UNIVERSITY OF KWAZULU-NATAL ™

INYUVESI YAKWAZULU-NATALI

Assessment of factors affecting adherence to chronic medicines among stable patients registered onto the Centralized Chronic Medicines Dispensing and Distribution (CCMDD) programme: The case of eThekwini Metropolitan Health district, South Africa

By

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Submitted as the dissertation component in fulfilment of the requirements for the degree of Master of Pharmacy by research in the school of Health Sciences, University of Kwazulu-Natal

November 2018

Declaration

I, Ms Mary-Anne Naidoo, declare as follows:

That the work described in this dissertation has not been previously submitted to UKZN or any other tertiary institution for purposes of obtaining an academic qualification, whether by I or any other party.

That my contribution to the project was as follows:

The research proposal was developed following consultations with my supervisor. The proposal was submitted to the Biomedical and Ethics Committee of the University of Kwa-Zulu Natal for review and approval. After receiving ethics approval, I had applied for KZN DOH approval. After receiving KZN DOH approval I organized the data collection with a team of data collectors, under the guidance of my supervisor. I drafted the manuscript presenting the work and this research is my original work. Where the use of the work of others has been made, it has been fully acknowledged.

Si 

Ms Mary-Anne Naidoo

Date

07/06/19

Date

07/06/2019

List of Manuscripts

1. Effects of information, counselling and stock availability on adherence to chronic medication among patients registered onto the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme: The case in the eThekwini Metropolitan Health district in South Africa.

Authors: Mary-Anne Naidoo [1*] and Manimbulu Nlooto[1]

2. The role of the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme in the improvement of adherence of patients to chronic medications: The case of eThekwini Metropolitan Health district in South Africa

Authors: Mary-Anne Naidoo [1*] and Manimbulu Nlooto[1]

Dedication

This dissertation is dedicated to my daughter Isabella Grace Pillay who was born amidst my postgraduate studies, I hope that my success inspires you to know that you're capable of achieving anything you put your mind to.

Acknowledgements

I would like to express my gratitude to the Lord Almighty, Jesus Christ, for with him all things are possible.

I am sincerely appreciative to all the patients in the eThekwini District of KwaZulu-Natal who willingly participated in this study. Without their input, this study would not be possible.

My sincere thanks to my supervisor, Dr Manimbulu Nlooto for all the guidance during my postgraduate studies.

I would like to thank my husband, Christopher Abraham Pillay for his unconditional love and inspiration through this journey.

I would like to express my heartfelt appreciation to my loving parents Mr and Mrs S Naidoo for their constant motivation and support.

I would like to thank Ms Phindile Nene, the postgraduate officer at the University of KwaZulu-Natal for always being so helpful and accommodating.

The College of Health Sciences at the University of Kwazulu-Natal is also gratefully acknowledged for the research opportunity.

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List of abbreviations

CDC: Centre for Disease Control

WHO: World Health Organization

ART: Anti-retroviral therapy

CCMDD: Centralized chronic medicine dispensing and distribution programme

NDP: National development plan

NHI: National Health Insurance

KZN: KwaZulu-Natal

KZN-DOH: KwaZulu-Natal Department of Health

PUPs: Pick-up points

NDOH: National Department of health

CDU: Chronic dispensing Unit

KZN-DOH: KwaZulu-Natal Department of health

PHC: Primary health care clinic

CHC: Community Health care centre

DH: District Hospital

RH: Regional Hospital

PTH: Provincial Tertiary Hospital

CH: Central Hospital

SH: Specialised Hospital

SMS: Short messaging system

TB: Tuberculosis

SPSS: Statistical programme for social science

USD: United States Dollar

WHO: World Health Organization

Abstract

Background

Globally more deaths are due to chronic disease compared to infectious disease. In South Africa, the number of patients has been increasing over the years for those who have been diagnosed with chronic diseases and thus requiring chronic treatment. The Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme is a national programme with the aim to improve patients access to medicines in the public health sector. To establish the implications of factors that affect patient adherence to chronic medication on the CCMDD programme in eThekwini Metropolitan Health district.

Methods

A descriptive cross-sectional study was conducted among stable chronic patients on the CCMDD programme in five public health facilities in eThekwini Metropolitan Health District South Africa between May and August 2017. The researcher administered face-to-face interviews were carried out using a semi-structured questionnaire with open and closed-ended questions.

Results

Most patients reported never experiencing out of stock of medicines at PUPs (365/417, 87.5%, 95%CI [84.1-90.5]) and never received an incomplete parcel (324/417, 77.7%, 95%CI [73.7-81.7]). Many respondents rated their relationship with CCMDD as good (221/417, 53.0%, 95%CI [48.12-57.79]); they were satisfied to collect their medicines without counselling at PUPs (411/417, 98.6%, 95%CI [97.47-99.73]) and rarely experienced challenges with the CCMDD programme (345/417, 82.7%, 95%CI [79.07-86.33]). Majority of respondents reported a waiting time less than 30 minutes (411/417, 98.6%, 95%CI [97.47-99.3]) after CCMDD programme implementation compared to two hours (398/417, 95.4%, 95%CI [93.39-97.41]) before CCMDD program implementation. Most respondents (370/417, 88.7%, 95%CI [85.66-91.74]) reported not missing their appointment for collection of their medicines.

Conclusion

Most respondents reported neither experiencing medicine stock-outs nor receiving incomplete medicine parcels, they had a good relationship with the CCMDD programme, were satisfied with no counselling at the PUPs and rarely experienced challenges. Majority respondents reported a significant decrease in the waiting time for the collection of their medicines after CCMDD programme implementation. Missed appointments for collection of medicine parcels were significantly low among study participants. These findings can suggest high levels of adherence to such a programme.

Keywords: Centralized Chronic Dispensing and Distribution, missed appointments, medicine availability, chronic medicines, incomplete prescriptions, waiting time

CHAPTER 1: INTRODUCTION

1.1 Background

In South Africa, the number of patients has been increasing over the years for those who have been diagnosed with chronic diseases and thus requiring chronic treatment (1). Challenges of adherence to treatment come along with the increase of patients requiring chronic medication. Centralized chronic medicine dispensing and distribution (CCMDD) programme is a national programme with the purpose of making health care more accessible to patients (1).

The main aim of the CCMDD programme is to improve access to medicines for patients in public health facilities in South Africa (2). According to the National Department of Health (NDOH), the CCMDD programme was rolled out in ten pilot districts across South Africa, as well as in two hospitals that are not in the National Health Insurance (NHI) pilot districts (3). The programme consists of two components, CCMDD which related to patient's medicines being centrally dispensed by private service providers and the Pick-up Points (PUPs) which relays conveniently to located places of collection of the pre-dispensed medicines (4). Registered PUPs are required to meet specific criteria that include, but not limited to, having operating hours of at least six days a week, geographically accessible and properly trained staff that would have the ability to carry out a verification of patients before issuing out medicines and maintain patient records. The trained staff are also required to perform specific functions at PUPs that include receiving, storing, and dispensing medicine parcels in line with protocols (5). Anticipated additional benefits of the CCMDD programme include improved patient adherence, tracking of defaulters, medicine management and availability to patients, decongestion of public health facilities and better medicine forecasting (6).

With the implementation of CCMDD programme in the eThekwini Metropolitan Health district, questions remain about the sustainable adherence of stable patients to their chronic medication. A stable patient on antiretroviral therapy (ART) is regarded as a patient that has been on the same treatment regimen for at least 12 months , stable as per disease management plan , has the most recent normal laboratory results , an undetectable viral load while a patient with diabetes is regarded stable if he/she has two consecutive fasting glucose readings and two consecutive normal blood pressure readings for hypertensive patients, no tuberculosis (TB) and no present conditions that require ongoing clinical care. These types of patients should be willing to be registered onto the CCMDD programme, have a valid South African ID number or asylum number if non-South African, and their prescribed medicines must be on the provincial CCMDD medicine list (7).

This study was conducted with the aim of establishing the implications of factors that affect patient adherence to chronic medication on the CCMDD programme in eThekwini Metropolitan Health district.

1.2 Literature Review

This is a brief overview of the literature. A relevant literature review has been included in each of the manuscripts included in this dissertation.

Globally, approximately 41 million deaths (71% of all deaths) are attributable to chronic disease with more than 17.9 million (44% of all noncommunicable deaths) deaths due to cardiovascular disease and diabetes (4% of all deaths) (8). This means that more deaths are caused by chronic diseases as compared to infectious diseases. In South Africa, there has been an ongoing increase over the years of patients diagnosed with chronic disease and thus requiring chronic treatment (9).

Access to healthcare can be interpreted using three different dimensions which include availability, affordability, and acceptability. Despite each dimension having a different focus and meaning, it is the interaction between all three dimensions that determine optimal access to healthcare (10). Developing countries still experience problems with access to medicines for chronic diseases which leads to mortality (11) with a lack of access is particularly in Africa and India (12). In 1994 the National Drug Policy (NDP) was developed in South Africa, with one of the objectives of the policy being to ensure availability of essential drugs to all citizens (13). Despite the above policy formed, the availability of essential medicines remains poor particularly in the public sector (14).

Medicine availability

Availability of medicines may have a direct impact on a patient's adherence to chronic medicines. A study in Nigeria showed that several medicine stock-outs in the area have proven to cause patients to not adhere to their chronic medicine (23). In another study in Abidjan, Côte d'Ivoire medicine stock-outs had a significant impact on the retention in care (adherence) and possible death to patients (24).

In an attempt to alleviate chronic diseases and improve patient compliance, the NDOH has established the CCMDD programme which dispenses prescriptions for patients with certain chronic conditions and distribution of already dispensed patient medicine parcels to PUPs [6]. A PUP is a venue like churches; mosques; tribal courts; war rooms and community halls (15) to close the gap of inaccessibility of medications to patients in deep rural and urban areas of South Africa. To reduce the costs on patients and long waiting times in health facilities, a private service provider has been appointed by The South African Pharmacy Council and numerous health districts to serve as a CCMDD unit (5).

How does the CCMDD Programme work?

Figure 1 illustrates the operational characteristics of the CCMDD programme. Chronic patients that are accessing their medicines from public health care facilities and meet the criteria as set out in the standard operating procedures can be registered onto the CCMDD programme (7). The prescriptions of registered patients are sent to the designated CCMDD service providers for centralized dispensing and

distribution of the patient's medicine parcel, thereafter the medicine parcel is transported with another designated service provider which will distribute the medicine parcel to registered PUPs and send out short messaging system (SMS) notification to patients. At registered PUPs, medicine parcels are checked upon receipt, issued to correct patients and a tally of uncollected parcels are carried out and returned to the service provider (4).

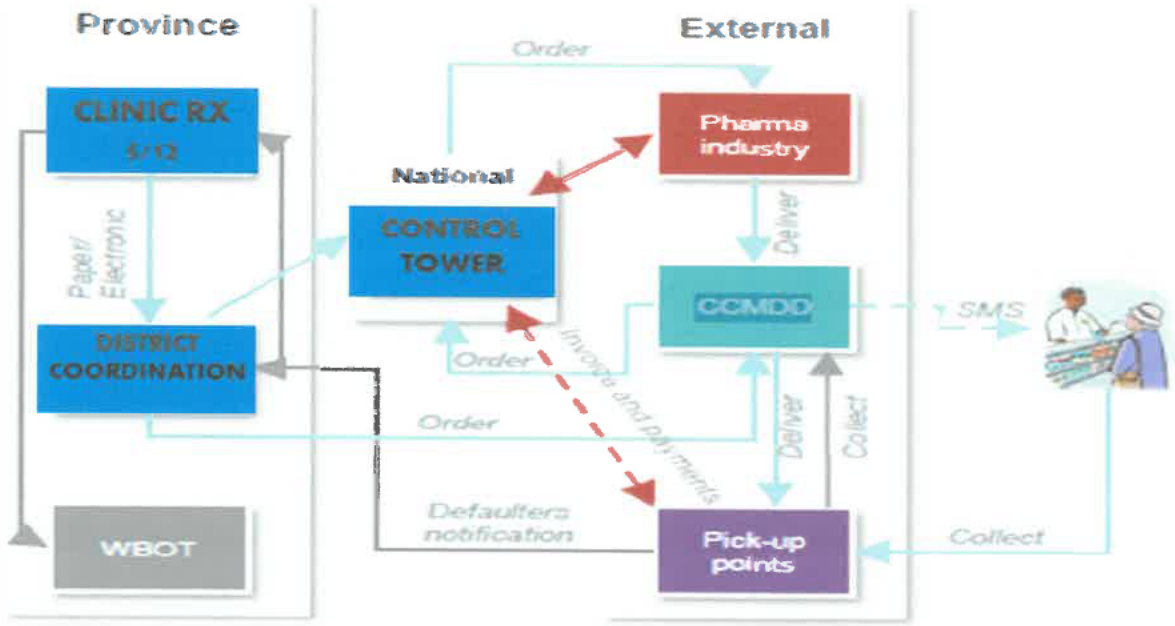

Figure 1: Centralized Chronic Medication Dispensing and Distributions (CCMDD) System

(Source Lab Discussion and Analysis; Interview with Lab Participants, 2014).

The CCMDD programme benefits both the patients and the health care system. Benefits to the patients include better medicine availability and conveniently located PUPs with increased operational times whilst benefits to the public healthcare facilities include a decreased workload, increased time for patient care in more complex disease conditions and less management of stock (2). The CCMDD programme is also advantageous as it decongests the public health facilities and reduces the waiting times of patients which leads to happier patients and staff (16).

Knowledge concerning health education has been introduced in the 1970s as a topic of importance to ensure that everyone could take ~~takes~~ a more dynamic role in influencing the health care system for the future (27). Insufficient health knowledge could be related to a lack of adherence. A study in Tanzania

about the patient-centred TB programme found that the success of the programme could improve if more information (knowledge) was given to patients and healthcare workers about the steps and elements of the TB programme (25). Another study also in Tanzania reported that knowledge was an indicator of adherence for patients on ART who had been offered more knowledge about their treatment protocols (26).

Provisional challenges of the CCMDD programme

The Chronic Dispensing Unit (CDU) programme that has been in operation in the Western Cape, South Africa is similar to the CCMDD programme in that it dispenses medicines centrally and distributes medicine parcels to patients in the public health sector (17). It can, therefore, be assumed that the CCMDD programme could possibly face similar problems as did the CDU programme.

Some of the challenges that were faced by the CDU programme include:

- Prescription management; The prescriptions that were completed by the facilities upon registration of CDU patients and sent to the private service provider for dispensing and distribution were rejected because the prescriptions were filled out incorrectly and had missing information (17).
- Selection of stable patients; Despite only chronic stable patients being registered onto the CDU programme, a monthly average of 10% of patients registered on the programme defaulted collection of medicine (17). Some reasons provided for defaulting collection were mobility problems, temporary migration to private health care and mixing up of appointment dates due to appointment cards poorly written (18).
- Inefficiencies in the running of the CDU programme by the health care departments lead to patients missing their collection of treatment and therefore adding to the default collection rate (18).
- Missing collection of treatment parcels by the patients caused other problems for the CDU programme that included medicines being expired before it could be redistributed for use, statistics can become skewed causing forecasting errors and a greater financial burden on the government to pay for the uplifting of medicine parcels (19).

1.3 Problem Statement

In South Africa, there is a substantial increase in chronic disease epidemic which is leading to a greater burden each year on the health system, which requires critical attention to ensure that we can achieve better health outcomes and economic growth (20). Chronic disease surveillance in South Africa needs to be reinforced to provide dependable information for planning and monitoring health policy as

monitoring of chronic diseases will ensure that country is striving towards the goals outlined in chronic disease strategic plans (21).

The CCMDD programme was developed with envisaged benefits to both public health sector facilities and patients that included improved quality of services, decongestion of facilities, reduced waiting times and better patient compliance (22).

Both internationally and locally there is insufficient research completed and published articles available on the CCMDD programme in South Africa as well as centralized dispensing programme across the world. This opens opportunities to carry out further research in this area.

1.4 Research questions aim and objectives

General research question

The general question of this study is 'What are the factors that affect patient adherence to chronic medication on the CCMDD programme in eThekwini Metropolitan Health district?'

The specific questions of this study are as follows:

4.2.1. Does the CCMDD programme improve patient's adherence to chronic medication?

4.2.2. How does the provision of information and counselling to patients affect the adherence to CCMDD programme?

4.2.3. How does stock availability affect patient adherence to CCMDD programme?

4.2.4. What are the implications of incomplete prescriptions delivered to patients on their adherence to the CCMDD programme?

Aim

To establish the implications of factors that affect patient adherence to chronic medication on the CCMDD programme in eThekwini Metropolitan Health district.

Hypothesis

Alternative hypothesis: Patients exhibit a higher adherence rate on the CCMDD programme when they have sufficient knowledge about the programme.

