information on when to return immediately?	Always	1	Sometimes	2	never	3
B4.5 Do you receive information on complications of non adherence?	Always	1	Sometimes	2	never	3

B4.6 Who supports you to take your medication everyday

B4.6.1	Spouse	1
B4.6.2	Children	2
B4.6.3	Sibling	3
B4.6.4	Employer	4
B4.6.5	Other	5

B5. WHAT TYPE OF REMINDER DO YOU GET,TO COLLECT YOUR MEDICATION.

B5.1 Do you have a cell phone?	Yes	1	No	2
B5.2 If yes, do you know how to read an sms?	Yes	1	No	2
B5.3 Do you always receive an sms to collect your medication?	Yes	1	No	2

SECTION C: FOLLOW UP AT PRIMARY HEALTH CARE SETTING

C1 Was full assessment carried out?	Always	1	Sometimes	2	Never	3
C2 Was the blood drawn from you at least once a year?	Always	1	Sometimes	2	Never	3
C3 Was the results interpreted to you?	Always	1	Sometimes	2	Never	3
C4 Any other investigations done on you?	Yes		No			
	1		2			
C5 Was your medication changed?	Always	1	Sometimes	2	Never	3
C6 Was the script renewed?	Always	1	Sometimes	2	Never	3
C7After a month where was your next appointment?	PHC Setting (clinic)		Pick up point			
	1		2			
C8 If at the clinic (PHC setting), indicate when is the next appointment	One week		Two weeks		One month	
	1		2		3	

ANNEXURE C – PARTICPANT INFORMTION LEAFLET AND CONSENT

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

ANNEXURE: C

PATIENT OR PARTICIPANT'S INFORMATION & INFORMED CONSENT DOCUMENT

STUDY TITLE: An investigation into factors contributing to non-adherence of patients collecting medication from Central Chronic Medication Distribution and Dispensing pickup points in Tshwane District.

Researcher: Susan Lerato Mashilo

Institution: .....

DAYTIME AND AFTER HOURS TELEPHONE NUMBER(S):

Daytime numbers: 082 458 1023

Afterhours: 082 897 5065

DATE AND TIME OF FIRST INFORMED CONSENT DISCUSSION:

			:
dd	mm	yy	Time

Dear Patient

Dear Mr. / Mrs. ..... date of consent procedure ...../...../.....

1) INTRODUCTION

You are invited to volunteer for a research study. This information leaflet is to help you to decide if you would like to participate. Before you agree to take part in this study, you should fully understand what is involved. If you have any questions, which are not fully explained in this leaflet, do not hesitate to ask the researcher. You should not agree to take part unless you are completely happy about all the procedures involved. In the best interests of your health, it is strongly recommended that you discuss with or inform your personal doctor of your possible participation in this study, wherever possible.

2) THE NATURE AND PURPOSE OF THIS STUDY

You are invited to take part in a research study. The aim of this study is to evaluate your adherence to collection of medicine. By doing so, we wish to learn more about factors contributing to your adherence and non adherence. Some problems could be serious and if identified early could save you from having problems later on.

1 of 3

3) EXPLANATION OF PROCEDURES TO BE FOLLOWED

This study involves answering some questions with regard to your age, sex, employment, accessibility of your pick up points, illness, your six months review, as well as your experience with regards to CCMDD

4) RISK AND DISCOMFORT INVOLVED.

No risk or discomfort is involved in this study

5) POSSIBLE BENEFITS OF THIS STUDY.

Identifying barriers associated with your adherence in collection of your chronic medication, and this will assist in future planning.

6) I understand that if I do not want to participate in this study, I will still receive standard treatment for my illness.

7) I may at any time withdraw from this study.

8 HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by that committee. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. A copy of the Declaration may be obtained from the investigator should you wish to review it.

