Self-care and medication adherence amongst older persons in a rural area

MATHAPELO WINNIE RAMAKHALE

Dissertation submitted for the degree

MAGISTER CURATIONIS

NURSING SCIENCE

in the

School of Nursing Science

at the Potchefstroom Campus, North-West University

Supervisor: Prof E Lekalakala-Mokgele

Co-supervisor: Dr MJ Watson

Mrs W Breytenbach

POTCHEFSTROOM

May 2012

DECLARATION

I, Mathapelo Winnie Ramakhale, student no: 12137812 declare that:

- **SELF-CARE AND MEDICATION ADHERENCE AMONGST OLDER PERSONS IN A RURAL AREA** is my own work and that all the sources that I have used or quoted are indicated or acknowledged in the bibliography.
- This study has been approved by the Ethics Committee of the institution Office of the North-West University (Potchefstroom Campus).
- This study complies with the research ethical standards of the North- West University (Potchefstroom Campus).

_____

MW RAMAKHALE

May 2012

ACKNOWLEDGEMENTS

I would like to thank my God, Jesus Christ, who gave me power and strength during this hard effort.

I would like to thank the following people for their support during the study:

- My loving husband, Seturumane, and my two daughters, Lebo and Sophia for their encouragement, support, care and understanding during the years that I was studying.
- Dr. MJ Watson, my supervisor, without whom I would not have finished my dissertation, for her guidance, love, encouragement, assistance and support throughout the study.
- Prof. E. Lekalaka-Mokgele for her input at the beginning of the study.
- Louise Vos and Sylvia Letsose for their support and help in the library.
- Mrs. W. Breytenbach for her continuous and friendly assistance during statistical data analysis, and Prof Steyn during the initial phase of my study.
- Mrs Christien Terblanche for the language editing.
- All the older persons, the golden thread of the study, who patiently shared their personal information and experiences related to self-care and medication adherence.
- The friendly field workers involved in the PURE-SA study that dedicated themselves to help with the data gathering process in Ganyesa and Tlhagameng.
- AUTHeR (African Unit of Trans-disciplinary Health Research) from the North-West University, Potchefstroom Campus, for financial support.

I DEDICATE THIS STUDY TO

My loving husband, father of my two beautiful daughters, my mom, sister and her husband who believed in me and always encouraged me during difficult times, for their love, support and patience. People like you are infrequently found and are to never be forgotten.

SUMMARY

Self–care and medication adherence amongst older persons in a rural area

This study focuses on the older person with chronic diseases, something that yields them vulnerable to a decline in self-care and medication adherence. South Africa has the highest percentage of older persons in Africa, and the North-West Province where the study was conducted presents with 7.34% persons older than 60 years. The growing population of older persons not only poses challenges to the primary health care (PHC) facilities, but also to the older persons themselves, their family members and the community where they live. Health services to the older persons have become overshadowed by an emphasis on child- and maternal care, as well as communicable diseases such as HIV/AIDS and TB. The reality however is that the older population is subjected to an ageing process that predisposes them to a number of chronic diseases, such as hypertension, cardiac diseases, diabetes mellitus and arthritis. This often requires that the older person be put on multiple chronic medications and therefore be made aware of the importance of self-care and medication adherence to deal effectively with their chronic diseases and in turn improving quality of life.

Non-experimental, quantitative research design was used to reach the aim of the study, namely to explore and identify possibilities for the enhancement of self-care and medication adherence of older persons in a rural area. This was done through objectives to explore and describe the factors of self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area of the North-West Province.

A literature review was first conducted by the researcher for a clear understanding of self-care and medication adherence of older persons. Thereafter a structured questionnaire consisting of a demographic-, self-care- and medication adherence section was employed. Trained field workers assisted with data collection. The questionnaires were distributed to 150 participants and 143 were completed in the homes of the older persons, resulting in a participation rate of 95%. Data collected was analysed in a sequential order; demographic data was first analysed with results shown in a frequency table; the exploratory factor analyses were done for data reduction on the self-care and the medication adherence questionnaire. Descriptive statistics and Cohen's effect sizes for the factors of self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst the older persons in a rural area.

The results revealed that the oldest participants, those older than 80 years, will seek help when they are unable to care for themselves, thus gender, relationship status and whether they smoke or not, showed no practical effect on self-care and medication adherence. There was however results that showed that different aspects of medication use can have a medium and/or large practical effect on factors of self-care and/or medication adherence. The results gave direction to the researcher to make recommendation to the nurses working in PHC facilities, future nursing research and nursing education.

[Key concepts: Ageing, older person, chronic diseases, chronic medication, non-medication management, barriers to chronic medications, PHC facilities, registered nurses, quality of life, self-care, medication adherence**]**

OPSOMMING

Selfsorg en medikasie nakoming onder ouer persone in ‘n landelike gebied

Hierdie studie fokus op ouer persone met kroniese siektes, iets wat hulle kwesbaar maak vir ’n afname in selfsorg en medikasie nakoming. Suid-Afrika het die hoogste persentasie ouer persone in Afrika, en die Noordwes Provinsie waar die studie uitgevoer is, het 7.34% persone ouer as 60 jaar. Die stygende ouer populasie hou nie net uitdagings in vir die primêre gesondheidsorg (PGS) fasiliteite nie, maar ook vir die ouer persone self, hulle gesinslede en die gemeenskappe waar hulle woon. Gesondheidsorg aan ouer persone word oorskadu deur die klem op kinder- en moedersorg, sowel as oordraagbare siektes soos MIV/VIGS en TB. Die realiteit is egter dat die ouer populasie onderwerp is aan ‘n verouderingsproses wat hulle geneig maak tot verskeie kroniese siektes, soos hipertensie, kardiovaskulêre siektes, diabetes mellitus en artritis. Die genoemde kroniese siektes vereis dikwels dat die ouer persoon meer as een kroniese medikasie gebruik en bewus gemaak moet word van die belangrikheid van selfsorg en medikasie nakoming om hulle kroniese siektes effektief te hanteer en sodoende kwaliteit van lewe te verbeter.

Nie-eksperimentele, kwantitatiewe navorsing is gebruik om die doel van die studie, naamlik die verkenning en identifisering van moontlikhede vir die verhoging van selfsorg en medikasie nakoming van ouer persone in ’n landelike gebied. Die doel van die studie het gerealiseer deur die uitvoering van die doelwitte naamlik die verkenning en beskrywing van die faktore van selfsorg en medikasie nakoming in verhouding tot ouderdom, geslag, verhouding status, gedrag en medikasie gebruik onder ouer persone in ’n landelike gebied van die Noordwes Provinsie.

Eerstens is ‘n literatuurstudie onderneem deur die navorser om ‘n duidelike begrip te kry van selfsorg en die medikasie nakoming van ouer persone. Daarna is ‘n gestruktureerde vraelys gebruik bestaande uit ‘n demografiese-, selfsorg- en medikasie nakomingsgedeelte. Opgeleide veldwerkers het gehelp met die data-insameling. Die vraelys is uitgedeel aan 150 deelnemers, en 143 is voltooi in die huise van die ouer persone, wat dui op ‘n deelname syfer van 95%. Die ingesamelde data is ontleed in ’n opeenvolgende wyse; die demografiese data is eerste ontleed en resultate getoon deur frekwensie tabelle; die eksploratiewe faktor analise is uitgevoer om data te verminder van die selfsorg en medikasie nakomingsvraelys. Beskrywende statistiek en Cohen se effek grootte vir die bepaling van die verband tussen die faktore van selfsorg en medikasie nakoming en die van

ouderdom, geslag, verhouding status, gedrag en medisyne gebruik onder ouer persone in ŉ landelike gebied is gebruik.

Die resultate toon dat die ouer deelnemers, dié ouer as 80 jaar, hulp sal soek wanneer hulle nie vir hulself kan sorg nie, terwyl geslag, verhouding status, gedrag wat dui op rook of nie rook nie, geen praktiese effek op selfsorg en medikasie nakoming getoon het nie. Daar was egter bevindings wat getoon het dat verskillende aspekte van medikasie gebruik ŉ medium en/of groot effek toon op selfsorg en medikasie nakoming. Die resultate het gelei tot die daarstel van aanbevelings deur die navorser aan die verpleegkundiges werksaam in PGS fasiliteite, aan toekomstige navorsing en verpleegonderrig.

[Sleutelwoorde: Veroudering, ouer persoon, kroniese siekte, kroniese medikasie, nie-medikasie hantering, struikelblokke by kroniese medikasie, PGS fasiliteite, geregistreerde verpleegkundiges, lewenskwaliteit, selfsorg, medikasie nakoming**]**

ABBREVIATIONS

ANC	African National Congress
ANOVA	Analysis of variance
ASA-A	Appraisal of self-care agency scale-A
DOH	Department of Health
COPD	Chronic Obstructive Pulmonary Diseases
ES	Effect Sizes
HIV	Human Immune Deficiency Virus
AIDS	Acquired Immunodeficiency Syndrome
NSAID	Non-Steroidal Anti-inflammatory
NWU	North West University
OTC	Over-the-Counter medicine
PASE	Physical Activity Scale for the Elderly
PHC	Primary Health care
PURE	Prospective Urban and Rural Epidemiological study
PURE-SA	Prospective Urban and Rural Epidemiological study in South Africa
P-value	Power value
SA	South Africa
SANC	South African Nursing Council
SD	Standard Deviation
WHO	World Health Organization

TABLE OF CONTENTS

CHAPTER 1

OVERVIEW OF THE STUDY

CHAPTER 2

LITERATURE REVIEW

CHAPTER 3

RESEARCH DESIGN AND METHOD

CHAPTER 4

RESEARCH RESULTS

CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS PERTAINING TO THIS STUDY, WITH SPECIFIC REFERENCE TOSELF-CARE AND MEDICATION ADHERENCE AMONGST OLDER PERSONS IN A RURAL AREA

APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

OVERVIEW OF THE RESEARCH

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

The world's population is rapidly ageing in both developed and developing countries, and therefore the health and well-being of the older person has become a worldwide public health concern. Global statistics show that the number of persons aged 60 years and older count to 650 million, and this number will be almost doubled to 1.2 billion in 2050 (Chucks, 2003:3). This increase in the number of older persons worldwide is due to an increased life expectancy, lower fertility due to increased use of contraceptives and the developments in medical technology (Geldenhuys, 2007:54). The rise in the number of older persons is not limited to industrialized countries. Developing countries are also influenced by the extraordinary rate of ageing (Chucks, 2004:14; Chucks, 2003:3, Rabie, 2009:1).

Sub-Saharan Africa has the lowest number of older persons as compared to other regions (Kimuna, 2005:13) and the African older population represented 5.1% of the total global population by the year 2000 (Chucks, 2003:3; Chucks, 2004:4). According to mid-year population estimates in 2009, South African ageing population, which refers to people over the age of 60 years, amounts to 3.7 million by the year 2001, and this represents 7.5 % of the whole South African population (Kay, **s.a**.:2; Joubert & Bradshaw, 2006; Lloyd-Sherlock, Barrientos, Moller & Saboia, 2012:2). Literature also reveals that despite the impact of the HIV/AIDS pandemic, ageing is rapidly taking place in South Africa (Joubert & Bradshaw, 2006; Westaway, 2010:213), having the highest percentage of older persons in Africa (Van Staden & Weich, 2007:14). The North-West Province, being the area of the study, had 7.34 % of people 60 years and older (Joubert & Bradshaw, 2004:152; Ntusi & Ferreira, 2004:3; Geldenhuys, 2007:54).

The African ageing population is prone to weakened health conditions as a result of a lack of resources, poverty, and malnutrition resulting from the social injustices they have lived under (Ntusi & Ferreira, 2004:3). Laditka (2004:233) adds to this by stating that care of the older person is not given priority in South Africa, resulting in social injustice. This state of affairs compromises the quality of life of the majority of older persons, particularly amongst the Africans. Most of the black population are dependent on social grants for survival, and this means that many of them cannot afford transport to access proper health care services (May,

2003:27). According to the National Department of Social Development (SA, s.a.), not all older persons received social grants in the past. Prior to 2010 males had to be 65 years old, while females had to be 60 years old to qualify for a social grant. Watson (2008:72) cites from a study conducted in the North-West Province the fact that only 72% of older persons receive social grants. People who are 60 years and older are classified as old, and they are challenged by old age diseases. The most common self-reported diseases include arthritis/rheumatism, followed by hypertension (May, 2003:28). Louw and Louw (2009:67) confirm that longevity is often accompanied by a decline in organ functioning as a result of the ageing process.

The ageing process predisposes the older person to a number of chronic diseases, such as hypertension, cardiac diseases, diabetes mellitus and arthritis to name a few, and this often requires that the older person be put on multiple chronic medications (Smeltzer *et al*., 2008: 230-237). The decline in the organs of the older persons means that their responsiveness to medication is compromised due to a change in pharmacodynamics and pharmacokinetics with age (Ebersole *et al*., 2008:226). The majority of older persons in South Africa obtain their chronic medications from the public health sector, and only a few who can afford to pay make use of the private health sector (Fish & Ramjee, 2007:29-37). Given the mentioned realities it should be clear that the older persons have their own health care needs (Agyarko *et al.,* 2000).

In 1994 primary health care (PHC) was introduced in South Africa with the aim of reforming health to provide free, cost effective, accessible and affordable health care to all citizens of South Africa (Dennill *et al*., 1999:6; Van Rensburg, 2004:133). However, studies highlight older persons' dissatisfaction about inefficient appointment systems, long waiting times, understaffed facilities and shortages of medication (Wolvaardt, 2005). In the private health sector the facilities are efficient and there are seldom queues. Each person receives individual attention to address individual needs. In the public health sector, there are no special services to care for the needs of the older persons in the PHC facilities. There are often long queues, no time to conduct physical examinations, and intolerance from health care professionals (Bradshaw & Steyn, 2001: 9). This could be because older persons' health care has become overshadowed by an emphasis on child, maternal and reproductive health care (Wolvaardt, 2005). The age group 60 years and older is attended to in the category of the general care of chronic conditions, which includes all ages and focuses on supplying them with chronic medication to improve their quality of life (Dennill *et al*.,1999:6; Clark, 2008:496). Controlling chronic diseases with chronic medication will not serve its purpose unless it is accompanied by a healthy lifestyle, and attention has to be paid to lifestyle modification behaviours such as tobacco cessation, medication adherence, diet control and physical activity (Brown *et al.,*

2007:99). In addition to these factors, socio-economic factors such as a lack of financial resources for basic needs such as food, clothes, shelter and health insurance, make it difficult for older persons to care for their own health (Gibbons, 2006:324). Chronic diseases together with physical disability, poor quality of life and hospital admissions pose a challenge to older persons. Factors such as age, gender, relationship status, behaviour and medication use amongst older persons might influence self-care and medication adherence. Adherence to chronic medications is crucial in order to control chronic diseases and this in turn places self-care central to the improvement of quality of life of older persons. According to Plummer and Molzahn (2009:134) quality of life refers to fulfilment and well-being (in this study that of the older person) that are increased by taking control of one`s health and health related matters.

Overall, people around the world are becoming aware of the importance of practicing self-care activities (WSMI, **s.a.**:12) performed to maintain the older person's quality of life and health. The self-care activities referred to involve three types of self-care requisites necessary to sustain health, as explained by Orem in Clark (1996:888). They are referred to as *universal self-care* (air, food, water, excrement, rest and social interaction of the older person), *developmental self-care* (refers to activities that the older persons engage in to help themselves to achieve developmental tasks like walking without a walking stick) and *health deviation self-care* (the older persons obtain the correct medical assistance, they deal with their chronic diseases, effectively take their prescribed chronic medication, adjust their lifestyle to their chronic disease, like food without salt for a hypertensive person). Self-care also includes self-care agency, self-neglect, self-care requisite, and therapeutic self-care demand. These refer to the activities that individuals, (in this study older persons) families and communities, as well as health care professionals undertake with the intention of enhancing health, preventing disease, limiting illness and restoring health (Wengström *et al*., 1999:764, Clark, 2008:496). These activities are collaborative roles of both professionals and individuals. Self-care activities such as weight loss, smoking cessation, following a diet rich in vegetables and fruits as well as adhering to prescribed medication, can control diseases such as hypertension (Beers *et al*., 2006:608). Large emphasis should be placed on successful ageing and the promotion of self-care (Clark, 2003:459) and nurses working in PHC facilities should consider just that when advising an older person regarding self-care and medication adherence.

1.2 PROBLEM STATEMENT

The majority of older persons tend not to practice self-care and commonly do not adhere to chronic medications supplied at PHC facilities (Clark 2008:501-502 Clark, 2008:502, Van Rensburg, 2004:270). There could be different reasons, namely the more frequently the medication has to be taken, the lesser the adherence; forgetfulness can lead to failure to take medication at the correct times; limitation in vision, illiteracy, and side effects of chronic medication pose a challenge to self-care and medication adherence amongst older persons in a rural area (Ebersole *et al*., 2008:306). As a previous accompanist of nursing students at a nursing college in the North-West Province and now an operational manager in PHC facilities where older persons receive their chronic medications, the researcher has observed that older persons are forced to mostly rely on themselves for health care in the absence of their family members who are either working or not living with them at all. This problem creates the need to explore possible ways in which the older person can be supported and/or taught with regard to their own self-care and their adherence to medication.