Objectives

1. To determine whether the CCMDD programme improve patient's adherence to chronic medication.

2. To establish whether the provision of information and counselling to patients affect the adherence to CCMDD programme.

3. To evaluate the effect of stock availability on patient adherence to CCMDD programme.

4. To establish the implications of incomplete prescriptions delivered to patients on their adherence to the CCMDD programme.

1.5 General Methodology

The researcher administered face-to-face interviews carried out among patients registered on the CCMDD programme from May 2017 to August 2017.

1.5.1 Study Design

A descriptive cross-sectional study using a questionnaire with both closed-ended and open-ended questions was researcher administered to 417 patients registered on the CCMDD programme in the public health sector in eThekwini Metropolitan Health district.

1.5.2 Study area

Figure 2 illustrates the map of the study sites included in this study. Five public healthcare facilities with different levels of care were approached in the eThekwini Metropolitan Health district. The public healthcare facilities included in this study consisted of two Community Health Centres (CHC1 and CHC2), two district hospitals (DH1 and DH2) and one regional hospital (RH1).

Figure 2: Map of eThekwini Metropolitan Health District

(Source, google maps)

1.5.3 Study population and sample size assumption

Eligibility criteria for this study included mainly stable patients on chronic medicines and registered onto CCMDD programme. A stable patient on ART is regarded as a patient that has been on the same treatment regimen for at least 12 months , stable as per disease management plan , has the most recent normal laboratory results , an undetectable viral load while a patient with diabetes is regarded stable if he/she has two consecutive fasting glucose readings and two consecutive normal blood pressure readings for hypertensive patients, no TB and no present conditions that require ongoing clinical care. These types of patients should be willing to be registered onto the CCMDD programme, have a valid South African ID number or asylum number if non-South African, and their prescribed medicines must be on the provincial CCMDD medicine list. The sample size is calculated by using the formula: $n = P(1-P)(Z\text{-}\alpha/2/E)^1$ where P= the proportion of patients in CCMDD programme, $(Z\text{-}\alpha/2)$ = a constant code representing 95% of confidence [1.96], E= margin error [+/- 0.05], p= expected prevalence of patients (28) . According to eThekwini municipality 2014/2015 Integrated Development Plan (29), the estimated population of patients on chronic medication was 207091 in 2014. With an expected prevalence of patients of 50% (p = 50%), 95% confidence interval and a margin of error of 5%, the computed formula yields a minimum sample size of 384 participants on chronic medication. To maintain the precision across the study sites and to account for drop-out and attrition, the minimum sample size was increased by 20%, the maximum sample size was 461 participants on chronic medication, irrespective of gender. The number of patients sampled in the study area was divided by the five PUPs selected.

1.5.4 Inclusion and exclusion criteria

1.5.4.1 Inclusion criteria

Eligible participants were required to be between 18 years old and above, they must be registered on the CCMDD programme for more than three months. The study population included stable chronic patients, irrespective of gender and racial groups in the study area.

1.5.4.2 Exclusion criteria

This study excluded patients, registered onto the CCMDD programme but not present at the selected PUPs at the time of data collection, patients attached to PUPs in private health institutions and those chronic patients belonging to adherence clubs outside public health care facilities.

1.5.5 Recruitment and selection of study participants

Study participants were systematically recruited and selected for this study. Every consenting second patient that presented to collect their medication parcels from PUPs was approached and recruited into the study. If a patient declined participation, the next patient entering the premises of the PUP was approached and selected. The procedure of sampling continued systematically in the five study sites

until the sample size was complete. The total sample size was divided by the five institutions to get the number of patients required to be interviewed per institution. Participants were selected at PUPs linked to public health care facilities from Monday to Friday during business hours. The researcher and research assistants administered face-to-face interviews which took approximately ten minutes to complete. The questionnaires were readily available in English and isiZulu. Where applicable the isiZulu version was completed with the aid of the researcher assistant. Some of the health care workers at the PUPs assisted with the translating of information into isiZulu, where necessary, for the patients that were illiterate.

1.5.6 Data collection technique and research instruments

Data were collected in five public health care facilities in eThekwini Metropolitan Health district by means of a researcher administered face-to-face interview using a semi-structured questionnaire which consisted of both open and closed-ended questions. Four sections were included in the questionnaire namely; Section A consisting of socio-demographic characteristics of participants, Section B related to CCMDD programme effect on adherence, Section C involving information and counselling upon registration on the CCMDD programme and Section D which dealt with the stock of medicines availability and repeat prescriptions. The questionnaires were available in both English and isiZulu. The translation of the isiZulu version of the questionnaires was conducted by an official translator working in the department of African languages, School of Arts at the University of KwaZulu-Natal School (Appendix 12)

1.5.7 Statistical analysis

Once data collection was completed, data was inputted on a Microsoft Excel spreadsheet and analysed using the statistical programme for Social Science (SPSS), version 25. Results were reported using descriptive statistics including frequencies, percentages and 95% confidence intervals. Categorical data were presented using tables and bar graphs. Associations between variables were carried out to determine the level of significance using Pearson Chi-Square or Fisher's Exact test, where applicable. A multivariate analysis was carried out using logistical regression method. All missing data from the patient questionnaires were treated as missing in the data analysis.

1.5.8 Ethics statement

The study was approved by the Biomedical Research Ethics committee of the University of KwaZulu-Natal under reference BE513/16. The KwaZulu-Natal Department of Health (KZN-DOH) and the eThekwini Metropolitan Health district gave gatekeeper permission to conduct this study. Thereafter gatekeeper permission was obtained from each study site.

Participants were informed about this study and asked whether they were willing to participate. Those who accepted to participate were asked to give consent before being interviewed. A copy of the consent

form was given to each participant. Participants were informed of their right to withdraw from the interview at any time. To ensure anonymity, participants were assigned codes that were known to the researchers. No names or identities appeared on the questionnaire. Findings of this study are being reported anonymously including study sites identified as CHC1, CHC2, DH1, DH2 and RH1.

1.6 Layout / Structure of the thesis

Chapter 1 outlines the introduction to the topic by providing information on the background as well as a literature review of existing studies regarding this topic. There is a statement of the problem, as well as research questions, the aim and objectives of this study. Information on the study design including, the study area, study design, statistical analysis and an ethics statement is also outlined.

Chapter 2 is a research article which has been prepared according to submission guidelines to the Journal of Pharmacy and Pharmaceutical Sciences, entitled, "*Effects of information, counselling and stock availability on adherence to chronic medication among patients registered onto the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme: The case in the eThekwini Metropolitan Health district in South Africa*"

Chapter 3 is a research article which has been prepared according to submission guidelines to the BMC Journal of Public Health, entitled, "*The role of the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme in the improvement of adherence of patients to chronic medications: The case of eThekwini Metropolitan Health district in South Africa*"

Chapter 4 is the synthesis and discussion of the significance of the findings of this study relating to the assessment of provisions of information, counselling, stock availability, incomplete prescriptions and the improvement of patient adherence to chronic medication on the CCMDD programme.

The appendices are attached at the end of this dissertation.

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"To assess the effect of provision of information, counselling, stock availability and incomplete prescriptions on adherence of chronic patients to the CCMDD programme a paper entitled, "*Effects of information, counselling and stock availability on adherence to chronic medication among patients registered onto the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme: The case in the eThekwini Metropolitan Health district in South Africa*". The paper presented the results of medicine stock availability, incomplete prescriptions, patient satisfaction, challenges experienced and patient knowledge about CCMDD programme. This paper was prepared following the guidelines of the Journal of Pharmacy and Pharmaceutical Sciences and submitted.

CHAPTER 2

Effects of information, counselling and stock availability on adherence to chronic medication among patients registered onto the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme: The case in the eThekwini Metropolitan Health district in South Africa

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Abstract

Purpose

Centralized Chronic Medicine Dispensing and Distribution (CCMDD) is a national programme aimed at making health care more accessible to patients. The programme intends to improve access to chronic medicines and decongest public healthcare facilities in South Africa. This study aims at assessing the effect of the provision of information, counselling, stock availability and incomplete prescriptions on adherence of chronic patients to the CCMDD programme.

Methods

A descriptive cross-sectional study was conducted among stable chronic patients on the CCMDD programme in five public health facilities in eThekwini Metropolitan health district South Africa between May and August 2017. The researcher administered face-to-face interviews were carried out using a semi-structured questionnaire with open and closed-ended questions. The questionnaire consisted of four sections: section A consisted of socio-demographic characteristics of participants, section B related to CCMDD programme effect on adherence, section C involved information and counselling upon registration on the CCMDD programme and section D dealt with medicines availability and incomplete prescriptions. This paper is reporting findings on sections A, C and D.

Results

Most patients reported never experiencing out of stock of medicines at Pick-up Points (PUPs) (365/417, 87.5%, 95%CI [84.1-90.5]) and never received an incomplete parcel (324/417, 77.7%, 95%CI [73.7-81.7]). Almost half of respondents rated their relationship with CCMDD as good (221/417, 53.0%, 95%CI [48.12-57.79]); they were reportedly satisfied to collect their medicines without counselling at PUPs (411/417, 98.6%, 95%CI [97.47-99.73]) and did not experience challenges with the CCMDD programme (345/417, 82.7%, 95%CI [79.07-86.33]). Majority of respondents did not know what was the meaning of the word CCMDD (323/417, 77.5%, 95%CI [73.49-81.51]).

Conclusions

This study found that most respondents reported neither experiencing medicine stock-outs nor receiving incomplete medicine parcels. Majority of respondents had a good relationship with the CCMDD programme, they were satisfied with no counselling at the PUPs and experienced no challenges. Although most of the respondents registered on the CCMDD programme had insufficient knowledge about the meaning of CCMDD programme; their satisfaction and relationship with the CCMDD program may suggest high levels of adherence to such a programme.

Background

Chronic disease defined by the Centre for Disease Control (CDC) as, *"conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both"* (1). A study conducted from 2000 to 2015 showed a 10% increase in deaths related to chronic diseases, which accounted for 70% of deaths internationally (2). From this increase, it can be concluded that chronic disease is a growing burden internationally.

Adherence can be understood by assessing the actions of a person and whether it coincides with the advice and counselling received from health care providers. Adherence can be affected by various determinants as explained by the World Health Organization (WHO) which include poor social and economic status , health care related factors which can constitute of underdeveloped health plans and inefficiencies in the health system , condition-related factors that considers the effect of disease state on patient, therapy-related factors that includes the overall treatment regimen implications and patient-related factors that looks at the overall patient role in adherence (3).

Medicine counselling and provision of information is an integral part of adherence. Health care related factors can constitute information and counselling that is given to a patient. Pharmacists are the custodian of medicines and they have a legal obligation that includes providing information and counselling to patients that are accurate and ensuring that the information is delivered in a manner that is understood so that the patient can utilize medicines safely (4). Information and counselling showed significant results in a study in Swaziland where 54% of patients on antiretroviral therapy (ART) showed a suppressed viral load after planned counselling (5) however in another study in Wessex that measured adherence of patients on antidepressant that were counselled on their medicines it was seen that counselling did not significantly produce good clinical outcomes among all its patients (6).

Differentiated care programmes (fast track drug refill, adherence clubs, community ART distribution points and community ART groups) that were being used in various parts of Africa produced positive results among patients and most patients reported benefiting from these programmes (7), similarly the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme in South Africa has produced results that make patients satisfied and happy as their medicine collection has been made easier (8).

Access to services is one of the eight points that are included in the Batho Pele principles that was published in 1997 to transform public service delivery in South Africa (9). Transport access to health facilities is a challenge that patient face internationally which can lead to patient non-adherence, this can be observed in two studies in Nepal and South Africa. (10-11).

In 1994 the National Drug Policy (NDP) was reported to the minister in South Africa, with one of the objectives of the policy being to ensure that there is the availability of essential drugs to all citizens (12). In a study in Swaziland that assessed the impact of medicine availability on patients showed that more than 50% of patients interviewed did not receive all their medicines which could lead to nonadherence (13). Medicine stock out is a challenge that affects both patients and health care professionals. In a study conducted in Brazil that looked at medicine availability of essential medicines, it was found that pricing of medicines was higher than international referencing pricing and availability of medicines were low which forced patients to resort to purchasing medicines at increased costs from private health sectors which caused a high out of pocket expense on the patient. (14). Stock-outs can be

avoided by ensuring that a safety stock level is maintained to keep stock level and recruiting suppliers that have the shortest lead time to ensure that the process of obtaining medicines is efficient (15).

With an attempt to improve patient adherence various community-supported models were being utilized in Africa that reduced cost and time spent in health facilities, high retention of care also affected adherence. A few of these programmes of differentiated care include appointment spacing and fast track drug refill, adherence clubs (facility-based clubs and community-based clubs), community ART distribution points and community ART groups (16). In South Africa, the CCMDD programme was piloted in the National Health Insurance (NHI) districts since February 2014 (17) with the objective of improving access to medication and increases adherence of patients to chronic treatment (18). The programme contracts the dispensing and distribution of repeat prescriptions for stable chronic patients to private sector service providers. The programme consists of two components, CCMDD and Pick-up Points (Pups). The first relates to individual patients' medicines being centrally dispensed and distributed to the point of service delivery. The second relates to the provision of pre-dispensed medicines at private sector pharmacies or PUPs, that is conveniently located for patients. A PUP is a venue like churches; mosques; tribal courts; war rooms and community Halls (19) to close the gap of inaccessibility of medications to patients in deep rural and urban areas of South Africa. To reduce the costs on patients and long waiting times in Health facilities, a private service provider has been appointed by The South African Pharmacy Council and numerous health districts to serve as a CCMDD unit (20). National Department of Health (NDOH) in South Africa introduced the CCMDD programme in ten pilot districts, namely Amajuba [KwaZulu-Natal (KZN)] ,Dr Kenneth Kaunda(North West), Gert Sibanda (Mpumalanga), Oliver Tambo (Eastern Cape), Tshwane (Gauteng), Pixley ka Seme (Northern Cape), Thabo Mofutsanyane (Free State) ,uMgungundlovu (KZN), uMzinyathi (KZN) and Vhembe (Limpopo) (21) as well as in two non-pilot hospitals through the NHI (22). At the beginning of 2017, the number of patients registered onto the CCMDD programme in KZN was 504 000 (23). Anticipated additional benefits of the CCMDD programme include improved patient adherence, tracking of defaulters, medicine management and availability to patients, decongestion to public health facilities and better medicine forecasting (24).

Assessment of the effects of information, counselling, stock availability and incomplete prescriptions on the CCMDD programme has limited data in South Africa. Other studies have been previously conducted in South Africa on similar programmes to the CCMDD. One such study on the Chronic Dispensing Unit (CDU) programme in the Western Cape reported that patients required more education and knowledge and medicine stock-outs presented as a challenge to the programme (25). Building from these previous studies and with regard to the implementation of the CCMDD programme, there is a need to assess the knowledge, satisfaction, challenges, medicine stock availability and receipt of incomplete medicine parcels experienced by patients on the CCMDD programme. This study aims at

assessing the effect of the provision of information, counselling, stock availability and incomplete prescriptions on adherence of chronic patients to the CCMDD programme.

Methods

Study Design

This study was a descriptive cross-sectional survey among stable chronic patients registered on the CCMDD programme in public healthcare institutions in the eThekwini Metropolitan Health district. The researcher administered face-to-face interviews were carried out with participants using a semi-structured questionnaire consisting of both open and closed-ended questions. Data was collected between May to August 2017.

Study sites

Figure 1 illustrates the map of the sites included in this study. There are sixteen health care facilities in the eThekwini Metropolitan Health district. These facilities were listed in alphabetical order and every third facility/pick up point was chosen from the list. This study was carried out in five public health facilities in the eThekwini Metropolitan Health district.

A referral system exists within the KwaZulu-Natal Department of Health (KZN-DOH) that consists of four levels of care. Level one consists of Primary Health care clinic (PHC), Community Health Care Centre (CHC) and District hospital (DH), level two consists of Regional Hospital (RH), level three consists of Provincial Tertiary Hospital (PTH) while level four is made up of Central Hospitals (CH) and Specialised Hospitals (SH) (26). In the above referral system, patients may move from PHC to CHC and then to DH at level one of care. If at level one health care facilities could not help, then a patient will be moved to level two of health care consisting only of RH. Level three (PTH) is used only when RH could not help the patient; finally, level four (CH and SH) will be used when all the other levels have failed to provide help to a patient.

In this study, two CHCs and three Hospitals were chosen from the list of sixteen healthcare facilities providing chronic dispensing medicine programme in the eThekwini Metropolitan Health district. The selected health care facilities were identified as follows: CHC1, CHC2, DH1, DH2 at level one and then RH1 at level two of the referral system in KZN Province, South Africa. The PUPs used for data collection were found on the premises of the five public health care facilities described above. PUPs were designated rooms, areas with specific queues at different sites.

