FEASIBILITY AND ACCEPTABILITY OF UTILISING SHORT MESSAGE SERVICE FOR FOLLOW-UP CARE OF OUTPATIENT MENTAL HEALTH CARE USERS IN THE UMGUNGUNDLOVU DISTRICT

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Dissertation submitted in fulfilment of the requirements for the Master of Health Sciences in Nursing in the Faculty of Health Sciences at the Durban University of Technology

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Declaration

This is to certify that this work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). This work has not previously been submitted in any form to the Durban University of Technology or to any other institution for assessment or for any other purpose.

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Abstract

Background

The mental well-being of an individual is affected by physical, social and psychological factors, which result in a psychiatric diagnosis. Difficulty in concentration and attention is experienced, and they become dependent on their families for financial and social support. Over the years, there has been a rapid growth in the use of mobile technology which has been proven to increase treatment adherence. Short message services may improve service delivery through appointment reminders, and improve communication between health care workers and patients.

Aim of the study

The aim of this study was to determine the feasibility and acceptability of utilising a short message service to remind outpatient mental health care users (MHCU) of their follow-up care in the uMgungundlovu District.

Methodology

The study employed a non-experimental quantitative survey. The study took place at four outpatient psychiatric clinics in the uMgungundlovu District in KZN. A non-probability convenient sampling method was used to select 182 participants at the psychiatric clinics.

Results

The majority of the respondents n=169 (92.9%) indicated that they would be interested in receiving the short message service. Results indicated that it would be feasible, acceptable and expedient to MHCUs to have access to the service.

Dedication

This dissertation is dedicated to my brilliant and outrageously loving and supportive husband, Mukesh, who has been a source of encouragement and strength during the challenges of my studies. I am thankful and blessed for having you in my life. Thank you for affording me the opportunity to complete this degree.

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Table of Contents

Declaration i

Abstract ii

Dedication iii

Acknowledgements iv

Table of Contents v

List of Tables ix

List of Figures x

List of Annexures xi

Glossary of Terms xii

Acronyms xiv

CHAPTER 1 : OVERVIEW OF THE STUDY 1

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY 1

1.2 PROBLEM STATEMENT 5

1.3 AIM OF THE STUDY 6

1.4 OBJECTIVES OF THE STUDY 6

1.5 SIGNIFICANCE OF THE STUDY 6

1.6 OUTLINE OF THE DISSERTATION 8

1.7 SUMMARY OF THE CHAPTER 8

CHAPTER 2 : LITERATURE REVIEW 9

2.1 INTRODUCTION 9

2.2 GLOBAL VIEW ON THE FEASIBILITY AND ACCEPTABILITY OF USE OF SMS BY HEALTH CARE USERS 9

2.3 FEASIBILITY AND ACCEPTABILITY OF USE OF SMS IN AFRICA 12

2.4 USE OF SMS SERVICE BY OUTPATIENT HEALTH CARE USERS IN SOUTH AFRICA 13

2.5 FACTORS THAT INCREASE THE ECONOMIC BURDEN 15
2.5.1 Depression 15
2.5.2 Treatment 15
2.5.3 Family burden 16
2.5.4 Cognitive impairment 17
2.5.5 Mortality/suicide 17
2.5.6 Homelessness / Poverty 18
2.5.7 Violence 18
2.5.8 Substance abuse 19
2.5.9 Abortion/pregnancy 19
2.5.10 Functional burden 20
2.6 BENEFITS OF SMS REMINDERS 20
2.7 CHALLENGES OF SMS REMINDERS 21
2.8 FEASIBILITY OF SMS REMINDERS 22
2.9 SUMMARY OF THE CHAPTER 23

CHAPTER 3 : THEORETICAL FRAMEWORK 25
3.1 INTRODUCTION 25
3.2 THEORETICAL FRAMEWORK THAT GUIDED THE STUDY 25
3.3 CONSTRUCTS OF THE HEALTH BELIEF MODEL 25
3.4 SUMMARY OF THE CHAPTER 29

CHAPTER 4 : RESEARCH METHODOLOGY 30
4.1 INTRODUCTION 30
4.2 RESEARCH PARADIGM 30
4.3 DESIGN 30
4.4 SETTING 31
4.5 SAMPLING PROCESS 31
4.5.1 Population size 31
4.5.2 Sampling technique 32
4.5.3 Inclusion criteria 33
4.5.4 Exclusion criteria 33
4.6 DATA COLLECTION TOOL 34
4.7 QUESTIONNAIRE DEVELOPMENT 34

4.8 DATA COLLECTON PROCESS 35
4.9 PRE-TESTING OF THE DATA COLLECTION TOOL 36
4.10 DATA ANALYSIS 36
4.11 RESEARCH RIGOUR 36
4.12 ETHICAL CONSIDERATIONS 37
4.12.1 Respect 38
4.12.2 Justice 39
4.12.3 Beneficence 40
4.13 SUMMARY OF THE CHAPTER 40

CHAPTER 5 : PRESENTATION OF THE RESULTS 41
5.1 INTRODUCTION 41
5.2 SAMPLE REALISATION 41
5.3 SECTION A: DEMOGRAPHIC DATA 42
5.3.1 Gender 42
5.3.2 Age 42
5.3.3 Location of residence 42
5.3.4 Language 43
5.3.5 Diagnosis of the respondents 43
5.4 SECTION B: MOBILE PHONE USAGE 45
5.4.1 Mobile phone usage 45
5.4.2 Cell phone package 46
5.4.3 Acceptability and feasibility of SMS 47
5.4.4 Missed appointments 48
5.4.5 Frequency of missed appointment 48
5.4.6 Reasons for missed appointments 49
5.5 CONCLUSION 50

CHAPTER 6 : DISCUSSION OF RESULTS 51
6.1 INTRODUCTION 51
6.2 DEMOGRAPHIC DATA 51
6.2.1 Gender and age 51
6.2.2 Location of residence 51
6.2.3 Language 52

6.2.4 Diagnosis of the respondents 52
6.3 MOBILE PHONE USAGE 53
6.3.1 Mobile phone usage 53
6.3.2 Mobile phone package 54
6.3.3 Acceptability and feasibility of SMS 55
6.3.4 Reasons for missed appointments 57
6.4 CONCLUSION 58

CHAPTER 7 : CONCLUSION, LIMITATIONS OF THE STUDY AND RECOMMENDATIONS 59
7.1 INTRODUCTION 59
7.2 CONCLUSION 59
7.2.1 Objective 1: Determine the number of MHCUs who will be willing to utilise the SMS 59
7.2.2 Objective 2: Assess if it would be feasible for MHCUs to utilise the SMS text service 59
7.2.3 Objective 3: Determine how often MHCUs miss their appointments 60
7.3 LIMITATIONS OF THE STUDY 60
7.4 RECOMMENDATIONS 61
7.4.1 Recommendations to the Department of Health 61
7.4.2 Nursing education 61
7.4.3 Further research 62

REFERENCES 63

ANNEXURES 75

List of Tables

Table 1.1: Outline of the dissertation 8
Table 3.1: Health Belief Model 26
Table 4.1: Sample size per facility 32
Table 5.1: Gender of the participants 42
Table 5.2: Age of the participants 42
Table 5.3: Location of residence 43
Table 5.4: Communication in English 43
Table 5.5: Diagnosis of the participants 43
Table 5.6: Cell phone package 46
Table 5.7: Frequency of missed appointments 49
Table 5.8: Reasons for missed appointments 49
Table 5.9: Other specified reasons for missed appointments 50

List of Figures

Figure 5.1: Diagnosis of respondents 45
Figure 5.2: Ownership of mobile phone 46
Figure 5.3: Cell phone package 47
Figure 5.4: Acceptability and feasibility of SMS 48

List of Annexures

Annexure 1: University ethics clearance 75
Annexure 2a: Letter of permission to the District Manager of uMgungundlovu Health District 76
Annexure 2b: Approval letter from District Manager of uMgungundlovu Health District 77
Annexure 3a: Letter of permission to the KZN Department of Health 78
Annexure 3b: Approval letter from the KZN Department of Health 79
Annexure 4a: Letter of permission to the CEO of Townhill Hospital 80
Annexure 4b: Approval letter from the CEO of Townhill Hospital 81
Annexure 5a: Letter of information in English 82
Annexure 5b: Consent in English 84
Annexure 6a: Letter of information in isiZulu 86
Annexure 6b: Consent in isiZulu 88
Annexure 7: Request for permission and approval to use the validated questionnaire 90
Annexure 8: Questionnaire in English 91
Annexure 9: Questionnaire in isiZulu 94
Annexure 10: Letter of consultation from the statistician 97
Annexure 10: Certificate from the professional editor 98

Glossary of Terms

Mental health care user

According to the Mental Health Care Act 17 of 2002, a mental health care user (MHCU) is a person receiving care, treatment and rehabilitation services, or using a health service at a health establishment aimed at enhancing the mental health status of a user (Republic of South Africa: 2002).

Mental health

This is a state of well-being in which the individual realises his or her own abilities, can cope with the normal stress of life, can work productively and fruitfully, and is able to make a contribution to his or her own community (World Health Organization [WHO] 2004: 2).

Burden of disease

This is the impact of a health problem, which is measured by financial costs, mortality, morbidity and other indicators (Bogart *et al*. 2014: 14).

Mental health care practitioner

According to the Mental Health Care Act 17 of 2002, a mental health care practitioner (MHCP) is a psychiatrist or registered medical practitioner or a nurse, occupational therapist, psychologist or social worker who has been trained to provide prescribed mental health care, treatment and rehabilitation services (Republic of South Africa 2002: 10).

Short messaging service

A short messaging service (SMS) is a method for sending text messages between mobile devices (Schilling *et al*. 2013: 3). It is commonly used to text

messages from person to person, from one mobile phone to another mobile phone. Messages can be sent to multiple phones at the same time.

Acronyms

Acronym	Full word/sentence
ANC	Antenatal care
ART	Antiretroviral therapy
CEO	Chief Executive Officer
HBM	Health Belief Model
KZN	KwaZulu-Natal
MHCP	Mental health care practitioner
MHCU	Mental health care user
mHealth	Mobile health
PHC	Primary health care
SADAG	South African Depression and Anxiety Group
SASSA	South African Social Security Agency
SIM	Subscriber identity module card
SMS	Short messaging service
TB	Tuberculosis
USA	United States of America
UK	United Kingdom
WHO	World Health Organisation

CHAPTER 1 : OVERVIEW OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

According to the World Health Organization (WHO) (2004: 2), mental health is a state of well-being in which the individual realises his or her own abilities, can cope with the normal stress of life, can work productively and fruitfully, and is able to make a contribution to his or her own community. The mental well-being of an individual is affected by physical, social and psychological factors, which results in a psychiatric diagnosis. According to Tillman (2015: 1), psychosis is a spectrum of disorders with many different aetiologies or origins. It is an altered sense of reality. This author also states that there is disruption in social and family relationships, and overall functioning. Difficulty in concentration and attention is experienced, and they become dependent on their families for financial and social support. According to the South African National Mental Health Policy Framework, neuropsychiatric disorders rank third in the overall burden of disease (Department of Health 2012: 11).

Millier *et al*. (2014: 86-87) suggest that over time there is a decline in mental functioning and social relationships in patients with Schizophrenia. This in turn causes occupational disability, cognitive impairment, poor health and suicide. Various dimensions overlap in the study. The focus was on quality of life, depression, treatment side effects, family or caregiver burden, cognitive functioning and social impairment, mortality, suicide, homelessness, morbidity, stigmatisation, violence and abortion/ pregnancy. Impaired cognitive functioning, leads to decreased empowerment and stigmatisation. The study proved that impaired cognitive functioning lead to depression, which then caused physical, emotional and economic distress. This affects a patients' quality of life negatively and can lead to suicide. Millier *et al.* (2014: 86-87) state that quality of life can be regarded a predictor of relapse.

Bogart *et al.* (2014: 14) argue that much of the burden that is placed on patients, carers, the health service and society, is due to relapses, which increase the risk of hospitalisation. Burden of disease is the impact of a health problem, which is measured in terms of financial costs, mortality, morbidity and other indicators. Jack *et al.* (2014) and Pareek and Kalia (2013: 56-62) agree that poor compliance with psychotropic medication increases the burden of disease in the country. A number of research findings reveal that forgetting is the most common reason mentioned for missed mental health appointments (Sims *et al.* 2012; Huang *et al.* 2013; Guy *et al.* 2012; Balogun *et al.* 2012; Trujillo 2015). Missed appointments increase the risk of patients not attending future appointments, disengagement from services, rehospitalisation, and treatment non-adherence. According to Mall *et al.* (2013: 364-370), mental health care users (MHCUs) may not attend follow-up appointments at mental health facilities, thereby reducing adherence to psychotropic medication, and increasing the risk of rehospitalisation.

Over the years, there has been a rapid growth in the use of mobile technology, and, according to Farris *et al.* (2015: 1-14), this has been proven to increase treatment adherence. These authors are of the opinion that the short messaging service (SMS) can improve service delivery through appointment reminders, and improve communication between healthcare workers and patients. In a study conducted at an academic hospital by Wagner *et al.* (2014: 74-80), it was found that 64% of patients did not adhere to their treatment. Eighty percent of those who were non-adherent to their treatment had experienced a relapse. A study conducted by Farris *et al*. (2015) found that reminders received as a text message increase attendance for follow-up appointments and treatment adherence.

Mall *et al*. (2013: 369) suggest that the majority of MHCUs prefer SMS text messaging as a method of reminding them to attend follow-up appointments and take treatment. The authors also state that non-adherence to treatment increases costs to the economy. Non-adherence can lead to relapse, rehospitalisation, homelessness, stigmatisation and violent episodes.

Research conducted in a health facility in Johannesburg by clinic staff has also proven that a SMS service operated reduced the loss to follow-up rate. This supports Mall *et al*. (2013: 369) findings, as the researcher also stated that mobile phone technology has been extremely effective in assisting with follow-up appointments.

Tomlinson *et al.* (2013: 1) state that mobile technology has proven to be effective for MHCUs that encounter challenges such as travel being expensive, time consuming, exhausting and physically challenging. Personal and working lives are disrupted. These challenges can be minimised or eliminated with the use of SMS.

Mobile health care (mHealth) is growing rapidly, and presents an avenue for delivering mental health treatment. Price *et al.* (2014: 427-436) state that personally owned devices are an effective way to include the use of mobile devices into mental health care. This presents an opportunity to prepare and engage patients in treatment, and to help overcome the structural barrier of distance. According to Price *et al*. (2014: 3), mobile devices are less cumbersome and are able to maintain privacy. They are also preferred among younger patients. Tomlinson *et al*. (2013: 1) and Price *et al*. (2014: 4) agree that such communication reduces barriers such as scheduling of appointments, parking, waiting times and costs; and this approach also benefits patients who are physically disabled, experience lack or difficulty with transportation, and have busy schedules with regards to work, study and school.

Nglazi *et al.* (2013: 13) conducted a study that proved that patients who received SMS messaging had increased rates of adherence to tuberculosis (TB) treatment. Leon *et al.* (2015: 16) and Farris *et al*. (2015: 1-14) had success in their findings for adherence to treatment of raised blood pressure as it was found to be acceptable, relevant and helpful when a SMS text message was received. Much can be done to improve attendance and treatment adherence by offering prompt, convenient appointments and

reminders (Farris *et al*. 2015: 1-14). Benefits need to outweigh the costs. Discontinuation of medication can lead to deterioration in quality of life. Unfortunately, patients who miss their appointments do not receive the full benefit of medical and psychiatric advice (Farris *et al*. 2015: 1-14).

At one of the facilities where the current study was conducted, the nursing staff based in the outpatient department has flexible bookings for their clients. Clients are given appointment dates depending on their availability. The pharmacy department now dispenses treatment from the outpatient department, making it convenient for clients. Patients who are living within the district have their medication packed by the selected hospitals' pharmacy department and sent to the patients' nearest clinic, making it convenient for them to collect treatment. Psychogeriatric patients have their medication sent to the frail care homes.

MHCUs default their appointments to collect treatment or come for their doctor's appointments. This unfortunately leads to some of them not being compliant on their psychotropic medication, relapsing and being readmitted. Upon enquiring as to the reasons for not adhering to treatment compliance and attending doctors' appointments, MHCUs often state that they forgot due to other priorities, and appointments were usually four weeks apart. There are currently on average 325 MHCUs utilising the mental health clinic. According to statistics obtained between August 2015 and January 2016, an average of about 64% of patients were at risk of relapsing due to missed appointments and missed treatment collection. The total number of admissions into the hospital between April-December 2015 was 536. According to the selected hospital's performance indicators for the period April-December 2015, the average length of stay for a MHCU was 93.8 days. The average cost of caring for a MHCU admitted in the hospital was R91.92 per day.