The researcher noted at the different PHC facilities that self-care and medication adherence can be influenced by factors like age, gender, relationship status in different households, behaviour of the older persons like smoking, as well as the way in which the medication is used. The older persons are sometimes on more than one type of chronic medication, different people and /or the older person themselves administer the medications, the older persons sometimes administer traditional medication and home remedies, and all these things influence medication adherence as an element of self-care. Peu (2008:15) confirms that both western and traditional health care practices apply in South Africa, which challenges the older persons using medication for chronic diseases.

In a prospective cohort study, PURE-SA (Watson, 2008:9) that track changing lifestyles, risk factors and chronic diseases using standardised methods to collect data every three years in urban and rural areas of fourteen countries in transition, including South Africa, questions were raised on the self-care abilities of older persons and their medication adherence. Consequently, it became a reality that older persons are faced with chronic diseases accompanying ageing that urged the researcher to understand the factors of self-care and medication adherence in relation to their older persons' age, gender, relationship status, behaviours like smoking and medication use. The researcher's quest for better understanding of possible gaps in self-care and medication adherence give rise to an important question within the research area; namely how can the older person, the family members and registered

nurses working in PHC facilities contribute to better self-care and medication adherence of older persons in a rural area. The following research questions were posed:

- Is there a relation between the factors of self-care and age, gender, relationship status, behaviour and medication use amongst older persons in a rural area?

- Is there a relation between the factors of medication adherence and age, gender, relationship status, behaviour and medication use amongst older persons in a rural area?

1.3 AIM AND OBJECTIVES OF THE STUDY

The aim of the study is to explore and describe the relation between age, gender, relationship status, behaviour and medication use of older persons in relation to their self-care and medication adherence in order to improve self-care and medication adherence of the older persons in a rural area. To achieve this aim, the following objectives should be met:

- To explore and describe the factors of self-care in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area;

- To explore and describe the factors of medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.

1.4 RESEARCH STATEMENT

The exploration and description of age, gender, relationship status, behavioural data and medication use will provide the researcher with a better understanding of factors influencing self-care and medication adherence of the older persons in a rural area and result in aspects to consider and make recommendations to the older person, the family members and registered nurses working in PHC facilities to improve quality of life of older persons.

1.5 ASSUMPTIONS OF THE RESEARCHER

The assumptions of the researcher operate on three levels namely meta-theoretical, theoretical and methodological assumptions that apply to this specific research in order to facilitate a clear and easy-to-understand process for future readers and researchers.

1.5.1 Meta-theoretical assumptions

The meta-theoretical perspective of this research is formulated according to the Christian philosophical view that sees man (and therefore also the older person), as a being created by God with the direct command to control the world as a steward. The following meta-theoretical statements about man, health, environment and nursing are relevant:

- **Man**

Man in this study refers to older persons, male or female, 60 years and older (Kimuna, 2005:13; Rabie, 2009:7), who are unique human beings created by the most high God in His image, consisting of body and spirit, functioning in an integrated bio-psycho-social manner in a quest for wholeness of self, family members and registered nurses. The body depends on the spirit for survival and vice versa, neither of the two can survive in the absence of the other one. According to the Bible old age is a reward from God for honouring one's parents. In fulfilling their purpose in God`s image, the family members and registered nurses support the older person in self-care and medication adherence.

- **Health**

The continuum of health is a state of spiritual, mental and physical wholeness. Health is therefore closely associated to religion. In this research the focus is placed on improvement of health through self-care and medication adherence. As persons age their health is compromised due to senescence, increasing the risk of death (Clark, 2008:496), and although the human being strives for physical, psychological, social and spiritual health, older persons experience more health problems due to the bio-physical deterioration processes of ageing.

- **Environment**

In this study environment refers to the area where the study took place, which is a rural part of the North-West province. The subjects all reside in this are, either alone or with family members. They receive their chronic medications in a PHC facility in the region offered by the

government. Older persons in rural areas are affected by poverty and a lack of resources, and most of them survive on social grants.

- **Nursing**

Nursing consists of those activities aimed at empowering older persons and families to promote, maintain and restore health. These activities should be promoted by the nurse working in a PHC facility, the older persons themselves and the family members to enhance self-care. Nursing depends on the help of God as caretaker of humankind, and refer to an important part of comprehensive PHC services provided to individual older persons and families. Nursing should encompass the age, gender, and relationship status, behaviours like smoking and medication use of the older person. This consists of goal directed services in order to meet the physical, psychological, social and spiritual needs of older persons in a rural area.

1.5.2 Theoretical assumptions

The theoretical assumptions in this study refer to the theory and conceptual definitions underlying it. Theories offer a systematic way of looking at the world and of describing the events explored in a study (Covington, 1998:1). Various models and theories were investigated to direct the study and understand self-care and medication adherence of the older person. In this study Orem's self-care theory helped to direct and gain clarity. Orem labels her self-care deficit theory as a general theory of nursing composed of three related theories namely the theory of nursing systems, theory of self-care deficit and theory of self-care (Tomey & Alligood, 2006:269; Clark, 1996:888). The theory of self-care is the focus of the study and indicates that human beings (in this study older person) are involved in self-care activities to maintain their state of wellbeing. Self-care is deliberate activities a person engages in to maintain life and health (Clark, 1999:91-92. Knowledge concerning self-care and medication adherence gained from this study will result in recommendations that will enhance the quality of life and well-being of older persons. The applicability of Orem's self-care deficit theory to self-care and medication adherence of older persons in a rural area is illustrated in the following table (see table 1.1).

Table 1.1: Dorothea Orem`s self-care deficit theory of nursing (as adapted from Clark, 1996:888-890)

Self-care concept	Application to the study
Self-care includes self-care agency, self-care agent and self-care deficit • Self-care agency refers to capability and power a person to engage in self-care operations • Self-care agent refers to an individual that engages in self-care • Self-care deficit refers to limitations regarding self-care capability and power (Tomey & Alligood, 2006:271).	The capability of the older person regarding medication adherence refer to the **self-care agency**. The older person is subjected to many hardships, like a chronic disease, and often without transport to reach the PHC facilities for medicine, etc. The older person with different chronic diseases such as hypertension and/or arthritis is the **self-care agent**. Literature clearly indicates that there could be many limitations in the self-care of the older person. Orem refers to this as **self-care deficit** (Rabie, 2009:11, Clark, 1996:888, Tomey & Alligood, 2006:271).
Universal self-care Are required goals and activities to be met for everyday life (Clark 1996:888).	Older persons need sufficient intake of clean air; they need a balanced diet including fruits and vegetables; they need clean water supply to prevent dehydration (not always that easy in a rural area where they do not always have running water); they need to rest and engage in mild activities such as walking to their neighbours or the nearest clinic or shops. Social interaction with their family members and other members of the community enhance quality of health.
Developmental self-care Activities designed to substitute achievements of developmental tasks (Clark, 1996:888).	Reasoning to be able to understand instructions from health care professionals, knowledge and skills to be able to practice self-care and medication adherence.
Health deviation self-care Activities that deal with ill health, disability and defects (Clark, 1996:888).	They need to be helped with self-care activities such as bathing and adherence to prescribed medications and to practice self-care. Simple, but clear health education on chronic diseases and medication adherence can enhance health of the older person.

1.5.3 Conceptual definitions

The following definitions have relevance for this study:

- **Older person**

The definition of old age differs from country to country and according to the society older persons lives in (May, 2003:4; Kinsella & Phillips, 2005:6). The World Health Organization (WHO) defines the older person as someone aged 65 years and older (WHO, 2004:9) and May (2003:4) suggests older persons living in South Africa to be people falling in the age group of 50-60. This study refers to the older person as male and females who are 60 years and older.

- **Self-care**

Self-care may be defined as the care taken by individuals towards their own health and well-being, including the care extended to their family members and others (WSMI, s.a.:5). Orem (2001:53) gives a very similar explanation and defines self-care as the deliberate activities a person engages in to maintain life and health (Clark 1996:888, Leenerts *et al.,* 2002:360). Self-care may be seen in relation to age, gender, relationship status, behaviour like smoking and medication use.

- **Medication adherence**

Medication adherence refers to the extent to which a person's intake of prescribed medications, following of a healthy diet, and other lifestyle modifications correspond with the recommendations of the health professional (SA, 2008: xxiii). In this study medication adherence will be seen in relation to age, gender, relationship status and medication use.

- **Age**

According to the Concise Oxford Dictionary (2002:20) age refer to a particular stage in someone's life, thus the person who are 60 years and older.

- **Gender**

Gender refers to the state of being male or female, in other words belonging to one or other sex (Concise Oxford Dictionary, 2002:479). The older persons included in this study are either male or female and both genders are included.

- **Relationship status**

In this study relationship status refers to an older person's connection/relation or association with one another, either by marriage (law/matrimony/wedlock/traditional culture) or single (widowed/divorced/spinster/bachelor).

- **Behaviour**

Behaviour is the way in which someone behaves or response towards a situation (Soanes & Angus, 2004:122). According to Coulson *et al*. (2002:52) the word "lifestyle" is closely linked to behaviour and some diseases are often caused by certain life style choices such as smoking that can lead to cardiovascular diseases (Clark, 2008:241).

- **Medication use**

Medication is defined by the Churchill Livingstone's Dictionary for Nursing as a therapeutic substance taken through different routes by patients as a means to healing (Brooker, 2006:148), that is flexible and adaptable to different situations (SA, 2008:xx). According to Soanes & Angus (2004:1592) "use" refers to "deploy as a means of achieving something". In this study medication use refers to the way older persons take their medications to control chronic diseases. In addition to the way older persons take their medication in relation to being on one or more chronic medications, those whose medication is administered by themselves or by somebody else, those who use or who do not use traditional medications, and also the times or frequency when medication is administered.

- **Chronic disease**

Chronic diseases refer to any bodily abnormality caused by a disease persisting for a long time or constantly recurring and of gradual onset that affects normal functioning of the body, referring to the older person in this study **(**Martin, 2007: 2086, Soanes & Angus, 2004:255). According to Kimuna (2005:3) some of the chronic diseases cause disability while others do not. In this study chronic diseases refer to decline in the body functions of older persons.

Symptoms of chronic disease may be mild, but can result in partial or complete disability, leading to impaired self-care activities and medication adherence that can lead to death in some older persons.

- **Chronic medication**

Chronic medications are drugs or medications given by mouth, by injection, or in the form of an ointment for the treatment or prevention of a disease for as long as the person lives (in this context the older person) (Brooker, 2006: 74), used in the management of chronic diseases.

- **Barriers to adherence to chronic medications**

A barrier is an obstacle that prevents access (Soanes & Angus, 2004:110). The barriers to adherence to medication refer to poor communication due to decline in memory and hearing impairment, decline in cognitive functioning as a result of aging. Difficulty in taking multiple medications, misunderstanding and denial resulting from the older person's attitude and beliefs (EDL,) and side effects also increase the risk of non-adherence to chronic medications.

- **Non-medication management**

Non-medication management refers to non-drug management options that apply to different chronic diseases, such as weight loss, moderate exercises, restriction of salt and fat intake, and relief of stress, alcohol cessation and avoidance of extreme temperatures. These actions are beneficial in the management of chronic diseases because they reduce complications, prevent death, control chronic diseases and improve quality of life of older persons (Altun, 2008:881).

- **Primary health care (PHC)**

PHC is essential health care that is based on practical, scientifically sound and socially acceptable methods aimed at improving the health (ANC, 1994:20, Lawn *et al*., 2008:1001) of older persons through self-care and medication adherence. The health care should be accessible to older persons and their families and they should participate in their own health care of which self-care forms an integral part at every stage of their life. Actions taken in the PHC facilities should be such that PHC facilities remain supportive to older persons.

- **Professional nurses**

Professional nurses are nurses registered with the South African Nursing Council (SANC) under the Nursing Act (33/2005) and are employed by the health sector (SA, 2005) to render PHC services to older persons who attend the PHC facilities in rural areas in the North-West Province

1.5.4 Literature review

The literature review aimed to identify what is known about self-care and medication adherence amongst older persons in a rural area to enhance their quality of life. The literature comprises relevant books, journal articles, newspaper reports, government publications, theses and dissertations, as well as the internet sources. The standard treatment guidelines and essential drug list for South Africa (SA, 2008) and Orem's self-care deficit nursing theory (Clark, 1996 and 2003) were used to highlight the importance of self-care and medication adherence of the older persons.

The following databases from the Library Services at the North-West University (NWU) were consulted*:* Academic Search Premier, A-Z journal list, Science Direct, EbscoHost, Medline, and Google Scholar.

1.6 METHODOLOGY

The explanations on the research methodology that will follow consist of the research design, the research method (population of older persons, sampling), data collection, pilot study, data analysis, validity and reliability.

1.6.1 Research design

The researcher chose a quantitative non-experimental research design to meet the objectives of this study (Burns & Grove, 2009:219). This design was selected so that the researcher could gain an overall picture of the factors influencing self-care and medication adherence amongst older persons in relation to age, gender, relationship status, behaviour like smoking, and medication use by using research strategies that are explorative, descriptive and contextual in nature (Burns & Grove, 2005:44; Cresswell, 2003:144; Mouton, 2006:102-103 & 133).

1.6.2 Research method

The research method consisted of identifying the population, sampling, data collection and data analysis. The research method, which entails two objectives, will be described in more detail in Chapter 3.

1.6.2.1 Population

The population for this study originated from the larger population of the PURE-SA study (see figure 1.1 below) and includes all the older persons (60 years and older), N=333 part of the Multi-National Prospective Urban and Rural Epidemiological Study (PURE-SA) (Kruger cited by Watson, 2008:53). The older persons as participants formed a sub-population of the larger population, N=2021 of the PURE-SA study. The reader should note that the population of older persons changed since the onset of the PURE-SA study in 2005, because of different reasons, such as death, movement, growing older and refusal of further participation.

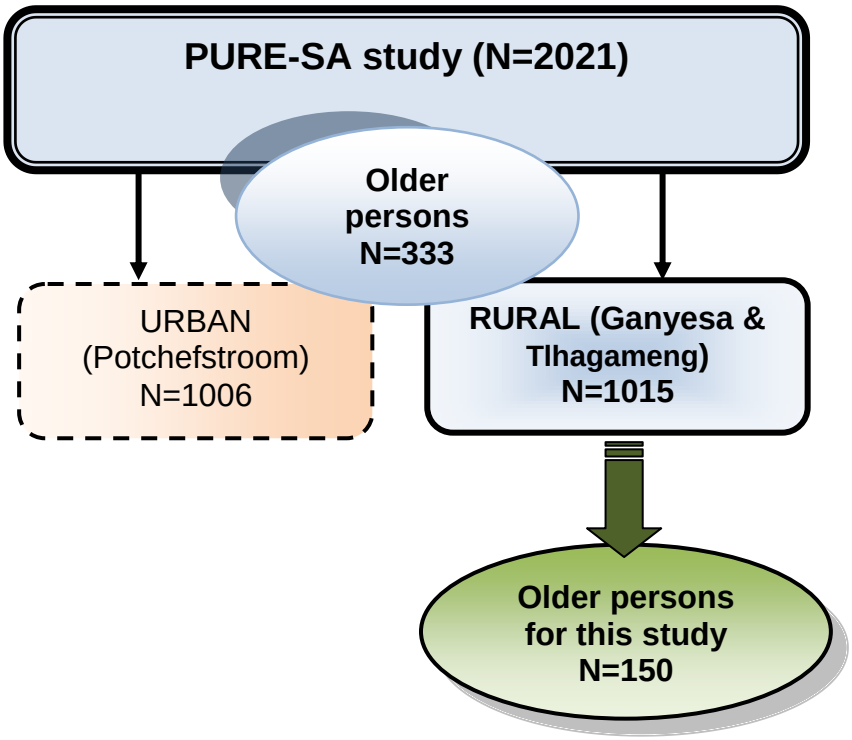

Figure 1.1: Illustration of population older persons originating from PURE-SA study (Watson, 2008:53)

1.6.2.2 Sampling

The all-inclusive sampling method was used in this study as all the older persons included in the PURE-SA study from the rural area was included in this study (see figure 1.1) with the criteria needed to provide the researcher with representative information concerning the older persons as a sample (Rossouw, 2005:113). The older persons included in this study consisted of 150 (one hundred-and-fifty) from the rural Tlhagameng and Ganyesa as a sub-population in the PURE-SA study (see figure 1.1 and paragraph 3.3.1).

The inclusion criteria for the older persons to participate in the study were the following:

- be on chronic medications and
- should be older than 60 years and been included in the PURE-SA study as participants..