Figure 1: Map showing eThekwini District (Source, google maps 2018)

Study population, inclusion criteria and exclusion criteria

Eligibility criteria for this study included mainly stable patients on chronic medicines and registered onto CCMDD programme. A stable patient on ART is regarded as a patient that has been on the same treatment regimen for at least 12 months , stable as per disease management plan , has the most recent normal laboratory results , an undetectable viral loads while a patient with diabetes is regarded stable if he/she has two consecutive fasting glucose readings and two consecutive normal blood pressure readings for hypertensive patients, no Tuberculosis (TB) and no present conditions that require ongoing clinical care. These types of patients should be willing to be registered onto the CCMDD programme, have a valid South African ID number or asylum number if non-South African, and their prescribed medicines must be on the provincial CCMDD medicine list (27)

Inclusion criteria

Eligible participants were required to be between 18 years old and above, they must be registered on the CCMDD programme for more than three months. The study population included stable chronic patients, irrespective of gender and racial groups in the study area.

Exclusion criteria

This study excluded patients, registered onto the CCMDD programme but not present at the selected PUPs at the time of data collection, patients attached to PUPs in private health institutions and those chronic patients belonging to adherence clubs outside public health care facilities.

Sampling technique

A systematic approach was adopted for the collection of data from patients registered on the CCMDD programme. Every alternate patient, who came to the PUP for collection of chronic medicines, was selected to carry out face-to-face interviews. The procedure of sampling continued systematically in the five study sites until the sample size was complete. If a patient declined participation, the next patient entering the premises of the PUP was approached and selected. The total sample size was divided by the five institutions to get the number of patients required to be interviewed per institution.

Sample size calculation

The sample size is calculated by using the formula: $n = P\ (1\text{-}P)\ (Z\text{-}\alpha/2/E)^1$ where P= the proportion of patients in CCMDD programme, $(Z\text{-}\alpha/2)$ = a constant code representing 95% of confidence [1.96], E= margin error [+/- 0.05], p= expected prevalence of patients (28) . According to eThekwini municipality 2014/2015 Integrated Development Plan (29), the estimated population of patients on chronic medication was 207091 in 2014. With an expected prevalence of patients of 50% (p = 50%), 95% confidence interval and a margin of error of 5%, the computed formula yields a minimum sample size of 384 participants on chronic medication. To maintain the precision across the study sites and to account for drop-out and attrition, the minimum sample size was increased by 20%, the maximum sample size was 461 participants on chronic medication, irrespective of gender. The number of patients sampled in the study area was divided by the five PUPs selected.

Procedure for recruitment and selection of study participants

Study participants were systematically recruited and selected for this study. Every consenting second patient that presented to collect their medication parcels from PUPs was approached and recruited into the study. Participants were selected at PUPs linked to public health care facilities from Monday to Friday during business hours. The researcher and research assistants administered face-to-face interviews which took approximately ten minutes to complete. The questionnaires were readily available in English and isiZulu. Where applicable the isiZulu version was completed with the aid of the researcher assistant. Some of the health care workers at the PUPs assisted with the translating of information into isiZulu, where necessary, for the patients that were illiterate.

Data collection technique and tool

Data were collected in five public health care facilities in eThekwini Metropolitan public health facilities by means of a researcher administered face-to-face interview using a semi-structured questionnaire which consisted of both open and closed-ended questions. Four sections were included in the questionnaire namely; Section A consisting of socio-demographic characteristics of participants, Section B related to CCMDD programme effect on adherence, Section C involving information and

counselling upon registration on the CCMDD programme and Section D which dealt with the stock of medicines availability and incomplete prescriptions. This article reports findings on Sections A, C and D of the questionnaire. Questions in Section C of the questionnaire focused amongst others on the meaning and purpose of the CCMDD programme, duration of registration on the CCMDD programme, relationship with the programme, challenges experienced and satisfaction with no counselling every time a patient picked up their medicine parcels from PUPs. Questions in Section D focused on incomplete parcels and medicine availability and its impact on the patient.

Statistical analysis

Once data collection was completed, data were imputed on a Microsoft Excel spreadsheet and analysed using the statistical programme for Social Science (SPSS), version 25. Results were reported using descriptive statistics including frequencies, percentages and 95% confidence intervals. Categorical data were presented using tables. Associations between variables were carried out to determine the level of significance using the Crudes odds ratio and Adjusted odds ratio, where applicable. A p-value ≤ 0.05 was estimated as statistically significant. A multivariate analysis was carried out using logistical regression method. All missing data from the patient questionnaires were treated as missing in the data analysis.

Ethical considerations

The study was approved by the Biomedical Research Ethics committee of the University of KwaZulu-Natal under reference BE513/16. The KZN-DOH and the eThekwini Metropolitan Health district gave gatekeeper permission to conduct this study. Thereafter gatekeeper permission was obtained from each study site.

Participants were informed about this study and asked whether they were willing to participate. Those who accepted to participate were asked to give consent before being interviewed. A copy of the consent form was given to each participant. Participants were informed of their right to withdraw from the interview at any time. To ensure anonymity, participants were assigned codes that were known to the researchers. No names or identities appeared on the questionnaire. Findings of this study are being reported anonymously including study sites identified as CHC1, CHC2, DH1, DH2 and RH.

Results

Response Rate

Face-to-face interviews were completed with 417 respondents out of the targeted maximum sample of 461 participants, yielding a response rate of 90.46%.

Socio-demographic characteristics of study participants

Table 1 presents socio-demographic characteristics of study participants. The majority of respondents were predominantly Black Africans (346/417, 83.0% , 95%CI [79.39-84.61]), female (279/417, 66.9%, 95%CI [62.38-71.42]), aged between 41-50 (200/417, 47.9%, 95%CI [43.2-52.8]), unemployed (207/417, 49.6%, 95%CI [44.8-54.4]) and resided in Urban area (337/417 , 80.8%, 95%CI [77.02-84.58]).

Table 1 Socio-demographic characteristic of study respondents (n=417), 2017

Variable	Category	Frequency	Percentage (%)	95% Confidence Interval
Gender	Female	279	66.9	62.38-71.42
	Male	138	33.1	28.58-37.62
	Total	417	100	
Race	Black	346	83.0	79.39-84.61
	Indian	66	15.8	12.3-19.3
	Coloured	5	1.2	0.15-2.25
	White	Nil	Nil	Nil
	Total	417	100	
Age in years	41-50	200	48.0	43.2-52.8
	51-60	86	20.6	16.72-24.48
	31-40	73	17.5	13.85-21.15
	61 or older	46	11.0	8.02-14.04
	21-30	12	2.9	1.29-4.51
	Total	417	100.0	
Occupation	Unemployed	207	49.6	44.8-54.4
	Employed – Full time	142	34.0	29.45-38.55
	Employed – part-time	46	11.0	8.02-14.04
	Pensioner	18	4.3	2.35-6.25
	Student	3	0.7	-0.1-1.5
	Missing value	1	0.2	-0.23-0.63
	Total	417	100.0	
Residence	Urban	337	80.8	77.02-84.58
	Rural	73	17.5	13.85-21.15
	Missing Data	7	1.7	0.46-2.94
	Total	417	100.0	

Information about the CCMDD programme by respondents

Table 2 presents knowledge about the CCMDD programme by study respondents. Many respondents have been collecting medicines from the CCMDD programme for less than or equal to eight months (294/417, 70.5%, 95%CI [66.12-74.88]). With regard to the knowledge of the CCMDD programme, most respondents did not know what was the meaning of the word CCMDD (323/417, 77.5%, 95%CI [73.49-81.51]). However, those respondents who knew the meaning of CCMDD (91/417, 21.8%, 95%CI [17.48-25.76]) equated it with a pick-up point of medicines (40/91, 44. 0%, 95CI [33.8-54.2]). The purpose of CCMDD programme was known to most of the registered patients enrolled onto the programme (234/417, 56.1%, 5%CI [51.34-60.86]), which was stated to decrease waiting time (158/417, 38.0%, 95%CI [33.34-42.66]).

Table 2 Knowledge about the CCMDD programme by study respondents (n=417), 2017

Variable	Category	Frequency	Percentage	95% Confidence Interval
No. of months on CCMDD	≤ 8 months	294	70.5	66.12-74.88
	> 8 months	88	21.1	17.18-25.02
	Missing data	35	8.4	5.74-11.06
	Total	417	100.0	
Do you know the meaning of CCMDD	No	323	77.5	73.49-81.51
	Yes	91	21.8	17.48-25.76
	Missing data	3	0.7	-0.1-1.5
	Total	417	100.0	
Explain the meaning of CCMDD	None (meaning is not known)	324	77.7	73.7-81.7
	Missing data	49	11.8	8.7-14.9
	Pick up point for chronic medicines	40	9.6	6.77-12.43
	To make medicine collection accessible	3	0.7	-0.1-1.5
	A clinic dispensary	1	0.2	-0.23-0.63
	Total	417	100.0	
Do you know the purpose of CCMDD	Yes	234	56.1	51.34-60.86
	No	181	43.4	38.64-48.16
	Missing data	2	0.5	-0.18-1.18
	Total	417	100.0	
Purpose of CCMDD	None (do not know the purpose)	182	43.6	38.84-48.36
	Missing data	33	7.9	5.31-10.49
	Decrease waiting time	158	38	33.34-42.66
	Make medicines more accessible to patients	41	9.8	6.95-12.65
	Pick up points for medicines	3	0.6	-0.14-1.34
	Total	417	100.0	

Provision of counselling, patient satisfaction and challenges experienced by respondents

Table 3 presents the provision of counselling, satisfaction and challenges experienced by study participants. Almost half of respondents rated their relationship with CCMDD as good (221/417, 53.0%, 95%CI [48.12-57.79]); they were reportedly satisfied to collect their medicines without counselling at PUPs (411/417, 98.6%, 95%CI [97.47-99.73]). Majority of respondents reported having experienced no challenges with the CCMDD programme (345/417, 82.7%, 95%CI [79.07-86.33]). However a few patients experienced challenges (68/417, 16.3%, 95%CI [12.75-19.85]), related to transport related problems (51/417, 12.2%, 95%CI [9.06-15.34]). Most respondents indicated that they would recommend the programme to the other patients (412/417, 98.8%, 95%CI [97.75-98-85]).

Table 3 Satisfaction and challenges experienced by respondents (n=417), 2017

Variable	Category	Frequency	Percentage	95% Confidence Interval
Relationship with CCMDD[a]	Good	221	53.0	48.12-57.79
	Satisfactory	192	46.0	41.22-50.78
	Missing data	4	1.0	0.05-1.95
	Total	417	100.0	
Satisfied with no counselling at PUPs[b]	Yes	411	98.6	97.47-99.73
	No	5	1.2	0.15-2.25
	Missing data	1	0.2	-0.23-0.63
	Total	417	100.0	
Challenges with CCMDD[a]	None (no challenges experienced)	345	82.7	79.07-86.33
	Transport problems	51	12.2	9.06-15.34
	No SMS received to inform patient of collection	3	0.7	-0.1-1.5
	Pick up point opens late and closes early	8	1.9	0.59-3.21
	Missing Data	4	1.0	0.05-1.95
	Not all medicines were received; the patient had to go back to facility pharmacy	2	0.5	-0.18-1.18
	Personal problems	2	0.5	-0.18-1.18
	Problems with the different colour of medicines	2	0.5	-0.18-1.18
	Total	417	100.0	
Would you recommend CCMDD[a]	Yes	412	98.8	97.75-98-85
	No	4	1.0	0.05-1.95
	Missing data	1	0.2	-0.23-0.63
	Total	417	100.0	

[a]CCMDD – Centralised chronic medicine dispensing and distribution, [b]PUPs- Pick up points

Medicines stock availability and incomplete prescriptions

Table 4 presents medicine stock availability and incomplete prescriptions of study participants. Most patients reported never experiencing out of stock of medicines at PUPs (365/417, 87.5%, 95%CI [84.1-90.5]). However, a few respondents experienced out of stock issues with their medicine parcels (51/417, 12.2%, 95%CI [9.06-15.34]); some of the respondents reported to be disappointed, abandoned, angry and worried (40/51, 78.4%, 95%CI [6.77-12.43]). This suggests that these few respondents had a negative impression of the CCMDD programme. Although the majority of respondents never experienced out of stock medicines at their PUPs, they indicated that they were given an alternative medicine for items that were out of stock (173/417, 41. 5%, 95%CI [36.77-46.23]). Majority of respondents indicated that they never received an incomplete parcel (324/417, 77.7%, 95%CI [73.7-81.7]). However, a few respondents received incomplete medicine parcels (91/417, 21.8%, 95%CI [17.84-25.76]) which led them to go back to their referring public health facilities to inquire about the incomplete medicine parcels. Thus, some of them felt bad and unhappy about the CCMDD programme (61/417, 14.6%, 95%CI [11.21-17.99]).

Table 4 Medicine stock availability and incomplete prescription characteristics of study respondents (n=417), 2017

Variable	Category	No.	%	95% Confidence Interval
Medicines out of stock	No	365	87.5	84.1-90.5
	Yes	51	12.2	9.06-15.34
	Missing data	1	0.3	-0.23-0.63
	Total	417	100.0	
If yes, how did you feel	None (Patient received all medicines)	365	87.5	84.33-90.67
	Patient felt negatively i.e. disappointed, abandoned, angry, bad, and worried	40	78.4	6.77-12.43
	Had to go back to the pharmacy at referring facility	2	0.5	-0.18-1.18
	Had to buy medicine from a private pharmacy	2	0.5	-0.18-1.18
	Happy as the pharmacy at the referring facility is very helpful	1	2.0	-0.23-0.63
	Missing data	7	1.7	0.46-2.94
	Total	417	100	
Alternative medicine given	None (Patient received all medicines)	235	56.4	51.64-61.16
	Yes	173	41.5	36.77-46.23
	No	9	2.2	0.79-3.61
	Total	417	100.0	
Received incomplete medicine parcels	No	324	77.7	73.7-81.7
	Yes	91	21.8	17.84-25.76
	Missing data	2	0.5	-0.18-1.18
	Total	417	100.0	
What did you do and feel when you received the incomplete parcel	None (Patients did not receive incomplete medicine parcels)	324	77.7	73.7-81.7
	The patient went back to referring health facility; felt bad	61	14.6	11.21-17.99
	The patient had to go home and come back another time; felt bad	21	5.0	2.91-7.09
	Missing data	8	1.9	0.59-3.21
	Had to enquire with service provider; felt bad	2	0.5	-0.18-1.18
	Felt bad	1	0.3	-0.22-0.82
	Total	417	100	

Associations between variable (bivariate analysis and multivariate analysis)

Table 5 presents associations between a patient relationship with CCMDD programme, patient satisfaction with no counselling when picking up medicine parcels, the receiving of incomplete medicine parcels, medicine stock-outs in patient medicine parcels and the number of months the patients are registered on the CCMDD programme. The bivariate concluded that 39.7% (151/380) of patients that claimed to have a good relationship with CCMDD programme, 76.4% (291/381) of patients that were satisfied with no counselling when they picked up their medicine parcel, 68.0% (259/381) that did not receive incomplete medicine parcels and 73.4% (279/380) that did not have medicines out of stock in their medicine parcels were all on the CCMDD programme for ≤ 8 months.

The adjusted odds ratio was 0.174 (p-value = 0.00) for respondents staying more than eight months on the CCMDD programme and who did not receive all their medicines. The adjusted odds ratio was 0.289 (p-value= 0.005) for respondents staying more than eight months on the CCMDD programme and who did not experience medicine out of stocks in their medicine parcels. After handling missing value and treating them as missing, the multivariate logistical regression showed receiving medicine parcels that were incomplete and receiving medicine parcels with medicine out of stock were significantly associated with the number of months that patients were registered on the CCMDD programme

Table 5 Multivariate analysis between the number of months registered onto CCMDD programme, patient relationship with CCMDD programme, patient satisfaction with not receiving counselling at PUPs, receiving of incomplete medicine parcels and medicine out of stocks.