1.2 PROBLEM STATEMENT

A problem statement articulates the nature, context and significance of a problem (Polit and Beck 2012: 92). At a tertiary psychiatric hospital, in an outpatient department, a number of mental health care services are offered to the public. The reason for these referrals is generally related to review of current treatment, as they are not responding to current medication, or they need to have treatment initiated. Once the MHCU is stable on their treatment, which is usually within six months, and their medication is now regarded as chronic, they are transferred back to their referring district hospitals or primary health care (PHC) facility for continuity of care. Clients are regarded as stable once their treating doctor establishes that the client's condition is unlikely to change, they are experiencing minimum or no side effects, have had all necessary investigations done as required, and if need be, have seen a psychologist, social worker and occupational therapist. Patients then continue with their treatment in their community. Chronic psychiatric treatment and medication for physical ailments are not supplied via this clinic, as per the hospital policy.

All patients have to be referred and are then booked by the nursing staff to be seen by a medical officer or registrar. A maximum of only four follow-up patients and two new patients can be seen by each doctor. Many patients do not attend their first appointment or their follow-up appointment. Many of the patients later reschedule their appointments. Those that do not reschedule are at risk of deteriorating further, relapse or hospital admission. Many patients do not inform the nursing staff when they are unable to attend their appointments. This makes it difficult to grant other patients appointments should the need arise. In general, a large number of patients tend to default their treatment for various reasons, making them non-compliant on the psychotropic medication. This is a challenge, as these patients remain mentally unhealthy, and cannot be transferred out of the clinic, thereby making it difficult to book new patients to be seen by the doctor.

1.3 AIM OF THE STUDY

The aim of this research study was to determine the feasibility and acceptability of utilising SMS to remind outpatient MHCUs of their follow-up care in the uMgungundlovu District.

1.4 OBJECTIVES OF THE STUDY

The objectives of the study were to:

- Determine the number of MHCUs who would be willing to utilise the SMS.
- Assess if it would be feasible for MHCUs to utilise the SMS text service.
- Determine how often MHCUs miss their appointments.

1.5 SIGNIFICANCE OF THE STUDY

According to Vernig and Repique (2015: 31-33) serious mental illnesses requires a long duration of treatment to maintain recovery. These authors argue that patients who miss their first outpatient appointment are less likely to be compliant on their medication and treatment plans. There are devastating consequences when patients do not attend their appointments. There is an increased risk of unemployment and homelessness. The study conducted by Vernig and Repique (2015: 31-33) indicates that a missed appointment means there has been lost revenue. It also creates longer waiting times to the next available appointment.

The current study will improve mental health care service delivery by encouraging provision of a SMS to MHCUs. This will hopefully significantly reduce the number of MHCUs from relapsing, as they will be reminded to comply with medication and keep follow-up appointments with their doctors. This will reduce the burden of cost incurred by the health department by reducing admissions and readmissions. By remaining compliant on treatment, MHCUs can resume normal daily functioning in their communities. This will also ensure that new MHCUs can access the service, as mentally healthy

users can be transferred out to their local clinics, community health centres or district hospitals to continue their treatment.

One of the mental health action plan strategies is prevention and promotion; to strengthen information systems, evidence and research for MHCUs. The strategy was implemented to promote the mental well-being of an individual (Saxena *et al.* 2015: 461). According to WHO statistics, more than 800 000 deaths worldwide are due to self-harm. Self-harm is rated number 15 in the 20 leading causes of death. Sub-Saharan Africa had 0.2% deaths and 1.6% for neurological deaths (WHO 2004: 33). This is an indication that this could have been prevented, if there was more active involvement or communication with MHCUs, specifically with SMS reminders.

According to Millier *et al.* (2014: 85-93), the cost of mental illness is large for individuals and society. This study aims to benefit MHCUs, caregivers, relatives, neighbours and others in a patient's daily life. The South African National Mental Health Policy Framework and Strategic Plan 2013-2020 indicates that there are serious social and economic costs associated with mental health issues (Department of Health 2012: 14). Direct costs are related to health care, and indirect costs include decreased productivity at home and work, loss of income, and loss of employment. Lund et al (2013: 849) states that it costs South Africa more to not treat mental illness than to treat it. Emphasis on current spending for mental health is for treatment and rehabilitation. There are minimum evidence-based mental health prevention and promotion programmes. The vision statement for this policy framework is to improve mental health for all South Africans by 2020. The framework also specifies that by 2015 the use of psychotropics should be carefully monitored and evaluated, which should be in line with broader quality improvement mechanisms.

1.6 OUTLINE OF THE DISSERTATION

The outline of the dissertation appears in Table 1.1.

Table 1.1: Outline of the dissertation

Chapter	Content
1. Orientation to the study	Introduction and background to the study.
2. Literature review	Review of the related literature.
3. Theoretical framework	Theoretical framework which guided the study.
4. Research design and methodology	Research design, sampling process, data collection and analysis as well as ethical considerations.
5. Results	Presentation of results.
6. Discussion of results	Discussion and explanation of results.
7. Conclusion, limitations and recommendations	Summary of findings, study limitations and recommendations.

1.7 SUMMARY OF THE CHAPTER

The purpose of this study was to determine the feasibility and acceptability of utilising SMS for follow-up care of outpatient MHCUs in uMgungundlovu District. The objectives were to determine the number of MHCUs who would be willing to utilise the SMS, assess if it would be feasible for MHCUs to utilise the SMS text service, and determine how often MHCUs miss their appointments. The following chapter is a summary of the literature review that was undertaken. This is followed by a chapter on the research methodology.

CHAPTER 2 : LITERATURE REVIEW

2.1 INTRODUCTION

The literature review focuses on the global view on the feasibility and acceptability of the use of SMS by health care users, use of SMS in Africa, and use of SMS service by outpatient health care users in South Africa, factors that increase the economic burden, as well as benefits, challenges and feasibility of SMS reminders.

2.2 GLOBAL VIEW ON THE FEASIBILITY AND ACCEPTABILITY OF USE OF SMS BY HEALTH CARE USERS

Non-attendance at appointments comes at a cost to both patients and government. Missed hospital appointments are a major worldwide issue. Taylor *et al.* (2012: 21) conducted a study in the physical therapy outpatient departments of two metropolitan hospitals in the United States of America (USA). They found that when vast numbers of patients do not attend appointments, clinical and administrative staff are inefficiently employed. Non-attendance rates at the physical therapy outpatient department were 16%. Guy *et al*. (2012: 615) mention that non-attendance is linked to adverse health outcomes for those who miss their appointments. Research conducted in Geneva by Perron *et al.* (2013: 125), indicated that there was a regular problem with missed appointments. This interfered with medical care, administrative and medical resources as well as patient health outcomes. The findings of these two studies reveal that different interventions were used as reminder methods to reduce non-attendance (Taylor *et al*. 2012 and Perron *et al*. 2013). Postal reminders in a study conducted by Perron *et al*. (2013) proved to be effective, yet costly, and the effect decreased over time. There was evidence that showed that telephone reminders reduced missed appointments. In the study conducted by Henderson (2008: 9-12), postal

reminders were effective, provided that they were sent within days of the appointment.

In a study conducted in the United Kingdom (UK) by Kunigiri, Gajebasia and Sallah (2014: 464), non-attendance rates were compared at follow-up appointments in an adult psychiatric outpatient clinic. They used three reminder methods, namely, letters, telephone, and text message reminders. According to Kunigiri, Gajebasia and Sallah (2014: 464), the UK has high non-attendance rates for hospital outpatient appointments. This indicates poor utilisation of resources, which also produces poor outcomes. Kunigiri, Gajebasia and Sallah (2014: 464) and Hallsworth *et al.* (2015: 2) agree that patients confirmed that forgetting was the main reason for missed appointments. This leads to inferior care for patients, inefficient staff utilisation and increased waiting times for patients. This eventually leads to overbooking.

The issue of confidentiality needs to be addressed with telephone or text messages. Letter reminders are safer, but there are administrative and postal costs involved. Kunigiri, Gajebasia and Sallah (2014: 466), state that the Department of Health in the UK encourages hospitals to reduce non-attendance, and a non-attendance policy is in place. The study by Kunigiri, Gajebasia and Sallah (2014: 466) concluded that no one particular reminder was more effective than the other. Text messages are inexpensive, but measures need to be put in place to ensure confidentiality. Hallsworth *et al*. (2015: 10) agree that SMS reminders reduce non-attendance. Naslund *et al.* (2015: 1) conducted a study in the UK as well, where they investigated mHealth interventions for serious mental illness. They point out that serious mental illness is one of the leading causes of disability worldwide. Apart from the comorbid medical conditions that these patients are at risk of getting, there are also socioeconomic concerns, like homelessness, unemployment and poverty which lead to reduced life span. Functional impairment, social isolation, anxiety, depression, low motivation and cognitive impairment is also experienced, and this increases the risk of suicide and rates of hospital admissions. Their research noted concerns regarding the usability and

acceptability of mobile applications due to the cognitive impairment and social challenges experienced by people with mental illness. These concerns were addressed using simple visual interfaces, familiar phrases, presenting content at a low reading level, and avoiding tasks that needed abstract reasoning. There have been many studies exploring feasibility, but there seems to be insufficient evidence whether it will be feasible for patients with mental illness diagnoses.

In a study conducted by Pijnenborg *et al.* (2010: 269-270) in the Netherlands, automated SMS text message prompts were sent to patients. This reminded them to take medication and attend mental health care appointments. When SMS prompts were stopped, attendance rates decreased. When text messages were sent out again, appointments increased. Unfortunately, medication adherence did not change. Challenges faced in this study included privacy. Naslund *et al*. (2015: 10) found that the use of technology is both feasible and acceptable among people with serious mental illness.

There has been a toolkit developed specifically for text messaging for medical and health service, known as the *Text Messaging in Healthcare Research Toolkit* (Schilling *et al.* 2013: 1). According to Schilling *et al*.'s (2013: 1) study, there are over 321.7 million wireless subscriptions within the USA. Text messaging was found to be cost effective and was able to reach a vast number of people. It also proved to be effective in providing health information and education, and support between the health care provider and the patient. However, according to Nglazi *et al.*'s (2013: 14) study conducted in Argentina, text messaging did not improve treatment adherence for tuberculosis (TB) treatment. A study conducted in the UK by Bogart *et al*. (2014: 7), suggested that psychiatric patients were willing to receive reminders on their mobile devices, as an additional service offered.

According to Farris *et al*. (2015), 33.5% of people who do not take medication properly in the USA contribute to over $290 billion in health care costs. Studies have been conducted to improve treatment compliance with chronic

medical conditions, as well as schizophrenic patients. Messages that target forgetfulness were used. A study conducted by Branson, Clemmey and Mukherjee (2013: 298) in the USA found that missed appointments were common barriers to treatment. This becomes a burden for community mental health centres due to long waiting lists, lost revenue, and the amount of time that staff spend on outreach. In the study, patients had stated that their reasons for missed appointments were mostly due to forgetting.

Seko *et al.* (2014: 591-602) conducted research in Canada on the efficiency of text message reminders for appointments. Participants were found to have a positive attitude towards mental health interventions. There was a high level of satisfaction regarding privacy. Lund *et al*. (2013: 845-846) state that research indicates that mental illness has a major socioeconomic impact on lower-middle income countries. In Taiwan, loss of productivity due to depression was $1 053 million dollars, and Kenya lost $2 569 719 dollars in productivity due to 5 678 admissions to psychiatric hospitals during the 1998/1999 financial year.

2.3 FEASIBILITY AND ACCEPTABILITY OF USE OF SMS IN AFRICA

According to Jack and Mars (2014: 2), there has been a rapid growth of mobile phone penetration in Africa. Two-thirds of the population have an active subscriber identity module card (SIM). South Africa ranks third in Africa when it comes to mobile phone penetration. This makes South Africa the perfect platform for mHealth projects.

Balogun *et al.* (2012: 76-80) conducted a study in Lagos, Nigeria, to determine if clients were willing to receive SMS reminders, as non-attendance for appointments at the clinic was a challenge for healthcare managers. Their study found that majority of the participants was willing to receive reminders.

In a research study conducted by Lund *et al.* (2014: 1) in Zanzibar on the decline in attendance and quality of care in antenatal care (ANC), a mobile phone text message and voucher for compensation was used as an

intervention. The results showed an increase in ANC attendance, which contributed towards improving maternal and new-born health. Nglazi *et al*. (2013: 566) found that in Kenya, SMS reminders increased the rate of clinic attendance on the appointment dates.

Jack and Mars (2014: 2) mention that there have been a few studies that show the benefit of using a mobile phone for healthcare in Africa. The SMS system has been used to remind patients of appointments, to take treatment, provide health education, clinical care, and to acquire data for disease surveillance. This has shown to improve patient outcomes.

2.4 USE OF SMS SERVICE BY OUTPATIENT HEALTH CARE USERS IN SOUTH AFRICA

Van Rensburg, Taljaard and Wilson (2014: 142-149) conducted a study at a specialist psychiatric outpatient clinic at a hospital in Gauteng, South Africa, whereby researchers looked at the impact that communication has on adherence of patients. The study was conducted in collaboration with the South African Depression and Anxiety Group (SADAG). The SADAG developed a communication intervention programme called Reminder and Support Adherence Programme. This was implemented in the hospital. The results of the study indicated that there was improved attendance. However, it was noted that the previous attendance rates were extremely poor. Therefore, any improvement with regards to communication motivated patients to attend. The study by Van Rensburg, Taljaard and Wilson (2014: 142-149) concluded that a similar communication strategy should be considered in existing local state sector specialist psychiatric outpatient clinics.

Crankshaw *et al.* (2010: 729-734) researched the feasibility and acceptability of cellular phones as appointment reminders and adherence messages. A structured questionnaire was used at an antiretroviral therapy (ART) clinic in a hospital in Durban, KwaZulu-Natal (KZN), South Africa. Verbal consent was taken from participants. Results of the study indicated that 99% of the

participants were agreeable for the clinic to contact them on their cellular phones. There was a gender difference in the pattern of cellular phone usage.

In South Africa, there has been a rapid growth in cellular devices, and this has created an opportunity for them to be used in health interventions. Norris, Swartz and Tomlinson (2013: 379-388) indicate that mobile phones are becoming more accessible to South Africans because of the reduction in prices. There is minimum data regarding mobile technology in the mental health field in South Africa, and it has been established that there is a scarcity of mental health resources. Norris, Swartz and Tomlinson (2013: 380) believe that mobile technology is an important option to address the treatment gap in South Africa.

Norris, Swartz and Tomlinson (2013: 381) state that many people already own mobile phones and this is a cost-effective method of disseminating information. Instant messaging is a cheaper option than SMS to engage with people who cannot afford SMSs, and is now being used widely. In South Africa, the application currently being used most frequently is WhatsApp. However, there are challenges that are still being encountered. The average South African is either not willing or able to use mobile technology (Norris, Swartz and Tomlinson 2013: 385). In a study conducted in Cape Town, people were reluctant to use mobile technology. South Africa has 11 official languages, yet network providers cater for international languages only. Data and patient security is another concern. Mobile devices can be lost or stolen. Norris, Swartz and Tomlinson (2013: 385) mention that South African cellular phone users have reported a high threat of theft. Sharing of phones is common, therefore privacy is jeopardised.

Lund *et al*. (2013: 849) reiterates that it costs South Africa more to not treat than to treat mental illness. This statement therefore, supports the initiatives for preventing mental illness and promoting mental health, as well as the up-scaling of mental health care and rehabilitation services, in order to reduce the economic burden of these illnesses.

2.5 FACTORS THAT INCREASE THE ECONOMIC BURDEN

2.5.1 Depression

Millier *et al*. (2014: 87) found that 39.4% of patients had depression on admission, together with poor mental and physical health, a decreased level of medication compliance, substance abuse problems, and poor family and social relationships. Statistics revealed that patients, who were depressed, used mental health services more frequently. Suicidal ideation had a higher rate in depressed patients. They found that many patients were severely handicapped by their symptoms, which made it difficult to reintegrate them into society. There was social withdrawal and a reduction in work as well as activities. In a study conducted in France by Lépine and Briley (2011: 4-6), findings indicated that there was cognitive impairment and social dysfunction among participants. This caused a reduction in performance and distress. Depressed patients were more likely to commit suicide.

2.5.2 Treatment

Chapman and Horne (2013: 449) agree that one of the determinants of non-adherence was forgetting, which was unintentional. Millier *et al*. (2014: 87) state that side effects from treatment most reported are weight gain, diabetes, metabolic syndrome, sexual dysfunction and tardive dyskinesia. This leads to treatment non-compliance. MHCUs are more likely not to comply with treatment, which causes more relapses, admissions and worsening disease symptoms. Kunigiri, Gajebasia and Sallah (2014: 464) suggests that non-attendance has a poor outcome in patient care. Non-attendance can indicate that the client is still having active symptoms of the illness, resulting in non-attendance at the clinic.