1.6.3 Data collection

Data collection is the process of gathering data from the participants (Burns & Grove, 2005:430). For this study the researcher used a structured questionnaire with items identified from literature and existing questionnaires focusing on the aspects pertaining to self-care and medication adherence of older persons. The questionnaire consisted of three sections (see Appendix A), namely section A on demographic data, section B on self-care and section C on medication adherence of older persons in a rural area.

Data was collected by trained field workers from the PURE-SA study who conducted face-to-face interviews using structured questionnaires (Maree & Pietersen, 2007:8). The fieldworkers were used to collect data because they already knew the area and the participants, as they have been collecting the data for the PURE-SA study for the past five years. The field workers also know at which households the 150 older persons (>60 years from the rural area) lives to complete questionnaires. The fieldworkers completed a total of 143 questionnaires at the homes of the older persons who voluntary agreed to participate.

It was also the fieldworkers whom were familiar with the rural area that assist in the pilot study. Polit and Beck (2006:506) describe a pilot study as a small-scale version of the study aimed at assessing the feasibility of the whole study. Ten participants who were not involved in the main study were given questionnaires (see Appendix A) to complete prior to the research project,

using the same inclusion criteria as the actual research project and a similar setting and data analysis techniques (Burns & Grove, 2005:42). It was necessary to change some of the wording of the questionnaire for better understanding after discussions with the Statistical Consultation Services, NWU, Potchefstroom Campus.

1.6.4 Data analysis

Data analysis is the process of organising, managing and reducing the raw data collected with the structured questionnaire. A plan for data analysis was executed with the assistance of the Statistical Consultation Services of the North-West University, Potchefstroom Campus. Data was computed and interpreted by the mentioned Statistical Consultation Services using SPSS Windows (program of the SPSS Inc., Chicago, IL1989-2008).

In this research, the measuring of relation between factors of self-care and medication adherence such as age, gender, relationship status, behaviour like smoking and medication use was done with the use of descriptive statistics (Brink *et al*., 2006:171). Effect sizes means the degree to which the phenomenon is present in the population and were measured as small, medium or large, which means something is practical significant enough to alter a clinical decision (in the study the PHC facilities where the older persons with chronic diseases are consulted by the registered nurses). Effect sizes vary according to the population being studied, use of mean and standard deviation can help calculate effect size (Burns & Grove 2005:355). Mean refers to the value obtained by summing all scores and dividing that by the number of factors, while standard deviation (SD) refers to a measure of dispersion that is calculated by taking the square root of the variance. Tukey`s comparison (Benjamini & Braun, 2002:1590) was employed to measure differences between more than two groups ("multiple comparisons"), such as the items that measured the times at which persons take medication, namely morning, evening, two-three times and not sure (see table 4.11 and table 4.20). Descriptive statistical methods were employed to describe and summarize the collected data (Brink *et al.*, 2006:171). It allowed the researcher to organize data obtained from the completed questionnaires in ways that give meaning and facilitate insight into, and examine the phenomenon self-care and medication adherence from a variety of angles (Burns & Grove, 2005:461).

1.7 RELIABILITY AND VALIDITY

In order to ensure reliability and validity the researcher took care to be as objective and honest as possible throughout the study and to avoid any bias so that personal preferences would not

influence the interpretation of the findings. Internal reliability (internal consistency) testing of the measurements (instruments) was estimated by using Chronbach's Alpha co-efficient (Pietersen & Maree, 2007:216). The reliability and validity of the study will be briefly discussed in this chapter (see chapter 3 for a detailed discussion).

1.7.1 Reliability

According to Burns and Grove (2005:374) reliability is referred to as the consistency and dependability demonstrated by a research instrument (questionnaire in this study) when it is used to measure the variable or attribute that it was designed to measure. Reliability refers to whether a technique applied repeatedly to the same objects gives the same results every time (Babbie, 2010:150). The internal consistency of the questions was determined by measuring Chronbach's alpha coefficient (Burns & Grove, 2005:376; Pietersen & Maree, 2007:216), which assesses items to determine their congruency. This was ensured by administering the instrument to a representative sample of the target population (chapter 3).

1.7.2 Validity

Validity refers to the degree to which an instrument (questionnaire) measures what it is supposed to measure (Maree & Pietersen, 2007:147). The questionnaire was judged for content by experts in the field of research to measure self-care as well as medication adherence amongst older persons in a rural area. Internal validity was ensured by complying with the precision standards during the data collection process. Data was recorded fully and the competence of both the researcher and the field workers was ensured by thoroughly orientating them with regard to the data collecting process (Rossouw, 2005:178-179).

Face validity was measured when the appearance of the questionnaire was evaluated on its "look" (Pietersen & Maree, 2007:216-217) by ensuring that the questionnaire contains questions on self-care and medication adherence amongst older persons in a rural area. The questionnaire was scrutinized by both the researcher, the two study-leaders and experts at Statistical Consultation Services, NWU, Potchefstroom Campus.

Content validity was ensured by evaluating the appropriateness of the questions contained in the questionnaire and whether the questions correspond with the objectives of the study (Polit *et al.,* 2001:309). Aspects of self-care and medication adherence amongst older persons were covered.

Construct validity was done with the aim of ensuring that the questionnaire meant the measurement of self-care and medication adherence amongst older persons in a rural area. The evidence for construct validity was obtained in the literature review.

1.8 ETHICAL CONSIDERATIONS

The researcher was responsible for planning the whole study and submitted a proposal for approval from the Research Committee as well as the Ethics Committee of the NWU, Potchefstroom Campus **(Number 04M10).** Permission was obtained to carry out the study as part of the PURE-SA study and to make use of their field workers (see Appendix D and E) for ethical approval).

All ethical aspects were adhered to (Burns & Grove, 2005:181-230) and will be discussed in detail in chapter 3. Consent forms were signed by participants, and all information regarding the research was provided to the participants, including the purpose of the study, how the study will benefit the participants and their right to give consent willingly. Participants were treated with respect and dignity. They were not taken advantage of because of their vulnerability. Ethical principles adhered to in this study included the principle of respect for the older person as well as beneficence and justice to ensure that older person's rights are protected throughout the study.

1.9 RESULTS

The results of the study will be communicated to the Dr Ruth Segomotsi Mompati district in the North-West Province so that decision makers may be influenced to implement the recommendations of the study in order to strengthen self-care and medication adherence amongst older persons in a rural area.

1.10 RESEARCH REPORT LAY-OUT

Chapter 1: Overview of the study

Chapter 2: Literature review

Chapter 3: Research Methodology

Chapter 4: Results, presentation, discussion and conclusions

Chapter 5: Evaluation of the study, integrated conclusions, limitations and recommendations for nursing practice, nursing education and nursing research to improve self-care and medication adherence of older persons from a rural area in the North-West Province.

1.11 SUMMARY

This chapter offered an overview of the study by formulating the problem statement, research questions, aim and objectives and the assumptions. A discussion of the research methodology (design and research methods), the questionnaire, role of field workers and of the researcher, as well as a brief discussion of the reliability and validity and the ethical consideration were provided in relation to the two objectives of the study.

Chapter 2 reports on the literature review conducted for a better understanding of self-care and medication adherence as well as related constructs.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter 1 offered an overview of the study, including an introduction and problem statement, the research problem, aims and objectives, paradigmatic perspective, research methodology, as well as rigour and ethical considerations of this study. This chapter reviews the literature available from all the relevant sources to give a detailed description of the self-care and medication adherence of older persons in a rural area in relation to age, gender, relationship status, behaviour and medication use. According to mid-year population estimates in 2009, South African ageing population, which refers to people over the age of 60 years, amounts to 3.7 million by the year 2001, and this represents 7.5 % of the whole South African population (Kay, **s.a.**: 2). The National Research Dissemination Workshop (HelpAge, 1999:67) furthermore notes that older persons should be included in the planning of their health care and that health care professionals, which includes the professional nurse, should work together with older persons to improve their self-care capabilities and medication adherence. Guinn (2004:271) adds that if health care professionals work together they can improve the knowledge of the older persons, resulting in enhanced self-care and medication adherence. It is consequently important that the registered nurse working in a primary health care (PHC) facility take note that the older persons can be affected in different ways, either psychologically, economically, socially or physically, which includes the ageing process.

Ageing predisposes an older person to chronic diseases, necessitating chronic medication. They will only adhere to these medications if they understand the concept of self-care, and this will in turn lead to improved quality of life. The literature review of the main themes, namely self-care and medication adherence of older persons was conducted so that the information could assist the researcher in preparing the questionnaire schedule on self-care capability and medication adherence. It also helped the researcher gain insight into the phenomena applicable to the study, which is self-care and medication adherence. Concepts relevant to the study were reviewed namely the ageing process of the older person, chronic disease, chronic medications, and barriers to chronic medications adherence, non-medication management, medication management, side effects, self-care as well as quality of life.

2.1.1 Ageing

Ageing refers to 'maturation and senescence of biological systems' (Clark, 2008:468-469) which refers to progressive weakening of the body systems, increasing the risk of death as a person ages. Ageing is a biological, psychological, and social life long developmental process, and it entails a regression of physiological functioning and a cognitive decline (Walsh & Crumbie, 2007:48; Watson, 2008:88 & 96; Drewnoski *et al.,* 2003:300). According to Goyal (2004:19) longevity results in increased age-associated morbidity and disability, what makes quality of life a crucial issue involving biophysical-, social- and psychological ageing. These factors will consequently be discussed.

- **Bio-physical ageing**

Bio-physical ageing refers to anatomical and physiological changes that occur over time in various systems of the body in order to meet demands that occur over time. Such changes may include changes in the nervous system, with possible cognitive dysfunction leading to dizziness, hypotension, confusion and dementia (Walsh & Crumbie, 2007:48; Smeltzer *et al.*, 2008:191-192). When the digestive system is affected by ageing the older person may experience dryness of the mouth due to decreased salivary flow, fullness of the abdomen, heartburn, indigestion with possible constipation due to a decreased gastric mortality, which consequently exposes the older person to impaired nutrition. According to Walsh and Crumbie (2007:48) and Smeltzer *et al.* (2008:191-192) a loss of nephrons in older persons can cause genital-urinary problems, leading to a decreased urinary filtration rate. Dr Jonathan M. Vapnek, associate clinical professor of urology at Mount Sinai School of Medicine (American Medical Network, 2007), explain that both older women and men can suffer from increased urinary frequency, which is fairly common and a normal consequence of ageing, whereas urinary incontinence is not. At least one out of every 10 people over the age of 65 experiences urinary incontinence and the stigma surrounding it causes many people to hide the fact that they have the problem, with a significant effect on their quality of life (American Medical Network, 2007).

According to Touhy & Kathleen (2010:239-240) changes that might occur due to old age leads to chronic diseases that are brought about by changes in the musculoskeletal systems. The same author mentions that hypertension is caused by stiffening of blood vessels which leads to cardio vascular diseases; decline in the respiratory structures lead to respiratory diseases, diabetes mellitus is caused by atrophy of the glands that are responsible for hormone secretion. Chronic diseases will be discussed in detail in (paragraph 2.3). Behavioural aspects such smoking can also play a significant role in the lives of older persons, and increase the risk of cancer with a life span reduction up to 15

years (WHO, 2008:18). In addition to physical ageing, there are aspects in social ageing that will be discussed in the following paragraph.

- **Social ageing**

Social ageing refers to the way an individual interacts with other members of society. Some authors state that social aspects can even been judged on the basis of the way people dress and the language they speak (in this study the older persons all speak Setswana) (Nilsson, 2009:1305). Older persons regard support from family members as important and the needs and expectations that these older persons have in terms of ageing should receive attention. This includes maintaining physical and psychological functions and continued involvement in social activities and relationships (Drewnoski *et al.,* 2003:300; Watson, 2008:11). With social ageing older persons tend to withdraw [refer to the disengagement theory (Watson, 2008:20)] from interacting with members of their community. Withdrawal can contribute to non-adherence to medication and reduced self-care, and this leads to poor quality of life (Walsh & Crumbie, 2007:470. Social factors have an influence on the total health and well-being of older persons (Ferreira & Kowal, 2006:34) with the main functions for successful ageing clearly visible, namely to avoid diseases and disease-related disability; maintaining physical and mental functioning; and to be actively involved in the community (Kinsella & Phillips, 2005:34, 36; Louw & Louw, 2009:256) The psycho-social development of the older person, their feelings of self-esteem, value, and place in the family and society can play an important role in self-care and medication adherence. A discussion of the psychological ageing follows for a clearer understanding of the functioning of the older person in this study.

- **Psychological ageing**

Psychological ageing is concerned with cognition and abilities such as memory, feelings, motivation, intelligence and attitudes that are all affected by ageing process (Nay & Garrat, 2010:172). With cognition older persons shows the ability to obtain, accumulation, share and use information (Touhy & Jett, 2012:91). The same author states that decline in cognitive functioning occur in old age due to changes in the neurons of the brain, decreased brain size, and brain weight. There is a prominent link between the low percentage of older persons belonging to social groups and the psychological risk factors that could be indicators and warning signs that the older persons are or can become depressed. Older persons from rural areas that do not belong to any social groups are prone to depression. Stress and depression is furthermore common amongst older persons in rural areas due to the financial burdens they carry. These stresses are linked to food scarcity (Watson, 2008:78 & 88). Another aspect that can have an influence on self-care and medication

adherence is a person's memory. This refers to the act of acquiring, the storage and retrieval of information. Failure in one's memory, especially the older person, can lead to embarrassment and can cause inconvenience and even danger (Louw & Louw, 2009:96). To add to the mentioned bio-physical, social and psychological aspects of ageing, it is important to also report on the behaviours of the older person that can influence self-care and medication adherence. Rotter (*in* Louw & Louw, 2009:261) refers to the term "locus of control" to assess the extent of control people have over their various circumstances. The mentioned term can be linked to the extent to which the older persons believes that they themselves should and can control their own behaviour, or the extent to which they believe factors outside themselves control their behaviour. Westaway (2010) states that regression of psychological functions increase the risk of chronic diseases which could then result in reduced self-care.

2.2 SELF-CARE

According to Orem's self-care deficit theory of nursing as a general theory composed of three related theories which are: the theory of nursing systems, the theory of self-care deficit which indicates why people can be helped through nursing, and theory of self-care which describes how and why people care for themselves. Theory of self-care is the most basic element of Orem's theory (Clark, 1996:888). Self-care encompasses concepts such as self-care agency, self-care agent, and self-care deficit (Clark, 1996:888). Dennill *et al.* (1999:75) sees self-care as including different ways and methods used by an individual (in this study older persons) to avoid behaviours such as smoking and alcohol abuse. Self-care refers to activities that individuals (in this study older person) undertake with the intention of enhancing health, preventing disease, limiting illness and restoring health. It is an important learned behaviour when it comes to facing diseases and maintaining function, and it also creates meaning and purpose in life (Willison, 2006:9). This ability is associated with health promotion and power to engage in self-care.

Self-care reduces the burden on family members and on health care. According to Chang (2009:91) self-care improves health, prevents illnesses and enhances life. Activities such as bathing, grooming, eating, self-medication, toileting, mobility, sleep and personal hygiene that are affected by old age will be better managed if the importance of self-care is understood. According to Wilson *et al*. (2007:426-438) self-care inspires older persons to take care of their health. In the following paragraphs self-care agency, self-care neglect, self-care deficit and self-care requisites will be discussed for a better understanding of the extent of the concept.

2.2.1 Self-care agency

Self-care agency is defined as the capability and power of older persons to look after themselves (Orem, 2001:268). Older persons as self–care agents, have self-care requisites and should know ways of meeting them. Self-care requisites might be prescribed to individuals, for instance chronic medications, or may entail non-medication management, such as no-smoking for hypertensive older persons to improve their quality of life (SA, 2008:62).

Individuals learn cultural standards within the family, and this brings about variations in self-care practices. Self-care needs knowledge, motivation and skills to improve the quality of life of older persons, if practiced correctly. Older persons are regarded as self-care agents who are responsible for their own health and wellbeing. If older persons are unable to care for themselves due to old age or disability dependent care agent comes in. This means that family members or registered nurses care for older persons (Tomey & Alligood, 2006:271). However, individualized factors such as age, health behaviour and medication use, affect the way self-care is performed. Older persons as self-care agents with lower levels of functioning due to old age and disease will have impaired self-care that might lead to self-neglect.

2.2.2 Self-neglect

Self-neglect refers to failure to engage in activities that promote health and prevent diseases such as food intake and adherence to prescribed medications. It ultimately leads to a poor quality of life (Lauder, 2001:546). Self-neglect is common among older people due to old age, decline in physical activities and chronic diseases (Gibbons, 2006:323). Some older persons practice self-neglect intentionally, while others are not aware that they are neglecting themselves. Behaviours such as household squalor, poor diet, poor health, poor personal hygiene, lack of exercise, poor sleeping habits, disregarding the need to take prescribed medication regularly and failure to sustain interpersonal relationships, refer to self-neglect. Older persons are sometimes unable to engage in activities of daily living due to mental or physical impairment, and this is a form of self-neglect (Landeveld *et al.,* 2004:414) with inability to provide optimum levels of self-care, consequently suffering from self-care deficit.