9) INFORMATION

That if you have any questions concerning this study, you should contact: Sister S L Mashilo tel: 012 545 7909/10 or cell: 082 897 5065

(You may not answer question/s that cause you any discomfort or that you wish to leave unanswered, e.g. your HIV status)

10) CONFIDENTIALITY

All records obtained whilst in this study will be regarded as confidential. Results will be published or presented in such a fashion that patients remain unidentifiable.

11) CONSENT TO PARTICIPATE IN THIS STUDY.

I have read or had read to me in a language that I understand the above information before signing this consent form. The content and meaning of this information have been explained to me. I have been given opportunity to ask questions and am satisfied that they have been answered satisfactorily. I understand that if I do not participate it will not alter my management in any way. I hereby volunteer to take part in this study.

I have received a signed copy of this informed consent agreement.

....

Patient name Date

..... Patient signature	..... Date
..... Investigator's name	..... Date
..... Investigator's signature	..... Date
..... Witness name and signature	..... Date

VERBAL PATIENT INFORMED CONSENT (applicable when patients cannot read or write)

I, the undersigned, ..., have read and have explained fully to the patient, named ..... and/or his/her relative, the patient information leaflet, which has indicated the nature and purpose of the study in which I have asked the patient to participate. The explanation I have given has mentioned both the possible risks and benefits of the study. The patient indicated that he/she understands that he/she will be free to withdraw from the study at any time for any reason and without jeopardizing his/her treatment.

I hereby certify that the patient has agreed to participate in this study.

Patient's Name _____
(Please print)

Patient's Signature _____ Date _____

Investigator's Name _____
(Please print)

Investigator's Signature _____ Date _____

Witness's Name _____

Witness's Signature _____ Date _____

ANNEXURE D – PERMISSION LETTER (PHC DIRECTOR)

Permission to access Patient information in Tshwane District

TO:
The Director: Tshwane Health District

Re: Permission to do research at Adelaide Tambo clinic and Mandisa Shiceka clinic

TITLE OF STUDY: An investigation into factors contributing to non-adherence of patients collecting medication from Central Chronic Medication Dispensing and Distribution pickup points in Tshwane District.

This study is approved by the relevant Head of Department [HOD]: .....
Signature.....

This request is lodged with you in terms of the requirements of the Promotion of Access to Information Act. No. 2 of 2000.

I am a student at the Department of Nursing at the University of Pretoria. I hereby request permission to conduct a study on the above topic on the clinic grounds. This study involves access to patients

The researcher request access to the following information: data bases.

I intend to publish the findings of the study in a professional journal and/ or to present them at professional meetings like
symposia, congresses, or other meetings of such a nature.

I intend to protect the personal identity of the patients by assigning each individual a random code number.

I undertake not to proceed with the study until we have received approval from the Faculty of Health Sciences Research
Ethics Committee, University of Pretoria.

Yours sincerely

Print Name SUSAN LERATO MASIA Signature

Permission to do the research study at this clinics and to access the information as requested, is hereby approved, on condition that there will be no cost to the above named clinics or District

Title and name of the Director: Modise Kuchuda (MR)

Name of clinic: 2 clinics

Signature: Date: 8/6/2018

ANNEXURE E – PERMISSION LETTER (PHC FACILITIES MANAGERS)

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Annexure 1

DECLARATION OF INTENT FROM THE PHC MANAGER FOR TSHWANE PROVINCIAL CLINICS

I give preliminary permission to **Ms. Susan Lerato Kebapetse Mashilo** to do his or her research on **"An Investigation Into Factors Contributing To Non Adherence Of Patients Collecting Medicine From Central Chronic Medication Dispensing And Distribution Pick Up Points In Tshwane District"** in

1. **Mandisa Shiceka Clinic**
2. **Adelaide Tambo Clinic**

I know that the final approval will be from the Tshwane Regional Research Ethics Committee and that this is only to indicate that the clinic/hospital is willing to assist.