Panayiotopoulos, Pavlakis and Apostolou (2013: 6) indicate that modern medication significantly reduces the symptoms of mental illness. This allows patients to have a normal life, and this will predict less tension between the patient and their relatives. This encourages a reduced need for supervision. A study conducted by Kaplan, Casoy and Zummo (2013: 1172) on medication

adherence indicated that 59% of patients had poor adherence, and two-thirds of patients were partially non-adherent. This represents a clinical problem and an economic burden, because it is associated with relapses, increased rates of hospitalisation, rehospitalisation and psychotic symptoms that remain persistent. Similarly, Chapman and Horne (2013: 448) state that non-adherence leads to poorer outcomes, which includes hospital admission. The authors point out that in order for psychiatric patients to realise and experience the full benefits of medication, it is imperative they take the prescribed dose, at the correct time, for the full treatment course. Unfortunately, more than 30% of patients do not take their treatment as prescribed, which increases the cost for patients and the healthcare system (Chapman and Horne 2013: 446). Chapman and Horne (2013: 447) believe that the use of technologies, such as SMS, may prove to be effective in improving adherence.

2.5.3 Family burden

Millier *et al*. (2014: 88) and Panayiotopoulos, Pavlakis and Apostolou (2013: 2-3) concur that family burden leads to work overload, sleep disturbance, financial problems and less spare time. This is known as environmental burden. Caregivers show signs of burnout, and loss of social contact outside the family. Family members have to quit their jobs or decrease working hours. Lépine and Briley (2011: 5) agree that mental illness disrupts family stability, with the patient and the patient's partner and family members being burdened with the prospect of decreased income which results from workplace absenteeism, underperformance or unemployment. This disruption frequently leads to separation or divorce. Panayiotopoulos, Pavlakis and Apostolou (2013: 8) state that families are faced with problems such as fear and anxiety with regards to the patients' symptoms, as well as treatment costs. Families are also faced with burden of care, which includes shame, embarrassment, and feelings of guilt and self-blame. Findings from their study indicated that caregivers who lived with schizophrenic patients encountered greater financial strain.

2.5.4 Cognitive impairment

Millier *et al*. (2014: 88) found that mentally ill people have lack of attention, problems with speed of processing, working and long-term memory, executive function and social cognition. Literature says that there is approximately 70% to 85% of cognitive dysfunction among patients. Kunigiri, Gajebasia and Sallah (2014: 466) state that there is great social impairment. Rock *et al.* (2013: 2029) agree with the findings of the study that was conducted by Lépine and Briley's (2011: 3-6) which revealed that patients who suffered from depression have cognitive impairment, and they have poor response to treatment. Rock *et al*. (2013: 2035) indicate that impaired cognition occurs in about two-thirds of depressed patients and has been linked to a poor response to treatment.

2.5.5 Mortality/suicide

Chapman and Horne (2013: 447) state that due to non-adherence of medication, suicide rates and hospitalisation have increased. Millier *et al*. (2014: 88) and Lépine and Briley (2011: 4) report that although antipsychotic treatment is linked with a higher mortality rate from cardiovascular disease, it reduces overall mortality, as compared to no treatment. Cardiac mortality is greater in patients with depression. According to research findings by Chesney, Goodwin and Fazel (2014: 153), the highest causes of mortality were substance use disorders and anorexia nervosa. The highest suicide risks included patients with borderline personality disorder, anorexia nervosa, depression and bipolar disorder. They further state that mental illness and substance use have evidence-based treatments, and delivering these treatments should reduce the risk of suicide. Chapman and Horne (2013: 448) indicate that poor treatment adherence increase the likelihood of patients becoming suicidal, which increases the premature mortality rate. Research was conducted on bipolar patients who had committed suicide. Plasma drug levels indicated that three out of 24 were non-adherent to antipsychotics, and ten out of ten were non-compliant to antidepressants, at the time of their suicide (Chapman and Horne 2013: 448).

2.5.6 Homelessness / Poverty

Millier *et al*. (2014: 88) affirm that homelessness and poverty can be associated with cognitive impairment. Deficits in personal memory, judgement or planning, can result in poor problem solving and social skills. Poor behavioural skills may be the reason that landlords deny housing to individuals that have cognitive impairment. Lund *et al.* (2011: 1502) mention that there is growing evidence that there is a negative cycle between mental illness and poverty. Lund *et al*. (2011: 1502) and de Silva, Hanwella and de Silva (2012: 14) agree that the risk of mental illness is increased among people living in poverty, and this therefore increases the chances that individuals with mental illness will remain in poverty. De Silva, Hanwella and de Silva (2012: 14: 14) suggest that economic support should be provided for patients with mental illness that is disabling, because they are not able to engage in full time employment. Lund *et al*. (2011: 1508) suggest that mental health interventions need to include both drug treatment and psychological therapy, either as an inpatient or outpatient, in order to break the cycle of poverty. However, results from their study indicated that these interventions had low compliance rates, and this would affect the ability of individuals to improve their economic outcomes. Lund *et al*. (2011: 1508) also indicate that clinical improvements improve family economic status, as there are fewer readmissions, shorter duration of hospital stay and longer time in employment. Therefore, improved economic status works in conjunction with improved clinical symptoms.

2.5.7 Violence

Millier *et al*. (2014: 90) state that the likelihood of committing crime is seven times higher among mentally ill patients. These authors suggest that violence is usually the result of inadequate treatment and fewer positive treatment outcomes. Kunigiri, Gajebasia and Sallah (2014: 466) concur, stating that patients who miss follow-up appointments have a higher admission rate and are more at risk of hurting themselves and others. Findings in a study conducted by Oram *et al.* (2013: 97) indicated there was a high prevalence of

domestic violence among psychiatric patients. Chapman and Horne (2013: 448) posit that poor treatment adherence increases the likelihood of patients becoming violent.

2.5.8 Substance abuse

Gainful employment is difficult to maintain, and this often leads to lack of independence in meeting basic needs like food, shelter and clothing. Further, alcohol and drugs are linked to social isolation, which is followed by non-adherence to treatment and irregular treatment intake. This increases the original symptoms (Millier *et al*. 2014: 90). Pickard and Fazel (2013: 3) believe that substance abuse is a risk factor for violence in mentally ill individuals. They continue to state that there is a strong relationship between schizophrenia and homicide. Findings from their study indicated that 40% of offenders were substance abusers, and suggested that substance abuse within mentally ill patients be considered a risk factor in violence and re-offending.

2.5.9 Abortion/pregnancy

Millier *et al*. (2014: 85-93) state that patients who do not take treatment correctly increase their risk of acting on delusions or hallucinations. This endangers the patient as well as the foetus if they are pregnant. The authors therefore believe that there is a need to implement prevention programmes, as well as safe and effective antipsychotic treatments. According to a study by Seeman (2013: 12-22), women suffering from schizophrenia were more vulnerable to unintended pregnancies. Results of Seeman's study indicated that there were high rates of coerced sex, high-risk sexual behaviour and little contraception. The unintended pregnancies had a high risk of birth complications, and the women were at risk for postpartum psychosis. The study findings also revealed that women used sex for exchange of cigarettes or other goods, and many had histories of rape and sexual abuse, therefore exposing them to sexually transmitted infections and unintended pregnancies. The women in Seeman's study tended to discontinue treatment during

pregnancy, therefore increasing the relapse rate. In a study conducted in the USA by Hall *et al.* (2014: 62-71), evidence showed that stressed and depressed women had twice the risk of pregnancy, and their findings highlighted the adverse impact of mental health symptoms on women.

2.5.10 Functional burden

Lépine and Briley (2011: 5) found that functional impairment was greater for mental disorders. The study revealed that 42% of the participants who had mental disorders, also had severe functional impairment. This decreased work productivity and increased the risk of absenteeism, therefore resulting in increased rates of unemployment and a reduction in annual earnings. The National Comorbidity Survey Replication found that absenteeism and presenteeism caused a loss of $36.6 billion per year in the USA. Panayiotopoulos, Pavlakis and Apostolou (2013: 2), state that there are direct and indirect costs. These include frequent hospitalisations, long-term psychosocial and economic support, and lifetime lost productivity. This therefore passes the financial burden from the family to the government.

Lund *et al*. (2013: 845-851) concluded that there is a strong association between mental illness and lost income in South Africa. The authors state that the total economic burden of mental illness is possibly even higher than that which was reported in their study. Direct economic costs were not considered, for example, costs incurred for treatment, and indirect costs, such as transportation to health facilities, lost income for caregivers, and disability grants. There are also hidden costs to carers and family that need to be considered.

2.6 BENEFITS OF SMS REMINDERS

The study conducted by Guy *et al*. (2012: 614), identified text message reminders as a strategy to improve patient attendance as they were a simple and an efficient option for health services to use. This strategy can improve service delivery and result in health benefits for patients. Branson *et al*. (2013:

298) found that text messages could be read at patients' convenience. A telephone call would be regarded as more intrusive than a text message. The findings of the survey conducted by Sims *et al*. (2012: 163) revealed that patients' attitudes were favourable towards SMS reminders. The advantages of using a mobile phone included popularity of such devices, user-friendliness, cost-effectiveness to send and receive messages, flexibility of using it anywhere, rapid response rate, interactivity and personal nature (Seko *et al*. 2014; Guy *et al*. 2012; Taylor *et al*. 2012). Text message reminders are also time efficient because the entire process is automated (Taylor *et al*. 2012: 21).

Kannisto *et al.* (2015: 7-8) conducted research in Finland which found that patients taking antipsychotic medication, and receiving SMS messages, were satisfied with the service. They endorsed the usage of simple, easy-to-use, current technology like cellular phones and SMSs, as it is acceptable in psychiatric outpatient services. Results of the study indicated that 70% of the participants found SMS reminders easy to use, and 63% felt that it did not cause any harm or disruption to their lives. Perron *et al*. (2013: 1-2) and Kannisto *et al*. (2015: 2) agree that SMS text messages are inexpensive, acceptable and cost effective.

2.7 CHALLENGES OF SMS REMINDERS

Some challenges experienced by Branson *et al*. (2013: 302) included broken phones, lost devices, or phones turned off due to lack of airtime. Another major concern was patient privacy. Branson *et al*. (2013) and Crankshaw *et al*. (2010) pointed out that if a patient misplaces their phone or leaves the device unattended, they run the risk of having messages read by others. During the study, the content was limited to date and time of the appointment. Seko *et al*. (2014: 599) experienced challenges as well, which included confidentiality, technical difficulties, the cost of providing participants with a mobile device, and data validity and reliability. Concerns were raised during the study regarding how data was to be handled, transmitted and stored. If the mobile device was lost, privacy could be jeopardised.

Kannisto *et al*. (2015: 5) stated that 13% of participants in their study felt that text messages caused 'harm'. A challenge encountered was that cognitive impairment was common in people with schizophrenia, and problems experienced was working memory, processing speed and verbal learning. This may present a challenge when utilising technology. Kannisto *et al*. (2015) and Perron *et al*. (2013) pointed out a major concern that health care providers might use the SMS service to shift responsibility to patients, and this may encourage decreased follow-up appointments.

Crankshaw *et al*. (2010: 731) found that women were not willing to be contacted by the clinic, as they did not want to be harassed by the clinic. Other challenges encountered by the clinic included respondents not knowing how to access messages, unable to read messages immediately, and participants already using other reminder strategies like the mobile phone alarm function.

2.8 FEASIBILITY OF SMS REMINDERS

According to Branson *et al*. (2013), Taylor *et al*. (2012: 21) and Guy *et al*. (2012: 615), the approach of using text messaging was regarded feasible because of the popularity of mobile phone usage and texting. There is widespread penetration of cellular devices in many countries. Guy *et al*. (2012: 627) discovered that according to mobile phone usage data, over 90% of the population in many countries own mobile phones. It was stated that the cost of sending a SMS / text message can be offset by the revenue that is generated from the increase in attendance. Branson *et al*. (2013); Guy *et al*. (2012: 627) and Taylor *et al*. (2012: 26) concluded that it would be feasible to send SMS reminders. The findings of the study conducted by Branson *et al*. (2013) revealed that feasibility was determined by how many reminders were not received by patients. Only 4% had not received the messages. Overall, the study concluded that SMS reminders were a promising strategy for improving attendance rates.

Seko *et al*. (2014: 599) and Guy *et al*. (2012: 615) agree that sending messages via mobile device was feasible, allowing for large-scale intervention at a minimal cost. Today, using a mobile phone in a public area is widely accepted. It was found in Perron *et al*.'s (2013: 2) study that attendance rates were slightly higher after patients received a telephone reminder, as compared to text message reminders. This indicated that direct, personal contact might be more effective than a text message. Studies by Kannisto *et al*. (2015: 7) and Crankshaw *et al*. (2010: 730-732) found that it would be feasible to send text messages for people with mental health problems.

Crankshaw *et al*. (2010: 730) discovered that 95% of participants used a prepaid service. This was an indication that many participants encountered financial constraints. The study indicated that almost 40% of respondents had owned cellular phones that were lost or stolen, and 28% reported damage to their phone. Twenty eight percent of respondents indicated that they shared their cell phone, which was more common among females. The respondents also reported that they frequently left their phones unattended, thereby allowing the possibility of someone else using it. The researchers pointed out that lost cellular devices can be easily replaced, but this can cause a problem from a communication point of view. Because many mobile phone users use prepaid airtime, this means that the original phone number would be lost once a new cellular device was acquired, because of a new SIM card. Crankshaw *et al*. (2010: 732) recommended that patients contact details should be updated regularly.

2.9 SUMMARY OF THE CHAPTER

The literature review highlighted the feasibility and acceptability of utilising a SMS service for appointment reminders. Evidence-based research proves that many clients, whether they were MHCUs or health users, were interested in receiving such reminders. Evidence also shows that appointment reminders increase clinic attendance rates. Literature was presented regarding the factors that contributed to the economic burden of mental health symptoms.

Evidence shows that there is a huge economic impact on an individual, the family, the employer, and society at large.

CHAPTER 3 : THEORETICAL FRAMEWORK

3.1 INTRODUCTION

This chapter discusses the theoretical framework that under-pinned the study. A theoretical framework is based on propositional statements which results from an existing theory (Brink, van der Walt and van Rensburg 2015: 26). According to Brink, van der Walt and van Rensburg (2015: 26), this helps the researcher to organise the study. It also provides a context in which a problem is examined and analysed.

3.2 THEORETICAL FRAMEWORK THAT GUIDED THE STUDY

The theoretical framework that was used was the Health Belief Model (HBM), which was developed in the 1950's (Janz and Becker 1984: 2). The underlying concept is that health behaviour is determined by personal beliefs or perceptions about a disease, and the strategies that are available to decrease its occurrence.

3.3 CONSTRUCTS OF THE HEALTH BELIEF MODEL

The main constructs in HBM include perceived susceptibility, perceived severity, perceived barriers and perceived benefits (Janz and Becker 1984: 2). These perceptions explain health behaviour. The emphasis is on self-care behaviour, helping patients appreciate the relationship between their self-management behaviours and their health (Nundy *et al*. 2013: 131). This is illustrated in Figure 3.1. Research studies will be presented regarding SMS reminders, to indicate the efficacy of using the HBM as a theoretical framework.