2.2.3 Self-care deficit

Self-care deficit refers to the relationship between self-care agency and therapeutic self-care demands of individuals in whom capabilities of self-care due to some limitations are not able to meet all components of therapeutic self-care demands (Orem, 2001:282). There is partial and complete self-care deficit, with a partial self-care deficit one is able to meet some self-care demands, for example older persons will adhere to medications, but not adhere to non- medication management, for example, eating fatty foods when suffering from hypertension, whereas with total self-care deficit all therapeutic demands remain unmet, such as prescribed medications that are not taken or wrongly taken. Additionally, no healthy lifestyle is followed for control of chronic diseases, and behaviours like smoking and alcohol consumption is practiced. Signs of self-care deficit are aspects like meeting self-care requisite, loss of recognition of self and environment as well as poor judgement and decision making.

Self-care deficit is associated with decreased performance in care measures and lack of effectiveness of the self-care in which older persons can engage (Orem, 2001:282-284). From the discussion it is clear that older persons and their self-care can be affected by ageing and chronic diseases that make them dependent on others for their health.

2.3 CHRONIC DISEASE

Chronic diseases either persist for a long time or are constantly recurring and require to be treated with chronic medications (Soanes & Angus, 2004:255, Touhy & Jett, 2010:240). According to Guinn (2004:268) older persons are affected by chronic diseases due to ageing and they should be actively involved in their care, accept and value the self by engaging in self-care activities to improve their quality of life and manage chronic diseases. Touhy and Jett (2010:240) state that ageing and long life is associated with chronic diseases. Chronic diseases bring about reduced self-care and lack of medication adherence, leading to a reduced quality of life. According to Joubert and Bradshaw (2006:154) chronic diseases, referred to as non-communicable diseases, are responsible for 84% of deaths in older persons. The symptoms of a chronic disease are sometimes less severe than those of the acute phase of the same disease (Ebersole *et al*., 2008:224 & Smeltzer *et al.,* 2008:147) and can affect people of all age groups. Unfortunately older persons are the ones who are mostly affected because of changes in the normal bio-physiological functioning of the organs and systems. Chronic diseases such as hypertension, diabetes, depression, cardio-vascular incident, respiratory diseases and arthritis may lead to a complete or partial disability, even to death (Smeltzer *et al.,* 2008: 230-237). Literature indicates that the majority of older persons suffer from at least one or

multiple chronic conditions (Vergani, 2005:8; Cassim, 2007:415; Elzen *et al*., 2007:1833; Bastiaens *et al*., 2007:33). According to the policy document on South Africa PHC, some chronic diseases are inherited while others can be caused by factors such as smoking, obesity, lack of exercise, alcohol consumption, poverty, genetic predisposition and malnutrition (SA, 2003:1).

Priority chronic diseases in South Africa to take note of are hypertension, diabetes type 2, asthma and strokes (SA, 2003:1). In addition to this, Kimuna (2005:13) mentions that factors associated with ageing such as drug absorption, drug distribution, metabolism, excretion and receptor, can exacerbates the risk of disability. Consequently chronic diseases can be managed with lifestyle choices and by chronic medications (Touhy & Jett, 2010:241). The results of a study conducted by Watson (2008:101) confirms that chronic diseases common in rural areas are hypertension, cancer, diabetes mellitus, heart disease, arthritis and asthma. The self-reported chronic diseases to be noted are similar; hypertension, cardio vascular disease, diabetes mellitus, musculoskeletal diseases and respiratory diseases (Joubert & Bradshaw, 2006:1; Westaway, 2010).

2.3.1 Hypertension

Hypertension, a bio-physical problem in the older person is common and described as a blood pressure of 140/90mmHg and above on three separate occasions (Nilsson, 2009:1305) and is common across the world. Hypertension is caused by renal stenosis, increase in the stiffness of the arteries, and is aggravated by smoking, alcohol consumption, sodium intake, genetic factors, obesity and stress (Joubert & Bradshaw, 2004:156; Goyal, 2004:23, Brown *et al.,* 2007:93). Hypertension can increase with ageing (Van Staden & Weich, 2007:14b) and is the leading chronic disease amongst older persons presenting without symptoms, termed as a “silent killer” (Watson, 2008:101). If it is not properly managed with self-care and medication adherence, hypertension may complicate into cardio-vascular disease (Walsh & Crumbie, 2007:311; Tierney *et al*., 2005:404; Smeltzer *et al*., 2008:855). Important to note that Beers *et al.,* (2006:608) mention that self-care activities such as medication management, diet control and physical activity can control hypertension.

2.3.2 Cardio-vascular disease

Cardio-vascular disease, being the third most common chronic disease among older persons, is increasing in incidence and prevalence, with many causes of which the most common is the disease of the myocardium (Walsh & Crumbie, 2007:101). It develops due to myocardium dysfunction, before and after the load of ventricular volume, as well as the

heart rate. Cardiac failure is a common feature of cardiac disease, and this is progressive among older persons (Smeltzer *et al*., 2008:947). Early detection of patients at risk such as those with hypertension (in this study older person) is important and can decrease complications such as diabetes mellitus and or cardio-vascular incidents (Smeltzer *et al.,* 2008:655; Walsh & Crumbie, 2007:48). With this reality in mind one should note the importance of self-care and the activities that a person (in this study the older person) can engage in to promote health, prevent disease, assess symptoms and enhance quality of life (Ward-Griffen & Bramwell, 1990:1070; Kendall & Rogers, 2007:130).

2.3.3 Diabetes Mellitus

Diabetes mellitus is caused by gluose uria and osmotic diuresis leading to lack of insulin (type1) or because of resistance to the absorption of insulin (type2) Brooker, 2005:70, (SA, and 2008:144). Diabetes mellitus is a very common disease amongst older persons. Zarowitz (2006:77) notes that among older persons admitted to nursing homes, 25% have diabetes mellitus, with more than 80% of these individuals also having cardiovascular disease, 56% having hypertension, and 69% having two or more chronic conditions in addition to diabetes. According to Smeltzer *et al*. (2010:1197) diabetes mellitus is common among all age groups mostly affecting people 65 years and older. Obesity affects cholesterol, triglycerides and insulin secretion, and per implication diabetes mellitus (Joubert & Bradshaw, 2004:156). Random blood glucose of 11mmol or fasting above 7mmol is regarded as diabetes mellitus (Walsh & Crumbie, 2007:557; Tierney *et a*l., 2005:1157). The disease might be familial or acquired (see paragraph 2.3) and without adjustments to aspects like weight-loss, glycaemic control, participation in regular exercise, cessation of smoking and treatment of hypertension and dyslipidaemias, complications like cerebro-vascular diseases is most likely to occur (Zarowitz, 2006:2) with a negative influence on self-care and medication adherence of older persons.

2.3.4 Cerebro-vascular diseases

Cerebro-vascular disease pertain to the blood vessels of the brain and affects both older male and female equally (Brooker, 2010:45). It results in brain injury caused by occlusion of the vessel by an embolism or rupture of the vessel (SA, 2008: 240), leading to impaired self-care capability and medication adherence. The same author adds that this is manifested as a stroke or transient ischemic attack (temporary stroke). If the blood pressure is not managed correctly, it may complicate into a stroke known as cerebro-vascular accident (Walsh & Crumbie, 2007:672-673; Smeltzer *et al*., 2008:191-192). A cerebro-vascular accident can cause inactivity because one hand or both hands may be affected and are not functioning. This may lead to disability, with a decline in self-care, consequently

leading to failure in medication adherence. Immobility and stiffness of the joints as a complication of cerebro-vascular accidents form part of effects to the musculoskeletal system.

2.3.5 Musculoskeletal diseases

Musculoskeletal diseases are caused by gradual progressive decrease in bone mass, beginning before age forty, but excessive loss of bone density results in osteoporosis in post-menopausal women, including older persons . Older women are more affected than men, also older persons who are living sedentary lifestyles, those who take less calcium, older women with a loss of oestrogen and a history of smoking (Reid *et al*., 2006:66). Osteoporosis manifests in muscles that decrease in size, loss of strength and endurance as well as flexibility because of inactivity. It affects large joints and accounts for backache and decreased height. Older persons are also affected by degenerative joint diseases, especially those who are above seventy years of age. Different measures are suggested to prevent osteoporosis namely high calcium intake and exercise that increases muscle endurance, strength and flexibility (Walsh & Crumbie, 2007:48; Smeltzer *et al*., 2008:192). Chronic back pain is also common amongst older persons, and it is disabling and frustrating and causes immobility and decreased quality of life (Haas *et al*., 2005:228; Pein *et al*., 2010, 306-307). Musculoskeletal diseases are shown to be prevalent amongst other chronic diseases that affect older persons (Vergani, 2005:8). When the musculoskeletal system of an older person is affected, it can also have other bio-physical effects on the older person, including effects in the respiratory system.

2.3.6 Respiratory diseases

Age-related changes occurring in the respiratory system of older persons affect the lung capacity and function, gas exchange, and diffusing capacity is also diminished, which makes older persons more prone to respiratory diseases (Walsh & Crumbie, 2007:557). When older persons have respiratory diseases they can be affected in different ways and present with symptoms like daily cough, chronic phlegm, wheeze most days or night, dyspnoea, asthma, chronic bronchitis and emphysema that in turn lead to reduced self-care capability and medication adherence. The Department of Health in South Africa warns that respiratory diseases such as asthma and chronic obstructive airway diseases with the mentioned symptoms are increasing worldwide and are passing by undiagnosed and undertreated (SA, 2003:1). Chronically inflamed airways also lead to bronchospasms, increased bronchial secretions, and mucus plug formation resulting in limited airflow (SA, 2008:267). Zagaria (2006:16) adds to by mentioning that decreased air flow increases

cough, which leads to the use of over-the-counter medications for coughs, resulting in under diagnosis of respiratory conditions. This leads to complications, other diseases and death.

Chronic diseases such as the ones briefly discussed above, necessitates that older persons be put on chronic medication to prevent complications and to improve their quality of lives, thus reducing dependency on others. There are some pharmacological aspects that need to be taken into consideration because they affect self-care and medication adherence of older persons. The ageing process can make it difficult for medication to be as therapeutic as desired.

2.4 CHRONIC MEDICATIONS

Chronic medications are prescribed to manage chronic diseases (Touhy & Jett, 2010:240). Older persons are the ones who consume the most medications among all age groups because of chronic diseases and pain. The same authors mentions that medication has been shown to improve the health and well-being of the older persons and to alleviate symptoms. However there are problems associated with medication use, such as medication interactions, drug side-effects, poly-pharmacy and non-adherence (SA, 2008: xxiii, Osterberg & Terblanche, 2005:490-491). In addition factors such as “over-the-counter” (OTC) medications and use of herbs can aggravate the problems (Gibbon, 2005:3). The same author states that side-effects associated with the use of medications include decreased appetite, nausea and vomiting, reduced sleep, constipation, diarrhoea and mal-absorption of nutrients in older persons. Drugs like oestrogen for menopause causes increased food intake which can lead to weight gain (Smeltzer *et al.,* 2008:201; Gibbon, 2005:1). With the use of multiple medications it is important to understand aspects related to absorption, distribution and excretion, and how medicine and their side-effects can affect older persons. In the next paragraph polypharmacy will be discussed as a factor affecting older persons because of multiple chronic diseases.

2.4.1 Polypharmacy

Polypharmacy entails the administration of more than one medication at the same time for treatment of more than one chronic disease (Gibbon, 2005:3). This practice is common amongst older persons because some suffer from more than one chronic disease, for instance hypertension, cardiac disease and diabetes mellitus (Kalula, 2007:423). In addition the same author mentions that social deprivation brought about by the death of a spouse, children working far from home or children married, are treated with medications instead of social interaction. Polypharmacy predisposes older persons to medication interaction and adverse reactions (Bergman-Evans, 2006:174). Side-effects of medications

are often treated with over-the-counter (OTC) medications, for example, *Enalapril* used for hypertension causes a dry cough, from there the use of cough medications, which in turn increases the risk for adverse reactions. Health care practitioners add to the problems that older persons face by prescribing more than one medication (Gibbon, 2005:4). A detailed history of the medications (including over-the-counter medications and herbs) used by the older patient should be taken during consultation (Miller, 2004:318). When the therapeutic goal is reached, medication should be decreased, for example, in the treatment of asthma the dosage can be decreased when asthma is well controlled (Gibbon, 2005:1; Smeltzer *et al*., 2008:189, Ebersole *et al.,* 2008:301). Pharmacokinetics is another aspect that needs to be considered when medication is prescribed to older persons.

2.4.2 Pharmacokinetics

Pharmacokinetics refers to the study of the way medications move through the body (Ebersole *et al.,* 2008:296; Smeltzer *et al*., 2008:201). It determines the concentration of medication in the body, including absorption, distribution, metabolism and excretion.

- **Absorption**

According to Kalula (2007:422 and Brooker (2005:2) medication needs to be absorbed into the blood stream to be able to work. Touhy and Jett (2010:220) mention that medications taken by mouth are absorbed slowly through the small intestines. The route of administration of medication determines the time it will take for the medication to be absorbed. Tablets and liquids are not absorbed equally, factors such as peristalsis affect the way the drug is absorbed, and some fat soluble agents enhance storage and delay elimination because of more binding sites (Gibbon, 2005:2).

- **Distribution**

After absorption medications should be distributed to the receptor site so that it can work. Some drugs need to be metabolised first, while others do not need to (Touhy & Jett, 2010:222). For medication to work it needs to be transported through circulation. Organs of high transportation include the liver, kidneys, brain and lungs, and they get the highest concentration of medications. Some drugs are bound to proteins to be distributed. In the presence of more than such medication the different medications compete with each other for binding, which results in toxicity because of the free drugs available (Kalula, 2007:422).

- **Metabolism**

Metabolism is the process through which the chemical structure of the medicine is converted into a metabolite that is easily excreted by the body (Touhy & Jett, 2010:222, Brooker, 2005:252). Metabolised medicine has the same effect as the original structure. Ageing affects metabolism of a drug, and the half-life of most drugs is therefore extended in the liver where all medicines are metabolised. Some drugs may auto-induce interactions because they are both substrates and inducers (Kalula, 2007:423).

- **Excretion**

Most drugs are excreted through the kidneys as urine, while others are excreted in sweat and saliva as metabolites or in an unchanged form (Touhy & Jett, 2010:222). The same author denotes that the ability to excrete the drug changes with advanced age. Glomerular filtration is affected, which results in a prolonged half-life of a drug eliminated through the renal system. This results in accumulation of a drug, which increases toxicity and adverse reactions (Kalula, 2007:423). Pharmacodynamics is another medication related factor that is equally an important aspect to understand before medications are prescribed to older persons.

2.4.3 Pharmacodynamics

Pharmacodynamics refers to the physiological interaction between the drug and the body, and refers to the medication's length and the intensity of its pharmacological effect on the target cells (Touhy & Jett, 2010:223). Medicines need to attach to receptors. A receptor protein has a specific shape and needs to attach to a molecule to cause a chemical reaction. When a chemical binds to a receptor, the therapeutic effect is initiated, when a drug attaches to a receptor it will initiate a therapeutic reaction (agonist) or it may occupy the receptor site by blocking the body's chemicals usual physiological reaction (antagonist). Medications can sometimes attach to various other types of receptors instead of attaching to one specific receptor, and that will bring about unwanted side-effects. Older persons are more prone to have unreliable responses to a drug because of changes in drug–receptor or drug-organ-receptor interactions, which cause a change in drug effect. They might have increased or decreased responses to drugs (Ebersole *et al*., 2007:301). Prescribing more than one medication to older persons should be avoided by all means to improve medication adherence and to reduce side-effects. Older persons are compelled to make use of medicines by certain factors that they have little control over (see paragraph 2.4).

It is clear that there can be problems with medication use, including medication interactions, drug side-effects, polypharmacy and non-adherence as well as factors such as over-the-counter medications and use of herbs. Factors such as pharmacodynamics and pharmacokinetics should be taken into consideration before medications are prescribed to older persons because these factors affect the self-care and medication adherence of older persons. In the following paragraph barriers to medication use in older persons will be discussed.

2.5 BARRIERS TO MEDICATION ADHERENCE

Barriers refer to factors that prevent access to something (Soanes & Angus, 2004:110) in this study barrier to taking medications (Osterberg & Blashke, 2005:490-491). Barriers can thus refer to numerous factors such as communication impairment, forgetfulness, physical disabilities as muscle weakness and impaired eyesight. Health care professionals often struggle to communicate with older persons due to factors such as diminished memory and hearing impairment (see paragraph 2.11). The brain is one of the organs that are affected by ageing, and this sometimes diminishes the cognitive functioning of older persons. Multiple medications because of multiple chronic diseases and side-effects of medications increase the risk of non-adherence to medications (see paragraph 2.8.1). According to Altun (2008:881-882) health education and health promotion goes hand in hand for improvement of self-care and medication adherence of older persons. This means that if health education is adequate enough, the self-care and quality of life of older persons will improve. Factors such as difficulty in opening medication containers due to disabilities brought about by ageing process makes it difficult to adhere to prescribed chronic medications. Health illiteracy makes it difficult for older persons to read and to understand instructions in order to make informed decisions. They have trouble reading health information and difficulty accessing health services. This leads to medication errors and non-adherence to chronic medications. Impaired physical functioning due to ageing can lead to reduced self-care (Kalula, 2007:424, Gibbon, 2005:1, Joubert & Bradshaw, 2004:153). Symptoms of depression may be associated with non-adherence to medication, and it is therefore important to understand the impact of depression on chronic disease self-care behaviour (Nau *et al*., 2007:206). The barriers to medication adherence also include other factors as social factors, economic factors and beliefs of older persons as discussed in the following paragraphs.