Other comments or conditions prescribed by the PHC Manager to the Researcher are

Mr. M. MAKHUDU
PRIMARY HEALTH CARE: TSHWANE
Date: 2/8/2018

. ANNEXURE: D

Permission to access information from patients at ADELAIDE TAMBO.....Clinic

To: The Clinic Manager ..N. C. MOENG

From: S L K Mashilo (The Investigator)

Re: Permission to do research at ADELAIDE TAMBO CLINIC

I am Professional Nurse S L K Mashilo, researcher working at Adeliade Tambo Clinic, in Tshwane District, Sub-District 2.

I am requesting permission to conduct a study in your facility that involves access to patients.

The request is lodged with you in terms of the requirements of the Promotion of Access to Information Act. No. 2 of 2000.

The title of the study is: An investigation into factors contributing to non-adherence of patients collecting medication from Central Chronic Medication Dispensing and Distribution pickup points in Tshwane District.

The researcher request access to the following information:

Access to the clinical files, patients, record book and the data base.

The Researcher intends to publish the findings of the study in a professional journal and/ or at professional meeting like symposia, congresses, or other meetings of such a nature.

The Researcher intends to protect the personal identity of the patients by assigning each patient a random code number.

The Researcher undertakes not to proceed with the study until we have received approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

S L K Mashilo

Signature of the Principal Investigator .....

Permission to do the research study at this facility and to access the information as requested is hereby approved.

FACILITY MANAGER: ....N:C Moeng.....

SIGNATURE: ....

Hospital Official Stamp

ANNEXURE: D

Permission to access information from patients at MANDISA SHILERA Clinic

To: The Clinic Manager I. C TSHAKA

From: S L K Mashilo (The Investigator)

Re: Permission to do research at MANDISA SHILERA CLINIC

I am Professional Nurse S L K Mashilo, researcher working at Adeliade Tambo Clinic, in Tshwane District, Sub-District 2.

I am requesting permission to conduct a study in your facility that involves access to patients.

The request is lodged with you in terms of the requirements of the Promotion of Access to Information Act. No. 2 of 2000.

The title of the study is: An investigation into factors contributing to non-adherence of patients collecting medication from Central Chronic Medication Dispensing and Distribution pickup points in Tshwane District.

The researcher request access to the following information:

Access to the clinical files, patients, record book and the data base.

The Researcher intends to publish the findings of the study in a professional journal and/ or at professional meeting like symposia, congresses, or other meetings of such a nature.

The Researcher intends to protect the personal identity of the patients by assigning each patient a random code number.

The Researcher undertakes not to proceed with the study until we have received approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

S L K Mashilo

Signature of the Principal Investigator .....

Permission to do the research study at this facility and to access the information as requested is hereby approved.

FACILITY MANAGER: I. C TSHAKA

SIGNATURE: .....

Hospital Official Stamp

ANNEXURE F – UNIVERSITY OF PRETORIA – INITIAL ETHICS APPROVAL LETTER

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IRB 0000 2235 IORG0001762 Approved dd 22/04/2014 and Expires 03/14/2020.

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences Research Ethics Committee

28/06/2018

Approval Certificate
New Application

Ethics Reference No: 249/2018

Title: AN INVESTIGATION INTO FACTORS CONTRIBUTING TO NON ADHERENCE OF PATIENTS COLLECTING MEDICINE FROM CENTRAL CHRONIC MEDICATION DISPENSING AND DISTRIBUTION PICK UP POINTS IN TSHWANE DISTRICT.

Dear Sr Susan Mashilo

The **New Application** as supported by documents specified in your cover letter dated 6/06/2018 for your research received on the 11/06/2018, was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 27/06/2018.

Please note the following about your ethics approval:
- Ethics Approval is valid for 2 years
- Please remember to use your protocol number (**249/2018**) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, or monitor the conduct of your research.

Ethics approval is subject to the following:
- The ethics approval is conditional on the receipt of **6 monthly written Progress Reports**, and
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers, MBChB; MMed (Int); MPharMed,PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health).