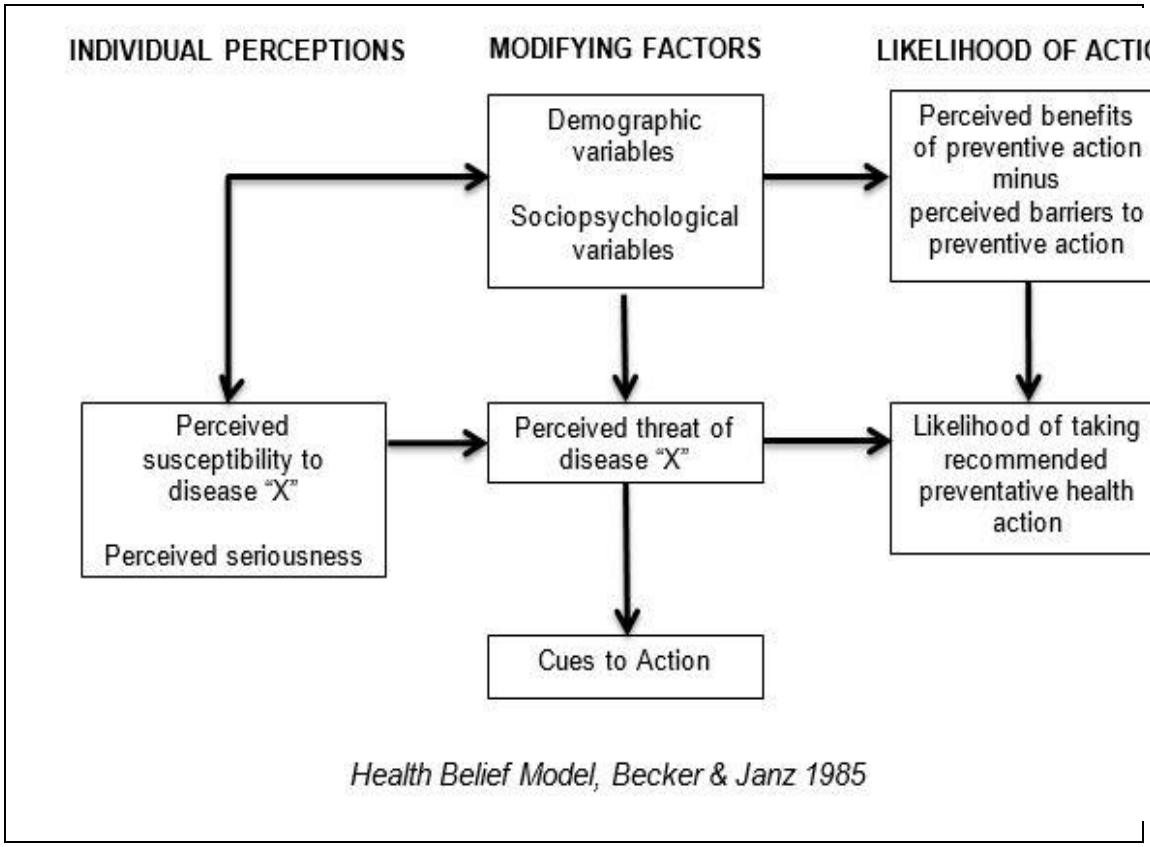

Table 3.1: Health Belief Model
Source: Janz and Becker (1985)

Perceived seriousness is an individual's belief regarding the severity of a disease. The perception is based on medical information and knowledge (Janz and Becker 1984: 2). This is the belief that one is vulnerable to the condition. The majority of MHCUs view a psychiatric diagnosis as a major concern, and a serious illness. The MHCUs believe they will be hospitalised, and this could mean lost income or lost employment due to stigmatisation. There is a perceived threat.

Perceived susceptibility is a powerful perception to encourage people to adopt healthier behaviours (Janz and Becker 1984: 2). The greater the perceived risk, the greater the chance of adopting behaviours to minimise the risk. Perceived susceptibility motivates people. MHCUs are motivated to be compliant on psychotropic medication, to prevent a relapse, and to avoid admission or readmission. They are motivated to adhere to treatment in order to remain employed and receive a source of income. They strive to maintain a normal lifestyle. When susceptibility is combined with seriousness, this results

in perceived threat. Behaviour usually changes when there is a perceived threat. With MHCUs, the perceived threat is that there is a risk of relapse and admission if they are not compliant on their treatment.

Perceived benefits are an individual's opinion of the value of a new behaviour in decreasing the risk of developing a disease; therefore people adopt healthier behaviours (Janz and Becker 1984: 2). Patients need to believe that there is a benefit, that following a particular recommendation will be advantageous, and that barriers and costs can be overcome. MHCUs who attend their follow-up appointments believe that they need to be compliant on treatment, because they need to avoid a relapse, prevent admission, and be able to qualify for a disability grant should the criteria be met. The use of mobile reminder applications is a recommended action that may reduce the disease threat (Trujillo 2015: 108).

Perceived barriers are the person's own perceptions of obstacles that prevent him/her from adopting a new behaviour (Janz and Becker 1984: 2). This is the most significant construct in determining behaviour change. In order for new behaviour to be adopted by an individual, there has to be a belief that the new behaviour will outweigh the consequences of the old behaviour (Janz and Becker 1984: 2). This belief overcomes barriers. One of the barriers perceived by MHCUs is weight gain due to the psychotropic medication, which is one of the reasons they may not adhere to treatment. If they are able to comply and attend their follow-up appointments, these concerns can be discussed with their doctor or mental health care practitioner (MHCP). There are alternative treatments available, namely typical and atypical psychotropics, with minimum side effects.

Modifying variables are personal factors that determine whether the new behaviour will be adopted (Janz and Becker 1984: 2-3). These can include culture, educational level, past experiences, skill and motivation. Many educated MHCUs are afraid of stigmatisation. MHCUs who have been previously admitted, do not want to experience it again as it was traumatic.

Cues to action are factors that will prompt an individual to start changing their behaviour (Janz and Becker 1984: 3). These include events such as mental health awareness month; people, such as MHCPs providing counselling and advice; MHCPs sending reminder SMS messages for follow-up care.

Self-efficacy is one's own belief in the ability to do something (Janz and Becker 1984: 2). MHCUs need to believe that they are capable of empowering themselves, by taking control of their mental health. The first step is compliance. This encourages MHCUs to be independent, and not add to the family burden of responsibility. Mbuagbaw *et al.* (2012: 2) used the HBM in their study in Cameroon in order to predict behaviour change. Short messages were sent to participants in the intervention group regarding adherence to ART. Trujillo (2015: 104-127) conducted a study on mobile reminders to enhance adherence in adults at an outpatient psychiatric clinic. The study indicated that 30% of the participants admitted to not taking medication due to forgetfulness, and 16% had other priorities. Trujillo (2015: 106) used the HBM as the theoretical framework to guide the study, and results indicated that patients who had an understanding of adherence realised that their behaviours can affect their treatment and quality of life (Trujillo 2015: 115).

Nundy *et al.* (2013: 125-132) used the HBM in their study for mobile phone-based diabetes interventions. Nundy *et al*. (2013: 131-132) concluded that the interventions affected self-management through several behavioural constructs, which included health beliefs, self-efficacy, and social support. Yun and Arriaga (2013) conducted a study on sending text messages to asthmatic patients as a health intervention. The intervention was designed using the HBM. Their findings concluded that the text messages led to improved health outcomes. They mention that the HBM is a cognitive theory of how individuals come to engage in preventative care management of their illness.

3.4 SUMMARY OF THE CHAPTER

The main constructs in HBM include perceived susceptibility, perceived severity, perceived barriers and perceived benefits. The emphasis is on self-care behaviour, helping patients appreciate the relationship between their self-management behaviours and their health (Nundy *et al*. 2013: 131). Research studies have been presented regarding SMS reminders to indicate the efficacy of using the HBM as a theoretical framework (Nundy *et al*. 2013; Yun and Arriaga 2013; Trujillo 2015; Mbuagbaw *et al*. 2012).

CHAPTER 4 : RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter gives an outline of the research design that was used to guide this study. The study setting, as well as the population and sample size is outlined. Ethical aspects of the study have been presented. The process used to collect and analyse the data is explained in detail.

4.2 RESEARCH PARADIGM

A paradigm assists the researcher to be organised in their way of thinking, observing and interpreting processes (Brink, van der Walt and van Rensburg 2015: 25). According to Grove, Burns and Gray (2014: 702), paradigm refers to a particular way of viewing phenomena that encompasses a set of philosophical assumptions and guides one's approach to enquiry. The study was informed by a positivist paradigm. A positivist paradigm is grounded on the assumption that there is reality out there which can be studied and known. Quantitative information is measured and analysed statistically (Polit and Beck 2014: 7). Valid, reliable data was generated with the use of a questionnaire.

4.3 DESIGN

Grove, Burns and Gray (2014: 195) define a research design as being a detailed plan according to which the research is conducted. Research design is about making choices and articulating a rationale for the choices one has made (Schwartz-Shea and Yanow 2013: 2). This study employed a quantitative, non-experimental survey. The design is appropriate to this study as there is social value. It was useful in generating knowledge that can lead to an improvement in health and services. MHCUs may benefit from the research. A survey was used to generate data, which had been adapted from Dr Caron Jack's study (Annexure 8 and Annexure 9). Permission was

obtained via email from Dr Jack to utilise the survey questions (Annexure 7). The questionnaire was formulated in isiZulu and English. Feedback to the community was conveyed in the language of their choice, and in a manner that was understood by everyone.

4.4 SETTING

Polit and Beck (2012: 743) describe a setting as an environment where data is collected for the study. The study took place at three community psychiatric clinics in the uMgungundlovu District in KZN, which are described below as Clinic A, Clinic B and Clinic C to maintain anonymity, and one hospital outpatient department (OPD). The four psychiatric clinics are based in a hospital in Pietermaritzburg. The selected hospital is a specialised hospital in the uMgungundlovu district. Clinical services rendered include child and adolescent psychiatric services, psychiatry, psychology, pharmacy, occupational therapy, social work and infection control. Tertiary services include first episode psychosis, dual diagnosis, psycho-geriatrics, neuro-psychiatry, child and adolescent unit, community liaison and outreach, HIV and psychiatry, and a psychotherapy unit. The four clinics service on average about 725 MHCUs per month. The medication for the clinic is packed by the selected hospital's pharmacy. Patients collect their psychiatric medication from their nearest clinic. Each community psychiatric clinic has only one professional nurse and one medical officer that attend to the psychiatric patients. The selected hospital's clinic has three professional nurses, and two medical officers/registrars on duty each day. All patient records are maintained manually.

4.5 SAMPLING PROCESS

4.5.1 Population size

A population refers to a set of individuals with common characteristics that the researcher wishes to study (Polit and Beck 2014: 61). The target population is the accessible population which is defined in terms of geographical location,

institutional affiliation or study unit characteristics to which the researcher has access, given the available resources (Streubert *et al*. 2003: 341). The accessible population is the population, often fixed in time and space, from which the actual sample is drawn (Stommel and Wills 2004: 299). From this study, the accessible population were MHCUs who visit the clinics on their appointment day. The number of MHCUs that collect treatment from the four clinics, total, on average about 725 per month. On average per month, Clinic A attends to 334 MHCUs, Clinic B 89 MHCUs, Clinic C 102 MHCUs, and the selected hospitals' OPD 200 MHCUs. The sample size for each clinic was drawn up in consultation with the statistician (Annexure 10) (Table 4.1).

Table 4.1: Sample size per facility

Facility	Sample size
The selected hospitals' outpatient department	50
Clinic A	84
Clinic B	22
Clinic C	26
Total	**182**

Due to the nature of the study as well as choosing convenience sampling, it made it very hard to calculate sample sizes. Often for these types of studies one decides on the time you can spend gathering data and see what sort of sample one would get. Collecting data for a week at each facility was decided upon. The total number of patients estimated to visit the 4 clinics in a month was 725. Taking ¼ of that would give a number (182) that visited in a week. This equates to sampling every patient that came in over a week. This seemed reasonable since patients from one week to the next should not be that different. The sample size of 182 is considered a reasonable size for analysis.

4.5.2 Sampling technique

The aim of sampling in quantitative research is to allow researchers to reach statistical validity and to generalise their results. Sampling can be defined as

the process of selecting cases to represent an entire population so that inferences about the population can be made. Two key considerations in assessing a sample in a quantitative study are its representativeness and size (Polit and Beck 2012: 275). A non-probability sampling method was used to select the participants. This method is regarded as more convenient and economical as participants cannot be easily persuaded or controlled (Brink, van der Walt and van Rensburg 2015: 139). In such an approach, access to the participants is limited because participants are selected as they present themselves for follow-up appointments and the researcher is unable to locate the entire population. According to Brink, van der Walt and van Rensburg (2015: 139), the quality of data will be high if the researcher works with willing and able participants. The technique used was convenience sampling. This is also known as accidental or availability sampling (Brink, van der Walt and van Rensburg 2015: 140). These are participants who are readily available for the study. This may present some bias, as participants will be at the right place at the right time. The researcher visited each clinic for a period of one week.

4.5.3 Inclusion criteria

- Participants who were 18 years and above.
- Participants who owned a cell phone.
- Participants who were utilising the mental health facility and are mentally healthy.

4.5.4 Exclusion criteria

- Participants less than 18 years old.
- Participants who resided in frail care facilities because their psychotropic medication is fetched by the nursing staff in the facility.
- Participants who were not mentally healthy.

4.6 DATA COLLECTION TOOL

A survey (Annexures 8 and 9) was used to generate data, which was adapted from Dr. Caron Jack's study. The survey was conducted through utilising a structured questionnaire. A questionnaire is a printed self-report form designed to elicit information which can be given through written responses of the participants. The questionnaire provides objectivity and support for statistical analysis (Burns and Grove 2011: 110). A structured questionnaire is one in which responses to the questions are pre-determined and in a specific order. This ensures that the data collected is unambiguous, and easy to count. During the development of a structured instrument, intense focus is placed on question formulation and content of the questions (Polit and Beck 2012: 297). A survey can be conducted to measure an event, attitude or behaviour in a specific population. At a specific point in time, the information is collected from a sample of the target population group through a descriptive survey. In the survey, the participants are asked to report events, feelings and behaviour retrospectively (Bowling 2009: 215).

4.7 QUESTIONNAIRE DEVELOPMENT

Permission was obtained via email from Dr. Jack to utilise the survey questions (Annexure 7). The questionnaire was developed by Dr. Jack, and then piloted with several participants for validation and to check for ambiguities. The original questionnaire was tested and has acceptable Cronbach. Looking at the objectives, questions were set that would yield data necessary to address each objective. Once the necessary questions were finalised, the questionnaire was piloted on eight people to make sure there are no ambiguities and all wording is clear. Thus the content of the questionnaire was checked by people who are familiar with the subject. The questionnaire was divided into two sections. The first section collected the demographic data of the respondents through closed-ended questions. The demographic data was included so that the characteristics of the participants could be described. This type of data can also be used when comparing different study samples, in other words when generalising the findings

(LoBiondo-Wood and Haber 2010: 277). The data relating to the most important specific characteristics of the respondents were gender, age, location of residence, ability to communicate in English and diagnosis. The second section of the questionnaire focused on determining the usage of a mobile phone.

4.8 DATA COLLECTON PROCESS

Participants were given the questionnaire by the researcher and independent health practitioners, so as not to influence participants' responses. The researcher liaised with the four psychiatric professional nurses in the psychiatric clinics, in order to gain co-operation and support. The researcher then scheduled a meeting at the discretion of the psychiatric professional nurses in order to explain the purpose of the study, and to address any concerns and suggestions.

Confidentiality involves the management of personal information. Permission was obtained from departmental heads for the researcher to utilise a consultation room in order to obtain written, informed consent from participants (Botma *et al*. 2010: 17). This ensured privacy and confidentiality. Informed consent forms were not stapled to the survey questionnaire. Participants were informed about the purpose of the research, if there were any risks or benefits involved, that participation was voluntary and that they could withdraw from the study or refuse to complete the questionnaire at any time. All hard copies of the data collected were stored in a locked, fireproof cupboard. The data file, stored as an electronic copy, is password protected.

In a month an estimated 725 patients visited these clinics. The researcher was at each of the clinics for a week and collected data from all patients who attended follow up care, during that week.

4.9 PRE-TESTING OF THE DATA COLLECTION TOOL

Botma *et al*. (2010: 275) state that a pre-test only tests specific aspects of a study, for example, the usability of the questionnaire. The pre-test determines if instructions are clear, and that participants understand what needs to be done. A pre-test survey was conducted by the researcher on eight participants who met the inclusion criteria. The data collected from the pre-test was not used in the main study. Participants were selected from the psychology outpatient department at the selected hospital. Results of the pre-test revealed that all the participants understood the instructions clearly, and did not experience any difficulties in completing the questionnaire.

4.10 DATA ANALYSIS

Data analysis is the manner that decreases, organises and gives meaning to data. As a convenience sample was used, descriptive statistics described and synthesised the data (Polit and Beck 2012: 299). Descriptive statistics in the form of tables and graphs were used to describe the data graphically. In order to test for significant trends in the data, inferential statistics were applied. These included Pearson's, t-tests, ANOVA and chi-square goodness-of-fit-tests. Where the conditions were not met for the application of these tests, non-parametric equivalent tests or exact tests were used. Throughout, a p-value of 0.05 was used to indicate significance. The analysis was carried out using SPSS, version 23.

4.11 RESEARCH RIGOUR

According to Grove, Burns and Gray (2014: 36), rigour is when one strives for excellence, which requires discipline. This involves detail, accuracy of data and precision. Data is collected in a systematic manner and contamination of data needs to be minimised. Reliability represents the consistency of the measure achieved (Botma *et al.* 2010). A valid measuring instrument should produce the same result when applied to different groups. Validity means that the conclusion of the study are justified based on the design and

interpretation. The measurement needs to represent a true value. Participants were given the questionnaire by the researcher and independent health practitioners, so as not to influence participants' responses. Participants were not intimidated in order to provide responses that the researcher was seeking. Confidentiality was reinforced and all completed questionnaires were placed in a sealed slotted box.