2.5.1 Social factors

Poor social support from family members makes it difficult for older persons to cope with ageing. Religious affiliation provides social support that bridges formal and informal

networks (Clark, 2008:509). Support from family members and friends have shown to improve medication adherence (Smeltzer *et al*., 2008: 227). Social factors that are associated with poor lifestyle behaviours include an unhealthy diet, lack of exercise, smoking and obesity (Nilsson, 2009:1305). These can all impact negatively on the health and well-being of older persons.

2.5.2 Economic factors

Lack of income or low income poses difficulty in terms of accessing health care services, which makes it difficult for older persons to adhere to return dates at PHC facilities to collect their chronic medications, especially in rural areas because health facilities are far from where older persons stay. Geldenhuys (2007:55) states that old age pension is not enough for survival. Old age pension is currently in 2011 R1, 040 per month (SA, 2009:1). Family members are also not able to provide for health care of their older persons they depend on the government pension for survival hence reduced self-care and medication adherence (Touhy & Jett, 2010:356).

2.5.3 Beliefs of older persons

Zagaria (2006:12) points out that most of the older persons depend on their culture and religion to manage their chronic conditions, precisely because they are so susceptible. For example, some Christian older persons only depend on prayer for healing and believe that God will heal them without chronic medications, some do not belief in taking medications for the duration of their lives because they cannot depend on medication for health, they believe God for healing. On the other hand you find older persons that use multiple drugs for chronic conditions, such as OTC medications, and according to Kuzuya *et al*. (2008:881) the use of traditional medications is common practice among older persons. The researcher has observed that chronic medication cannot be used in isolation; it should be complimented with non-drug management such as weight-loss, exercise, enough rest, and no smoking or alcohol use in order to be effective.

2.6 NON-DRUG MANAGEMENT FOR CHRONIC DISEASES

According to Standard Treatment Guidelines and Essential Medicines List (SA, 2008:vi-vii) non-drug management for different chronic diseases such as moderate exercise, restriction of salt and fat intake, weight reduction if obese, relief of stress, alcohol cessation and avoidance of extreme temperatures are beneficial in the management of chronic diseases because they reduce complications, prevent death, control chronic diseases and enhance quality of life of older persons. For example, non-drug management in hypertension, like salt restriction, weight loss and physical activity, reduces the risk of cardio- vascular

diseases (SA, 2008:61). Pein *et al*. (2010:76) indicate that non-drug management is effective in the management of chronic diseases. Weight control for instance helps with the glycaemic control and improves insulin action in diabetes. Non-drug management should be used in collaboration with medications to improve quality of life of older persons and to be effective in the control of chronic diseases.

2.7 MEDICATION MANAGEMENT FOR CHRONIC DISEASES

The following medication is commonly used in PHC facilities for the management of chronic diseases of older persons to improve their quality of life:

Table 2.1: Medications commonly used in PHC facilities for the step-wise management of chronic diseases (SA, 2008; Gibbon, 2005)

CHRONIC DISEASE		**MEDICATION MANAGEMENT**
Hypertension	BP 140-159/90-99	Hydrochlorothiazide 12,5mg daily
	BP 160-179/100-109	ACE-inhibitor (Enalapril 10mg daily) **or** Long acting channel blocker (Amlodipine 5mg daily)
	BP >180/>110	Hydrochlorothiazide 25mg daily **and** ACE-inhibitor (Enalapril 20mg daily) **and** Long acting channel blocker (Amlodipine 10mg daily) **and** Atenolol 15mg daily
Cardiovascular diseases	Mild volume overload Significant volume overload	Hydrochlorothiazide (25-50mg daily) Furosemide (40-80mg daily)
	All with Congestive cardiac failure (CCF) If serum potassium can be monitored	ACE-inhibitor Enalapril up-10mg twice daily (BD) **add** Spironolactone (25mg daily)
	CCF	Carvedilol (12.5-50mg in single or divided doses)
	Symptomatic CCF	Digoxin (0.125mg daily)
Diabetes Mellitus	Typical symptoms and random blood glucose above 11mmol/L **or** Fasting blood glucose level≥7mmol/L	Biguanide (Metformin 500-850mg daily)
	Failed step 1:Hb1c >8% or fasting blood glucose above 8mmol/L	Binguanide (Metformin 500-850mg) Salphonylureas (Glibenclamide 2.5-7.5mg daily **or** Gliclazide 40-160mg daily (If more than 40mg is needed divide the dose)

	Insulin therapy	Add on therapy 10-20 units of insulin in the evening before bedtime
	Substitution therapy	Twice daily= 15-30 units of insulin divided as: • 10 units 30 minutes before breakfast • 5 units 30 minutes before supper
Cerebrovascular diseases	Stroke	Aspirin 150mg daily (with hypertension medications discussed under hypertension)
Musculoskeletal diseases	Acute Gout	Non-steroidal anti-inflammatory (NSAID) (400-800mg after a meal 8hourly) If NSAID's are contraindicated: Prednisone (40mg daily)
	Chronic Gout	Allopurinol (100-400mg daily)
	Osteoarthritis	Paracetamol 1000-4000mg per day) Methyl Salicylate ointment (UMS) If no response, **add** NSAID, Ibuprofen (200-400mg 8 hourly after meals)
Respiratory diseases	Mild Asthma & Moderate Asthma	Budesonide or Beclomethasone (200mcg 12hourly) If no response, **add** Beta 2-agonist (Salbutamol 1-2 puffs 3-4 times a day)
	Chronic Obstructive Pulmonary Diseases (COPD)	Patients failing to respond to the test dose of Salbutamol: Beta 2- agonist (salbutamol 1-2 puffs 3-4 times a day) And if controlled: Ipratropium bromide (2 puffs 6-8 hourly) If response to inhaler therapy is poor: Theophylline (200-300mg 12hourly)

2.8 CHRONIC MEDICATIONS AND THEIR SIDE-EFFECTS

In older persons medications are associated with side-effects (Gibbons, 2006:i) as indicated in the table below.

Table 2.2: Chronic medications and side effect (adapted from Gibbon, 2005; Pein *et al*., 2010 & SA, 2008).

MEDICATIONS	SIDE-EFFECTS
ANTI-HYPERTENSIVE MEDICATIONS (Hypertension)	Postural hypotension, incontinence, glycosuria and hypoglaecemia in diabetics, precipitates gout, hypokalemia, anorexia, gastric irritation, constipation, dizziness, headache, diarrhoea, nausea, fatigue, vomiting, bradycardia, hypotension, disturbances of sleep, dry mouth, muscle cramps, renal failure and oliguria

ANTI–CARDIAC MEDICATIONS (Cardiovascular)	Constipation, dizziness, hypotension, syncope, tachycardia, diarrhoea, dysuria, nocturia, diarrhoea, urinary frequency, epigastric pain, nausea and diarrhoea, headache, mood changes, sleep disturbances, digestive disorder, palpitations, nausea and hypotension, headache, dizziness, weakness, paresthesia, nausea and anaemia.
ANTI–DIABETICS (Diabetes mellitus)	Anorexia, constipation, nausea, vomiting, headache, dizziness, weakness, paresthesia, nausea and anaemia.
ANTI SROKE (Stroke)	Gastro intestinal irritation, bronchospasm, abdominal pain, nausea, vomiting, tinnitus and lactic acidosis.
NON-STEROIDAL ANTI–INFLAMMATORIES (Musculoskeletal)	Gastro intestinal irritation, bronchospasm, abdominal pain, nausea, vomiting, tinnitus, and lactic acidosis.
ANTI–ASTHMATICS AND COPD (Respiratory)	Insomnia, constipation, vomiting and diarrhoea and confusion fine tremors, headache and dizziness.

Chronic medications are prescribed to older persons to control chronic diseases. However, they are associated with side-effects, which are the undesirable effects of a drug. Medication adherence will be maintained if self-care is understood and side-effects associated with medication will be managed better, thus quality of life of older persons will be improved.

2.9 QUALITY OF LIFE

Old age predisposes a person to multiple chronic diseases (see paragraph: 2.1), which subsequently leads to a decline in quality of life and limitation of activities. Diseases like arthritis, hypertension, asthma, diabetes, cardiac diseases and depression are common among older persons, and they bring about poor quality of life due to functional impairment (Baird & Sands, 2006:442). Quality of life is multi-dimensional; it refers to the measures that allow individuals to cope successfully with every aspect of life and the challenges encountered, including physical, psychological and social roles (Wengstörm *et al.*, 1999:764). Self-care activities that are affected are: medication adherence, bathing, dressing, and eating, as well as limited physical activity. Modification of lifestyle such as low salt intake, no fat intake, no alcohol intake, weight reduction, nutritious diet and medication adherence will improve their quality of life (Beers *et al.,* 2006:2506), consequently compressing morbidity and mortality

Fitness in cardio-vascular and muscular organs such as the lungs through physical activity can lead to improved quality of life for older persons and can increase their independence. PASE (Physical Activity Scale for the Elderly) was used as an instrument to determine the effectiveness of exercise in improving the quality of life of older persons, and it was shown

to be an effective measure to improve quality of life of older persons with chronic disease (White *et al*., 2009). Tsai (2006:144) adds that self-care and medication adherence improves the quality of life of older persons.

2.10 CONCLUSION STATEMENTS

Conclusion statements from the literature study on self-care and medication adherence follow hereafter.

2.10.1 Conclusion statements on self-care

- Ageing, a biological, psychological, and social life long developmental process that affects both genders, refers to senescence and decline of body functions resulting in disability with an increased risk of death.
- Ageing affects different dimensions of people and may differ between age groups and genders. Biophysical ageing results in changes in both bodily form and function of males and females. Social ageing can be viewed as an important dimension whereby older persons tend to withdraw from interacting with members of their community, also the family and neighbours. Relationship status can thus affect aspects like self-care and support like help to adhere to medication. Psychological ageing which often results in cognitive decline leading to forgetfulness and impaired decision making can have a noticeable effect on self-care and medication adherence.
- Self-care comprises activities that older persons perform on their own to maintain life and function in order to enhance their quality of life.
- Failure to engage in self-care activities often leads to self-neglect and consequent failure in medication adherence. Signs of self-care deficit will be recognised when the persons older than 60 years show inadequacy to meet self-care requisite and poor judgement on self-care and decision making with direct or indirect impact on medication adherence.
- Failure to meet individual's therapeutic demand which means activities that are necessary to maintain function and promote development of the older person leads to self- care deficit.
- Chronic diseases that normally develop slowly and persistent over a long time, may affect the older person more intense and poses a greater challenge to them to persevere towards self-care.

2.10.2 Medication adherence

- Chronic diseases that mostly affect older persons are hypertension, diabetes mellitus, cardio-vascular-, cerebro-vascular-, musculoskeletal- and respiratory diseases which necessitates that they should be put on chronic medications.

- Older persons, respectable of their age, gender and relationship status, consume

- Pharmacodynamics plays an important role that should be considered when prescribing medications/drugs to older persons. The physiological interaction between the medication/drug prescribed and the body of the older person often result in unreliable responses with unwanted side-effects.

- Chronic medication are associated with barriers for the effective management of chronic diseases, such as social factors which includes support from family members, economic factors leading to low income and beliefs that can be cultural or religious of nature.

- Non-medication management of chronic diseases may have an influence on the self-care and medication adherence of older persons which includes aspects like moderate exercise and smoking cessation that reduces the risk of further loss of self-care abilities and quality of life.

- Chronic medications are associated with side effects. Therefore education regarding side effects of medications is vital to enable older persons to adhere to chronic medications to enhance their quality of life.

2.11 SUMMARY

The chapter offered a literature review of the concepts of ageing, chronic disease, chronic medications, self-care and quality of life. Ageing is biological, psychological and social. Degeneration of organs due to old age predisposes older persons to chronic diseases such as hypertension, cardiac diseases, asthma, diabetes mellitus, respiratory diseases, arthritis, as well as cancer. This necessitates the use of chronic medications. However, factors such as pharmacological aspects of ageing should be taken into consideration before medications are prescribed, because chronic medications are associated with side-effects and drug interactions. Older persons consume traditional medications such as herbs and OTC's, leading to polypharmacy. This risk of undesirable interactions is increased by health illiteracy. Self-care and medication adherence improves quality of life of older persons.

CHAPTER 3

RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION

The previous chapter offered a literature review within the research framework in order to examine self-care and medication adherence amongst older persons. The purpose of this chapter is to provide a detailed explanation of the methodology employed in this study. Special attention will be paid to the research design, research method, data analysis, reliability measures, as well as the ethical considerations relevant to this study.

The aim of the study is to make recommendations to the older person, family members, and registered nurses working in PHC facilities to enhance self-care and medication adherence amongst older persons in a rural area. The following objectives were formulated to enable the researcher to make the mentioned recommendations that would serve to enhance the quality of life of older persons (see table 3.1):

Table 3.1: Objectives of the study

Objective 1	Objective 2
To explore and describe the factors of self-care in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area	To explore and describe the factors of medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.

3.2 RESEARCH DESIGN

The quantitative non-experimental research design used is explorative, descriptive and contextual in nature. The research questions were detailed explicitly to provide direction to the study. According to Burns and Grove (2005:231) a quantitative design is a formal, objective, systematic enquiry process that uses numerical data to obtain information about the world. Questionnaires are used for specific reasons and Babbie (2010:256) mentions that specific information is sought to investigate and analyze an area of concern. In this study the area of concern is factors of self-care and medication adherence in relation to age, gender, relationship

status, behaviour and medication use amongst older persons in a rural area. The overall purpose of the study is to make recommendations to the older person, family members and registered nurses working in PHC facilities to enhance self-care and medication adherence amongst older persons in a rural area. The different elements of the research design will be discussed in the paragraphs below.

3.2.1 Quantitative research

Brink *et al.* (2006:92) mention that a quantitative research design determines the methodology that has to be used to obtain information for the study. The methodology has to consider the participants (in this study the older person), data collection, data analysis and the results. According to Burns and Grove (2005:24) a quantitative design refers to a formal, objective and systematic process during which numerical data is used for describing variables (in this study factors of self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area).

3.2.2 Explorative research

Explorative research aims to gain insight into a specific area, and to become familiar with new facts and the established information regarding the phenomenon (Brink *et al.*, 2006:104; De Vos *et al*., 2007:106). In this research the exploration was aimed at gaining knowledge and an understanding of self-care and medication adherence in relation to age, gender, relationship status, and behaviour and medication use of older persons in a rural area. In addition to an explorative design, descriptive element in the study design allowed the researcher to examine and describe the data gained from the empirical world of the older persons as participants more clearly (Burns & Grove, 2009:359).

3.2.3 Descriptive research

The phenomena selected for description were factors of self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area. Descriptive research was furthermore selected because it could assist the researcher in the provision of a complete picture of the phenomena (in this study self-care and medication adherence) as they currently manifest and as they are experienced by the participants (Brink *et al.*, 2006:104), it also explains the relationship between variables with no attempt to determine cause-effect relationship (Brink *et al.,* 2006:102).

3.2.4 Contextual research

According to Burns and Grove (2005:170) a study that is contextual in nature should show findings that are valid and applicable to a specific situation. Brink *et al.* (2006:64) state that once the population has been identified, the sample should be selected, the data collection method designated, and the method for analysing the results established. This study was conducted in Ganyesa and Tlhakgameng, a rural area in the North-West Province and a clear outlay of the context follow hereafter as adapted from Watson (2008:32).

Figure 3.1: Map to indicate the areas where study took place in the North-West Province (Source: www.linx Africa)

This study formed part of the PURE-SA study (refer to paragraph 1.6.2.1) with the main focus to examine health changes on non-communicable diseases over a period of 12 years within the North-West province in rural area of Ganyesa and urban area of Potchefstroom districts. The Ganyesa rural area includes the Tlhakgameng population which are referred to as the rural population and Potchefstroom district as the urban population (Watson, 2008:52). For the sake of clarity on the geographical boundaries for this study of older persons in the rural area the

reader should refer to figure 3.1 that contain a map of the district. **Ganyesa,** a village 70 km from Vryburg in the North-West Province of South Africa, 450 km West of Potchefstroom on the highway to Botswana and 70 km from the Botswana boarder with good infrastructure, referred to in this study as rural community; and **Tlhakgameng,** a deep rural village, situated 30 km from Ganyesa and 40 km from the Botswana boarder with almost no infrastructure, referred to in this study as rural community.