☎ 012 356 3084 deepeka.behari@up.ac.za / fhsethics@up.ac.za http://www.up.ac.za/healthethics
✉ Private Bag X323, Arcadia, 0007 - Tswelopele Building, Level 4, Room 60 / 61, 31 Bophelo Road, Gezina, Pretoria

ANNEXURE G – TSHWANE DISTRICT – CLEARANCE CERTIFICATE

GAUTENG PROVINCE
REPUBLIC OF SOUTH AFRICA

Enquiries: Mpho Moshime-Shabagu
Tel: +27 12 451 9036
E-mail: Mpho.Moshime@gauteng.gov.za

TSHWANE RESEARCH COMMITTEE: CLEARANCE CERTIFICATE

MEETING: 06/2018
PROJECT NUMBER: 56/2018
NHRD REFERENCE NUMBER: GP_201807_015

TOPIC: An Investigation into Factors Contributing to non-Adherence of Patients Collecting Medicine from Central Chronic Medication Dispensing and Distribution pick up points in Tshwane District.

Name of the Researcher:	Ms. Susan Lerato Kebapetse Mashilo
Name of the Supervisor:	Dr. S L M Mataboge
Name of the co-supervisor:	Mrs. S. Rossouw
Facility:	Mandisa Shiceka Clinic Adelaide Tambo Clinic
Name of the Department:	University of Pretoria

NB: THIS OFFICE REQUEST A FULL REPORT ON THE OUTCOME OF THE RESEARCH DONE AND

NOTE THAT RESUBMISSION OF THE PROTOCOL BY RESEARCHER(S) IS REQUIRED IF THERE IS DEPARTURE FROM THE PROTOCOL PROCEDURES AS APPROVED BY THE COMMITTEE.

DECISION OF THE COMMITTEE: APPROVED

.....
Mr. Peter Silwimba
Deputy Chairperson: Tshwane Research Committee

Date.....3/08/18

.....
Mr. Mothomone Pitsi
Chief Director: Tshwane District Health

Date: 2018/08/08

ANNEXURE H – STATISTITIAN LETTER

AGRICULTURAL RESEARCH COUNCIL

BIOMETRY

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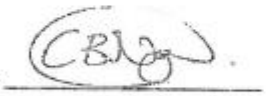
Letter of clearance

This letter confirms that project titled **Community mobilisation for improved food access and physical activity to combat non-communicable diseases** was discussed with **Cynthia Boitumelo Ngwane** (a statistician working for Biometry unit at Agricultural Research Council).

I assisted with determining the sample size, sampling methodology and data analysis method. The sample size was determined using sample size with proportion method. I will also be assisting with data analysis and interpretation of the results. The data analysis tool to be used to achieve the objectives of the study will be Descriptive statistics and Chi-squared test (for independence and equal proportion). All data will be analysed using SAS statistical software package.

Name Cynthia Boitumelo Ngwane Date 25 April 2018

Signature 

ANNEXURE I – STORAGE

Principal Investigator(s) Declaration for the storage of research data and/or documents

I, the Principal Investigator(s), Mashilo Susan of the following trial/study titled **An investigation into factors contributing to non-adherence of patients collecting medicine from central chronic medication dispensing and distribution pick up points in Tshwane District** will be storing all the research data and/or documents referring to the above mentioned trial/study at the following address: Department of Nursing Sciences, University of Pretoria, South Africa

START DATE OF TRIAL/STUDY: 01/06 /2018 END DATE OF TRIAL/STUDY: 31__/12_ /2019

I understand that the storage for the abovementioned data and/or documents must be maintained for a minimum of 15 years from the commencement of this trial/study.