The original questionnaire was in English but the language and words of the questionnaire were translated into isiZulu. The isiZulu questionnaires were translated back to English to ensure validity of data collection. The data collected was accurately coded, captured and subsequently analysed using version 23 of SPSS. Correct coding also ensured that MHCUs were not repeated in the study. The researcher cross-checked codes with the statistician. The researcher ensured that questionnaires were completed by MHCUs as they presented for follow-up care at the clinic. MHCUs were booked in advance for their appointment by the clinic staff. This was cross-checked against appointment bookings. The study took place at the psychiatric clinics where MHCUs attended their follow-up care, therefore ensuring that only MCHUs participated in the study. Data obtained was screened.

4.12 ETHICAL CONSIDERATIONS

Research, participants and society need to be respected and protected against harm. For this purpose, codes of ethics have been developed to ensure that research participants are protected (Burkhardt and Nathaniel 2008: 306-308). Once ethics clearance was granted by the Institutional Research Ethics Committee (IREC) (Annexure 1), permission was sought and granted by the District Manager of uMgungundlovu Health District (Annexures 2a and 2b), KZN Department of Health (Annexure 3a and 3b) and the Chief Executive Officer (CEO) of the hospital (Annexures 4a and 4b). The letter of information which outlined the aim of the study and the process of data collection was given to participants (Annexures 5a and 6a). All consenting participants were requested to sign an informed consent form (Annexures 5b

and 6b). The participant was informed that they could withdraw from the study or refuse to complete the questionnaire at any time and that there would be no penalty imposed.

Questionnaires and informed consent forms were handed to participants once a mental state examination had been conducted, and the participant was regarded as mentally healthy. The mental state examination was conducted by advanced psychiatric practitioners in the respective clinics.

The three ethical principles that guided the researcher during the research process included a) respect for persons, b) justice, and c) beneficence. Human rights need to be protected in research (Brink, van der Walt and van Rensburg 2015: 34).

4.12.1 Respect

Respect involves three beliefs namely, individuals are autonomous, respect for traditional practice and culture, and additional protection for individuals with diminished autonomy. A person has the right to choose whether they want to participate in a study. Participation must be voluntary. These rights need to be respected by the researcher. Traditional practices need to be respected, as some religious groups and communities differ in their beliefs (Brink, van der Walt and van Rensburg 2015: 35). Vulnerable groups need to be protected where power relations are present (Brink, van der Walt and van Rensburg 2015: 35); such groups include children, individuals with mental disorders, institutionalised individuals and patients who are unconscious. MHCUs are regarded as a vulnerable group (Brink, van der Walt and van Rensburg 2015: 42).

In the current study, the researcher ensured that the principles of ethics were strictly adhered to. All participants received an information letter which outlined the nature of the research study, and provided comprehensive and clear information regarding participation in the study. Informed consent was obtained from all participants before they participated in the research study.

The information letter and informed consent form were provided in English and IsiZulu. Advanced MHCPs were involved in the data collection process. MHCUs who presented at the clinic for follow-up care and treatment collection were approached to participate.

Confidentiality was maintained throughout the data collection process. Confidentiality requires that the participant's personal information and responses be kept private (Burkhardt and Nathaniel 2008: 309). The researcher ensured confidentiality by restricting access to the data. Electronic data were kept in a password protected computer and only the researcher and the supervisors had access to the data. Hard copies were kept in a lockable cupboard at the researcher's home. Participants' completed questionnaires were placed in a sealed, slotted box.

4.12.2 Justice

Brink, van der Walt and van Rensburg (2015: 36) state that justice is the participant's right to fair treatment and selection. Participants must be selected for the research problem, they must be treated fairly and agreements must be adhered to. The right to privacy must be respected, and information obtained remain confidential (Brink, van der Walt and van Rensburg 2015: 37).

In this study, all participants who presented at the clinic for follow-up care on the day data was being collected, were requested to participate. The inclusion and exclusion criteria were strictly followed. Participation was voluntary, informed consent obtained and confidentiality was maintained. The participant could choose to participate or not to participate after having received information regarding the research (Annexures 5a and 6a). The participants' choices were respected (Burkhardt and Nathaniel 2008: 54).

4.12.3 Beneficence

Beneficence is securing the well-being of a participant from discomfort and harm (Brink, van der Walt and van Rensburg 2015: 35). These include physical, psychological, emotional, spiritual, economic, social or legal aspects. Should this be compromised, the research should be abandoned or restated in order for the research to be undertaken in an ethical environment (Brink, van der Walt and van Rensburg 2015: 36). Brink, van der Walt and van Rensburg (2015: 36) state that researchers enter organisations and the lives of participants, therefore there should be respect for organisational culture and reputation.

In the current study, potential MHCUs who were willing to participate in the study completed the questionnaire in a closed room, thereby providing confidentiality and privacy. Participants arriving at the clinic for scheduled follow-up care were approached. This ensured there were no financial implications for the participant. Participants were assured that they or the institution would not be identified in the report in a way that could cause them harm.

4.13 SUMMARY OF THE CHAPTER

This chapter provided an overview of the research methodology used to guide the study. The results of the study will be presented in the chapter that follows.

CHAPTER 5 : PRESENTATION OF THE RESULTS

5.1 INTRODUCTION

This chapter will discuss the data analysis process and present the results of the study. The purpose of data analysis in any research is to organise and give order to a large body of collected information so that general conclusions can be reached and communicated in the research report.

In order to manage raw data, data was captured on an excel spread sheet. The data collected was thereafter analysed using SPSS, version 23. Tests used in the analysis included the following:

- Descriptive statistics including means and standard deviations, where applicable. Frequencies are represented in tables or graphs. These statistics describe and summarise data (Brink, van der Walt and van Rensburg 2015: 180).
- Chi-square goodness-of-fit-test: this is a univariate test, used on a categorical variable to test whether any of the response options are selected significantly more/less often than the others. Under the null hypothesis, it is assumed that all responses are equally selected.
- Chi-square test of independence: used when there are two categories of variables from a single population. This is used to determine whether there is an association between two variables.
- Binomial test: tests whether a significant proportion of respondents select one of a possible two responses.

5.2 SAMPLE REALISATION

In total, 182 questionnaires were distributed, and (n=182) 100% were returned. There were no spoils and all questionnaires were fully completed.

5.3 SECTION A: DEMOGRAPHIC DATA

This section presents data in respect of personal information of respondents including: gender, age, location of residence, language and diagnosis of the participant.

5.3.1 Gender

Gender of participants who completed the questionnaires is illustrated in Table 5.1. The majority of the participants were females (n=94) 51.6% with a lesser percentage being males (n=88) 48.4%.

Table 5.1: Gender of the participants

Gender	Frequency	Percentage
Male	88	48.4%
Female	94	51.6%
Total	182	100%

5.3.2 Age

Ages of participants who completed the questionnaires are illustrated in Table 5.2. Respondents were between the ages 18 and 83 years old. The average age of participants was 45.94.

Table 5.2: Age of the participants

	N	Minimum	Maximum	Mean
Age	182	18	83	45.94

5.3.3 Location of residence

The location of participants who completed the questionnaire is illustrated in Table 5.3. The majority of participant lived in other areas (n=78) 42.9%.

Table 5.3: Location of residence

Location	Frequency	Percentage
OPD in selected hospital	8	4.4%
Clinic A	51	28%
Clinic B	20	11%
Clinic C	25	13.7%
Other	78	42.9%
Total	182	100%

5.3.4 Language

The significant majority of participant could communicate in English (n=174) 95.6%. The number of participant who could communicate in English, and who completed the questionnaires in English, is illustrated in Table 5.4.

Table 5.4: Communication in English

	Frequency	Percentage
Can communicate in English	174	95.6%
Cannot communicate in English	8	4.4%
Total	182	100%

5.3.5 Diagnosis of the respondents

There were (n=146) 80.2% participant who knew their diagnosis, and (n=35) 19.2% did not know their diagnosis, and one missing system (n=1) 0.5%. Table 5.5 illustrates their answers.

Table 5.5: Diagnosis of the participants

Diagnosis	Frequency	Percentage
Psychotic disorder	46	31.5%
Anxiety disorder	40	27.4%
Bipolar disorder	32	21.9%
Depression	61	41.8%
Cognitive disorder	10	6.8%
Eating disorder	6	4.1%
Somatic symptoms and related disorder	1	0.7%
Adjustment disorder	1	0.7%
Epilepsy	18	12.3%
Other	3	2.1%

Some participants have more than one diagnosis. Of those who knew their diagnosis (n=146) 80.2%, (n=46) 31.5% indicated that they have been diagnosed with psychotic disorder; (n=40) 27.4% had anxiety disorder; (n=32) 21.9% suffered with bipolar disorder; (n=61) 41.8% suffered from depression; (n=10) 6.8% were diagnosed with cognitive disorder; (n=6) 4.1% had an eating disorder; (n=1) 0.7% of participants suffered with somatic symptoms and related disorders, as well as adjustment disorder; and (n=18) 12.3% were diagnosed with epilepsy. Other diagnosis included borderline personality disorder, sleep disorder, obsessive compulsive disorder and Huntington's disease.

The number suffering from each of these disorders is not a majority proportion of the sample. There is a significant relationship between forgetting to collect medication and suffering from a psychotic disorder, χ^2 (1) =6.377, p=.012. A significant number of those who suffer from a psychotic disorder forgot to collect their medication. Figure 5.1 illustrates the diagnosis of the participants.

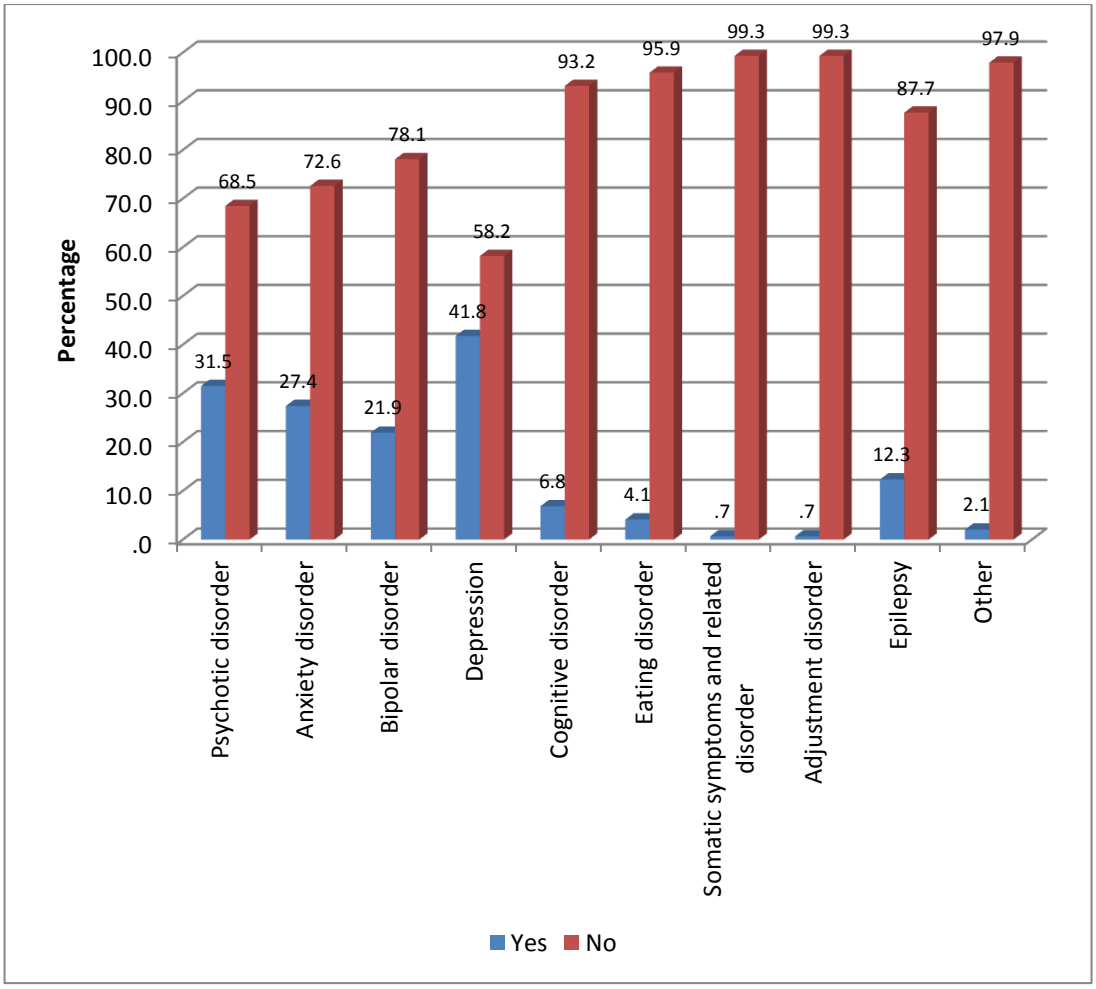

Figure 5.1: Diagnosis of participants

5.4 SECTION B: MOBILE PHONE USAGE

This section presents data in respect of mobile phone usage, acceptability as well as feasibility of using SMS as reminders for follow-up care, and missed appointments.

5.4.1 Mobile phone usage

A significant (n=181) 99.5%, p<.0005 of participants, as illustrated in Figure 5.2, owned and used a mobile phone. One participant did not own a mobile phone, but did use and have access to a mobile phone.

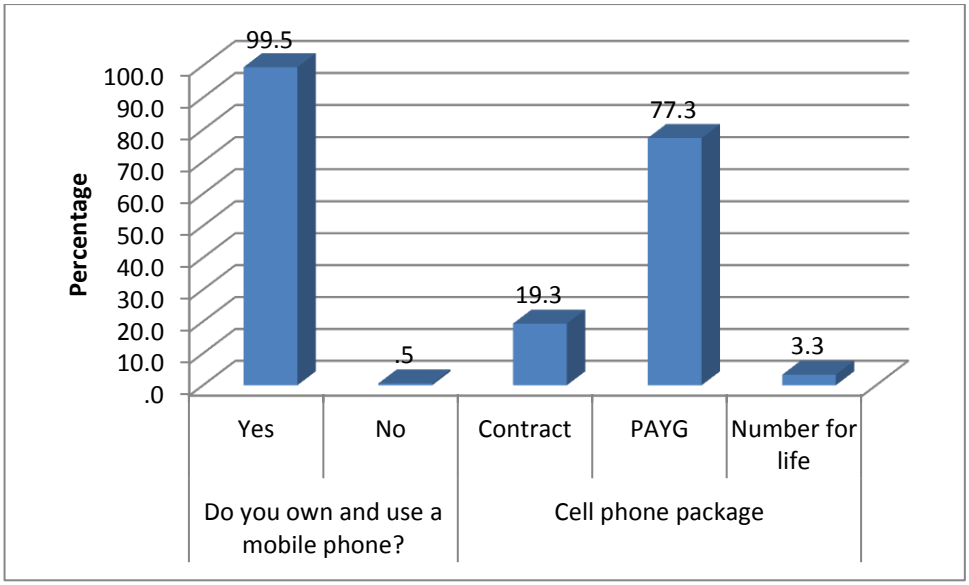

Figure 5.2: Ownership of mobile phone

5.4.2 Cell phone package

Of the (n=181) 99.5% of participants who owned and used cell phones, a significant number (n=140) 77.3% indicated that they run their cell phones on a 'pay as you go' basis, χ^2 (2) =164.762, p<.0005; and (n=35) 19.3% had a cell phone contract. Table 5.6 and Figure 5.3 illustrate the cell phone package used by participants.

Table 5.6: Cell phone package

	FREQUENCY	PERCENTAGE
Contract	35	19.3%
Pay As You Go (PAYG)	140	77.3%
Number for life	6	3.3%
Total	181	100%

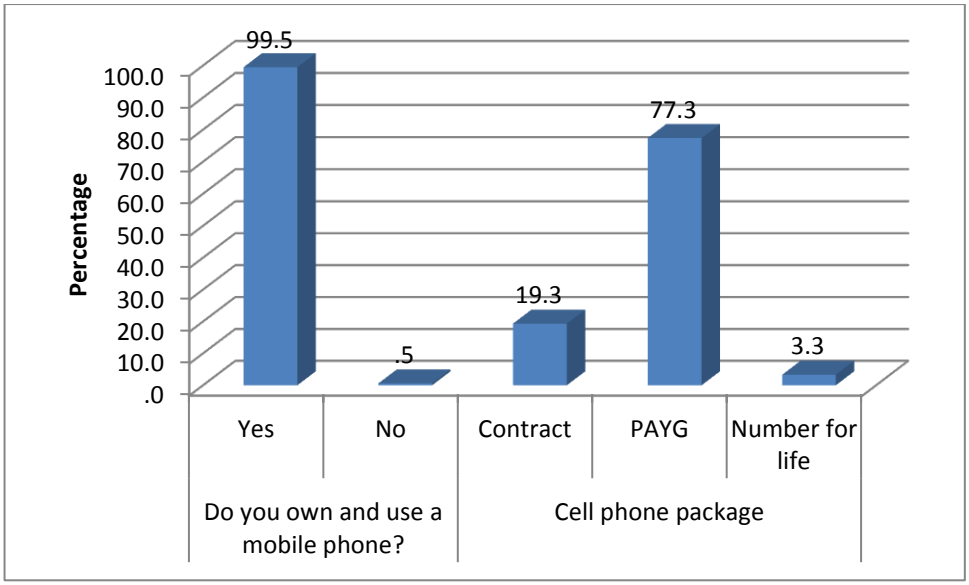

Figure 5.3: Cell phone package

5.4.3 Acceptability and feasibility of SMS

A significant proportion of the participants indicated that they were the only user of the mobile phone (n=151) 83%, p<.0005; they did not lend their mobile phone to other people (n=142) 78%, p<.0005; they did not change their number in the past year (n=143) 78.6%, p<.0005; and they did not share the sim card with other people (n=74) 95.6%, p<.0005.