The context was specific, and the rationale behind a contextual design was to gain an overall picture of the problem and to come up with solutions to the identified problems. The contextual framework of the study refers to the environment and the conditions where the study took place. In this study the environment was a rural area with scarce resources well known by the researcher. In the rural area the distances between the older persons' homes and the clinics and between clinics and hospitals were large, and this influences accessibility to the health services and other services and/or sectors. Most of the participants had houses built with bricks and although most of them had clean running water and toilets, some did not, some stay far from the clinic while some stay nearer. For those who stay far, transport is a major problem when it comes to accessing health care facilities. Most of the participants stay with family members and survive on state pensions; they are all from an African socio-cultural background and historically from the previously disadvantaged group (Watson 2008:36).

3.3 RESEARCH METHOD

Detailed information on the research method is provided below, with emphasis on the population, sampling, data collection and data analysis.

3.3.1 Population

LoBiondo-Wood and Haber (2006:291) describe population as a well-defined set with specific properties. The population that was utilised in this research included all older persons (60 years and older), N=333, already participants in the PURE-SA study that started in 2005. The older persons as participants formed a sub-population of the larger population, N=2021 of the PURE-SA study (see figure 1.1).

3.3.2 Sampling method

The all-inclusive sampling method was used, because all the older persons living in the rural area that participated in the PURE-SA study were included in this study (see figure 1.1). The sample used from the PURE-SA study complied with the inclusion criteria of the study (Burns &

Grove, 2009:343), namely persons older than 60 years, living in the rural areas Ganyesa and Tlhakgameng in the North West Province and using chronic medication, were selected.

Large sample sizes are difficult to obtain in nursing studies, are costly and would require long data-collection periods. However, because this is a descriptive study that is not intended for generalization, a smaller sample is acceptable (Burns & Grove, 2009:357-359). The sample size was influenced by the availability of older persons who were already participants of PURE–SA study in the Ganyesa and Tlhakgameng rural area (as explained from the 150 older person populations, 143 participated voluntary). During the survey of the PURE-SA study in 2005, it was identified that the older participants demonstrated health decline and that a study on self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use will add value to the larger PURE-SA study.

3.4 DATA COLLECTION

Data collection is the process of precise, systematic gathering of information relevant to the study, from the participants (Burns & Grove, 2005:430) in order to achieve the aim of the study. The study employed a structured data collection tool (questionnaire), descriptive in nature, to measure factors of self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.

The questionnaire was structured into three (3) sections, namely on demographic information, self-care and medication adherence with the aim of collecting systematic and unbiased data from the older persons as participants. The section in the questionnaire on self-care (see Appendix A, section B) was adapted from the standardised self-care agency scale after permission was granted from the developers (see Appendix E where permission was asked by the researcher and granted by prof G. Brouns). Section C (see Appendix A) on medication adherence was developed from available literature.

The questionnaire used in the study had the advantage that it was only marked with a barcode that ensured anonymity of the participants and it was a quick way to gather the data from the older persons in their own homes (Rabie, 2009:83). A consultant from the Statistical Consultation Services of the Potchefstroom Campus was asked to evaluate the questionnaire on face value to enhance the validity thereof and determine whether the questionnaire could be applied to this study. The items in the questionnaire were formulated in the most understandable way possible, to be answered on a 4-point Likert-based rating scale (see Appendix A).

A total of 150 questionnaires were distributed by both the fieldworkers and the researcher to the older persons as participants of whom 143 were completed, making the response rate 95%. Factors such as the fact that participants were older persons that are vulnerable were taken into consideration, and therefore questionnaires were completed at their homes by the researcher and fieldworkers. Data was collected from June to July 2009 by six trained field workers of the PURE-SA study, which had at that time been running for five years. Field workers were utilized to avoid bias when selecting participants. They already knew the participants because they had been collecting data for the PURE-SA study for the past five years. Their role was to identify participants (in this study older persons in the households included in the study), to explain the purpose of the research project, to inform them of ethical issues on the consent form and to complete questionnaires on behalf of older persons because most of them could not write due to lack of formal education or disability due to diseases such as arthritis and visual impairment. To exclude the possibility of fabrication or falsification the researcher joins the fieldworkers during the data collection period as mentioned hereafter. The work team of PURE-SA and co-ordinator for quality insurance did spot checks on weekly basis to the rural area to ensure that all data of the whole study were authentic and that the fieldworkers visited the older persons in the households included in the study.

For better understanding of the data collection process that was followed a short explanation of the role of the researcher follows. The researcher was introduced to the field workers in the PURE-SA study after which appointments were made to explain the purpose and objectives of the research project, method of data collection, and ethical aspects to the field workers. At another appointment with field workers the researcher orientated them with regard to how they should complete the questionnaires after which they were given the chance to ask questions, and then issued with the questionnaires. The researcher went with the fieldworkers to the homes of older persons to help them complete the questionnaires. After a period of two weeks the researcher went back to the rural area to collect the completed questionnaires of the pilot study (see paragraph 3.5) to clarify any misunderstandings, for example explaining the consent form to the participants. The researcher took the ten (10) completed questionnaires and returned after a month to collect the rest of the questionnaires that were completed by both the researcher and fieldworkers. Codes were written on each of the questionnaires to identify participants, no names were used.

3.5 PILOT STUDY

Burns and Grove (2005:42) define a pilot study as a minor study that is based on a proposed study to improve or refine the research method before a major study is conducted. According to Brink *et al.,* (2006:166) a pilot study refers to a small scale study conducted prior to the main study on a limited number of subjects from the population at hand in order to investigate the feasibility of the study and to refine the data collection instrument (in this study a questionnaire). The pilot study was useful in this study because the researcher compiled the questionnaire for the purpose of measuring self-care and medication adherence amongst older persons in a rural area. Questionnaires developed by the researcher were taken to the supervisor for evaluation and then to the Statistical Consultation Services of the North-West University (NWU) Potchefstroom Campus for evaluation and correction. Some of the sentences were reconstructed, some were deleted, and after that the questionnaire was approved. Before actual data was collected, questionnaires were distributed to ten (10) older persons who were not part of the actual study, but who met the criteria for participation as stated in paragraph 3.4 for completion by field workers. Participation in the pilot study took place on a voluntary basis. This was done to determine the validity of the questionnaires and to improve quality of the study. The field workers were able to complete the questionnaires on behalf of older persons (tick the choice made by the older person) for those who could not read and/or write. Completion of each questionnaire took approximately twenty minutes.

3.6 DATA ANALYSIS

The purpose of data analysis is to reduce and organize the data into an interpretable form, to formulate a conclusion to the problem statement, and to give meaning to the data (Burns & Grove, 2005:43). Descriptive as well as explorative statistics were utilized to describe, summarize and synthesize the data, and to convert and condense the data into an organized representation with meaning (Brink, 2006:171). The statistical analysis of the data was done with the assistance of the Statistical Consultation Services of the NWU, Potchefstroom Campus. Data analysed by staticians at the North-West University Potchefstroom Campus included the demographic data, self-care and medication adherence amongst older persons of the rural area of Ganyesa and Tlhagameng in the North-West Province of South Africa.

A descriptive data analysis approach employs a measure of central tendency; namely, mean and measures of dispersion, i.e., the standard deviation, which is the most widely used

measure of variability and of relationship (Burns & Grove, 2005:462-463; Brink *et al.*, 2006:178). The t-test was used to demonstrate that the difference between the two means of the two groups, were significant (Burns & Grove, 2005:502; Ellis & Steyn, 2003:51; Brink *et al.*, 2006:182).

Data of the participants on self-care and medication adherence was analysed in relation to the following variables:

- Age (group 60-80 and >81),
- Gender (male and female),
- Relationship status (single and married),
- Behavioural data (smokers and non-smokers),
- Medication use was divided into four sets of data, namely:
  - ✓ Poly-pharmacy (on one chronic medication and on more than one chronic medication),
  - ✓ Who administer the medication (administered medication self and medication administered by somebody else),
  - ✓ Traditional medication (use traditional medication and do not use traditional medication)
  - ✓ Frequency of medication use (the results on the data when the participant take their medication was divided into four groups, namely in the morning, in the evening, two to three times a day and not sure when to take medication)

The level of statistical significance was defined at a probability value of $p=<0.05$, signifying a significant difference, and $p=<0.01$, signifying a highly significant difference. For the purposes of the study, effect sizes were calculated to determine the practical significance of the findings and the results focused on the p-values calculated. Even if a study does not have statistically significant results, the results can still be applied to clinical practice and may be considered to be of practical importance (Ellis & Steyn, 2003:52, Burns & Grove, 2005:355; Pietersen & Maree, 2007:211). As a result of the fact that non-random sampling was done, interpretation of comparisons between means of groups were done according to Cohen's effect sizes (Cohen, 1988:500). Effect sizes indicate practical significance – that is the extent to which a difference is large enough to have an effect in practice (Steyn, 2002). Thus no inferential statistics were

interpreted, although p-values are reported as if random sampling was assumed for the sake of completeness.

The following guidelines by Cohen (1988:503) in Ellis and Steyn (2003), and Pietersen and Maree (2007:211) were followed for d-values regarding differences between means: small effect (d = 0.2), medium effect means it is noticeable with the naked eye (d = 0.5), large effect that means practically significant (d ≥ 0.8). The calculation of effect sizes make the differences independent of units and size and relate them to the spread of data (Ellis & Steyn, 2003). The information used to calculate effect sizes included the items age (group 60-80 and >81), gender (male and female), relationship status (single and married), behavioural data (smokers and non-smokers), medication use (on one chronic medication and on more than one chronic medication; administer medication self and medication administer by somebody else; use traditional medication and do not use traditional medication). The analyses of the frequency of medication use will be explained hereafter.

Analysis of variance (ANOVA) is an extension of the t-test and can compare more than two means simultaneously. Tukey`s test was used in this study to determine which of the means differ significantly (Brink *et al*., 2006:183). Tukey`s comparison (Benjamini & Braun, 2002:1590) was employed to measure differences between more than two groups ("multiple comparisons"), the items that measured the frequency of medication, that is the times at which persons take medication, namely morning, evening, two-to-three times a day and not sure when to take medication (see table 4.11 and table 4.17).

An exploratory factor analysis was done on the self-care questionnaire as a data reduction method. Items cluster when they are closely linked, and are then called factors (Burns & Grove, 2005:489; Pietersen & Maree, 2007:218-221). Items that did not cluster meaningfully on a specific factor were regarded as a factor on its own. In case of factors with two or more items, Chronbach alpha`s coefficients were calculated to determine the reliability of the specific factor. For the purpose of this study single items were regarded as factors on their own.

3.7 RELIABILITY AND VALIDITY

According to Burns and Grove (2005:33) rigour involves striving for excellence in research with discipline, adherence to details and strict accuracy. Rigour includes reliability and validity.

3.7.1 Reliability

The reliability of the questionnaire referred to the consistency of scores obtained by the same persons when they are re-examined with the same questionnaire on different occasions, or with different sets of equivalent items, or under other variable examining conditions (Anastasi & Urbina, 1997:84). The Chronbach Alpha coefficient for reliability was computed in this study for each measuring instrument based on the inter-item correlations (Burns & Grove, 2009:379). Maree and Pietersen (2007:216) indicate that if the reliability estimates are 0.80 and above, the questionnaire is regarded as acceptable, but if the reliability estimates are below 0.60, reliability is unacceptable. However, Field (2005:668) states that in the social sciences values below 0.70 and even lower are acceptable when measuring constructs due to variability.

Because "reliability is a characteristic of data" (Eason, 1991:84), the researchers took into account that the participants themselves had an influence on score quality in this study. As Thompson (1994:839) explains, because total score variance is an important aspect of reliability, the participants involved in the study will themselves affect score reliability: "the same measure, when administered to more heterogeneous or more homogenous sets of subjects, will yield scores with differing reliability".

The validity of the structured questionnaire indicates whether it measures what it was supposed to measure and how well it does so (Anastasi & Urbina, 1997:113). The researcher was aware that the term face validity is a non-scientific judgment as to how well a questionnaire may look superficially to those who use it. It is, however, necessary for a questionnaire to have face validity because without it, cooperation and motivation, as well as user and public acceptance, will be problematic (Linn, 1989:165). The statistician agreed that on face value both the questionnaires, one on self-care and the other on medication adherence, could be applied if small adaptations were made. Content validity was determined subjectively by involving experts to judge the relevance of the questionnaire items regarding the subject area under assessment (the self-care ability and medication adherence of the older person). Empirical methods to assess content validity included exploratory factor analysis and the identification of the underlying structure of the questionnaire items (see paragraph 4.4.1).

To prevent threats to internal validity and reliability, which includes the Hawthorne effect, maturation of the participants and mortality, and to ensure true reflection of reliability, the

questionnaires and samples were conducted concurrently. The researcher remained objective, and the instrument was found reliable after corrections were made.

3.7.2 Validity

Validity of an instrument means the ability of an instrument to measure the construct that it is intended to measure and to yield the accuracy of the claim (Burns & Grove, 2005:376; Brink *et al*., 2006:207-208). The four most used types of validity to measure the accuracy of the variables measured are:

- **Content validity**

Content validity refers to the ability of an instrument to represent all different components of the variable to be measured, in this case self-care and medication adherence amongst older persons (Rossouw, 2005:123). Content validity was assured by determining the appropriateness of the questionnaires and checking whether the questions corresponded with the study objectives (Polit *et al.,* 2001:309). According to De Vos *et al*. (2007:160) all components must be included, if one is ignored, the content is not valid. The instrument should measure the concept accurately. The full meaning should be given in the variable measured to provide valid, accurate, adequate sample, of all content (De Vos *et al*., 2007:160). The scale used measured demographic data, self–care and medication adherence amongst older persons in a rural area.

- **Face validity**

The instrument appeared to measure what it was supposed to measure, which is self- care and medication adherence amongst older persons in a rural area. This is based on intuitive judgment by expects in the field of research. The researcher submitted the questionnaire to Statistical Consultation Services of the North-West University, Potchefstroom Campus for approval before it was handed to participants for completion. This is important during questionnaire development, because it determines the reliability and clarity of the content under study (in this study self-care and medication adherence). Without face validity participants may be resistant, which may in turn affect the results (Brink *et al*., 2006:207; De Vos *et al*., 2007:161). Simple language was used to enable older persons to understand the questionnaire, as well as to enable field workers to complete the questionnaire.

- **Criterion related validity**

Criterion related validity refers to the ability to compare an instrument with another one that is also valid. If the instrument matches the collected data using the criterion measured, the used instrument is valid with the same group of participants. The questionnaire on self-care was adapted from other questionnaires and from a literature review for medication adherence (see paragraph 3.5.1) (Brink *et al.*, 2006:207).

- **Construct validity**

Construct validity deals with the meaning of the instrument. It examines the fit between conceptual and operational definitions and it determines whether the instrument actually measures the theoretical construct that it is supposed to measure amongst (Burns & Grove, 2009:731). The evidence for construct validity was obtained in the literature review, and from the representativeness of the target population.

3.8 ETHICAL CONSIDERATIONS

According to Brink *et al.* (2006:31-40) the researcher has to be aware of the right of the participants and other ethical issues when planning a research project. The following ethical principles as identified by Burns and Grove, (2005:181-230) guided the researcher to carefully consider and refrain from ethical dilemmas that might occur during the study.

- **Permission to conduct the study**

The researcher had consent from the PURE-SA study of North-West University to carry out the research project amongst their participants and to make use of the field workers already participating in the PURE-SA study. Ethical approval **number 04M10** was granted (see Appendix B). Consent was also granted from the North-West Provincial Department of Health (see Appendix C). Older persons were not taken advantage of because they were vulnerable and after they were informed on the purpose and objectives of the study, a voluntary consent form was offered to the older persons for signing before the study was conducted (see Appendix D). With the permission of the participants, the interviews were completed that lasted ±20 minutes.

- **Anonymity and confidentiality**

The researcher treated all information as confidential and numbers were used to identify the questionnaires. The older persons as participants' names do not appear anywhere in the research findings. Questionnaires were kept in a safe place under lock and key.

- **Protection from harm and discomfort**

The principle of beneficence states that one should do well to participants and do no harm them (Burns & Grove, 2005:181). There were no risks or discomfort involved because all the questionnaires were completed in a setting safe and familiar to the participants, in the privacy of the participant's home. Participants' needs were respected and they were treated with sensitivity, especially when entering their homes care was taken by the fieldworkers not to trespass on their privacy. Because older persons are a vulnerable group, the researcher ensured that referral protocols were in place during the process of the research for counselling and/or other health care, if the need should arise.

- **The right to full disclosure**

Participants were informed about the nature of the study, their right to refuse participation and the risks and benefits. All misunderstandings were clarified during the course of the study.

- **The right to self-determination**

The right to self-determination means that no participant was coerced and no constraints were placed on the participants. The older person was capable of self-determination and they can control their own destiny (Burns & Grove, 2005:181). Plain, simple language that could be understood by the older persons was used to avoid coercion. The older persons were also reminded of their right to withdraw from the study if they so wished, and were assured that there will be no penalty and prejudice against those who wished to withdraw.