UNTIL WHICH YEAR WILL DATA WILL BE STORED: Jun 2018 until July 2036

Name ___**Mashilo SLK**_____

Signature _____ **Date** 30/04/2018

ANNEXURE J – DECLARATION OF HELSINKI – ETHICAL PRICIPLES

Special Communication

World Medical Association Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects

World Medical Association

Adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964, and amended by the: 29th WMA General Assembly, Tokyo, Japan, October 1975
35th WMA General Assembly, Venice, Italy, October 1983 41st WMA General Assembly, Hong Kong, September 1989
48th WMA General Assembly, Somerset West, Republic of South Africa, October 1996 52nd WMA General Assembly, Edinburgh, Scotland, October 2000
53rd WMA General Assembly, Washington, DC, USA, October 2002 (Note of Clarification added) 55th WMA General Assembly, Tokyo, Japan, October 2004 (Note of Clarification added)
59th WMA General Assembly, Seoul, Republic of Korea, October 2008 64th WMA General Assembly, Fortaleza, Brazil, October 2013

Preamble

1. The World Medical Association (WMA) has developed the Dec- laration of Helsinki as a statement of ethical principles for medi- cal research involving human subjects, including research on identifiable human material and data.

   The Declaration is intended to be read as a whole and each of its constituent paragraphs should be applied with consider- ation of all other relevant paragraphs.

2. Consistent with the mandate of the WMA, the Declaration is ad- dressed primarily to physicians. The WMA encourages others who are involved in medical research involving human subjects to adopt these principles.

General Principles

3. The Declaration of Geneva of the WMA binds the physician with the words, "The health of my patient will be my first consider- ation," and the International Code of Medical Ethics declares that, "A physician shall act in the patient's best interest when provid- ing medical care."

4. It is the duty of the physician to promote and safeguard the health, well-being and rights of patients, including those who are involved in medical research. The physician's knowledge and con- science are dedicated to the fulfillment of this duty.

5. Medical progress is based on research that ultimately must in- clude studies involving human subjects.

6. The primary purpose of medical research involving human sub- jects is to understand the causes, development and effects of diseases and improve preventive, diagnostic and therapeutic in- terventions (methods, procedures and treatments). Even the

   best proven interventions must be evaluated continually through research for their safety, effectiveness, efficiency, accessibility and quality.

7. Medical research is subject to ethical standards that promote and ensure respect for all human subjects and protect their health and rights.

8. While the primary purpose of medical research is to generate new knowledge, this goal can never take precedence over the rights and interests of individual research subjects.

9. It is the duty of physicians who are involved in medical research to protect the life, health, dignity, integrity, right to self- determination, privacy, and confidentiality of personal informa- tion of research subjects. The responsibility for the protection of research subjects must always rest with the physician or other health care professionals and never with the research subjects, even though they have given consent.

10. Physicians must consider the ethical, legal and regulatory norms and standards for research involving human subjects in their own countries as well as applicable international norms and stan- dards. No national or international ethical, legal or regulatory re- quirement should reduce or eliminate any of the protections for research subjects set forth in this Declaration.

11. Medical research should be conducted in a manner that mini- mises possible harm to the environment.

12. Medical research involving human subjects must be conducted only by individuals with the appropriate ethics and scientific edu- cation, training and qualifications. Research on patients or healthy volunteers requires the supervision of a competent and appropriately qualified physician or other health care profes- sional.

ANNEXURE K – EDITOR'S LETTER

I

N Sutherland
21 Aero Rd
Valhalla
0185

November 2022

I, Nicolette Sutherland (ID 740711 0250 081), hereby confirm that I have edited the proposal to engage in the presentation of the master's thesis noted below. The utmost care will be taken to ensure that the Final Document is free of spelling and grammatical errors, however, the accuracy of the final work remains the responsibility of the author.

Author:	Susan Lerato Kebapetse Mashilo
Title:	An investigation into factors contributing to non-adherence of patients collecting medicine from central chronic medication dispensing and distribution pick-up points in the Tshwane district

The edit includes the following:

- Spelling
- Vocabulary
- Punctuation
- Grammar
- Consistency in terminology, numbering, font style.
- Sentence construction
- Suggestions for text with unclear meaning
- Logic: Relevance, clarity, and consistency
- Checking the list of references against in-text sources.

Nicolette Sutherland

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