The SMS on the mobile phone is utilised by a significant number of the participants (n=165) 92%, p<.0005. Participants received a good mobile phone signal from their home (n=156) 86.2%, p<.0005, and a significant proportion of participants indicated that their mobile phone had never been stolen (n=126) 69.6%, p<.0005.

A significant proportion of participants indicated that they had never forgotten to collect their medication (n=120) 66.3%, p<.0005. N=83 (45.9%, p<.0005) of participants had been out of airtime for more than a week; this is a significant proportion of the sample. A significant proportion of participants were able to keep their mobile phone battery charged (n=170) 93.9%, p<.0005, and a significant (n=169) 93.4%, p<.0005 were interested in receiving medical

reminders via sms on their phone. Figure 5.4 illustrates the acceptability and feasibility of using SMS.

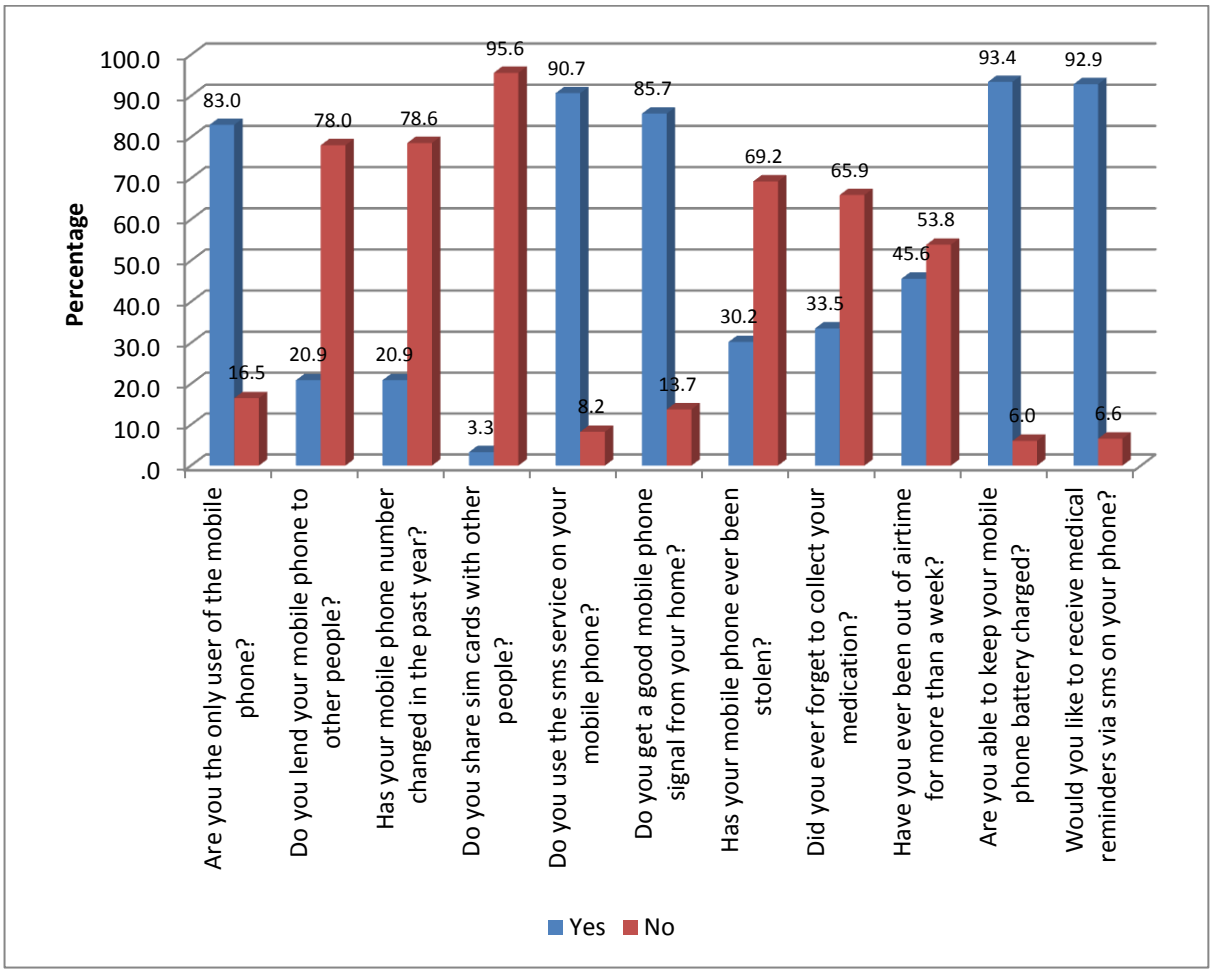

Figure 5.4: Acceptability and feasibility of SMS

5.4.4 Missed appointments

A significant number of the (n=84) 46.2%, p<.0005 participants had missed appointments and (n=98) 53.8%, p<.0005 stated that they had not missed an appointment.

5.4.5 Frequency of missed appointment

Of the (n=84) 46.2% participants who had missed appointments, (n=28) 33.3% had missed their appointment once, and (n=45) 53.6% had missed

their appointment 2-3 times. Table 5.7 illustrates how often respondents missed appointments in a 12 month period.

Table 5.7: Frequency of missed appointments

	Frequency	Percentage
Never missed an appointment	98	-
Once	28	33.3%
2-3 times	45	53.6%
4-6 times	7	8.3%
>6 times	4	4.8%
Total	182	100%

5.4.6 Reasons for missed appointments

Of the (n=84) 46.2% participants who had missed appointments, (n=58) 69%, p<.0005 indicated that they had forgotten; (n=5) 6%, p<.0005 of participants had no money; participants had no transport (n=4) 16.7%, p<.0005; and (n=14) 16.7%, p<.0005 of participants were working. Table 5.8 illustrates the reasons for missed appointments.

Table 5.8: Reasons for missed appointments

	Frequency	Percentage
Never missed an appointment	98	-
I forgot	58	69%
I had no money	5	6%
I had no transport	4	4.8%
I was working	14	16.7%
Other	3	3.6%
Total	182	100%

Other reasons specified for missed appointments included having to fetch a grandchild (n=1) 1.2%, p<.0005; participant was on holiday (n=1) 1.2%, p<.0005; and participant was sick (n=1) 1.2%, p<.0005. Table 5.9 illustrates other specified reasons for missed appointments.

Table 5.9: Other specified reasons for missed appointments

	Frequency	Percentage
Valid	81	96.4%
Had to fetch grandchild	1	1.2%
Holiday	1	1.2%
Sick	1	1.2%
Total	84	100%

5.5 CONCLUSION

In this chapter, the researcher was able to analyse the information obtained from using a survey questionnaire. Substantial data on demographics and mobile phone usage was obtained. The next chapter presents a discussion of the results.

CHAPTER 6 : DISCUSSION OF RESULTS

6.1 INTRODUCTION

In the previous chapter, the researcher was able to analyse the data that was obtained from using a survey questionnaire. A discussion of the findings of the study is presented in this chapter. This study aimed to determine the number of MHCUs who will be willing to utilise the SMS, assess if it would be feasible for MHCUs to utilise the SMS text service, and determine how often MHCUs missed their appointments. The theoretical framework that was used to guide the study was the HBM, whereby health behaviour is regulated by the patient's personal belief about their disease, and strategies used to decrease the occurrence.

6.2 DEMOGRAPHIC DATA

6.2.1 Gender and age

The findings of the study revealed that the majority of the participants were females (n=94) 51.6% with a lesser percentage being males (n=88) 48.4%. The results further showed that the participants were between the ages 18 and 83 years old, the average age of participants being 45.94. According to Bangasser and Valentino (2014: 303), the onset and severity of severe psychiatric illnesses occur more frequently in women than in men. Findings by Torous, Friedman and Keshavan (2014: 6) indicate that age may not be a barrier to technology.

6.2.2 Location of residence

The majority of participants lived in other outlying areas (n=78) 42.9%, hence participants travelled a distance to receive follow-up care at the clinic. As a result, this could imply financial implications for a missed appointment. In terms of one of the constructs from the HBM, this study has identified that the location of residence of participants could be a perceived barrier. This can be an obstacle that prevents an individual from adopting a new behaviour. A study conducted by

Pell *et al.* (2013: 7) indicated that patients had missed appointments because they had to use public transport and encountered travel costs. The costs varied depending on how far they lived from the clinic.

6.2.3 Language

The major proportion of participants could communicate in English (n=174) 95.6%. This does not necessarily indicate that participants could read English. However, the questionnaires were completed by the participants themselves, indicating that they could read English. Only a small proportion of (n=8) 4.4% could not communicate in English. These participants completed the questionnaire in isiZulu. The language median most commonly used in South Africa is English, and the majority of SMS are sent in English. This could inadvertently disadvantage non-English speaking MHCUs.

According to the HBM, language may be a perceived barrier to follow-up care as MHCU's avoid follow-up appointments due to communication difficulties. Pell *et al*. (2013: 8) and Kaplan-Lewis and Percac-Lima (2013: 253) concur that communication is a problem, which contributes to poor clinic attendance. In a study conducted by Kaplan-Lewis and Percac-Lima (2013: 253) the findings revealed that non-English speakers were less likely to attend appointments. In Pell *et al*.'s (2013: 8) study, a communication barrier was encountered, and this obstacle was overcome by having one-to-one communication and health talks with patients. Little attention has been devoted to the impact of language on follow-up care.

6.2.4 Diagnosis of the respondents

Results of this study indicate that there were 146 participants who knew their diagnosis, with the largest proportion (n=46) 31.5% being diagnosed with a psychotic disorder; (n=61) 41.8% with depression; (n=40) 27.4% suffering from anxiety; and (n=32) 21.9% diagnosed with bipolar disorder. According to the HBM, perceived seriousness is an individual's belief about the gravity of the disease and perceived susceptibility motivates people to adopt healthier

behaviour (Janz and Becker 1984: 2). One of the barriers perceived could be the ability to use mobile technology. Firth *et al.* (2016: 452) state that feasibility could be compromised due to symptoms and cognitive dysfunction; yet Harrison *et al.* (2011: 520) found in their study that there was a reduction in stress, anxiety and depression, with marked improvements in functional impairment when SMS reminders were used. The findings in the study conducted by Kannisto *et al*. (2015: 7) confirmed that people with psychiatric disorders are capable of using SMS interventions. Cognitive impairment is common. Nevertheless, Ben-Zeev *et al.* (2013: 341) found that this was not a barrier, owing to the fact that many people with a psychiatric diagnosis were willing to use mobile devices if given the opportunity.

6.3 MOBILE PHONE USAGE

6.3.1 Mobile phone usage

A significant (n=181) 99.5%, $p < .0005$ of participants owned and used a mobile phone, which supports the findings of Torous, Friedman and Keshavan (2014: 5), Firth *et al*. (2016: 452) and Ben-Zeev *et al*. (2013: 343), that ownership of a mobile phone among patients who have a mental disorder is increasing substantially. This is evident in this study because respondents owned and used mobile devices, irrespective of the stigma that comes with having a psychiatric diagnosis (Mestdagh and Hansen 2014: 84). This is an indication that participants were able and willing to utilise mobile devices as this is a perceived benefit to them. A valuable construct identified by this study is self-efficacy, whereby MHCUs are confident that they are capable and have the ability to take control of their mental health.

The HBM is a cognitive theory of how individuals come to engage in preventative care management of their illness (Yun and Arriaga 2013: 1769). A cue to action is a key construct as it prompts individuals to change their behaviour (Janz and Becker 1984: 3). Individuals with a psychiatric diagnosis are proactive in empowering themselves to own and use a mobile phone. Ben-Zeev *et al,* (2014: 1244) and Ben-Zeev *et al*. (2013: 341) concur that mobile phone ownership is

expanding due to the advantage of devices being light-weight, easy to operate, are usually carried on the person, are usually turned on, and are reducing in cost. Firth *et al.* (2016: 453) predicts that ownership of mobile devices will continue to escalate among people with mental disorders.

6.3.2 Mobile phone package

Although Firth *et al*. (2016: 449) mention that unemployment reduces access to technology, results of this study indicate otherwise. Of the (n=181) 99.5% of participants who owned and used mobile phones, a significant (n=140) 77.3%, $p < .0005$ indicated that they run their cell phones on a 'pay as you go' basis, and (n=35) 19.3% had a mobile phone contract. Results could indicate that the majority of MHCUs are unemployed or not earning well, which results in MHCUs being unable to take out mobile phone contracts. This could also be a contributing factor for why respondents have 'pay as you go' packages, as it is more affordable and easily accessible.

According to the HBM, unemployment can be a perceived barrier due to financial implications. Lack of finances reduces attendance for follow-up appointments. In order for new behaviour to be adopted, there has to be a belief that the new behaviour will outweigh the consequences of the old behaviour (Janz and Becker 1984: 2). In order to continue receiving a disability grant from the South African Social Security Agency (SASSA), one of the criteria is to remain compliant on treatment and attend follow-up appointments (Republic of South Africa 2017). This can be demonstrated as a perceived benefit.

Mestdagh and Hansen (2014: 84) mentioned in their study that many patients felt unsupported in the work place; people had a low tolerance for the illness; and were afraid of mentally disturbed patients. This stigma prevents patients from finding gainful employment and forces them to apply for a disability grant through SASSA. The amount that MHCUs are currently entitled to receive is a maximum of R1600 per month.

6.3.3 Acceptability and feasibility of SMS

A significant proportion of the participants indicated that they were the single user of the mobile phone (n=151) 83%, p<.0005, they did not lend their mobile phone to other people (n=142) 78%, p<.0005, and they did not share the sim card with other people (n=174) 95.6%, p<.0005. This suggests it is feasible to send SMSs because privacy can be secured, as mobile devices have password access, pattern security lock, retinal scanners, as well as fingerprint identification.

The HBM construct, cue to action, is the effect an intervention can have on health behaviour (Yun and Arriaga 2013: 1776). Factors that will enable cue to action include privacy and security, turnover of cell phone number, data charges, mobile signal and an interest in mobile technology. Cue to action was supported by the fact that majority of the of respondents already use SMSs. Cue to action prompts individuals to take control of their health needs, by utilising various methods as reminders, as evidenced from the results of the study by Madhvani *et al.* (2015: 514), where patients used diaries and relatives/friends to remind them of appointments.

Torous, Friedman and Keshavan (2014: 6) and Harrison *et al*. (2011: 521) agree that privacy and security are paramount. Although there is biometric security on mobile devices, and despite network security technologies, privacy and security remain an important issue.

Although a significant number of participants did not change their number in the past year (n=143) 78.6%, p<.0005, Georgette *et al.* (2016: 7) found that there was a compelling need to update patient phone numbers due to the high phone turnover.

A significant number of participants indicated that they used SMSs on the mobile phone (n=165) 92% p<.0005, which strengthens the cue to action perspective. However, in Torous, Friedman and Keshavan's study (2014: 6), they found that patients were more interested in using smartphone messaging applications than using SMSs.

A significant number of participants received a good mobile phone signal from their home (n=156) 86.2%, p<.0005. These results indicate that MHCUs would be able to receive SMSs with minimal disruption of service, although Harrison *et al.* (2011: 521) mention that mobile coverage can vary within and between networks. Ben-Zeev *et al.* (2013: 341) stated that approximately 90% of the world's population is covered by a mobile cellular signal.

A significant proportion of participants indicated that their mobile phone had never been stolen (n=126) 69.6% p<.0005. Even if a phone has been stolen, the researcher is aware that this does not necessarily mean that there will be a changed number, as the option for retaining one's number for life or a SIM swap, is now possible. This does, however, mean that patient phone numbers still need to be updated regularly due to the high turnover of mobile devices (Georgette *et al*. 2016: 7).