Variables		Number of Months registered on CCMDD[a] programme		Total	COR[b] (95% CI[c])	p-value COR[b]	AOR[d] (95% CI[c])	p-value logistic regression
		≤ 8 Months	> 8 Months					
Patient relationship with CCMDD[a]	Good	151 (39.7%)	51 (13.4%)	202 (53.2%)	1.28 (0.79-2.04)	0.304	1.688 (0.952-2.993)	0.073
	Satisfactory	141 (37.1%)	37 (9.7%)	178 (46.8%)	1 (ref)[e]		1 (ref)[e]	
Total		292 (76.8%)	88 (23.2%)	380 (100.0%)				
Satisfied with no counselling at PUPs[f]	No	2 (0.5%)	0 (0.0%)	2 (0.5%)	0	0.999	0	0.999
	Yes	291 (76.4%)	88 (23.1%)	379 (99.5%)	1 (ref)[e]		1 (ref)[e]	
Total		293 (76.9%)	88 (23.1%)	381 (100.00%)				
Received incomplete medicine parcel	No	259 (68.0%)	39 (10.2%)	298 (78.2%)	0.104 (0.060-0.181)	0.00	0.174 (0.085-0356)	0.174
	Yes	34 (9.0%)	49 (12.9%)	83 (21.8%)	1		1	
Total		293 (77.0%)	88 (23.0%)	381 (100.00%)				
Medicines out of stock	No	279 (73.4%)	55 (14.5%)	334 (87.9%)	0.078 (0.038-0.157)	0.00	0.289 (0.120-0.694)	0.005
	Yes	13 (3.4%)	33 (8.7%)	46 (12.1%)	1		1	
Total		292 (76.8%)	88 (23.2%)	380 (100.00%)				

[a] Centralized chronic medicine dispensing and distribution, [b] Crudes odds ratio, [c] Confidence interval, [d] Adjusted odds ratio, [e] Reference, [f] Pick up points

Discussion

This study describes the effect of knowledge, satisfaction, challenges, medicine availability and incomplete prescriptions can have on the retention of patients to the CCMDD programme. There are limited studies that have been conducted on the CCMDD programme in South Africa. There is no baseline data and comprehensive evaluation is yet to be conducted.

Most of the respondents on the CCMDD programme did not know what was the meaning of the word CCMDD (323/417, 77.5%), this is in agreement with a study in India where a poor level of awareness of health services available was mainly attributed to poor health education (30). Patient education can form an integral part in their adherence as identified in a study in Spain that found a more complete patient education and information can have a positive effect on patient adherence (31).

This study found that the majority of respondents reported having experienced no challenges with the CCMDD programme (345/417, 82.7%). However, the respondents that reported challenges mainly attributed them to transport related problems (51/67, 75%). Transport-related challenges experienced are also highlighted in a study carried out in eThekwini KZN where it was noted that transportation is a challenge that patients experience when refilling their prescriptions for chronic treatment (32). In another study in the Democratic Republic of Congo, transport-related challenges were the cause of patients not going to the main hospital in the area for treatment that resulted in an advanced state of disease, a programme was initiated in the country for drug delivery close to patient homes to enhance adherence to treatment (16).

This study found that almost half of respondents rated their relationship with CCMDD as good (221/417, 53.0%); which could indicate that patients are happy with the programme and the staff that offered their assistance with handing out of their medicine parcels at the PUPs. This falls in line with the findings of two studies looking into patient satisfaction; in Iran, patients were satisfied from receiving care irrespective of whether the service was delivered by a Pharmacist or a staff member (33) and in an Oxford University Hospital majority of patients were satisfied from receiving treatment from a satellite pharmacy (similar to a CCMDD PUP) which was one kilometre away from the main pharmacy (34).

This study found that approximately 98% (411/417) of study participants were happy with not receiving counselling every time they collected their treatment parcels. This is in agreement with the Fast-track refills programme that is run in Malawi where patients have clinical consultations once every six months with a health care profession but receive their medicine refills every two months without having any health education (35) and the feedback that was received on this programme from the patients were positive as they believed that this programme increases patient adherence to treatment (36).

This study found that most patients reported never experiencing out of stock of medicines at PUPs (365/417, 87.5%) and never collected incomplete medicine parcels at PUPs (324/417, 77.7%). These findings disagree with a study in South Africa where the CDU experienced many stock-outs which led to frustrations for both healthcare professionals and patients due to incomplete medicine parcels being delivered to chronic patients (37). Another study in Malawi that assessed the experiences in a Multi-month scripting programme amongst others has identified challenges that relate to stock availability, particularly low stock or stock-outs and how this can affect the running of the programme as it prevents patients from receiving multiple months' supply of medication (38). Stock out of medication can be a major barrier to patient adherence which could lead to detrimental effects to a patient's health as identified in a study where almost half of the patients that experienced stock-outs died from their chronic conditions when compared to another group of patients with the same chronic condition but having received their full chronic medication (39). A few respondents that experienced stock-outs (51/417, 12.2%) and incomplete medicine parcels (91/417, 21.8%) reported negative feelings towards these experiences. This is in agreement with a study in South Africa that found that patients were dissatisfied with health services due to the lack of resources particularly medicine stock-outs (42).

This study found that there was no significant difference between the number of months patients registered on the CCMDD programme and patient's relationship with the programme, patient satisfaction with no counselling at PUPs and patients receiving incomplete medicine parcels following logistic regression analysis. However, the association between the number of months patients registered on the CCMDD programme and patients experiencing medicine stock-outs showed a significant difference (p-value = 0.005). This may suggest that there is a feeble percentage of out of stock medication for patients registered on the CCMDD programme. These findings are in agreement with the ongoing study in South Africa by the Stop stockouts programme which reported that the CCMDD programme had reduced the frequency of stock-outs by 70% (41).

Strengths and Limitations

This study achieved an acceptable response rate of 90.45% which is in line with the expected response rate that researchers should aim to achieve in research as explained by Johnson (40). The sample size of this study is above the minimum sample size estimated in this study. However, certain limitations exist in this study, the findings of this study may not be generalised to the entire population of chronic patients registered on the CCMDD programme in South Africa. This study focused on the perspectives of patients and their experiences on the CCMDD programme in the eThekwini Metropolitan health district. More studies are needed in the future to compare this study to other districts in KZN as well as other provinces in South Africa. In addition, studies on public awareness about the CCMDD programme may be useful for the general population in South Africa.

Conclusion

Most respondents reported neither experiencing medicine stock-outs nor receiving incomplete medicine parcels. Majority of respondents had a good relationship with the CCMDD programme, they were satisfied with no counselling at the PUPs and experienced no challenges. Although most of the respondents registered on the CCMDD programme had insufficient knowledge about the meaning of CCMDD programme; their satisfaction and relationship with the CCMDD program may suggest high levels of adherence to such a programme. This study focused on the perspectives of patients about the CCMDD programme. More studies should be carried out to look at the perspective of health care professionals and stakeholders involved and their contribution and impact on the CCMDD programme. Further studies should be carried out to understand the effects of missed appointments, waiting time and PUPs on adherence.

Abbreviations

ART: Anti-retroviral therapy

CCMDD: Centralized chronic medicine dispensing and distribution programme

CDC: Centre for Disease Control

CDU: Chronic dispensing Unit

CH: Central Hospital

CHC: Community Health care centre

DH: District Hospital

KZN: KwaZulu-Natal

KZN-DOH: KwaZulu-Natal Department of health

NDOH: National Department of health

NDP: National development plan

NHI: National Health Insurance

PHC: Primary health care clinic

PTH: Provincial Tertiary Hospital

PUPs: Pick-up points

RH: Regional Hospital

SH: Specialised Hospital

SPSS: Statistical programme for social science

TB: Tuberculosis

WHO: World Health Organization

Funding acknowledgement

MN acknowledge the stipend and running expenses received from the College of Health Sciences – University of KwaZulu-Natal.

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After presenting the assessment of the provision of information, counselling, stock availability and incomplete prescriptions on adherence of chronic patients to the CCMDD programme in the eThekwini Metropolitan health district in Chapter 2, the establishment of whether the CCMDD programme improves patient adherence to chronic medication, were further reported in Chapter 3. A paper entitled, *"The role of the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme in the improvement of adherence of patients to chronic medications: The case of eThekwini Metropolitan Health district in South Africa"*, was prepared following the guidelines of the Journal of Public Health.

CHAPTER 3

The role of the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme in the improvement of adherence of patients to chronic medications: The case of eThekwini Metropolitan Health district in South Africa

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Abstract

Background

Centralized Chronic Medicine Dispensing and Distribution (CCMDD) is a national programme aimed at making health care more accessible to patients. The programme intends to improve access to chronic medicines and decongest public healthcare facilities in South Africa. The aim of this study is to establish whether the CCMDD programme improves patient adherence to chronic medication.

Methods

A descriptive cross-sectional study was conducted among stable chronic patients on the CCMDD programme in five public health facilities in eThekwini Metropolitan Health district, South Africa between May and August 2017. The researcher administered face-to-face interviews were carried out

using a semi-structured questionnaire with open and closed-ended questions. The questionnaire consisted of four sections: section A consisted of socio-demographic characteristics of participants, section B related to CCMDD programme effect on adherence, section C involved information and counselling upon registration on the CCMDD programme and section D dealt with medicines availability and incomplete prescriptions. This paper is reporting findings on sections A and B.

Results

Majority of respondents reported a waiting time less than 30 minutes (411/417, 98.6%, 95%CI [97.47-99.3]) after CCMDD programme implementation compared to two hours (398/417, 95.4%, 95%CI [93.39-97.41]) before CCMDD program implementation; a significant association exists between waiting time before and after implementation of CCMDD, p value<0.05. Many respondents (370/417, 88.7%, 95%CI [85.66-91.74]) reported not missing their appointment for the collection of their medicines. Most respondents indicated travelling less than 30 minutes to collect their medicines (366/417, 87.8%, 95%CI [84.66-90.94]) at a cost between $0.84-$1.52 (302/417, 72.4%, 95%CI [68.11-76.69]).

Conclusions

Most respondents reported a significant decrease in the waiting time for the collection of their medicines after CCMDD programme implementation. Missed appointments for collection of medicine parcels were significantly low among study participants which could be a good predictor of adherence. CCMDD Pick-up points were the preferential point to collect medicines, they provided better access and were more convenient to respondents than the public health care facility with regards to travel time for collection of medicine parcels and transport costs. More studies are needed to investigate the perspective of health care professionals and stakeholders involved in the CCMDD programme.

Keywords: Centralized Medicine Dispensing and Distribution of Medicine, Pick-up Points, Adherence, chronic medicines, National Department of Health, missed appointments.

Background

The World Health Organization (WHO) has estimated that approximately 15 million deaths are attributed to chronic diseases each year, which accounts for 70% of deaths globally, making chronic diseases the main cause of death (1). Medication adherence can affect the overall outcome of disease control and lead to death (2). Nonadherence to chronic medication can pose serious health risks to patients. Nonadherence defined by the WHO as "the extent to which a person's behaviour – taking

medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" (3).

Interventions to retain chronic patients in care have been tried and developed worldwide. Many health programmes worldwide have advised ways to improve adherence among patients on chronic medications. In California, United States of America (USA) ,an interactive SMS (short messaging system) programme was used on nonadherent or partially adherent patients that involved sending an SMS to remind the participants to refill their prescription, which produced a higher refill rate in nonadherent and partially adherent patients compared to a similar group of patients that did not receive any reminders to refill their medications (4).

In South Africa, the number of patients has been increasing over the years for those who have been diagnosed with chronic diseases and thus requiring chronic treatment (5). Waiting times and transport costs can play a major role in adherence. A study conducted in three African countries stated that even though patients were happy to take their chronic medication, they were faced with other structural challenges like extended waiting times of greater than six hours and high travelling costs to health facilities to pick up their medicines ; these factors could cause unintentional nonadherence and make patients not present to health facilities to refill their prescriptions (6).

There are many measures that have been used in various studies across the world to measure the adherence of patients to their treatment. Some measures include the self-reported medicine adherence report scale questionnaires (7), self-reported adherence questionnaire using the Morisky Scale (8) and assessing database prescriptions claims on a computerized system i.e. filling of prescriptions (9).

Minimizing the time it takes a patient to receive complete healthcare could increase their adherence to treatment. In South Africa, a study that looked at the factors that contributed to non-adherence found that extended waiting times at public health facilities could be linked to defaulting treatment (10). Another study also in South Africa confirms that extended waiting times lead patients to not come to health facilities to collect their treatment (11).

Travelling characteristics that include cost and time that is experienced by patients for medicine collection is a factor that can negatively affect patient adherence to their treatment (12,13). Community adherence clubs which is a type of medicine collection point has proven to make medicine collection easier and improve patient adherence to their treatment (14). Some collection points currently available can include pharmacies or adherence clubs which have proven to save patients time and money in treatment collection (15).

Missed appointments are a common practice among patients that can be noted across the world (16,17,18). Missed appointments can be a good measure of adherence to treatment. By understanding the reasons for missed appointments in the health sector we can assist in ensuring that the rate of missed

appointments is reduced. A missed appointment can be attributed to various barriers. Forgetting to attend appointments is one such reason that has been reported in two studies in the USA (19,20).

The Central chronic medicine dispensing and distribution (CCMDD) programme has been established by the National Department of Health (NDOH) in South Africa with the purpose of ensuring greater accessibility of healthcare, a decrease in the burden of chronic disease and improvement of patient compliance (5). The main aim of the CCMDD programme is to decongest the public health facilities and improve the accessibility of chronic medicines to patients (21). The CCMDD programme can be understood in two parts, the first being the CCMDD component that contracts a private service provider that will centrally dispense chronic prescriptions of stable patients and distribute these pre-dispensed medicine parcels to a Pick-up points (PUPs). A PUP is a venue like private sector pharmacies, churches; mosques; tribal courts; war rooms and community Halls (22) that are conveniently located to the patients registered on this programme where these pre-dispensed medicine parcels are being issued to these patients. To assist in reducing the cost that patients would have to incur and to decrease overall patient waiting time, private service providers have been appointed to serve as CCMDD units (23). The CCMDD programme has been piloted in ten districts in South Africa through the National Health Insurance (NHI) (24). By the year 2017, the number of patients registered onto the CCMDD programme in the KZN province amounted to 504 000 (25). The overall expected benefits of the CCMDD programme include improved patient adherence, tracking of defaulters, medicine management and availability to patients, decongestion to public health facilities and better medicine forecasting (26).

Adherence of patients to chronic treatment, registered onto the CCMDD programme, has limited data in South Africa. Other studies have been previously conducted in South Africa on similar programmes to the CCMDD. One such study on the Chronic Dispensing Unit (CDU) programme in the Western Cape reported that patients missed appointments (18) while another study showed benefits of the CDU with regards to waiting times and improved access to medicines (5). Building from these previous studies and with regard to the implementation of the CCMDD programme, there is a need to understand factors associated with the missing collection of medicines by patients on this programme. The aim of this study is to establish whether the CCMDD programme improves patient adherence to chronic medication.

Methods

Study Design

This study was a descriptive cross-sectional survey among stable chronic patients registered on the CCMDD programme in public healthcare institutions in the eThekwini Metropolitan Health district. The researcher administered face-to-face interviews were carried out with participants using a semi-

structured questionnaire consisting of both open and closed-ended questions. Participants were systematically selected. Data was collected between May to August 2017.

Study sites

Figure 1 illustrates the map of the sites included in this study. There are sixteen health care facilities in the eThekwini Metropolitan Health district. These facilities were listed in alphabetical order and every third facility/pick up point was chosen from the list. The study was carried out in five public health facilities in the eThekwini Metropolitan Health district.

A referral system exists within the KwaZulu-Natal Department of Health (KZN-DOH) that consists of four levels of care. Level one consists of Primary Health care clinic (PHC), Community Health Care Centre (CHC) and District hospital (DH), level two consists of Regional Hospital (RH), level three consists of Provincial Tertiary Hospital (PTH) while level four is made up of Central Hospitals (CH) and Specialised Hospitals (SH) (27). In the above referral system, patients may move from PHC to CHC and then to DH at level one of care. If at level one health care facilities could not help, then a patient will be moved to level two of health care consisting only of RH. Level three (PTH) is used only when RH could not help the patient; finally, level four (CH and SH) will be used when all the other levels have failed to provide help to a patient.

In this study, two CHCs and three Hospitals were chosen from the list of sixteen healthcare facilities providing chronic dispensing medicine programme in the eThekwini Metropolitan Health district. The selected health care facilities were identified as follows: CHC1, CHC2, DH1, DH2 at level one and then RH1 at level two of the referral system in KwaZulu-Natal (KZN) Province, South Africa. The PUPs used for data collection were found on the premises of the five public health care facilities described above. PUPs were designated rooms, areas with specific queues at different sites.

Figure 1: Map showing eThekwini District Study population, (Source, Google maps)

Inclusion criteria and Exclusion criteria

Eligibility criteria for this study included mainly stable patients on chronic medicines and registered onto CCMDD programme. A stable patient on Antiretroviral therapy (ART) is regarded as a patient that has been on the same treatment regimen for at least 12 months , stable as per disease management plan , has the most recent normal laboratory results , an undetectable viral loads while a patient with diabetes is regarded stable if he/she has two consecutive fasting glucose readings and two consecutive normal blood pressure readings for hypertensive patients, no tuberculosis (TB) and no present conditions that require ongoing clinical care. These types of patients should be willing to be registered onto the CCMDD programme, have a valid South African ID number or asylum number if non-South African, and their prescribed medicines must be on the provincial CCMDD medicine list (28).