- **Honesty**

The researcher will respect the scientific community by protecting the integrity of the scientific knowledge and will execute other responsibilities namely to share the information with the community at stake through campaigns and awareness. No falsification of data was allowed, all

data was accurate and correct. Research was conducted with honesty, and those who contributed were acknowledged (Brink *et al*., 2006:40)

3.9 SUMMARY

In this chapter, each step of the research process was explained, including a detailed description of the research methodology employed, the research design, the research method, the data collection and data analysis. Rigour was taken into consideration with reference to validity and reliability. This study design was selected in order to meet the objective of this study, which is to describe self-care and medication adherence amongst older persons in a rural area. The entire study was well planned, the rights of the participants were protected throughout, and nothing relevant to the study was omitted.

In the following chapter, the results will be presented and discussed, as well as the conclusions drawn from the results.

CHAPTER 4

RESEARCH RESULTS

4.1 INTRODUCTION

In Chapter 3 the researcher discussed the research design, research methodology, validity and reliability, as well as ethical aspects. The purpose of this chapter is to present the reader with a detailed description of the findings of the study and to offer an interpretation. The results will be presented and discussed in order to gain a better understanding of the relation between factors of self-care and medication adherence and age, gender, relationship status, behaviour and medication use of the older person in a rural area. This will then enable the researcher to make recommendations to the older persons, family members and registered nurses working in primary health care (PHC) facilities in order to enhance self-care, and thus medication adherence for improvement of quality of life (see table 4.1 regarding the objectives of the study).

Table 4.1: Objectives of the study

Objective 1	Objective 2
To explore and describe the factors of self-care in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area	To explore and describe the factors of medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.

The rapid increase in the number of older persons worldwide and the increased burden that chronic diseases have become on public health-care systems, led the researcher to identify recommendations that will enhance self-care and medication adherence amongst older persons in a rural area. This will consequently improve their quality of life and lessen dependency on family members or on the health care systems.

The research was done in a PHC context in the Ganyesa and Thlakgameng rural area in the Ruth Segomotsi Mompati Health District, North-West Province (refers to Chapter 3, paragraph 3.2.4). The literature review and the two data sets from the empirical world (the measuring of self-care and medication adherence of older persons) form the basis for the recommendations of the study.

4.2 REALISATION OF DATA COLLECTION

A quantitative design, descriptive and contextual in nature, was followed and implemented according to a non-experimental path (LoBiondo-Wood & Haber, 2006:240). For self-care an existing standardised questionnaire was utilized whereas the questionnaire on medication adherence was developed from the literature review to identify the relation between factors of self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.

A total of six field workers participating in the research project of PURE-SA were employed for this study. The PURE-SA study started in August 2005 and will continue until November 2012 (see paragraph 1.6.2.1 and 1.6.3 for clearer understanding on the PURE-SA study). The field workers were trained to do data collection and focus on aspects like informed consent, and ensuring privacy and confidentiality.

The questionnaire used as data collection instrument was outlined in chapter 3, paragraph 3.4. Data collection involved participants 60 years and older from the rural area Ganyesa and Tlhakgameng (see paragraph 1.6.2.1 and 1.6.2.2 on the older persons as population). The population consisted of 150 older persons, of whom 143 participated in the study, a participation rate of 95%.

The results of each section will be discussed separately. Data analysis was done in a sequential order as illustrated in figure 4.1. The demographic data was first analysed and the results shown in a frequency table. Secondly the exploratory factor analyses were done for data reduction on the self-care questionnaire and the medication adherence questionnaire. Lastly descriptive statistics and Cohen's effect sizes for the factors related to self-care and of medication adherence were done. Factors of self-care in relation to age, gender, relationship status, behavior and medication use and then factors of medication adherence in relation to age, gender, relationship status, behavior and medication use were analysed.

The results were presented in such a manner that the reader gains an understanding of the demographic data in relation to self-care and medication adherence.

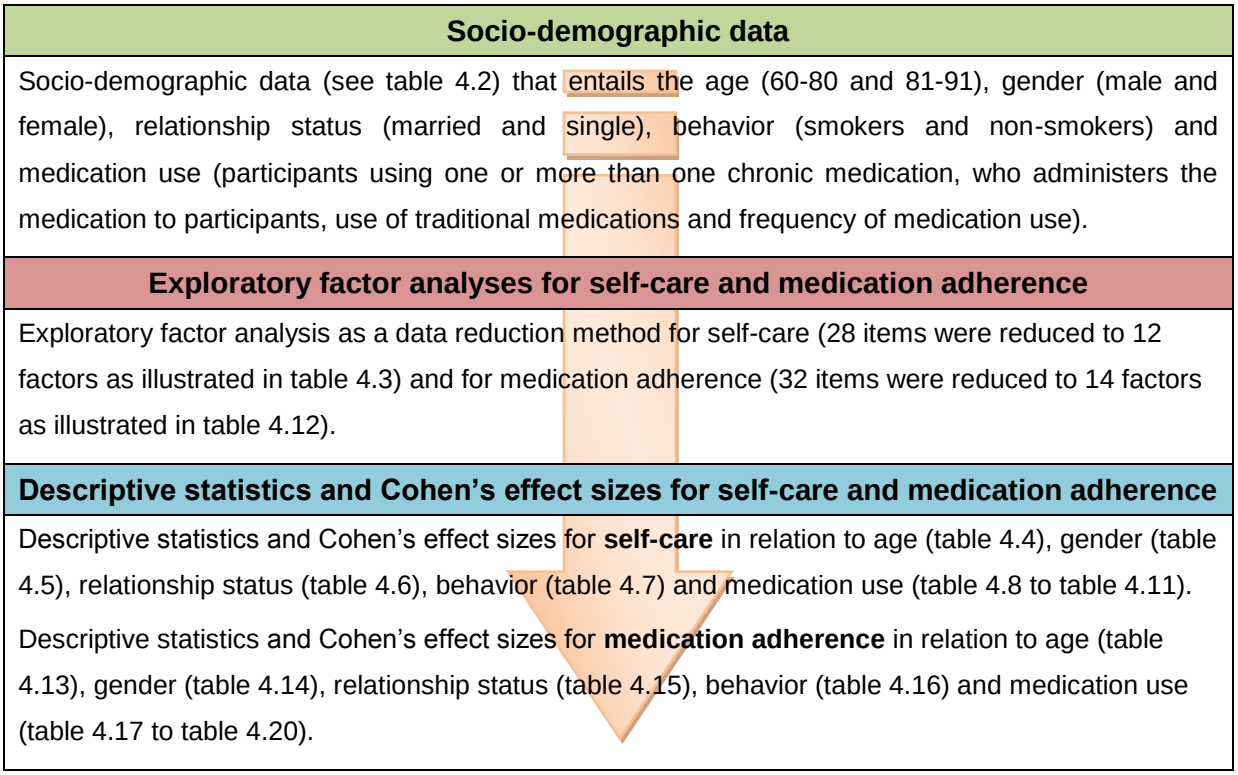

Figure **4.1:** **Schematic outlay of data analyses process**

4.3 DEMOGRAPHIC PROFILE OF OLDER PERSONS IN A RURAL AREA

Frequency tables were drawn to describe the socio-demographic variables (see section A of the questionnaire, Appendix A) pertaining to the 143 participants who live in a rural area and who participated in the study. The demographic data included the age, gender and relationship status of older persons. Age was divided into two groups for discussion, 60-80 and 81-91. Gender referred to male or female. Current relationship status was clustered: single (divorce, separated and widowed), married (live in a relationship and/or married by constitutional or traditional law). The source of income was grouped in governmental grants (old age pension and other grants like child support grant), other sources (income from children, spouse and other, like friends). The older persons included in this study mainly came from the black previously disadvantaged groups (see paragraph 3.2.4). The discussion above presented a summary of the demographic profile of the older persons in a rural area according to the different characteristics for self-care and for medication adherence, which will be discussed hereafter (see table 4.2).

Table 4.2 indicates that 143 persons older than 60 years living in a rural area participated in the study. The researcher used chronological markers to group the participants in two main groups for systematic discussions of results.

Table 4.2: Demographic data of older persons (n=143) in a rural area

Characteristics	n = number	Percentage
AGE in years		
60-80	107	74.83%
81-91	28	19.58%
Unanswered	8	5.59%
Total (N=143)	143	100%
GENDER of older persons		
Male	57	39.86%
Female	86	60.14%
Total (N=143)	143	100%
LANGUAGE of older persons		
Tswana	135	94.40%
Other black languages	3	2.10%
Unanswered	5	3.50%
Total (N=143)	143	100%
CURRENT RELATIONSHIP STATUS of older persons		
Single	28	19.58%
Married	68	47.55%
Divorced	1	0.70%
Widowed/separated	23	16.80%
Live in a relationship	21	14.69%
Unanswered	2	1.40%
Total (N=143)	143	100%
SOURCE OF INCOME of the older persons		
Governmental grants	131	91.61%
Other sources	11	7.69%
No source of income	1	0.70%
Total (N=143)	**143**	**100%**

With regard to age, nearly 75% of the participants were between 60-80 years of age. Most of the persons who participated resorted under old age, while 20% of the participants were in the age group of late old age (81-91 years of age). In as far as gender is concerned, males constituted a percentage of 40%, while females outnumbered their male counter parts with a percentage of 86%. It seems a reality that the females not only outnumber the males (Watson,

2008:71) in the area where the study was conducted, but in the whole of Southern Africa. The language that is spoken mostly in this rural area is Setswana, with a percentage of 98%, while only 2% of the respondents speak another indigenous black language. Regarding current relationship status, 37% of the older persons were single while 63% were married. On the question regarding the participant's source of income, 98% answered that they live on a grant like an old age pension, with 8% indicating that they live on other source of income, such as from their children, spouses and friends, while only 1% declared that they have no source of income. Geldenhuys (2007:54) and Watson (2008:72) confirm the fact that the majority of participants benefit from old-age pension.

4.4 RESULTS AND DISCUSSION ON SELF-CARE FACTORS OF OLDER PERSONS

After 95% of the participants (see paragraph 4.2) completed the questionnaires, the analysis and the necessary consultation to interpret the findings was conducted by the Statistical Consultation Services of North West-University (Potchefstroom Campus). The results obtained from the self-care questionnaire will be revealed and discussed first, followed by the results related to medication adherence, both in relation to age, gender, relationship status, behaviour and medication use.

4.4.1 Exploratory factor analysis of the self-care of older persons as participants

An exploratory factor analysis was done to reduce the data (see table 4.3 and table 4.12). Descriptive statistics and Cohen's effect sizes were used to determine the differences between means (see paragraph 4.4.2 and 4.5.2). Items cluster when they are closely linked, and are then called factors (Burns & Grove, 2005:489). Items that did not cluster meaningfully on a specific factor were regarded as a factor on its own. In case of factors with two or more items, Chronbach's Alpha coefficients were calculated to determine the reliability of the specific factor. For the purpose of this study single items were regarded as factors on their own. The following table (see table 4.4.2) reports on factors of self-care. The reader should refer to the self-care scale, section B of the questionnaire for clarity on all 28 items before clustering of items (factor analysis) into 12 factors (see Appendix A, section B and table 4.3).

Table 4.3: Factor analysis of self-care

FACTOR	ITEMS	CRONBACH`S ALPHA VALUES
Factor 1: Healthy lifestyle	10,7,24,19,13,27,23	0.78
Factor 2: Negligence of personal needs	5	a
Factor 3: Use of home remedies	11	a
Factor 4: Significance of taking care of self	4,3,2,1	0,66
Factor 5: Accountable for own health	27,16,28,8,25,21,20	0.73
Factor 6: Dependence on an expert for own health	12	a
Factor 7: Ability to seek help	25,6,9	0.50
Factor 8: Seldom have time for self	17	a
Factor 9: Ability to identify signs & symptoms	20,22,23	0.50
Factor 10: Understand bodily function	14,15,21	0.70
Factor 11: Having planned programmes for rest	18	a
Factor 12: Tendency of ignoring sickness	26	a

a= Please note that Chronbach's Alpha values could not be calculated as a results of the fact that the factor consists only of one item

Six factors (factor 1, 4 5, 7, 9 and 10) showed an acceptable reliability with values of 0.78, 0.66, 0.73, 0.50, 0.50 and 0.70 respectively. Items 2, 3, 6, 8, 11 and 12 did not cluster together with other items and will be discussed as factors on their own.

Healthy lifestyle as a factor resulted from items that refer to participants who eat a balanced diet, eat in a way that ensures that their weight will stay normal, know what foods to eat to keep them healthy, have planned programmes for exercise, are getting enough sleep, doing their daily activities no matter what, and have changed their old habits that made them sick. These items yielded the Chronbach`s Alpha value of 0.78, which is acceptable and shows moderate reliability (Pietersen & Maree*,* 2007:215-216).

Significance of taking care of self included items that look at whether the participants like themselves, whether they make sure that their environment stays clean, look for better ways to care for themselves and would gladly give up some of their set ways if it means improving their health. This factor seemed important since its Chronbach`s Alpha is 0.66, which indicates acceptable reliability (Field, 2005:675).

The factor that looked at whether participants are *accountable for own health* included items that would indicate if the participants do their daily activities no matter what, whether they take

care of themselves, understand themselves and their needs well, they make their own decisions, seek information to care for themselves, take responsibility for own actions and are interested in learning about various disease processes and how the diseases affect them. This factor showed an acceptable Chronbach`s Alpha value of 0.73.

The cluster looking at the participant's *ability to seek help* showed that they are not all keen to seek information to care for themselves. They often feel like they lack energy to care for their health needs, and that they would like to seek help. This resulted in a lower reliable Chronbach's Alpha value of 0.50.

Participants are able *to identify signs and symptoms* and they are interested in learning about various disease processes and how these affect them. They can usually tell that they are becoming sick days before they get sick, and most of them have changed the old habits that made them sick, as evidenced by a Chronbach`s Alpha value of 0.50, which yielded a lower acceptance as reliable.

I understand my body function, means that the older person understands the body and how it functions, examines the body to see if there are changes and takes responsibility for own action*s.* This factor had an acceptable Chronbach`s Alpha value of 0.70 (Pietersen & Maree*,* 2007:215-216).

Due to the fact that factors 2, 3, 6, 8, 11 and 12 did not cluster and that their Chronbach`s Alpha values were too low, they were analyzed item by item as factors. In the context of a social science they can still indicate practical significance and should not be ignored. The participants have a likelihood of *ignoring the feeling that they are sick and hoping that it goes away*; they make use of home remedies as evidenced by the fact that they *try home remedies that have worked in the past*. They also have a tendency of *depending on health care workers for their health* as most of them responded by saying that they *tend to neglect their personal needs* as well as expe*cting an expert to tell them what to do when they have a problem.*

4.4.2 Descriptive statistics and Cohen's effect sizes for the factors related to self-care of older persons as participants

The data collected from the older persons (hereafter referred to as participants) were analyzed by both the researcher and a statistician from the Statistical Consultation Services, NWU, Potchefstroom Campus, after the completed questionnaires were captured and computed. The measure of a mean and standard deviation of groups were used to describe the differences in the data (Burns & Grove, 2005:463-465). Data of participants included variables such as age,

gender, relationship status, behavioural data (smoking and alcohol use, which were combined), medication use (when medication is taken, who administers medication to the older person, the older person is on more than one chronic medication and sometimes uses traditional medications).

As a result of the fact that no random sampling was done, interpretation of comparisons between group's means were done according to Cohen's effect sizes (Cohen, 1988). Effect sizes indicate practical significance that is the extent to which a difference is large enough to have an effect in practice (Steyn, 2002). Thus no inferential statistics were interpreted, although p-values are reported as if random sampling was assumed. The following guidelines were used for Cohen's effect sizes (d-values) regarding differences between means: small effect: d = |0.2|; medium effect (noticeable with the naked eye): d = |0.5|; large effect (practically significant): d ≥ |0.8|.

The calculation of effect sizes make the differences independent of units and size and relate them to the spread of data (Ellis & Steyn, 2003). The information used to calculate effect sizes included the items 60-80 and 81-91 for age, male or female, and single or married for marital status. Tukey`s comparison was employed to measure differences between more than two groups (see table 4.11 and table 4.20), such as the items that measured the times at which persons take medication, namely morning, evening, two-three times and not sure. The level of significance for this study was defined at a probability value of p=<0.05; signifying a significant difference, and p=<0.01; signifying a highly significant difference. In addition to the statistical significance, effect sizes were calculated to determine the practical effect of the results. The best method to comment on the practical significance of this study was to use the difference between the two means of the two sets of data, divided by the estimate for standard deviation: which is the effect size. Burns and Grove (2005:580) indicate that the results do not have to be necessarily statistically significant to have importance in clinical practice. The practical significance of the results is important in nursing practice. Effect sizes for difference between the two age groups of participants for self-care will be discussed next.