A noteworthy percentage of participants indicated that they had never forgotten to collect their medication (n=120) 66.3%, p<.0005. This could be due to the majority of the participants already using complementary methods of reminders, such as diaries and relatives/friends to remind them of appointments. This portrays self-care behaviour, an important concept of the HBM, where patients appreciate the relationship between their self-management behaviours and their health (Nundy *et al*. 2013: 131). In a study for mobile phones being utilised as an appointment reminder, conducted by Madhvani *et al.* (2015: 514), it was reported that 61.5% of respondents used a clinic register card with the appointment date on it; a smaller percentage used a diary/appointment book, while others relied on a close friend, relative or partner. A very small percentage (10.5%) used a mobile device as a reminder.

A significant number of participants (n=83) 45.9%, p<.0005 had been out of airtime for more than a week. This is not a large proportion, but it could indicate that financial barriers might exist, which is supported by Firth *et al*. (2016: 452) who found that financial barriers impacted on patients' ability to purchase data plans. The study conducted by Harrison *et al*. (2011: 521) reported that data

charges and SMS cost could vary widely. This would also be dependent on the mobile phone package that respondents were using. In the study conducted by Georgette *et al*. (2016: 2630), patients did not incur any costs when an SMS was sent to them. Tavakolizadeh *et al.* (2014: 1) noted that mobile users were online all the time, responsive and available for SMSs, consequently making SMS acceptable and feasible.

A significant proportion of participants were able to keep their mobile phone battery charged (n=170) 93.9% p<.0005, and a significant (n=169) 93.4%, p<.0005 were interested in receiving medical reminders via SMS on their phone. Haddad, Brain and Scott (2014: 56) mention that in their study, patients were interested in receiving SMS as they were cheap, nonintrusive and a simple way of sending information. Ben-Zeev *et al*.'s (2014: 1250) study of illness management in individuals with a mental disorder proved that SMSs were feasible and acceptable. This study revealed that MHCUs were interested in receiving SMS, which is supported by findings from Yun and Arriaga (2013: 1777) that mention that the HBM presents valuable opportunities.

6.3.4 Reasons for missed appointments

A significant number of the participants (n=84) 46.2%, p<.0005 had missed appointments. Of the (n=84) 46.2% participants who had missed appointments, (n=28) 33.3% had missed their appointment once, (n=45) 53.6% had missed their appointment 2-3 times, (n=7) 8.3% had missed an appointment 4-6 times, and (n=4) 4.8% had missed an appointment more than 6 times. Trujillo (2015: 106) used the HBM as the theoretical framework to guide his study, and results indicated that patients who had an understanding of adherence realised that their behaviours can affect their treatment and quality of life (Trujillo 2015: 115). According to the HBM construct, MHCUs in this study may not perceive the seriousness of their diagnosis as a serious threat as (n=58) 69%, p<.0005 indicated that they had forgotten their appointments.

Kaplan-Lewis and Percac-Lima (2013: 252-254) found that forgetting and miscommunication were the main reasons for not attending appointments. They recommended text messaging as a way of targeting these barriers. Haddad, Brain and Scott (2014: 56) state that reminders are helpful if forgetting is unintentional. If non-adherence was due to a deliberate decision taken by the MHCU, this approach would not be feasible.

Participants who were working accounted for (n=14) 16.7%, p<.0005 of the sample, which could possibly account for the (n=35) 19.3% of participants who had mobile phone contracts. The findings in a study conducted by Boksmati *et al.* (2016: 2) were that forgetfulness and work were contributing factors to missed appointments.

Participants who had no money to attend follow-up care, accounted for (n=5) 6%, p<.0005 of the sample, and (n=4) 16.7%, p<.0005 had no transport. The HBM model mentions perceived barriers, which is a person's own perception of obstacles (Janz and Becker 1984: 2). A financial barrier was revealed in Pell *et al*.'s (2013: 7) study in Ghana, Kenya and Malawi, where patients attending the ANC clinic had to pay for transport to the clinic, as well as charges for attending the clinic. Respondents in Pell *et al*.'s study (2013:7) indicated that they often had to wait for money to become accessible in order to attend clinic appointments, which may be due to unemployment.

6.4 CONCLUSION

This chapter discussed the results of the research findings. Additional literature was sourced to support findings. The main constructs of the HBM were discussed and integrated into the discussion.

CHAPTER 7 : CONCLUSION, LIMITATIONS OF THE STUDY AND RECOMMENDATIONS

7.1 INTRODUCTION

This chapter will conclude the research study, discuss limitations experienced, and suggest recommendations for the study.

7.2 CONCLUSION

The study findings are concluded according to the objectives below:

7.2.1 Objective 1: Determine the number of MHCUs who will be willing to utilise the SMS

This objective addressed the relationship between MHCUs and the willingness to use the SMS. The study demonstrated that there was an interest and increased access to mobile technology. The majority of MHCU's used and owned mobile devices (n=181, 99.5%). The great majority of MHCUs (n=169, 93.4%) were interested in receiving SMSs, therefore this study shows that there is an interest and increased access to mobile technology.

7.2.2 Objective 2: Assess if it would be feasible for MHCUs to utilise the SMS text service

The results from this study are consistent with various studies that showed SMS text message reminders can be a useful tool in order to improve health outcomes; SMS reminders for follow-up care may be an effective method in improving appointment attendance and treatment adherence. The results of this study revealed that text messaging could be a viable method of improving attendance rates for follow-up care of MHCUs, and endorses the use of existing mobile technology, such as SMSs. The majority of participants indicated that they utilise SMSs (n=165, 92%). Mobile device turnover was only (n=55) 30.4%. Even though (n=83) 45.9% of the participants had been out of airtime for more than a week,

there is no cost involved, neither is airtime required to receive a SMS. The majority of participants received a strong network signal (n=156, 86.2%) and were able to keep their mobile device's battery charged (n=170, 93.9%). The majority of participants were single users of their mobile device (n=151, 83.4%), but with biometric security features available on mobile devices, information can be secured. It is evident from this study that SMS text messages would be acceptable and feasible for MHCUs.

7.2.3 Objective 3: Determine how often MHCUs miss their appointments

The results of the study indicated that (n=84) 46.2% participants had missed their appointment at some stage. A majority of participants (n=45) 53.6% had missed their appointment 2-3 times. Although a substantial proportion of participants had indicated that they had not missed appointments or forgot to collect treatment, the relapse and admission rate remain high, reducing quality of life and incurring a high economic cost for inpatient care.

7.3 LIMITATIONS OF THE STUDY

There were several limitations to the study. Firstly, results were obtained from MHCUs attending psychiatric community clinics and a tertiary outpatient department where medication is supplied from one pharmacy department. There are numerous other clinics that have their medication dispensed to them by district hospitals. Feasibility and acceptability may prove to be different at those clinics, as they are situated in different areas, with varied resources. In relation to this another limitation was that the sample size of 182 participants was small. A vast number of MHCUs attend outlying clinics for follow-up care, but these are not designated psychiatric clinics. Many MHCUs attend general clinics, and are not accounted for as MHCUs.

There may be some degree of respondent bias due to familiarity with the researcher.

7.4 RECOMMENDATIONS

The following recommendations based on the results of the study are made with special reference to recommendations to the Department of Health, nursing education and further research.

7.4.1 Recommendations to the Department of Health

Research results from this study can be used as motivation to the Department of Health to consider the strategy of sending SMS reminders to MHCUs for their follow-up care and develop appropriate policy in this regard. This will prove to be beneficial as it will contribute towards ensuring quality care. As health care providers, the main aim is to ensure that patients receive the best quality care, prevention of relapse and in-patient care. Encouraging patients to attend follow-up appointments will prompt MHCUs to be treatment compliant, allow for early detection of extra-pyramidal side effects caused by the use of psychotropic medication, bring about a reduction in in-patient care, and decrease the economic burden to families and society.

The researcher suggests that MHCPs be trained and have access to digital technology in order to communicate effectively with MHCUs.

7.4.2 Nursing education

Currently the nursing curriculum does not include information technology. It is strongly recommended that the nursing education curriculum incorporates digital technology. The digital technology suggested would be computer literacy in order to operate a general computer; information literacy so that students will be able to identify the need for information, and nurse informatics in order to integrate nursing science, computer science and information science. These skills will equip a nurse with the necessary information technology skills, which will aid in the successful implementation of such a service.

Mental health nurses should be encouraged to be able to communicate in the language of choice in the clinics they are working at. A short language course is recommended. This will aid in bridging the gap created by a language barrier.

7.4.3 Further research

The researcher is of the view that this topic warrants further research. This study is limited in its generalisability due to a small sample size. Therefore, it is suggested that a larger feasibility study be conducted to ascertain the usefulness of an SMS system. This should include district hospitals and outlying clinics to account for the large number of MHCUs who do not attend psychiatric hospitals and clinics.

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ANNEXURES

Annexure 1: University ethics clearance

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31 March 2017

IREC Reference Number: **REC 107/16**

Mrs L Ramlucken
P O Box 312
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3720

Dear Mrs Ramlucken

Feasibility and acceptability of utilising short message service for follow-up care of outpatient mental health care users in the uMgungundlovu District

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letters.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Yours Sincerely,

Professor J K Adam
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2017 -03- 31
INSITUTUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

Annexure 2a: Letter of permission to the District Manager of uMgungundlovu Health District

100 Old Main Road
Camperdown
3720

The District Manager
UMgungundlovu Health District
Pietermaritzburg
3201

Dear Madam

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

I am presently registered for a Master's Degree at the Durban University of Technology in the Department of Nursing. The proposed title of my study is "*Feasibility and acceptability of utilising short message service for follow-up care of outpatient mental health care users in uMgungundlovu District*".

I hereby request permission to conduct the study at the following psychiatric clinics: Scottsville Clinic, Eastwood Clinic, Woodlands Clinic and Town Hill Hospital Outpatient Department. A questionnaire will be used to collect data from mental health care users. Participation is voluntary, and informed consent will be obtained from all participants. Confidentiality will be maintained at all times. Please find attached a copy of the summary of the research proposal. Prof M.N Sibiya is the supervisor for the study and may be contacted on 031-373 2606. Her email address is nokuthulas@dut.ac.za

Sincerely

…….....
Mrs L. Ramlucken (Researcher)
Telephone: 084 586 3259
Email: l.ramlucken@gmail.com

Annexure 2b: Approval letter from the District Manager of uMgungundlovu Health District

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

uMgungundlovu Health District
Private Bag x9124, Pietermaritzburg, 3200
171 Hoosen Haffajee Street
Pietermaritzburg
Tel.:033- 897 1089, Fax.:033-897 1078
Email.:mark.green@kznhealth.gov.za
www.kznhealth.gov.za

TO	Sr. L. Ramlucken (Researcher)
CC:	Mrs. S. Mbambo Mrs. N. Zimu Mrs. N. Mkhabela
FROM :	Mr M. Green O/B/O District Manager: uMgungundlovu Health District
DATE :	**29/03/2017**
RE :	**Permission to Access PHC facilities for Research Purposes**

Your research approved in the attached documents is hereby supported by the uMgungundlovu Health District.

This correspondence serves as permission for you to enter the following facilities; **Scottsville Clinic, Eastwood Clinic and Woodlands Clinic** and interact with the staff and clients to ensure that the research goals are met.

You are required to ensure that all you conduct yourself professionally and are correctly identified whilst in the facilities and at all times when interacting with clients.

Please present this letter to the respective operational manager at each clinic you will be visiting in order that he/she allows you access required to complete your research.

Thank you,

Mr. M. R. Green – DD Planning M&E
pp Mrs. N. M. Zuma-Mkhonza
District Manager: uMgungundlovu Health District

29/03/2017
Date

Annexure 3a: Letter of permission to the KZN Department of Health

100 Old Main Road
Camperdown
3720

The Health Research and Knowledge Management Component
KwaZulu-Natal Department of Health
Private Bag X9051
Pietermaritzburg
3201

Dear Dr Lutge

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

I am presently registered for a Master's Degree at the Durban University of Technology in the Department of Nursing. The proposed title of my study is "*Feasibility and acceptability of utilising short message service for follow-up care of outpatient mental health care users in uMgungundlovu District*".

I hereby request permission to conduct the study at the following psychiatric clinics: Scottsville Clinic, Eastwood Clinic, Woodlands Clinic and Town Hill Hospital Outpatient Department. A questionnaire will be used to collect data from mental health care users. Participation is voluntary, and informed consent will be obtained from all participants. Confidentiality will be maintained at all times. Please find attached a copy of the summary of the research proposal. Prof M.N Sibiya is the supervisor for the study and may be contacted on 031-373 2606. Her email address is nokuthulas@dut.ac.za

Sincerely

…….....

Mrs L. Ramlucken (Researcher)
Telephone: 084 586 3259
Email: l.ramlucken@gmail.com

Annexure 3b: Approval letter from the KZN Department of Health

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:
Health Research & Knowledge Management

Physical Address: 330 Langalibalele Street, Pietermaritburg
Postal Address: Private Bag X9051
Tel: 033 395 2805/ 3189/ 3123 Fax: 033 394 3782
Email: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

HRKM Ref: 089/17
NHRD Ref: KZ_2016RP53_270

Date: 20 March 2017
Dear Mrs L. Ramlucken
DUT

Approval of research

1. The research proposal titled **'Feasibility and acceptability of utilising message services for follow-up care of outpatient mental health care services'** was reviewed by the KwaZulu-Natal Department of Health.

   The proposal is hereby **approved** for research to be undertaken at Eastwood, Scottsville, Woodlands clinic & Townhill 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 Mr X. Xaba on 033-395 2805.

Yours Sincerely

Dr E Lutge
Chairperson, Health Research Committee
Date: 20/03/17

Fighting Disease. Fighting Poverty. Giving Hope

Annexure 4a: Letter of permission to the CEO of Townhill Hospital

100 Old Main Road
Camperdown
3720

The Chief Executive Officer
Town Hill Hospital
Pietermaritzburg
3200

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY

I am presently registered for a Master's Degree at the Durban University of Technology in the Department of Nursing. The proposed title of my study is "Feasibility and acceptability of utilising short message service for follow-up care of outpatient mental health care users in uMgungundlovu District".

I hereby request permission to conduct the study at the following psychiatric clinics: Scottsville Clinic, Eastwood Clinic, Woodlands Clinic and Town Hill Hospital Outpatient Department. A questionnaire will be used to collect data from mental health care users. Participation is voluntary, and informed consent will be obtained from all participants. Confidentiality will be maintained at all times. Please find attached a copy of the summary of the research proposal. Prof M.N Sibiya is the supervisor for the study and may be contacted on 031-373 2606. Her email address is nokuthulas@dut.ac.za

Sincerely

…….....

Mrs L. Ramlucken (Researcher)
Telephone: 084 586 3259
Email: l.ramlucken@gmail.com

Annexure 4b: Approval letter from the Chief Executive Officer

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

TOWN HILL HOSPITAL

Hyslop Road, Pietermaritzburg, 3201
PO Box 400, Pietermaritzburg, 3200
Tel: 033 341 5500, Fax 033 345 5720
www.kznhealth.gov.za

HEALTH RESEARCH AND
ETHICS COMMITTEE

Enquiries: Dr J Brooker

Date: 19/01/2017

The CEO: Mrs. Z.G. Mfeka

RE: Proposed research: Feasibility and acceptability of utilizing short message service for follow-up care of outpatient mental health care users in the uMgungundlovu District

Dear Mrs. Mfeka

Please note that the Town Hill Hospital: Health Research and Ethics committee has considered the application from Sr Ramlucken regarding the above research to be conducted at Town Hill Hospital. She has obtained provisional ethical clearance from DUT (IREC Ref No: REC 107/16).

The committee had no objection to her conducting her research at Town Hill Hospital and believes that the outcomes of her research will directly benefit Mental Health Care Users by positive influence on service delivery.

The committee thus advises that you approve her request (i.e. Gate Keeper approval). Pending the following:

- Health research and Ethics approval for KZN Department of Health.
- Final Ethics Approval from DUT

Kind Regards

Dr Janine Brooker
Acting Head clinical Unit: Town Hill Hospital
Chairperson – Health Research and Ethics Committee
Town Hill Hospital

Approved / ~~Not Approved~~

Mrs. Z.G. Mfeka
CEO
Town Hill Hospital

Annexure 5a: Letter of information in English

Warm greetings. Thank you for agreeing to participate in this study.

Title of the Research Study: Feasibility and acceptability of utilizing short message service for follow-up care of outpatient mental health care users in uMgungundlovu District

Principal Investigator/s/researcher: Mrs. L. Ramlucken, B Cur.

Co-Investigator/s/supervisor/s: Professor M.N. Sibiya, D Tech: Nursing (Supervisor); Mrs. N.P. Zikalala, M Cur (Co-supervisor)

Brief Introduction and Purpose of the Study: Many mental health care users forget to attend mental health appointments. The missed appointments increase the risk of patients not attending future appointments, disengagement from services, re-hospitalisation and treatment non-adherence. There has been a rapid growth in the use of mobile technology. Research has proven that SMS can improve service delivery through appointment reminders, and improve communication between healthcare workers and patients. The purpose of this study is to determine the number of mental health care users who will be willing to utilize the SMS text service; and to determine if it would be feasible for mental health care users.