Inclusion criteria

Eligible participants were required to be between 18 years old and above, they must be registered on the CCMDD programme for more than three months. The study population included stable chronic patients, irrespective of gender and racial groups in the study area.

Exclusion criteria

This study excluded patients, registered onto the CCMDD programme but not present at the selected PUPs at the time of data collection, patients attached to PUPs in private health institutions and those chronic patients belonging to adherence clubs outside public health care facilities.

Sampling technique

A systematic approach was adopted for the collection of data from patients registered on the CCMDD programme. Every alternate patient, who came to the PUP for collection of chronic medicines, was selected to carry out face to face interviews. The procedure of sampling continued systematically in the five study sites until the sample size was complete. If a patient declined participation, the next patient entering the premises of the PUP was approached and selected. The total sample size was divided by the five institutions to get the number of patients required to be interviewed per institution.

Sample size calculation

The sample size is calculated by using the formula: $n = P(1-P)(Z-\alpha/2/E)^1$ where P= the proportion of patients in CCMDD programme, $(Z-\alpha/2)$ = a constant code representing 95 % of confidence [1.96], E= margin error [+/- 0.05], p= expected prevalence of patients (29). According to eThekwini municipality 2014/2015 Integrated Development Plan (30), the estimated population of patients on chronic medication was 207091 in 2014. With an expected prevalence of patients of 50% (p = 50%), 95% confidence interval and a margin of error of 5%, the computed formula yields a minimum sample size

of 384 participants on chronic medication. To maintain the precision across the study sites and to account for drop-out and attrition, the minimum sample size was increased by 20%, the maximum sample size was 461 participants on chronic medication, irrespective of gender. The number of patients sampled in the study area was divided by the five PUPs selected.

Procedure for recruitment and selection of study participants

Study participants were systematically recruited and selected for this study. Every consenting second patient that presented to collect their medication parcels from PUPs was approached and recruited into the study. Participants were selected at PUPs linked to public health care facilities from Monday to Friday during business hours. The researcher and research assistants administered face to face interviews which took approximately ten minutes to complete. The questionnaires were readily available in English and isiZulu. Where applicable the isiZulu version was completed with the aid of the researcher assistant. Some of the health care workers at the PUPs assisted with the translating of information into isiZulu, where necessary, for the patients that were illiterate.

Data collection technique and tool

Data were collected in five public health care facilities in the eThekwini Metropolitan public health district facilities. There exist many methods for measuring adherence. In this study, self-reports of participants were used to assess whether they (patients) filled their prescriptions regularly. A researcher administered face-to-face interviews were conducted using a semi-structured which consisted of both open and closed-ended questions. Four sections were included in the questionnaire namely; Section A consisting of socio-demographic characteristics of participants, Section B related to CCMDD programme effect on adherence, Section C involving information and counselling upon registration on the CCMDD programme and Section D which dealt with the stock of medicines availability and repeat prescriptions. This article reports findings on Sections A and B of the questionnaire. Questions in Section B of the questionnaire focused amongst others on waiting time for medication parcels before and after implementation of CCMDD programme, missed appointments, medicine collection preference, travel time to PUP and associated costs. Adherence to the CCMDD programme was measured by patients not missing their appointments as well as picking up regularly their medicine parcels (filling regularly their prescriptions). Participants in the study were directly asked in face-to-face interviews if they have not collected their medicine parcels as per the stipulated date (missed their appointments).

Statistical analysis

Once data collection was completed, data was inputted on a Microsoft Excel spreadsheet and analysed using the statistical programme for Social Science (SPSS), version 25. Results were reported using descriptive statistics including frequencies, percentages and 95% confidence intervals. Categorical data

were presented using tables and bar graphs. Associations between variables were carried out to determine the level of significance using Pearson Chi-Square or Fisher's Exact test, where applicable. A p-value ≤ 0.05 was estimated as statistically significant. A multivariate analysis was carried out using logistical regression method. All missing data from the patient questionnaires were treated as missing in the data analysis.

Ethical considerations

The study was approved by the Biomedical Research Ethics committee of the University of KwaZulu-Natal under reference BE513/16. The KZN-DOH and the eThekwini Metropolitan Health district gave gatekeeper permission to conduct this study. Thereafter gatekeeper permission was obtained from each study site.

Participants were informed about this study and asked whether they were willing to participate. Those who accepted to participate were asked to give consent before being interviewed. A copy of the consent form was given to each participant. Participants were informed of their right to withdraw from the interview at any time. To ensure anonymity, participants were assigned codes that were known to the researchers. No names or identities appeared on the questionnaire. Findings of this study are being reported anonymously including study sites identified as CHC1, CHC2, DH1, DH2 and RH1.

Results

Response Rate

Face-to-face interviews were completed with 417 respondents out of the targeted maximum sample of 461 participants, yielding a response rate of 90.46%.

Socio-demographic characteristics of study participants

Table 1 presents socio-demographic characteristics of study participants. The majority of respondents were predominantly Black Africans (346/417, 83.0%, 95%CI [79.39-84.61]), female (279/417, 66.9%, 95%CI [62.38-71.42]), aged between 41-50 (200/417, 47.9%,, 95%CI [43.2-52.8]) , unemployed (207/417 , 49.6%, 95%CI [44.8-54.4]) and resided in Urban area (337/417 , 80.8%, 95%CI [77.02-84.58]).

Table 1 Socio-demographic characteristic of study respondents (n=417), 2017

Variable	Category	Frequency	Percentage (%)	95% CI
Gender	Female	279	66.9	62.38-71.42
	Male	138	33.1	28.58-37.62
	Total	417	100	
Race	Black	346	83.0	79.39-84.61
	Indian	66	15.8	12.3-19.3
	Coloured	5	1.2	0.15-2.25
	White	Nil	Nil	Nil
	Total	417	100	
Age in years	41-50	200	48.0	43.2-52.8
	51-60	86	20.6	16.72-24.48
	31-40	73	17.5	13.85-21.15
	61 or older	46	11.03	8.02-14.04
	21-30	12	2.9	1.29-4.51
	Total	417	100	
Occupation	Unemployed	207	49.6	44.8-54.4
	Employed – Full time	142	34.0	29.45-38.55
	Employed – part-time	46	11.03	8.02-14.04
	Pensioner	18	4.3	2.35-6.25
	Student	3	0.7	-0.1-1.5
	Missing value	1	0.2	-0.23-0.63
	Total	417	100	
Residence	Urban	337	80.8	77.02-84.58
	Rural	73	17.5	13.85-21.15
	Missing Data	7	1.7	0.46-2.94
	Total	417	100	

The effects of CCMDD on adherence

Self-reported waiting times

Figure 2 presents waiting time characteristics of respondents. Waiting time of majority of respondents before implementation of CCMDD programme was predominantly more than two hours (398/417,

95.4%, 95%CI [93.39-97.41]), the waiting time had significantly decreased to less than 30 minutes (411/417, 98.6%, 95%CI [97.47-99.3]) after the implementation of the CCMDD programme. This may suggest that the waiting time for patients has decreased to one-quarter of the time usually spent in public healthcare facilities.

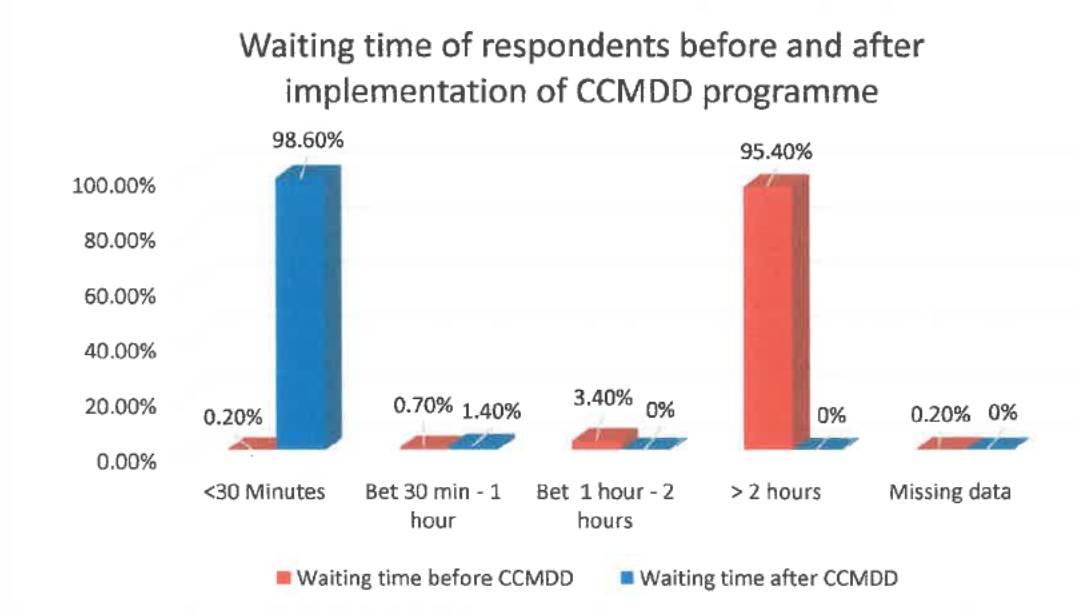

Figure 2: Waiting time characteristics of study respondents (n=417), 2017

Medicine collection points preference

Majority of respondents preferred collecting their treatment from designated CCMDD pick up points (412/417, 98.8%, 95%CI [97.75-99.85]) compared to the original point of collection (pharmacy departments in the health institutions).

Self-reported travelling to medicine collection points

Table 2 presents travelling characteristics of study respondents. Majority of respondents indicated that they travel 30 minutes or less to collect their medicines (366/417, 87.8%), they used public transport by bus/taxis (337/417, 80.8%) and it cost incurred between R11-R20 ($0.84-$1.52) (302/417, 72.4%).

Table 2 travelling characteristics of study respondents (n=417), 2017

Variable	Category	Frequency	Percentage (%)	95% Confidence Interval
Time is taken to travel to PUPs	≤ 30 minutes	366	87.8	84.66-90.94
	31-60 minutes	33	7.9	5.31-10.49
	Missing data	17	4.1	2.2-6.0
	91-120 minutes	1	0.2	-0.23-0.63
	61-90 minutes	Nil	Nil	Nil
	Total	417	100	
Mode of transport used	Public Transport by bus/taxi	337	80.8	77.02-84.58
	Walking	58	13.9	10.58-17.22
	Private car	19	4.6	2.59-6.61
	Public transport by train	2	0.5	-0.18-1.18
	Missing value	1	0.2	-0.23-0.63
	Total	417	100	
Travelling cost (in Rands)	11-20 ($0.84-$1.52)*	302	72.4	68.11-76.69
	≤ 10 ($0.76)*	62	14.9	11.48-18.32
	21-50 ($1.60-$3.80)*	42	10.1	7.21-12.99
	51-100 ($3.88-$7.61)*	5	1.2	0.15-2.25
	Missing data	6	1.4	0.27-2.53
	Total	417	100	

*Legend = Value in United States Dollar *(USD) –average exchange rate between May 2017-August 2017; 1 USD = 13.14

Missed appointments

Table 3 presents the major reasons for missed appointments at PUPs. The majority of respondents reported that they took their medicines as per instructions by their health care professional (414/417, 99.3%, 95%CI 98.5-100.1). Almost 89% (370/417, 88.7%, 95%CI 85.66-991.74) of respondents reported never missing their appointment for collection of treatment at PUPs. The main reason for missed appointments was due to the respondent forgetting to collect their treatment (22/417, 5.3%).

Table 3 Reasons for missed appointments by respondents (n=417), 2017

Variable	Category	Frequency	Percentage (%)	95% confidence interval
Reasons for missed appointments	None (never defaulted treatment)	370	88.7	85.66-91.74
	Forget to collect	22	5.3	3.15-7.45
	Missing data	15	3.6	1.81-5.39
	Away from home at the time of collection	4	0.9	-0.01-1.81
	Got busy with work	3	0.7	-0.1-1.5
	Transport problems	2	0.5	-0.18-1.18
	Felt sick due to health condition	1	0.2	-0.23-0.63
	Total	417	100	

Associations between variables (bivariate analysis)

Table 4 presents an association between waiting time before and after the implementation of the CCMDD programme. The majority of respondents (396/411, 96.3%) waited more than two hours before the implementation of the CCMDD programme and less than 30 minutes after the implementation of CCMDD, p-value < 0.05

Table 4: Association between waiting time before CCMDD implementation and waiting time after CCMDD implementation

Association between waiting time before CCMDD implementation and waiting time after CCMDD implementation					
		Waiting time after CCMDD		Total	P-value (Pearson Chi-Square)
		<30 Minutes	Between 30Minutes-1 Hour		
Wating time before implementation of CCMDD programme	<30 Minutes	2 (0.5%)	Nil	2 (0.5%)	0.000
	>2 Hours	396 (96.3%)	2 (33.3%)	398 (95.7%)	
	Between 1-2 Hours	11 (2.7%)	3 (50.0%)	14 (3.4%)	
	Between 30Minutes-1 Hour	2 (0.5%)	1 (16.7%)	3 (0.7%)	
Total		411 (100.0%)	6 (100.0%)	417 (100.0%)	

Legend: CCMDD – Centralized chronic medicine dispensing and distribution

Table 5 presents a multivariate analysis between waiting time before CCMDD programme implementation, waiting time after CCMDD programme implementation, medicine collection point preference and missed appointments in a multi logistic regression model. Before the implementation of the CCMDD programme, those respondents that waited two or more hours missed their appointment (44/47, 93.6%) while after the implementation of the CCMDD programme, none of the respondents missed their appointment among those who reported waiting for less than 30 minutes. The majority of respondents who preferred to collect their medicine parcels from CCMDD PUPs did not miss their appointment.

Table 5: Multivariate analysis between missed appointments, waiting time and pick up point preference

Variables		Missed Appointments		Total	Crudes odds ration or 95% CI	p-value COR	AOR (95% CI)	p-value logistic regression
		No	Yes					
Waiting time before implementation of CCMDD programme	< 30 Minutes	Nil	1 (0.2%)	1 (0.2%)	-	0.999	-	-
	Between 30 minutes – 1 hour	2 (0.5%)	1 (0.2%)	3 (0.7%)	0.24 (0.22-2.79)	0.260	0.123 (0.01-2.0)	0.141
	Between 1-2 hours	13 (3.1%)	1 (0.2%)	14 (3.3%)	0.154 (0.007-3.57)	0.244	0.10 (0.03-3.15)	0.191
	> 2 Hours	355 (85.1%)	44 (10.6%)	399 (95.7%)	1	-	1	-
Total		370 (88.7%)	47 (11.3%)	417 (100.00%)				
Waiting time after implementation of CCMDD programme	< 30 Minutes	364 (88.1%)	47 (11.4%)	411 (99.5%)	-	0.999	-	0.999
	Between 30 minutes – 1 hour	6 (1.5%)	Nil	6 (1.5%)	1	-	1	-
Total		370 (89.6%)	47 (11.4%)	417 (100%)				
Medicine pick up point preference	CCMDD PUPs	368 (88.2%)	45 (10.8%)	413 (99.0%)	0.37 (0.4-3.61)	0.391	0.25 (0.02-2.77)	0.256
	Public health facilities pharmacies	3 (0.7%)	1 (0.3%)	4 (1.0%)	1	-	1	-
Total		371 (88.9%)	46 (11.1%)	417 (100.0%)				

(1) – Indicates reference category

Legend: AOR- Adjusted odds ratio, COR- Crudes odds ratio, CCMDD -Centralized chronic medicine dispensing and distribution, PUPs -Pick-up points

Discussion

The study describes the effect of waiting time, pick up points preference, travel costs and travel time on missed appointments whilst on the CCMDD programme. There are limited studies that have been conducted on the CCMDD programme in South Africa. There is no baseline data and comprehensive evaluation is yet to be conducted.

This study found that waiting time after implementation of CCMDD had significantly decreased. This finding is in agreement with one of the goals of the CCMDD programme which is to decreases congestion in the public health facilities, leading to reduced waiting times and happier patients and staff (31). The finding of this study is also in line with the aims of the CDU in the Western Cape, which is similar to the CCMDD programme, and proposed a decrease in waiting time (18). A study carried out in three African countries about long waiting times expressed how long waiting times greater than six hours could affect the adherence of a patient (6). Therefore, the reduced waiting time after the implementation of CCMDD will contribute to a decreased number of patients missing treatment collection.

This study found that the majority of patients preferred collecting their treatment from CCMDD pick up points compared to the previous collection point (pharmacy departments in health institutions). This falls in line with the benefits of the CDU; patients prefer collecting from alternate pick up points as these points provide better access to medication and make medicine collection more convenient (5).