Outline of the Procedures: You are kindly requested to complete a questionnaire, and this will take you 10-15 minutes. The questionnaires will be delivered and collected by the researcher. Participants will be asked to

complete the questionnaire when they present at the clinic for follow-up care. Questionnaires will be collected by the researcher.

Risks or Discomforts to the Participant: None

Benefits: The researcher will make recommendations that will contribute towards ensuring quality care.

Reason/s why the Participant May Be Withdrawn from the Study: The researcher foresees no reason for withdrawing the participant from the study. The participant may withdraw at any time as participation is voluntary.

Remuneration: There is no remuneration for participating in this study.

Costs of the Study: The participant will not bear any costs by participating in the study.

Confidentiality: You will not be requested to fill in personal, identifying details. A code will be used to number the questionnaire.

Research-related Injury: None.

Persons to Contact in the Event of Any Problems or Queries: Please contact the researcher, Mrs. L. Ramlucken on 084 5863259; my supervisor, Professor M.N. Sibiya on 031-373 2606; or the Institutional Research Ethics administrator on 031-373 2900. Complaints can be reported to the Director: Research and Postgraduate Support, Prof S Moyo on 031-373 2577 or moyos@dut.ac.za.

Annexure 5b: Consent in English

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Lucelle Ramlucken, about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: 113/16,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____ _____ ____ _____

Full Name of Participant Date Time Signature / Right Thumbprint

I, L. Ramlucken (name of researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

L. Ramlucken _____ _____

Full Name of Researcher Date Signature

_____ _____ _____

Full Name of Witness (If applicable) Date Signature

_____ _____ _____

Full Name of Legal Guardian (If applicable) Date Signature

Annexure 6a: Letter of information in IsiZulu

Incwadi yolwazi

Izilokotho ezinhle. Ngiyabonga ukuthi uvume ukuzimbandakanya kulolucwaningo.

Isihloko socwaningo: Kumele kubhekwe ukuthi kungenzeka futhi kwamukele ukuthi basebenzise imilayezo yesevisi yomyalezo omfishane mayelana nokulandelisa ukunakekelwa kweziguli emakhaya ngokwempilo yengqondo esifundeni saseMgungundlovu.

Umphenyi omkhulu/ umcwaningi: Mrs. L. Ramlucken, B Cur.

Umlekeleli womphenyi /nomphathi: Solwazi M.N. Sibiya, Oneziqu zobuDokotela; Nkk. N.P. Zikalala, M Cur, Oneziqu seMastazi.

Isingeniso esifishane kanye nenjongo yesifundo: Abagula ngokwenqondo abaningi bayakhohlwa ukuhambela /ukuthamela ukumiswa kwesikhathi nendawo yokuhlangana mayelana nokudingida ukugula ngengqondo.Izikhathi zokuhlangana ezingahanjelwanga zenyusa ubungozi kweziguli ezingayihambeli imihlangano elandelayo, nokuzehlukanisa nesevisi, nokulaliswa ngokuphindelela esibhedlela, nokulashwa okungaphumeleli, kube nezinga elinyukile ekusethsenzisweni kobuchwepheshe kwezoku xhumana.
Abacwaningi bathole ukuthi ukusetshenziswa kwama sms kungenza ngcono ukuhlinzekwa kwezidingo ngendlela yokusebenzisa izikhumbuzo ukuqashwa, kanye nokwenza ngcono ukuxhumana phakathi kwabasebenzi bezempilo

kanye neziguli. Inhloso yalesifundo ukucacisa inombolo yabasebenzisa izikhungo zabagula ngengqondo ukusebenzisa isevisi yama SMS; nokunquma ukuthi kungase kube nokwenzeka yini kubantu abasebenzisa izikhungo zabagula ngengqondo.

Uhlaka lwezinqubo: uyacelwa ukuba ugcwalise uhla lwemibuzo, lokhu kungakuthatha imizuzu eyishumi kuya kweyishumi nanhlanu. Uhla lwemibuzo luyothunyelwa luphinde lulandwe umcwaningi. Abayoba yingxenye yalolucwaningo bayacelwa ukua bagcwalise uhla lwemibuzo uma befika emtholampilo ngokuzolandelela ukunakekelwa. Uhla lwemibuzo luyolandwa umcwaningi.

Izingozi noma ukungaphatheki kahle okubangelwa ukuba umhlanganyeli: Azikho

Izinzuzo: Umcwaningi uyokwenza izincomo noma iziphakamiso eziyoba nesandla ekuqinisekiseni ukunakekelwa okusezingeni.

Isizathu/izizathu ezingabangela umhlanganyeli ukuba ahoxiswe kulolucwaningo: Uma umcwaningi esebona singekho isizathu sokuhoxisa umhlanganyeli kucwaningo.Umhlanganyeli angahoxa noma ingasiphi iskhathi njengoba ukuhlanganyela kungokuzithandela.

Amaholo: Akukho nkokhelo eyozuzwa ngokuhlanganyela kulolucwaningo

Izindleko zocwaningo: Umhlanganyeli ngeke athwale izindleko ngokuhlanganyela kulolucwaningo

Okuyimfihlo: Ngeke ucelwe ukuba ugcwalise imininingwane yakho. Ikhodi iyosetshenziswa ukuze kubalwe uhla lwemibuzo.

Ubungozi obuhlobene nocwaningo: Uyacelwa ukuba uthinte umcwaningi, Nkk. L. Ramlucken kulenombolo 084 586 3259; Uwengamele ucwaningo, Solwazi Sibiya (inombolo yocingo. 031-373 2606) noma Institutional Research Ethics Administrator on 031-373 2900. Izikhalazo zingabikwa kuMqondisi Womnyango wocwaningo, Solwazi, Prof S Moyo on 031 373 2577 or moyos@dut.ac.za.

Annexure 6b: Consent in isiZulu

Isivumelwano sokuhlanganyela kucwaningo:

- Ngiyaqinisekisa ukuthi ngithintwe umcwaningi, u Lucelle Ramlucken, ngemvela phi inzuzo, (nobunzima) bocwaningo. Inombolo yemigoma yocwaningo: 113/16.
- Ngitholile, ngafunda ngazengaqondisisa ngokumbandakanyeka kwalo locwaningo.
- Kusobala kimi ukuthi imiphumela yalolu cwaningo ihlangene nezimfihlo zami maqondana nobulili, iminyaka, usuku lokuzalwa. Amagama ami kumbe ibizo lami kuzoba imfihlo kulolucwaningo.
- Umangibheka izidingo zocwaningo ngiya vuma ukuthi yonke imininingwane eqoqekengesikhathi kucwaningwa, kungenzeka igcinwe kwisi khahlamezi umcwaningi.
- Kungenzeka noma kunini nga phandle kwesivumelwano ngihoxe ekuzibandakanyeni kocwaningo.
- Sengibenesikhathi esanele ukubuza (nginga phoqiwe) ukuzilungiselela ngizabandakanye nocwaningo.
- Ngiyaqonda ukuthi lonke ulwazi olwanele olutholakale ngokuzimba ndakanya kwami kulolucwaningo ngiyokwaziswa ngalo.

_____	_____	_____	_____
Igama eliphelele Isithupha isigxivizo	**Usuku**	**Isikhathi**	**Soyina/kwesokudla**

Mina mcwaningi Lucelle Ramlucken (igama lomcwaningi) ngiyaqininisekisa ukuthi lombandakanyi ongenhla uchazelwe ngokuphelele ngemvelaphi, izimiso, zocwaningo.

_____ _____ _____

Igama eliphelele lomcwaningi Usuku Isikathi

_____ _____ _____

Igama eliphelele lofakazi Usuku Sayina

_____ _____ _____

Igama eliphelele lomgcini osemthethweni Usuku Sayina

Annexure 7: Request for permission and approval to use the validated questionnaire

Annexure 6: Letter of permission

Ramlucken Lucelle

From: lucelle ramlucken <l.ramlucken@gmail.com>
Sent: 31 March 2016 07:04 PM
To: Ramlucken Lucelle
Subject: Fwd: Questionnaire for research study

---------- Forwarded message ----------
From: Caron Jack <Jackcl nukzn.ac.za>
Date: Tue, Feb 16, 2016 at 3:00 PM
Subject: Re: Questionnaire for research study
To: lucelle ramlucken <l.ramluckency mail.com>

Dear Lucelle,

Of course you may use my questionnaire. I designed it.

Kind Regards

Dr Caron Jack

From: lucelle ramlucken <l.ramlucken@gmail.com>
Sent: 15 February 2016 19:45
To: Caron Jack
Subject: Questionnaire for research study

Good evening,

My name is Lucelle Ramlucken, and I am currently doing my MHSci: Nursing through the Durban University of Technology. My research topic is Determining the feasibility and acceptability of using short message service (SMS) to remind psychiatric patients of follow-up care.

I am interested in using the questionnaire that you used in your research Ethical considerations of mobile phone use by patients in KwaZulu ™ Natal: Obstacles for mHealth?

Please may I have your permission to use the questionnaire?

Kind regards
Lucelle

1

Annexure 8: Questionnaire in English

Please select ONE answer for each question by using 'X'.

Do not write your name on the questionnaire.

SECTION A: DEMOGRAPHICS

1. Gender

Male	
Female	

2. What is your age? _____

3. Location of residence

Townbush/Chasevalley	
Scottsville	
Woodlands	
Eastwood	
Other	

4. Do you speak English?

Yes	
No	

5. What is your diagnosis? (Tick all that apply)

	YES	**NO**
5.1 Psychotic disorder		
5.2 Anxiety disorder		
5.3 Bipolar disorder		
5.4 Depression		
5.5 Cognitive disorder		
5.6 Eating disorder		
5.7 Somatic symptoms and related disorder		
5.8 Adjustment disorder		
5.9 Epilepsy		
5.10 I do not know		

5.11 Other: Please specify _____		

SECTION B: MOBILE PHONE USAGE

6. Do you own and use a mobile phone?

Yes	
No	

6.1 If you answered YES to Q6, select ONE response below that best describes your cell phone package?

Contract	
Pay as you go	
Number for life	

Respond YES or NO to each of the following questions

Questions	YES	NO
7. Are you the only user of the mobile phone?		
8. Do you lend your mobile phone to other people?		
9. Has your mobile phone number changed in the past year?		
10. Do you share sim cards with other people?		
11. Do you use the SMS on your mobile phone?		
12. Do you get a good mobile phone signal from your home?		
13. Has your mobile phone ever been stolen?		
14. Did you ever forget to collect your medication?		
15. Have you ever been out of airtime for more than a week?		
16. Are you able to keep your mobile phone battery charged?		
17. Would you like to receive medical reminders via SMS on your phone?		

18. Have you ever missed any appointments?

Yes	
No	

18.1 If you answered YES to question 18, how often have you missed appointments in a 12 month period? (Select ONE option only)

Once	
2 - 3 times	
4 - 6 times	
More than 6 times	

19. If you have missed appointments, what was the reason? (Select the ONE option that applies most often).

I forgot	
I had no money	
I had no transport	
I was working	
Other: Specify _____	

THANK YOU FOR PARTICIPATING IN THE STUDY

Annexure 9: Questionnaire in IsiZulu

Iphepha lemibuzo yokusetshenziswa kwamakhala ekhukhwini

Maka impendulo yakho ngokukhetha okukodwa ngokusebenzisa u 'X'.
Ungalibhali igama lakho kuloluhlu lwemibuzo.

SECTION A: IMIBUZO EPHATHELENE NAWE

1. **Ubulili**

Owesilisa	
Owesifazane	

2. **Mingaki iminyaka yakho?** _____

3. **Indawo ohlala kuyo**

Townbush/Chasevalley	
Scottsville	
Woodlands	
Eastwood	
Okunye	

4. **Uyasikhuluma isilunga / isingisi?**

Yebo	
Cha	

5. **Isiphi isifo onaso? (Khetha okuyikho)**

	YEBO	**CHA**
5.1 Ukuphambana kwengqondo		
5.2 Inikinga yovalo		
5.3 Ukujabula / ukucasuka ngokweqile		
5.4 Umoya ohlale uphansi / noma umzwangedwa		
5.5 Isifo sokukhohlwa		
5.6 Isifo sengqondo esihambisana nendlela yokudla		
5.7 Ukugula kwengqondo okuhambisana nezimpawu emzimbeni		
5.8 Ukuthikamezeka emoyeni		

5.9 Isifo sokuwa		
5.10 Angisazi		
5.11 Esinye isifo : ngicela uchaze _____		

SECTION B: UKUSETSHENZISWA KOMAKHALEKHUKHWINI

6. Unawonoma uyawusebenzisa umakhala ekhukhwini?

Yebo	
Cha	

6.1 Uma uphendule ngo yebo kumbuzo wesithupha khetha kulena engenzansi okuvumelana ngomakhala ekhukhwini wakho?

Inkontileka	
Ukuthenga iethaymi uma isiphelile	
Inamba for life	

Phendula YEBO noma CHA kulemibuzo elandelayo

Imibuzo	**YEBO**	**CHA**
7. Uwena wedwa osebenzisa lomakhala ekhukhwini?		
8. Uyabolekisa ngomakhala ekhukhwini?		
9. Uke wayishinstha inamba kulonyaka ophelile?		
10. Bakhona abantu osebenzisa nabo i sim card yakho?		
11. Uyawasebenzisa ama sms?		
12. Idonsa kahle inetwork ekhaya?		
13. Lake lantshontshwa ucingo lwakho?		
14. Wake wakhohlwa ukulanda imishanguzo yakho?		
15. Uke uyiswele iairtime ngakhezu kwesonto?		
16. Uyakwazi ukugcina ibhethri ishajiwe?		
17. Uyafuna kuthunyelelwa imiyalezo ezokukhumbuza imishanguzo ocingweni lakho?		

18. Kuke kwenzeka yini wangakwazi ukuza ngosuko onqunyelwe lona ukuba uze?

Yebo	
Cha	

18.1 Uma impendulo yakho ingu – yebo kukangaki onyakeni ungaphumeleli ukuza?

Kanye	
Ngaphezu kwezikhathi ezintathu	
Ngaphezu kwezikhathi ezintathu kuya kweziyisithupha	
Ngaphezu kwezikhathi eziyisithupha	

19. Uma ungaphumelelanga ukuza njengokunqunyiwe kusuke kuyini imbangela?

Ngikhohliwe	
Bengingenamali	
Bengingenanto yokuza njengemoto	
Bengisebenza	
Okunye: uchaze kuyini	

NGIYABONGA UKUZIMBANDAKANYA KULOLUCWANINGO

Annexure 10: Letter of consultation from the statistician

Annexure 9: Letter regarding future analysis

Gill Hendry B.Sc. (Hons), M.Sc. (Wits), PhD (UKZN)
Mathematical and Statistical Services

Cell: 083 303 9696
email : hendryfam@telkomsa.net

25 April 2016

To whom it may concern

Please be advised that I will be assisting Ms L. Ramlucken (student number 21644765) who is presently studying for a Master of Health Sciences in Nursing with the statistical aspects of her study.

Yours sincerely

Gill Hendry (Dr)

Annexure 11: Certificate from the professional editor

DR RICHARD STEELE
BA, HDE, MTech(Hom)
HOMEOPATH
Registration No. A07309 HM
Practice No. 0807524
Freelance academic editor
Associate member: Professional Editors' Guild, South Africa

110 Cato Road
Glenwood, Durban 4001
031-201-6508/082-928-6208
Fax 031-201-4989
Postal: P.O. Box 30043, Mayville 4058
Email: rsteele@telkomsa.net

EDITING CERTIFICATE

Re: **Lucelle Ramlucken**
Master's dissertation: **FEASIBILITY AND ACCEPTABILITY OF UTILISING SHORT MESSAGE SERVICE FOR FOLLOW-UP CARE OF OUTPATIENT MENTAL HEALTH CARE USERS IN THE UMGUNGUNDLOVU DISTRICT**

I confirm that I have edited this dissertation and the references for clarity, language and layout. I am a freelance editor specialising in proofreading and editing academic documents. My original tertiary degree which I obtained at the University of Cape Town was a B.A. with English as a major and I went on to complete an H.D.E. (P.G.) Sec. with English as my teaching subject. I obtained a distinction for my M.Tech. dissertation in the Department of Homeopathy at Technikon Natal in 1999 (now the Durban University of Technology). During my 13 years as a part-time lecturer in the Department of Homoeopathy at the Durban University of Technology I supervised numerous Master's degree dissertations.

Dr Richard Steele
08 June 2017
electronic