This study found that respondents reported low rate for missed appointments. Missed appointments before being registered on the CCMDD programme was not measured. Missed appointments can be a good predictor to adherence. From the 11.3% of respondents that missed their appointments, they have mainly done so because they forgot to collect their medicines, this is in line with a study done in Uganda that adherence among ART patients where forgetfulness was a major reason for missed appointments which caused virological failure in patients (32).

This study showed that travelling to pick up points took approximately 30 minutes or less and cost between R11-R20 ($0.84-$1.52). Although the proximity to the CCMDD PUPs reduced the cost of travelling to a minimum; this minimal travel cost may still be heavy on a certain category of chronic patients. This minimal cost found in this study is in agreement with a study carried out on the CDU programme in the Western Cape (18). High travelling costs can lead to unintentional nonadherence as patients are unable to present at health facilities to collect their medication (6). Due to minimal travel costs the chances of patient collection their treatment is relatively high. A study in Botswana about adherence among ART patients found that travel to clinics stretched about 1000km away and this caused nonadherence in a small percentage of the study population (33).

In a bivariate analysis, this study showed a significant difference between waiting time before and after CCMDD implementation (p-value = 0.00). This is in agreement with the findings of a study in Western Cape, South Africa, that reported that if patients receive their medicine with a shorter waiting time then they will be more likely to adhere to the medication (34). Following a logistic regression analysis, this study found that there was no significant difference between missed appointments and waiting time before CCMDD implementation, waiting time after CCMDD implementation and medicine pick up point preference, However, before CCMDD implementation respondents that waited two or more hours missed their appointments while after implementation of the CCMDD programme, none of the respondents that waited less than 30 minutes- one hour missed their appointments. Majority of respondents who preferred collecting from CCMDD PUPs did not miss their appointments. This is in agreement with the findings in a study in Brazil that looked at the Aids drug dispensing unit which was developed to distribute ART's to patients; the number of patients that became more aware of their disease state and collected their medicines more regularly increased (35).

The findings in this study may suggest that there was a decrease in waiting time experienced by patients after the implementation of the CCMDD programme. In addition, patients preferred the CCMDD programme PUPs which were convenient for them. This may justify the low rate of missed appointments, hence highlighting the positive effect and good levels of adherence to the CCMDD programme.

Strengths and limitations of the study

This study achieved an acceptable response rate of 90.45% which is in line with the expected response rate that researchers should aim to achieve in survey research as explained by Fincham (36). The sample size of this study is above the minimum sample size estimated in this study. However certain limitations exist in this study, study sites were not equally distributed from level one and level two of the referral system. Four of the study sites were chosen from level one of care in the public health care referral system and only one public health institution was chosen from level two of care in the public health care referral system. In this study PUPs were attached to public health care facilities; however, other PUPs, which were not included in this study, exist in private institutions, adherence clubs outside the public healthcare facilities, halls and churches. Further studies are needed to evaluate the adherence of patients in those other PUPs not included in this study. This study only looked at the patient's perspective on the CCMDD programme in the eThekwini Metropolitan Health district, more studies should be conducted in the future to compare this study to other districts in KZN as well as other provinces in South Africa. More studies should be carried out to look at the perspective of health care professionals and stakeholders involved and their contribution and impact on the CCMDD programme.

Conclusion

This study found that the CCMDD programme had significantly decreased the waiting time for patients to one-quarter of the time usually spent in public healthcare facilities. The majority of respondents reported never missing their appointment for the collection of treatment at PUPs. Many respondents in this study had a better preference for the PUP rather than their primary referring public health care facility. This suggests that the CCMDD programme may improve the adherence levels of chronic patients to their treatment. Further studies are warranted to evaluate the level of satisfaction of chronic patients on the programme with regard to non-counselling and shortages of medicines at PUP. In addition, perspectives of health care providers need to be investigated for a comprehensive picture of the functioning of the CCMDD programme.

Abbreviations

ART: Antiretroviral Therapy; CCMDD: Centralized Chronic Medicine Dispensing and Distribution ; CDU: Chronic Dispensing Unit; CH: Central Hospital; CHC: Community Health center; DH: District Hospital; KZN: KwaZulu-Natal; KZN-DOH: KwaZulu-Natal Department of Health; NDOH: National Department of Health; NHI: National Health Insurance; PHC: Primary Health Care; PTH: Provincial Tertiary Hospital; PUPs: Pick-up points; RH: Regional Hospital; SH: Specialized Hospital; SMS: Short Messaging System; SPSS: Statistical programme for Social Science; TB: Tuberculosis; USA: United States of America; USD: United States Dollar; WHO: World Health Organization;

Acknowledgements

The authors are grateful to the KZN-DOH for granting permission to conduct this study in the five public health care facilities.

Funding

Stipend and running expenses were received from the College of Health Sciences- University of KwaZulu-Natal

Availability of data and materials

The data for this study can be made available upon request.

Authors Contribution

MN drafted the initial manuscript and collected data.

MN conceived the project, revised the initial manuscript for content and approved the final version as senior author.

Ethics approval and consent to participate

The study was approved by the Biomedical Research Ethics committee of the University of KwaZulu-Natal (BE513/16). The KZN-DOH and the eThekwini Metropolitan Health district gave gatekeeper permission to conduct this study. Written and informed consent was obtained from the study participants. A copy of the form was given to each participant.

Consent for publication

Not applicable

Competing Interests

The authors declare no conflict of interests.

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CHAPTER 4 – SYNTHESIS CHAPTER

4. Synthesis and Discussion - Significance of major findings

4.1 Satisfaction and Challenges experienced by respondents

Almost half of the respondents rated their relationship with CCMDD as good (221/417, 53.0%, 95%CI [48.12-57.79]) which could indicate that patients are happy with the programme and the staff that offered their assistance with handing out of their medicine parcels at PUPs. This is in agreement with a study in Lesotho that assessed perspectives of patients enrolled in the Community ART group model; these patients experienced a positive impact from the programme in terms of satisfaction (1). A study in Brazil found that 83% of patients were less adherent to their chronic medicines before joining a chronic dispensing programme (2). This study also found that the majority of respondents reported having experienced no challenges with the CCMDD programme (345/417, 82.7%, 95%CI [79.07-86.33]). However, the respondents that reported challenges mainly attributed it to transport related problems (51/67, 75%, 95%CI [64.71-85.29]). This agrees with a study in Uganda where transport-related challenges significantly affected patient care and adherence to chronic treatment (3).

4.2 Medicines stock availability and incomplete prescriptions

This study found that most patients reported never experiencing out of stock of medicines at PUPs (65/417, 87.5%, 95%CI [84.1-90.5]) and never collected incomplete medicine parcels at PUPs (324/417, 77.7%, 95%CI [73.7-81.7]). These findings disagree with a study that looked at six low and middle-income countries internationally where chronic medicine availability in the public and private sector was very poor which leads to increased mortality and morbidity in chronic patients (4). Stock-out of medication can be a major barrier to patient adherence which could lead to detrimental effects to a patient's health as identified in a study in India where only 45.2% overall availability of medicine exists in certain public health facilities (5).

4.3 Association between the number of months on the CCMDD programme and medicine stock-outs.

This study found a significant level of association between the number of months patients were registered on the CCMDD programme and patients experiencing medicine stock-outs (p-value = 0.005). The majority of respondents who were on the programme for ≤ 8 months did not experience medicine stock-outs. This is in agreement with a study in Brazil that reported improved accessibility to pharmaceutical services in dispensing units, thus having a good availability of anti-retroviral medicines (10). However, another study in South Africa showed a disagreement; medicine stock-outs was a serious

challenge experienced in the chronic dispensing unit programme as medicine parcels were delivered to the prescribed points of collection without all the prescribed medicines (11).

4.4 Waiting time before and after implementation of the CCMDD programme

In terms of waiting time before and after implementation of the CCMDD programme, majority of patients waited more than two hours (398/417, 95.4%, 95%CI [93.39-97.41]) before the implementation of the CCMDD programme, and the waiting time had significantly decreased to less than 30 minutes (411/417, 98.6%, 95%CI [97.47-99.3]) after the implementation of the CCMDD programme. The finding of this study is also in line with the aims of the CDU in the Western Cape, which is similar to the CCMDD programme, showing a proposed a decrease in waiting time (6). A study carried out in a Community Health Care Centre in South Africa expressed how long waiting times is a major challenge that causes patient dissatisfaction, decreased quality of care, non-adherence to chronic treatment leading to poor control of chronic disease (7). Therefore, the reduced waiting time after the implementation of CCMDD will contribute to a fewer number of patients missing treatment collection.

4.5 Medicine PUP preference

Almost all study participants preferred collecting their treatment from designated CCMDD pick up points (412/417, 98.8%, 95%CI [97.75-99.85]) compared to the original point of collection (pharmacy departments in the health institutions). This falls in line with the benefits of the CDU, patients prefer collecting from alternate pick up points as these points provide better access to medication and make medicine collection more convenient (8).

4.6 Patients missed appointments whilst registered on the CCMDD programme

Majority of patients that were registered on the CCMDD programme reported never missing their appointment for collection of treatment at PUPs which accounts for 89% (370/417, 88.7%, 95%CI [85.66-991.74]). From the small percentage of patients that did miss their appointments, the main reason for missed appointments was due to the respondent forgetting to collect their treatment (22/417, 5.3%, 95%CI [3.15-7.45]), this is in line with a study on a dispensing programme in Western Cape, South Africa, where forgetfulness of appointment date was a contributor to missed appointments (9). Missed appointments before being registered on the CCMDD programme was not measured. Missed appointments can be a good predictor to adherence.

4.7 Association between missed appointments, waiting time and pick up point preference

Following multivariate analysis, this study found that respondents who waited two or more hours before CCMDD implementation also reported missing their appointments (44/47, 93.6%). However, after CCMDD programme implementation no respondents who waited between 30 minutes – one hour

reported missing their appointments. These findings are in agreement with a study in Ethiopia which reported that long waiting times could have attributed to more than a quarter of the patients being non-adherent to their treatment (12). Majority of respondents who preferred collecting from CCMDD PUPs did not miss their appointments (368/371, 88.2%). This is in agreement with a study in Tanzania that showed a high rate of treatment success (adherence) for patients on the patient-centred TB treatment programme which gave patients the option to choose from either receiving their treatment from facility-based or community based observed treatment (13).

4.8 General Conclusion

This study found that most respondents reported neither experiencing medicine stock-outs nor receiving incomplete medicine parcels. Majority of respondents had a good relationship with the CCMDD programme, they were satisfied with no counselling at the PUPs and experienced no challenges. This study further found that the CCMDD programme had significantly decreased the waiting time for patients to one-quarter of the time usually spent in public healthcare facilities. The missed appointments reported by the patients were very low as almost 90% of patients reported not missing their appointment and the collection of their medicine parcels. Many respondents also reported having a better preference for the PUPs rather than their primary referring public health care facilities. The overall findings suggest that chronic stable patients registered on the CCMDD programme were highly satisfied as their medicines were readily available at their PUP preference and their waiting time had decreased substantially. These indicators may suggest a high level of patient adherence to their chronic medicines on such a programme. This study focused on the perspectives of patients about the CCMDD programme.

4.9 Recommendation for future research

Further research is needed to cover the patient's perspectives, knowledge and experiences from the remaining provinces and districts in South Africa where the CCMDD programme is being implemented. More studies should be carried out to look at the perspective of health care professionals and stakeholders involved for a comprehensive picture of the functioning of the CCMDD programme and their impact and contribution to this programme. Patient education and awareness campaigns should be carried out by the health sector of South Africa to promote the CCMDD programme. More investigations should be carried out to understand the challenges experienced by the service provides that are currently being used in the dispensing programmes in South Africa.

4.10 References

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Appendices

1.BREC Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

06 March 2017

Ms M Naidoo (210504064)
Discipline of Pharmaceutical Sciences
School of Health Sciences
Naidoo.maryanne23@gmail.com

Dear Ms Naidoo

Title: Factors contributing to the adherence of patients on the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme: The case of eThekwini Metropolitan Health District in South Africa.
Degree: M-Pharm

BREC REF NO: BE513/16

EXPEDITED APPLICATION

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 05 September 2016.

The study was provisionally approved pending appropriate responses to queries raised. Your response received on 28 February 2017 to BREC letter dated 26 January 2017 have been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have now been met and the study is given **full ethics approval** and may begin as from 06 March 2017.

This approval is valid for one year from **06 March 2017.** To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be **RATIFIED** by a full Committee at its next meeting taking place on **14 March 2017.**

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yo[redacted]

Pro[redacted]eni
Chair: Biomedical Research Ethics Committee

cc supervisor: nlooto@ukzn.ac.za cc postgraduate officer: nenep1@ukzn.ac.za

Biomedical Research Ethics Committee
Professor J Tsoka-Gwegweni (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 2486 Facsimile: +27 (0) 31 260 4609 Email: brec@ukzn.ac.za

2. Approval from the KwaZulu-Natal department of health

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

330 Langalibalele street
Private Bag X9051 PMB, 3200
Tel: 033 395 2805/3189/3123 Fax: 033 394 3782
Email: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

DIRECTORATE:
Health Research & Knowledge Management (HKRM)

Reference: HRKM062/17
KZ_2017RP28_229

13 February 2017

Dear Ms M Naidoo
(University of KwaZulu-Natal)

Subject: Approval of a Research Proposal

1. The research proposal titled **'Factors contributing to the adherence of patients on the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme: The case of eThekwini Metropolitan Health District in South Africa'** was reviewed by the KwaZulu-Natal Department of Health (KZN-DoH).

   The proposal is hereby **approved** for research to be undertaken at Clairwood hosp., Ekuhlengeni Psychiatric hosp., Hlengisizwe CHC, King Edward VIII hosp., KwaMashu CHC, Osindisweni CHC & RK Khan hospital.

2. You are requested to take note of the following:
   a. Make the necessary arrangement with the identified facility before commencing with your research project.
   b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.

3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Ms G Khumalo on 033-395 3189.

[redacted]
Chairperson, Health Research Committee
Date: 14/02/17

3.Approval from eThekwini Department of Health

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Physical Address: 83 Kind Cetshwayo Highway, Mayville, Durban, 4001
Postal Address: P Bag X54318, Durban 4000
Tel: 031 - 2405308 Fax: 031 2405555 Email: somaroo@ukzn.ac.za

DIRECTORATE:
eThekwini District Office

13 December 2016

Dear Ms Naidoo

Re: Factors contributing to the adherence of patients on the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme: The case of Ethekwini Metropolitan Health District in South Africa

I have pleasure in informing you that the eThekwini District Office supports the above-mentioned NICD research project, at the following health care facilities:

i. Clairwood Hospital
ii. Ekuhlengeni Psychiatric Hospital
iii. Hlengisizwe CHC
iv. King Edwards Hospital
v. Kwamashu CHC
vi. Osindisweni CHC
vii. RK Khan Hospital

Please note the following:

i. All research activities must be conducted in a manner that does not interrupt clinical care at the health care facility,
ii. logistical details must be arranged with the CEO/medical manager /operational manager of the facility,
iii. this research project should only commence after final approval by the KwaZulu-Natal Health Research and Knowledge Unit, and full ethical approval, has been granted, and
iv. a report of your findings should be forwarded to the eThekwini district office on completion of your project.

[redacted]
H Somaroo (Dr)
Public Health Medicine Specialist

4.Study Information letter (isiZulu)

IZITHASISELO:

Isithasiselo 10.1.A Incwadi yolwazi ngocwaningo

UNIVERSITY OF KWAZULU-NATAL ™

INYUVESI YAKWAZULU-NATALI

Ifomu lokucela imvume

Ifomu yokucela imvume ingeyeziguli ezihlonzwe zaphinde zabhaliswa ohlelweni lwe-Central Chronic Medicine Dispensing and Distribution (CCMDD) oluqalwayo njengamanje ezikhungweni zezempilo zomphakathi eSifundazweni saseThekwini Metropolitan Health District KwaZulu-Natal. Ngicela iziguli ukuthi zizibandakanye ocwaningweni olisihloko sithi: "Assessment of factors affecting adherence to chronic medicines among stable patients registered onto the Centralized Chronic Medicines Dispensing and Distribution (CCMDD) programme: The case of eThekwini Metropolitan Health district, South Africa"

Igama lomcwaningi: Mary-Anne Naidoo,

Inombolo yokubhalisa yomfundi: 210504064, Email: naidoo.maryanne23@gmail.com

Igama lomeluleki: Dr Manimbulu Nlooto

I-email: Nlooto@ukzn.ac.za, Ucingo: 0312607030

Igama lesikhungo: University of KwaZulu-Natal

Igama leziqu: Master's in pharmacy by Research 2016

Ingxenye 1: Iphepha lolwazi

ISINGENISO:

Igama lami nginguMary-Anne Naidoo, njengamanje ngiqedela iziqu zami ze-master's in pharmacy ngocwaningo eNyuvesi YaKwazulu-Natal. Ucwaningo lwami lugxile ohlelweni lwemithi ye-Central Chronic ekhishwa iphinde isatshalaliswe (CCMDD), oluqalwayo njengamanje ezikhungweni zezempilo zomphakathi. Ngizobe ngenza ucwaningo ngomthelela ezigulini ezibhaliswe kulolu hlelo.

Ngizokunika ulwazi bese ngikucela ukuthi uzibandakanye ocwaningweni lwami. Ngaphambi kokuba unqume ukuthhi uyazibandakanya, ungakhuluma nanoma ubani othanda ukukhuluma naye ngalolu cwaningo. Uma ungawaqondi amanye amagama noma amabinzana amagama kuleli fomu lokucela imvume, ungayibuza imibuzo.

INHLOSO YOCWANINGO

Uhlelo lwe-CCMDD luqalwe ezikhungweni zezempilo zomphakathi ukwehlisa umthwalo ezikhungweni zezempilo kanjalo futhi nokuqinisekisa ukuthi imithhi iyatholakala ezigulini ngendlela elula. Ngokuqonda imithelela yalolu hlelo esigulini, singakwazi ukubona izinkinga bese sithola izixazululo ezinkingeni esizibonile. Lolu cwaningo luzohlanganisa ukuzibandakanya kwakho ohlwini lwemibuzo nasengxoxweni yabantu okuzobe kuxoxwa nabo. Ungacelwa ukuba uzibandakanye kulolu cwaningo njengoba sibona ukuthi isipiliyoni sakho osithole ngokubhalisa ohlelweni lwe-CCMDD lungasiza ekuqondeni kangcono imithelela yalolu hlelo ezigulini. Ngale ndlela singaqonda kangcono izinkinga bese sizama ukuthola izixazululo ezingasiza esikhathini esizayo.

UKUZIBANDAKANYA NGOKUZITHANDELA

Ukuzibandakanya kulolu cwaningo kungukuzithandela. Uma ukhetha ukungazibandakanyi kulolu cwaningo, ukubhalisa kwakho ohlelweni lwe-CCMDD angeke kuphazamiseke. Uzoqhubeka uthole ukunakekelwa kwezempilo nokwelashwa kulesi sikhungo.

INQUBO:

Lolu cwaningo luzobandakanya uhlu lwemibuzo kanye nengxoxo yalabo okuzoxoxwa nabo. Sifuna ukwazi ukuthi ithini imibono yakho ngohlelo lwe-CCMDD kanye nezinkinga okungabe zikhona osewuke wahlangabezana nazo. Kuyofanele ubambe iqhaza engxoxweni eyothatha cishe abantu abaphakathi kuka 5-7 nabo ababhalisile ohlelweni lwe-CCMDD. Lezi zingxoxo ziyobe ziphethwe umcwaningi, uMary-Anne Naidoo. Ingxoxo neqembu iyoqala ngoMary-Anne Naidoo. Ngale ndlela sizoqinisekisa ukuthi wonke umuntu uzizwa ekhululekile futhi ekwazi ukuphendula nanoma omuphi umbuzo ngocwaningo. Uyocelwa ukuthi wabelane ngolwazi lwakho ngohlelo lwe-CCMDD. Angeke sicele nanoma omuphi umuntu ozibandakanyayo ukuthi abelane nathi ngezinkolelo zakhe, akwenzayo, njalo njalo. Akuphoqelekile ukuthi wabelane nanoma yingoluphi ulwazi uma uzizwa ungakhululekile.

Izingxoxo ziyobanjelwa ezikhungweni zezempilo lapho ubhalise khona noma endaweni oyikhethile olanda kuyona imithi. Izingxoxo ziyoqoshwa ngesiqophamazwi, nakuba kunjalo, akekho umuntu oyohlonzwa ngegama lakhe. Okuqoshiwe kuyogcinwa umeluleki wami weziqu ze-Masters, uDokotela M. NIooto, ehhovisi lakhe e-UKZN. Ulwazi oluzoqoshwa luyogcinwa luyimfihlo, akekho omunye umuntu ngaphandle komeluleki wocwaningo lwami (Dr Manimbulu NIooto) ongahlangene nalolu cwaningo oyokwazi ukufinyelela kulokhu okuqoshiwe. Okuqoshiwe kuyoshatshalaliswa emva kweminyaka emihlanu uma sekuqedwe ucwaningo lwe-Masters.

Uhlu lwemibuzo luyonikezwa wena ngqo umcwaningi uMary-Anne Naidoo ozibandakanye kulolu cwaningo kanti luyolandwa (uhlu lwemibuzo) yimina uma selugcwalisiwe. Wamukelekile ukuthi uphendule imibuzo ngokwakho noma ngingakusiza ngokuthi ngikufundele imibuzo bese ubhala phansi izimpendulo zakho. Kungathokozeleka uma ungaphendula yonke imibuzo kulolu cwaningo. Nakuba kunjalo, uma ungathandi ukuphendula nanoma omuphi umbuzo, ungadlulela embuzweni olandelayo. Ucwaningo luyosatshalaliswa uMcwaningi kulabo abazibandakanyile lapho belanda khona imithi yabo. Uyocelwa ukuba uphendule yonke imibuzo ngaleso sikhathi kanti le mibuzo iyolandwa uma sewuqedile ukuyigcwalisa. Imibuzo kufanele ikuthathe cishe imizuzu eyishumi nanhlanu ukuyigcwalisa. Umuntu ngamunye ozozibandakanya uyokwaziwa ngenombolo. Imibuzo oyiphendulile iyoba imfihlo. Umcwaningi nomeluleki kuphela abaqondene ngqo nalolu cwaningo abayokwazi ukubona izimpendulo zakho. Imibuzo ephendulwe yaqedwa iyogcinwa ehhovisi lomeluleki weziqu zami ze-Masters uDr M. NIooto.

ISIKHATHI ESIZOLUTHATHA (UCWANINGO)

Ucwaningo luzothatha unyaka kanti ngalesi sikhathi uyocelwa ukuba ugcwalise uhlu lwemibuzo bese uzibandakanya kanye engxoxweni yeqembu okuzoxoxwa nalo.

UBUNGOZI

Mancane amathuba okuthi ungabelana nathi ngolwazi olumayelana nawe ngqo. Nakuba kunjalo, asifisi ukuthi lokhu kwenzeke. Akuphoqelekile ukuthi uphendule nanoma emiphi imibuzo ocwaningweni noma ezingxoxweni zezqembu uma uzizwa ungakhululekile.

IMIHLOMULO

Lolu cwaningo lungase lungabi nayo imihlomulo eza kuwena ngqo. Nakuba kunjalo, luyosisiza thina ukuthi siqonde imithelela yohlelo lwe-CCMDD ezigulini. Siyokwazi ukuqonda izinkinga bese sizama ukuthola izixazululo esikhathini esizayo.

INKOKHELO

Angeke ukhokhelwe ngokuzibandakanya kulolu cwaningo.

UBUMFIHLO

Lolu cwaningo luzokwenziwa luqedelwe esikhungweni sezempilo somphakathi. Kungenzeka ukuthi lokhu kudonse amehlo ezinye iziguli ezingakulungele ukuthi zibe socwaningweni. Lonke ulwazi esiluhlanganisa ezimpendulweni zakho kanye neqembu okuzoxoxiswana nalo angeke kwabelwane ngalo komunye umuntu ongaphandle kweqembu locwaningo. Lonke ulwazi oluhlanganisiwe luyogcinwa luyimfihlo. Izimpendulo zakho ziyohlonzwa ngenombolo kanti lolu lwazi luyogcinwa luphephile. Siyokucela wena kanye nabanye abazibandakanyayo eqenjini okuzoxoxwa nalo ukuthi

bagcine lonke ulwazi okwabelwane ngalo ezingxoxweni luyimfihlo, bangabelani ngalolu lwazi kwabanye abantu abangekho eqenjini locwaningo. Singaluleka abazibandakanyayo eqenjini ukuthi bagcine izingxoxo ziyimfihlo; nakuba kunjalo, angeke sivimbele abazibandakanyayo ekutheni babelane ngolwazi kwabanye. Ulwazi esilutholayo kulabo abazibandakanyayo angeke kwabelwane ngalo kunanoma ubani ngaphandle komgomo womcwaningi kanye nabafundi abenza iziqu ze-Masters abathinteka ngqo kulolu cwaningo.

ILUNGELO LOKUNQABA NOMA UKUHOXA

Awuphoqelekile ukuthi uzibandakanye ocwaningweni. Uma ukhetha ukungazibandakanyi kulolu cwaningo, ukunakekelwa kwezempilo okutholayo angeke kuphazamiseke. Ungakhetha futhi ukuthi uyeke ukuzibandakanya ekuphenduleni imibuzo kanye nasezingxoxweni zeqembu nanoma yingasiphi isikhathi.

UBANI ONGAXHUMANA NAYE

Uma unemibuzo ungaxhumana noMary-Anne Naidoo.

Email: naidoo.maryanne23@gmail.com Ucingo: 076 583 7005

Isihlongozo socwaningo sibuyekezwe sagunyazwa yi-UKZN Biomedical Research Ethics Committee (inombolo yokugunyaza_____). Ikomiti lezokulunga yilona eliqondene ngqo nokuqinisekisa ukuthi abazibandakanyayo ocwaningweni bavikelekile engozini ngesikhathi besesocwaningweni.

Uma kunezinkinga, okukukhathazayo noma ufisa ukuthola kabanzi ngekomiti lezokulunga eligunyaze lolu cwaningo, ungaxhumana no:

1. Dr Manimbulu Nlooto I-email: Nlooto@ukzn.ac.za, Ucingo: 0312607030
2. UKZN Biomedical Research Ethics Committee
   Research Office, Westville Campus
   Govan Mbeki Building
   Private Bag X 54001
   Durban
   4000
   KwaZulu-Natal, SOUTH AFRICA
   Ucingo: 27 31 2604769 - Ifeksi: 27 31 2604609
   I-email: BREC@ukzn.ac.za

5. Study information letter (English)

Information letter about the Study

UNIVERSITY OF KWAZULU-NATAL ™
INYUVESI YAKWAZULU-NATALI

Informed Consent

The informed consent form is for the patients that have been identified and registered on the Central Chronic Medicine Dispensing and Distribution (CCMDD) programme that is being rolled out in the public health facilities in EThekwini Metropolitan Health District of KwaZulu-Natal Province. I am inviting patients to participate in the research project titled "Assessment of factors affecting adherence to chronic medicines among stable patients registered onto the Centralized Chronic Medicines Dispensing and Distribution (CCMDD) programme: The case of eThekwini Metropolitan Health district, South Africa "

Name of the Investigator: Mary-Anne Naidoo,

Student number: 210504064, Email: naidoo.maryanne23@gmail.com

Name of Supervisor: Dr Manimbulu Nlooto

Email: nlooto@ukzn.ac.za, telephone: 0312607030

Name of Organization: University of KwaZulu-Natal

Name of project and version: Master's in pharmacy by Research 2016

Part 1: Information sheet

INTRODUCTION:

My name Is Mary-Anne Naidoo and I am currently completing my master's in pharmacy by research at the University of KwaZulu-Natal. My research is based on the current Central Chronic medicine distribution and dispensing (CCMDD) programme that is being rolled out in public health sectors. I will be investigating the effect on the patients that are registered on this programme. I am going to give

you some information and invite you to participate in my research. Before you decide on participating you can speak to whomever you feel welcome with about this research. If you do not understand any words or phrases in the consent form, you may ask questions.

PURPOSE OF RESEARCH

The CCMDD programme has been initiated in the public health sector to ease the burden on the health sector as well as to ensure that medicines become readily available to patients in a more convenient process. By understanding the effects of this programme on the patient we can outline the shortcomings and find solutions to the problems experienced. This research will involve your participation in a questionnaire and a focus group discussion. You have been invited to participate in this research as we feel that your experiences gained from being registered onto the CCMDD programme can contribute to a better understanding of the effect of the programme on patients. In this way, we can understand the shortcomings and determine possible solutions for the future.

VOLUNTARY PARTICIPATION

Your participation in this research is completely voluntary. If you choose to not participate in this research, your registration on the CCMDD programme will not be affected. You will still receive all medical care and treatment from this facility.

We are asking you to help us learn more about the effects of the CCMDD programme on the patients in your community. We are inviting you to take part in this research project. If you accept, you will be asked to participate in researcher administered face-to-face interview with a questionnaire The questionnaire and the discussion will be provided and collected by UZKN.

PROCEDURE:

This research will involve your participation in a questionnaire and. We want to learn what are your thoughts on the CCMDD programme as well as any shortcomings you have experienced. You will have to take part in a discussion with approximately 5 -7 people who are also registered on the CCMDD programme. The discussions will be guided by the investigator, Mary-Anne Naidoo. The group discussion will begin with Mary-Anne Naidoo. This way we will ensure that everyone is comfortable and be able to answer any question you have about the research project. You will be asked to share your knowledge about the CCMDD programme. We will not ask any participant to share any personal beliefs, practices etc. You do not have to share any knowledge if you feel uncomfortable.

The discussions will take place in the health facilities where you have been registered or from pick up points that you have chosen. The discussions will be tape recorded, however, no person will be identified by their names. The tape will be kept with my Masters Supervisor Dr.M.Nlooto at his office based at UKZN. The information that will be recorded will be kept strictly confidential, no other person

else except my research supervisor (Dr Manimbulu Nlooto) involved in this project will have access to these recordings. The tapes will be destroyed 5 years after the completion of the Master's Project.

The questionnaires will be administered by me the investigator, Mary-Anne Naidoo, directly involved in this project. I will be assisting by administering the face-to-face questionnaire by reading out the questions and writing down your response. It would be appreciated if you could answer all the questions in the survey. However, if you do not wish to answer any particular question, you can move on to the next question. The survey will be administered by the Investigator to participants at pick up points upon collection of the medicine parcels. The questionnaire should take approximately 15 minutes to complete. Your personal information e.g. your name will not be required on the questionnaire. Each participant will be identified by a number. Your questionnaire will be confidential. Only the investigator and my supervisor directly involved in this research will have access to your questionnaires. The completed questionnaire will be kept with my Masters Supervisor Dr.M.Nlooto.

DURATION:

The research will take place over a year and during this time you will be asked to complete a questionnaire and participate in a focus group discussion once.

RISKS:

There is a small possibility that you may share some personal information with us by chance. However, we do not wish for this to occur. You do not have to answer any questions in the survey or the focus group discussions if you do not feel comfortable.

BENEFITS:

This research might not have any direct and immediate benefit to you. However, it will aid us to understand the effect of the CCMDD programme on patients. We will be able to understand shortcomings and aid in finding solutions for the future.

REIMBURSEMENTS:

You will not be provided with any incentives to participate in this research.

CONFIDENTIALITY

This research is going to be completed in a public health facility. There is a possibility that this can draw some attention to other patients that do not meet the criteria to be surveyed. All the information we gather from your questionnaire and the focus group discussion will not be shared to anyone outside the research team. All information gathered will be kept confidential. Your completed questionnaire will be identified by a number, not by your name. Only the researcher will know both your name and your number, and this information will be safely guarded. We will ask you and the other participants in

the group discussions to keep all information shared in the discussions confidential and do not share this information with others outside the group. We can merely advise the participants in the group to keep the discussions confidential; however, we cannot prevent participants form sharing information with others. The information that we receive from participants will not be shared with anyone except the principal investigator and the master's students directly involved in this research.

RIGHT TO REFUSE OR WITHDRAW

You are not obligated to participate in the research. If you choose to refuse to participate in this research, the healthcare services you receive will not be compromised. You can also choose to stop participating in the questionnaire and focus group discussions at any time.

WHO TO CONTACT

If you have any questions you can contact Mary-Anne Naidoo

Email: naidoo.maryanne23@gmail.com telephone: 076 583 7005

The research proposal has been reviewed and approved by the UKZN Biomedical Research Ethics Committee (approval number BE513/16). An ethics committee is responsible for ensuring that research participants are protected from harm while participating in research.

In the event of any problems, concerns or if you wish to find out more about the research ethics committee that has approved this research, you can contact:

1. Dr Manimbulu Nlooto Email: Nlooto@ukzn.ac.za, telephone: 0312607030
2. UKZN Biomedical Research Ethics Committee
   Research Office, Westville Campus
   Govan Mbeki Building
   Private Bag X 54001
   Durban
   4000
   KwaZulu-Natal, SOUTH AFRICA
   Tel: 27 31 2604769 - Fax: 27 31 2604609
   Email: BREC@ukzn.ac.za

6. Informed consent (isiZulu)

Isithathasiselo 10.2. Ifomu yokucela imvume yokuzibandakanya

INGXENYE 2: ISITIFIKETI SEMVUME

Mina u_____ (Amagama aphelele ngosonhlamvukazi) ngazisiwe ngokwanele ngocwaningo olisihloko sithi:"Assessment of factors affecting adherence to chronic medicines among stable patients registered onto the Centralized Chronic Medicines Dispensing and Distribution (CCMDD) programme: The case of eThekwini Metropolitan Health district, South Africa"

Wu _____ (Igama lomcwaningi omkhulu/omqoqela ulwazi, bhala ngosonhlamvukazi).

Ngiyaqinisekisa ukuthi ngilutholile ulwazi ngocwaningo noma ngifundeliwe lona. Ngibe nethuba lokubuza imibuzo ngase ngithola izimpendulo ezingigculisayo. Ngiqonda ngokugcwele izinhloso nenqubo yalolu cwaningo.Ngiyazibophezela ukuthi ukuzibandakanya kwami kulolu cwaningo kungukuzithandela futhi ngingakwazi ukuhoxa ocwaningweni nanoma yingasiphi isikhathi. Ukunqaba kwami ukuzibandakanya noma ukuhoxa ocwaningweni angeke kube nomthelela ekunakekelweni kwami ngezempilo engikutholayo. Ngiyazi ukuthi uma ngisenemibuzo ngocwaningo ngisengashayela umcwaningi omkhulu ucingo uMary-Anne Naidoo email: Naidoo.maryanne23@gmail.com, Ucingo: 076 583 7005

Uma ngisenemibuzo noma okungikhathazayo ngamalungelo ami njengozibandakanyayo ocwaningweni, noma uma kunengxenye yocwaningo engikhathazayo noma abacwaningi, ngingaxhumana ne:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Ucingo: 27 31 2604769 - Ifeksi: 27 31 2604609
I-email: BREC@ukzn.ac.za

_____ _____

Kusayina ozozibandakanya Usuku

_____ _____

Kusayina ufakazi Usuku

_____ _____

Kusayina umhumushi Usuku

(Uma kunesidingo)

Isitatimende somcwaningi/umuntu onikezwa imvume

Ngiyaqinisekisa ukuthi ozibandakanyayo uyiqondile inhloso yocwaningo nokuthi lumayelana nani. Ngiyaqinisekisa ukuthi nginikeze ozibandakanyayo ithuba lokubuza imibuzo ngase ngiminikeza izimpendulo ngokugcwele. Ngiyaqinisekisa ukuthi ozibandakanyayo akaphoqwanga ukuthi avume, uzivumele ngokuthanda. Ikhophi yesicelo semvume inikeziwe ozibandakanyayo.

Igama lomcwaningi/ umuntu onikezwa imvume _____

Kusayina ufakazi/ umuntu onikezwa imvume _____

Usuku _____

Usuku/Inyanga

7. Informed consent (English)

Consent form to participate in the study

PART 2: CERTIFICATE OF CONSENT

I _____ (full name in capital letters) have been sufficiently informed about the study entitled "Assessment of factors affecting adherence to chronic medicines among stable patients registered onto the Centralized Chronic Medicines Dispensing and Distribution (CCMDD) programme: The case of eThekwini Metropolitan Health district, South Africa"

By _____ (name of principle investigator / fieldworker in capital letters).

I confirm that I have received information about the study or it has been read to me. I have had the opportunity to ask questions and my questions were answered to my satisfaction. I fully understand the purpose and procedures of this study.

I hereby declare that my participation in this study is completely voluntary and that I have the ability to withdraw from the study at any time. My refusal to participate or to withdraw from the study will not have any impact on the healthcare service I receive. I know that if I have any further questions about the study I can call the principal investigator Mary-Anne Naidoo email: Naidoo.maryanne23@gmail.com, telephone: 076 583 7005

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za

_____ _____

Signature of Participant Date

_____	_____
Signature of Witness	Date
_____	_____
Signature of Translator	Date
(Where applicable)	

Statement by the researcher/person taking consent

I confirm that I have ensured that the participant has understood the purpose of my research and what it entails. I confirm that I have given the participant an opportunity to ask questions and I have answered the questions fully. I confirm that the participant has not been coerced into giving consent, and the consent has been given voluntarily. A copy of this informed consent has been provided for the participant.

Print name of researcher/person taking consent _____

Signature of researcher/ person taking consent_____

Date _____

Day/month

8. Letter of permission and support to the facility manager

To the Chief Executive Officer /facility manager

(Name of the institution to be inserted here)

Date

Dear Sir/Madam

RE: Permission to conduct my study in your facility

My name is Mary-Anne Naidoo (student number 210504064). I am currently registered with the University of KwaZulu-Natal completing my master's in pharmacy. My master's in pharmacy research study title is "Assessment of factors affecting adherence to chronic medicines among stable patients registered onto the Centralized Chronic Medicines Dispensing and Distribution (CCMDD) programme: The case of eThekwini Metropolitan Health district, South Africa"

After obtaining permission from the KwaZulu-Natal provincial department of Health and a letter of support from the eThekwini Health, I have finally received full approval from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal to conduct my study well described above. However, I have been advised by both the eThekwini district Health and the KwaZulu-Natal provincial department of Health, to contact the CEO of the facilities involved in my study to gain their permission as gatekeepers and to make the necessary logistical arrangements before starting with my data collection. Your facility has been chosen as per my research protocol to participate in the study. Would you please allow me to enter the premises of your facility and interact with relevant managers to have access to patients registered on the Centralized Chronic Medicine Dispensing and Distribution (CCMDD) programme? I would like to visit your institution during the week of the 3rd to the 7th of April 2017 to conduct my study. I would appreciate your cooperation and assistance in making it possible for me to come through and collect my data.

Please find attached relevant documents to support my request (KZN –DOH permission letter, eThekwini permission letter, full Biomedical Research Ethics Committee -UKZN).

If you need clarification, you may as well contact my supervisor at the following email address: Nlooto@ukzn.ac.za or telephone number: 0312607030.

Yours faithfully

Mary-Anne Naidoo Email: naidoo.maryanne23@gmail.com

9. Questionnaire for the patient involvement in the CCMDD study -isiZulu version

Isithasiselo 10.4. Uhlu lwemibuzo yesiguli

Uhlu lwemibuzo yeziguli ezilanda imithi yazo lapho ziyilanda khona.

Sicela ufake uphawu ebhokisini noma ugcwalise ulwazi oludingekayo endaweni efanele.

1. Isigaba A

Ulwazi ngenai labantu (ngokobuhlanga) endaweni ohlala kuyona

1.1 Ubulili bakho?

Owesifazane	
Owesilisa	

1.2. Uhlanga lwakho?

OMnyama	
Ikhaladi	
UMndiya	
Omhlophe	
Okunye *(Cacisa)*	

1.3. Uphakathi kweyiphi iminyaka?

Iminyaka	
18-21	
21-30	
31-40	
41-50	
51-60	
61 noma ngaphezulu	

1.4. Usebenzaphi?

Angisebenzi	
Ngiyasebenza (Ngokugcwele)	
Ngibamba amatoho	
Ngihola impesheni	
Ngingumfundi	

1.5. Uhlala kuphi? _____

2. Isigaba B

Imiphumela yokulandela uhlelo lwe-CCMDD

2.1 Ulinde isikhathi esingakanani **ngaphambi** kokuba uthole imithi yakho kodwa ube ubhalisile ohlelweni lwe-CCMDD?

Ngaphansi kwemizuzu engama-30	
Phakathi kwemizuzu engama-30 kuya ehoreni elilodwa	
Phakathi kwehora elilodwa kuya kwamabili	
Ngaphezu kwamahora amabili	

2.2 Ulinda isikhathi esingakanani manje ukuthi uthole imithi yakho **emva** kokuba sewubhalisile ohlelweni lwe-CCMDD?

Ngaphansi kwemizuzu engama-30	
Phakathi kwemizuzu engama-30 kuya ehoreni elilodwa	
Phakathi kwehora elilodwa kuya kwamabili	
Ngaphezu kwamahora amabili	

2.3. Ukhetha okuphi ukulanda imithi yakho ezindaweni okulandwa kuzona ze-CCMDD noma esikhungweni owawukade ukusona?

Ezindaweni zokulanda ze-CCMDD	
Esikhungweni sezempilo somphakathi	

2.4 Awukaze uyilande imithi yakho ngosuku owawubekelwe lona?

Yebo	
Cha	

Uma impendulo kungu Yebo, awukaze uyilande imithi yakho ngesikhathi esinqunyiwe? -

_____

_____

2.4 Imitthi yakho uyisebenzisa njengoba uyalelwe oqeqeshiwe, onakekela ngezempilo?

Yebo	
Cha	

2.5 Uhamba ibanga elingakanani uma uyolanda imithi yakho? _____

_____

2.6 Usebenzisa hlobo luni lwezinto zokuhamba uma uyolanda imithi yakho?

Ibhasi	
Isitimela	
Itekisi	
Imoto encane	
Okunye *(cacisa)*	

2.7 Kukubiza malini ukuya lapho kulandwa khona imithi uma uyoyilanda?

R0 –R10	
R11-R20	

R21-R30	
R31-R40	
Okunye *(Cacisa)*	

3. Isigaba C

Ulwazi nokwelulekwa

3.1 Uyazi ukuthi kusho ukuthini/kuchazani lokhu: Central Chronic Medicine Distribution and Dispensing (CCMDD)?

Yebo	
Cha	

Uma impendulo kungu Yebo, Chaza _____

3.2Uyayazi inhloso yohlelo lwe-CCMDD?

Yebo	
Cha	

Uma impendulo kungu Yebo, chaza kafushane ukuthi yini oyiqondayo ngenhloso? -

_____

_____

3.3 Sesingakanani isikhathi ulanda imithi yakho ohlelweni lwe-CCMDD?

_____

3.4 Ungabukala kanjani ubudlelwano bakho ne-CCMDD?

Buhle	
Bubi	
Buyanelisa	

3.5 Eziphi izinselelo ohlangabezana nazo uma uyolanda imithi yakho e-CCMDD?

_____

3.6. Ungancoma kwezinye iziguli ukuthi zijoyine uhlelo lwe-CCMDD?

Yebo	
Cha	

3.7 Kungabe uthokozile ngokungatholi ukwelulekwa ngemithi yakho ngaso sonke isikhathi uma uyoyilanda?

Yebo	
Cha	

4. Isigaba D

Ukungabikhona/ukuphela kwemithi nokungapheleli kwamaphepha akuvumela ukuthi ulande imithi

4.1 Wake wayithola imithi engaphelele (kunemithi engekho)?

Yebo	
Cha	

Uma impendulo kungu Yebo, wenzenjani? _____

Waphatheka kanjani? _____

4.2 Wake watshelwa ukuthi imithi yakho iphelile?

Yebo	
Cha	

Uma impendulo kungu Yebo, lokhu kwakwenza waphatheka kanjani?

_____

_____

10. Questionnaire for the patients involved in the study – English version

Patient Questionnaire

Questionnaire for patients picking up their medicines at pick-up points

Please tick in the box or fill in the necessary information where applicable.

1. Section A

Sociodemographic data

1.1 What is your Gender?

Female	
Male	

1.2. What Race are you?

Black	
Coloured	
Indian	
White	
Other *(Please specify)*	

1.3. What age category do you belong in?

Age group	
18-21	
21-30	
31-40	
41-50	
51-60	

61 or older	

1.4. What is your occupation?

Unemployed	
Employed (Full time)	
Employed (Part-time)	
Pensioner	
Student	

1.5. Where do you reside? _____

2. Section B

CCMDD programme effect on adherence

2.1 What was your waiting time to collect your medicines **before** being registered on CCMDD programme?

Less than 30 minutes	
Between 30min- 1 hour	
Between 1 hour -2 hours	
More than 2 hours	

2.2 What is your current waiting time to collect your medicine parcels **after** being registered on the CCMDD programme?

Less than 30 minutes	
Between 30min- 1 hour	
Between 1 hour -2 hours	
More than 2 hours	

2.3 Do you prefer collecting your medicine from CCMDD pick-up points or from the institution you were previously at?

CCMDD pick-up points	
Public Health facility	

2.4 Have you ever not collected your medicine as per the stipulated date is given to you?

Yes	
No	

If yes, why have you not collected your medicines on time? _____

_____

2.4 Do you take you medicines as directed by your health care professional?

Yes	
No	

2.5 How far do you travel to a pick-up point to collect your medicines? _____

_____

2.6 What mode of transport do you use to collect your medicine?

Bus	
Train	
Taxi	
Private car	
Other *(please specify)*	

2.7 How much does it cost to travel to the pick-up point to collect your medicines?

R0 –R10	
R11-R20	
R21-R30	
R31-R40	
Other *(please specify)*	

3. Section C

Information and counselling

3.1 Do you know what Central Chronic Medicine Distribution and Dispensing (CCMDD) mean?

Yes	
No	

If yes, explain _____

3.2Do you know the purpose of the CCMDD programme?

Yes	
No	

If yes, briefly explain what you understand about the purpose? _____

_____

3.3 How long have you been collecting your medicines from the CCMDD programme?

_____

3.4 How do you rate your relationship with CCMDD?

Good	
Bad	
Satisfactory	

3.5 What are some of the challenges you face with collecting your medicines from CCMDD?

_____

3.6. Would you recommend other patients that you know to join the CCMDD programme?

Yes	
No	

3.7 Are you happy about not receiving counselling on your medication every time you collect your medicine parcels?

Yes	
No	

4. Section D

Stock availability and Incomplete prescriptions

4.1 Have you ever received your medicine parcel incomplete (medicines missing)?

Yes	
No	

If yes, what did you have to do? _____

How did you feel? _____

4.2 Have you ever been told that your medicines are out of stock?

Yes	
No	

If yes, How did this make you feel? _____

_____

4.3 Were you given an alternative medicine in place of the medicine out of stock?

Yes	
No	

4.4 How long did you go without a specific medicine?

1 week	
2 weeks	
3 weeks	
1 month	
More than a month	

4.5 Did you buy the medicine from a private pharmacy?

Yes	
No	

If yes, how much did it cost you? _____

4.6 Did you feel ill without medicines?

Yes	
No	

If yes, what symptoms did you experience? _____

_____

11. Ethics training certificate

Zertifikat

Certificado

Certificat

Certificate

TRREE

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale
Promoting the highest ethical standards in the protection of biomedical research participants

Clinical Trials Centre
The University of Hong Kong

Certificat de formation - Training Certificate

Ce document atteste que - this document certifies that

Mary-Anne Naidoo

a complété avec succès - has successfully completed

Research Ethics Evaluation

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research eth

April 24, 2016

Professeur Dominique Sprumont
Coordinateur TRREE Coordinator

FMH Continuing Education Program (5 Credits)
Programme de Formation continue (5 Crédits)

FPH Continuing Education Programs
Programmes de formation continue

Ce programme est soutenu par - This program is supported by :

European and Developing Countries Clinical Trials Partnership (EDCTP) (www.edctp.org) - Swiss National Science Foundation (www.snf.ch) - Canadian Institutes of Health Research (http://www.cihr-irsc.gc.ca/e/29891.html) - Swiss Academy of Medical Science (SAMS/ASSM/SAAM) (www.samw.ch) - Commission for Research Partnerships with Developing Countries (www.kfpe.ch)

[REV : 20140328]

Zertifikat

Certificado

Certificat

Certificate

TRREE

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale
Promoting the highest ethical standards in the protection of biomedical research participants

Clinical Trials Centre
The University of Hong Kong

Certificat de formation - Training Certificate

Ce document atteste que - this document certifies that

Mary-Anne Naidoo

a complété avec succès - has successfully completed

Introduction to Research Ethics

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research et

[redacted]

April 7, 2016
CID: 2ua8vED14r

Professeur Dominique Sprumont
Coordinateur TRREE Coordinator

FMH Continuing Education Program (5 Credits)
Programme de Formation continue (5 Crédits)

FPH Continuing Education Programmes
Programmes de formation continue

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European and Developing Countries Clinical Trials Partnership (EDCTP) (www.edctp.org) - Swiss National Science Foundation (www.snf.ch) - Canadian Institutes of Health Research (http://www.cihr-irsc.gc.ca/e/2891.html) - Swiss Academy of Medical Science (SAMS/ASSM/SAMW) (www.samw.ch) - Commission for Research Partnerships with Developing Countries (www.kfpe.ch)

[REV : 20140326]

12. Proof of isiZulu translation

UNIVERSITY OF KWAZULU-NATAL

INYUVESI YAKWAZULU-NATALI

Howard College Campus

Memorial Tower Building

School of Arts

African Languages Cluster

13 October 2016

To whom it may concern:

This letter serves as proof that I translated research documents, Consent forms and questionnaires, for **Mary-Anne Naidoo** for her Master's Degree. Her student number is **210 504 064**. For any queries I can be contacted on my contact details below.

[redacted]

.....

Translator)

13/10/16

Date

Tel: (031) 260 7849

Email: gumedeh@ukzn.ac.za