4.4.2.1 Descriptive statistics and effect sizes for the factors related to self-care for the two different age groups

To determine if there was a difference between age group 60-80 (1) and age group 81-91 (2) regarding the factors related to self-care, Cohen`s effect sizes for differences between means were calculated and is reported in table 4.4. For group (1) 107 persons within the age group of

(60-80) responded, compared to group (2) of whom 28 who were within the age group (81-91) responded.

Table 4.4: Descriptive statistics and effect sizes of the factors related to self–care for the two different age groups.

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Healthy lifestyle	1	107	2.52	0.58	0.13	0.29
	2	28	2.69	0.49		
Factor 2: Negligence of personal needs	1	106	2.40	0.76	0.67	0.09
	2	28	2.46	0.74		
Factor 3: Use of home remedies	1	107	2.61	1.02	0.18	0.28
	2	28	2.89	0.96		
Factor 4: Significance of taking care of self	1	107	3.13	0.47	0.90	0.03
	2	28	3.12	0.55		
Factor 5: Accountable for own health	1	107	2.98	0.46	0.72	0.06
	2	28	3.01	0.36		
Factor 6: Dependence on an expert for own health	1	107	2.72	0.74	0.33	0.19
	2	28	2.86	0.65		
Factor 7: Ability to seek help	1	107	2.83	0.78	0.00 *	0.50 ◊
	2	28	3.21	0.50		
Factor 8: Seldom have time for self	1	107	2.75	0.79	0.95	0.01
	2	27	2.74	0.45		
Factor 9: Ability to identify signs and symptoms	1	107	2.85	0.56	0.41	0.15
	2	28	2.76	0.63		
Factor 10: Understanding of body function	1	107	2.398	0.52	0.31	0.21
	2	28	2.86	0.58		
Factor 11: Having planned programmes for rest	1	106	2.56	0.72	0.75	0.07
	2	28	2.50	0.84		
Factor 12: Tendency of ignoring sickness	1	107	2.67	0.86	0.81	0.05
	2	28	2.71	0.81		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect ♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.4 Cohen's effect sizes for difference between the two age groups were found to be small for all the factors on self-care except for the factor ***"Ability to seek help"*** which yielded a medium effect size of 0.50. The mean of the group 60-80 (1) was 2.83, while the group 81-91 (2) was 3.21. This result indicated that the second age group (2), 81-91 years of age, that is the oldest participants agree more than the younger age group (1). The oldest age group (2) will thus seek help more than group (1) when they are sick with a medium practical effect.

4.4.2.2 Descriptive statistics and effect sizes of the factors related to self-care for the two different gender groups

This factor aimed to determine if there was a difference between male (1) and female (2) regarding the factors related to self-care. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.5. From the persons 57 males (1) responded, compare to 86 (2) females who responded.

Table 4.5: Descriptive statistics and effect sizes for the factors related to self–care for the two different genders.

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1:Healthy lifestyle	1	57	2.56	0.55	0.96	0.01
	2	86	2.57	0.58		
Factor 2:Negligence of personal needs	1	57	2.37	0.77	0.43	0.13
	2	83	2.47	0.74		
Factor 3:Use of home remedies	1	57	2.67	1.07	0.96	0.01
	2	86	2.67	0.96		
Factor 4:Significance of taking care of self	1	57	3.11	0.48	0.79	0.04
	2	86	3.13	0.51		
Factor 5:Accountable for own health	1	57	2.95	0.46	0.47	0.12
	2	86	3.01	0.43		
Factor 6:Dependence on an expert for own health	1	57	2.68	0.71	0.18	0.23
	2	86	2.85	0.73		
Factor 7:Ability to seek help	1	27	2.88	0.50	0.82	0.04
	2	86	2.86	0.52		
Factor 8:Seldom have time for self	1	56	2.57	0.78	0.33	0.35
	2	86	2.85	0.69		
Factor 9:Ability to identify signs and symptoms	1	57	2.80	0.62	0.47	0.12
	2	86	2.87	0.53		
Factor 10: Understanding of body function	1	57	2.92	0.54	0.48	0.12
	2	86	2.98	0.56		
Factor 11: Having planned programmes for rest	1	57	2.46	0.85	0.23	0.19
	2	86	2.61	0.83		
Factor 12: Tendency of ignoring sickness	1	57	2.46	0.85	0.01	0.42
	2	86	2.81	0.83		

a=p-value obtained from t-test for independent groups in case of random sampling
*****=statistically significant at a 0.05 level in case of random sampling
◊=medium effect ♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.5 Cohen's effect sizes for difference between the two genders were found to be small with no practical influence on the self-care factors.

4.4.2.3 Descriptive statistics and effect sizes of the factors related to self-care for the two different relationship status groups

This factor aimed to determine if there was a difference between relationship statuses single (1) and married (2) regarding the factors related to self-care. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.6. Here for group (1) 52 single older persons responded compared to 89 from group (2) who were married.

Table 4.6: Descriptive statistics and effect sizes for the factors related to self–care for the two different relationship statuses.

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Healthy lifestyle	1	52	2.63	0.46	0.32	0.15
	2	89	2.54	0.61		
Factor 2: Negligence of personal needs	1	49	2.55	0.77	0.16	0.25
	2	89	2.36	0.74		
Factor 3: Use of home remedies	1	52	2.63	0.97	0.77	0.05
	2	89	2.69	1.04		
Factor 4: Significance of taking care of self	1	52	3.17	0.47	0.39	0.14
	2	89	3.09	0.52		
Factor 5: Accountable for own health	1	52	2.99	0.41	0.94	0.01
	2	89	2.98	0.47		
Factor 6: Dependence on an expert for own health	1	52	2.75	0.71	0.84	0.04
	2	89	2.78	0.72		
Factor 7: Ability to seek help	1	52	2.80	0.54	0.24	0.20
	2	89	2.91	3.00		
Factor 8: Seldom have time for self	1	51	2.76	0.76	0.73	0.06
	2	89	2.72	0.72		
Factor 9: Ability to identify signs and symptoms	1	52	2.69	0.49	0.01*	0.40
	2	89	2.93	0.60		
Factor 10: Understanding of body function	1	52	2.88	0.57	0.93	0.01
	2	89	2.89	0.59		
Factor 11: Having planned programmes for rest	1	52	2.58	0.75	0.68	0.07
	2	88	2.52	0.73		
Factor 12: Tendency of ignoring sickness	1	52	2.63	0.77	0.78	0.04
	2	89	2.67	0.90		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect ♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.6 Cohen's effect sizes for difference between the two relationship statuses, single or married were found to be small for all the factors on self-care, thus no practical effect to take into consideration.

4.4.2.4 Descriptive statistics and effect sizes of the factors related to self-care for the two different behavioural data groups

This factor aimed to determine if there was a difference between behavioural data that refer to smokers (1) and non-smokers (2) regarding the factors related to self-care. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.7. The responses showed 46 smokers compared to 79 non-smokers.

Table 4.7 Descriptive statistics and effect sizes for the factors related to self–care for the two different behavioural data groups, smokers and non-smokers.

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Healthy lifestyle	1	46	2.42	0.57	0.02	0.44
	2	79	2.67	0.56		
Factor 2: Negligence of personal needs	1	45	2.42	0.78	0.75	0.06
	2	77	2.47	0.74		
Factor 3: Use of home remedies	1	46	2.70	1.05	0.60	0.10
	2	79	2.59	0.98		
Factor 4: Significance of taking care of self	1	46	3.14	0.45	0.62	0.08
	2	79	3.10	0.52		
Factor 5: Accountable for own health	1	46	2.97	0.47	0.71	0.07
	2	79	3.00	0.43		
Factor 6: Dependence on an expert for own health	1	46	2.87	0.65	0.34	0.16
	2	79	2.75	0.76		
Factor 7:Ability to seek help	1	46	2.90	0.47	0.35	0.16
	2	79	2.54	0.54		
Factor 8:Seldom have time for self	1	45	2.67	0.80	0.34	0.12
	2	79	2.76	0.70		
Factor 9:Ability to identify signs and symptoms	1	46	2.71	069	0.01*	0.40
	2	79	2.98	0.41		
Factor 10: Understanding of body function	1	46	2.93	0.61	0.92	0.02
	2	79	2.95	0.52		
Factor 11: Having planned programmes for rest	1	46	2.76	0.79	0.50	0.12
	2	79	2.66	0.88		
Factor 12: Tendency of ignoring sickness	1	45	2.42	0.78	0.75	0.06
	2	77	2.47	0.74		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect ♦=large effect
Note: No differences in total number of participants due to missing values.

Cohen's effect sizes for differences between the participants that smoke and those that do not smoke were found to be small with no practical effect on all the self-care factors.

4.4.2.5 Descriptive statistics and effect sizes of the factors related to self-care and medication use

Medication use measured whether the person uses one or more than one chronic medication, who administers the medication to participants, use of traditional medications and frequency of medication use. The results are presented in this order.

- **Participants on one or more than one medication**

The first items aimed to determine if there was a difference between medication use (1) *on one medication* and (2) *on more than one medication* regarding the factors related to self-care. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.8. Results indicated that 62 participants are on one chronic medication compared to 79 whom are on more than one chronic medication.

Table 4.8: Descriptive statistics and effect sizes for the factors related to self–care for the two different groups, (1) persons on one medication and (2) older persons on more than one medication

Factors	Group	n	Mean	Std Dev	p-value (a)	d-value
Factor 1: Healthy lifestyle	1	62	2.44	0.58	0.03*	0.36
	2	79	2.65	0.55		
Factor 2: Negligence of personal health	1	62	2.48	0.65	0.39	0.13
	2	77	2.38	0.83		
Factor 3: Use of home remedies	1	62	2.81	0.92	0.18	0.21
	2	79	2.58	1.06		
Factor 4: Significance of taking care of self	1	62	3.17	0.51	0.20	0.21
	2	79	3.07	0.48		
Factor 5: Accountable for own needs	1	62	2.95	0.48	0.37	0.14
	2	79	3.01	0.39		
Factor 6: Dependence on an expert for own health	1	62	2.81	0.65	0.62	0.08
	2	79	2.75	0.78		
Factor 7: Ability to seek help	1	62	2.93	0.44	0.16	0.21
	2	79	2.81	0.56		
Factor 8: Seldom have time for self	1	62	2.76	0.56	0.90	0.02
	2	78	2.74	0.84		
Factor 9: Ability to identify signs and symptoms	1	62	2.86	0.57	0.67	0.07
	2	79	2.82	0.58		
Factor 10: Understanding of body function	1	62	3.03	0.55	0.12	0.26
	2	79	2.89	0.54		
Factor 11: Having planned programmes for rest	1	62	2.61	0.78	0.43	0.13
	2	78	2.51	0.72		
Factor 12 Tendency of ignoring sickness	1	62	2.58	0.88	0.22	0.20
	2	79	2.76	0.82		

a=p-value obtained from t-test for independent groups in case of random sampling
*****=statistically significant at a 0.05 level in case of random sampling
◊=medium effect ♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.8 Cohen's effect sizes for difference between the two different groups *on one medication* (1) and on *more than one medication* (2) regarding the factors related to self-care were found to be small with no practical effect.

- **Who administers medication to participants: self or somebody else?**

This item aimed to determine if there was a difference between who administers medication, *self* (1) and *somebody else* (2) regarding the factors related to self-care. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.9. Responses showed that 78 participants administer medication themselves (1) compared to 7 of group (2) who rely on somebody else.

Table 4.9: Descriptive statistics and effect sizes of the factors related to self-care of two different groups; whom administers medication *self* (1) or *by somebody else* (2)

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Healthy lifestyle	1	78	2.56	0.61	0.88	0.04
	2	7	2.53	0.43		
Factor 2: Negligence of personal needs	1	77	2.42	0.75	0.67	0.17
	2	7	2.29	0.76		
Factor 3: Use of home remedies	1	78	2.74	1.05	0.60	0.16
	2	7	2.57	0.79		
Factor 4: Significance of taking care of self	1	78	3.21	0.50	0.31	0.34
	2	7	3.04	0.39		
Factor 5: Accountable for own health	1	78	3.12	0.43	0.00*	0.50◊
	2	7	2.47	0.43		
Factor 6: Dependence on an expert for own health	1	78	2.71	0.95	0.70	0.15
	2	7	2.99	0.44		
Factor 7: Ability to seek help	1	78	2.99	0.44	0.32	0.41
	2	7	2.76	0.57		
Factor 8: Seldom have time for self	1	78	2.68	0.78	0.63	0.14
	2	7	2.57	0.53		
Factor 9: Ability to identify signs and symptoms	1	78	2.94	0.54	0.52	0.26
	2	7	2.71	0.85		
Factor 10: Understanding of body function	1	78	3.10	0.53	0.15	0.62◊
	2	7	2.71	0.62		
Factor 11: Having planned programmes for rest	1	77	2.62	0.78	0.09	0.80♦
	2	7	2.00	0.82		
Factor 12: Tendency of ignoring sickness	1	78	2.63	0.88	0.66	0.18
	2	77	2.43	1.13		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect;
♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.9 Cohen's effect sizes for the differences between who administers medication, *self* (1) or *somebody else* (2) in relation to the following factors on self-care:

"*Accountable for own health*" yielded a medium effect of 0.50. A comparison of the means shows that the mean of the group that take medicine self (1) was 3.12, while group on somebody else (2) had a mean of 2.47, which means that group (1) agrees more than group (2). The group of participants who administer medicine self is more accountable for their own health than the ones whose medication is administered by somebody else with a medium practical effect on self-care.

"Understanding of bodily function" yielded a medium effect of 0.62. Comparison shows the means of group (1) to be 3.10, while group (2) was 2.71, which means that the first group agrees more than the second group. These results indicate that the persons that administer medicine self (1) understands their bodily function better than those whose medicine is administer by somebody else (2) with a medium practical effect.

The factor of self-care ***"Have planned programmes for rest"*** had a large practical effect of 0.80. A comparison of the means showed that group (1) was 2.62, while group (2) was 2.00, which means that the first group (1) agrees more than group (2). Those participants who administer their own medication have planned programmes for rest more so than those whose medication is administered by somebody else; it does have a practical influence on self-care.

- **Use of traditional medications**

This factor tested if there was a difference between older persons who use traditional medication (1) and those who do not use traditional medication (2) regarding the factors related to self-care. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.10. Responses showed that (1) 68 older persons use traditional medication compared to (2) 73 who do not use traditional medication.

Table 4.10: Descriptive statistics and effect sizes for the factors related to self-care for the two groups, using traditional medication (1) and not using traditional medication (2).

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1:Healthy lifestyle	1	68	2.43	0.55	0.03*	0.50◊
	2	73	2.70	0.56		
Factor 2:Negligence of personal health	1	68	2.49	0.76	0.39	0.11
	2	73	2.07	0.73		
Factor 3:Use of home remedies	1	68	2.87	0.88	0.18	0.37
	2	73	2.47	1.08		
Factor 4:Significance of taking care of self	1	68	3.07	0.56	0.20	0.18
	2	73	3.17	0.43		
Factor 5:Accountable for own health	1	68	2.88	0.46	0.37	0.50◊
	2	73	3.09	0.40		
Factor 6:Dependence on an expert for own health	1	68	2.74	0.78	0.62	0.13
	2	73	2.84	0.67		
Factor 7:Ability to seek help	1	68	2.83	0.49	0.16	0.16
	2	73	2.91	0.53		
Factor 8:Seldom have time for self	1	68	2.76	0.74	0.90	0.04
	2	73	2.74	0.73		
Factor 9:Ability to identify signs and symptoms	1	68	2.67	0.66	0.66	0.50◊
	2	73	3.00	0.43		
Factor 10: Understanding of body function	1	68	2.92	0.62	0.11	0.11
	2	73	2.99	0.48		
Factor 11: Having planned programmes for rest	1	68	2.43	0.82	0.43	0.27
	2	73	2.66	0.61		
Factor 12: Tendency of ignoring sickness	1	68	2.59	0.87	0.21	0.26
	2	73	2.77	0.84		

a=p-value obtained from t-test for independent groups in case of random sampling
*****=statistically significant at a 0.05 level in case of random sampling
◊=medium effect;
♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.10 Cohen's effect size for the differences in use of traditional medications for the factor ***"Healthy life style"*** was found to be 0.50, which is a medium effect. The mean of group (1) was 2.43; while group (2)'s mean were 2.70, which indicate that the second group agreed more than the first group. It can thus been said that participants who do not make use of traditional medications tend to lead a healthy lifestyle more than those who make use of traditional medications with a medium practical effect.

The item ***"Accountable for own health"*** had an effect size of 0.50, which is a medium effect and can be of practical significance. The mean of group (1) was 2.88, while group (2) had a mean 3.09. The second group agreed more than the first group. These results indicate that persons that make use of traditional medications are more accountable for their own health than those who do not make use of traditional medications with a medium practical effect.

The effect size of the item ***"Ability to identify signs and symptoms"*** was 0.50, which is a medium effect. A comparison shows that the mean of group (1) was 2.67, while group (2) had a mean of 3.00. This shows that the second group (2) agreed more than the first group (1). Thus the finding demonstrates that persons who make use of traditional medicine are more able to identify signs and symptoms than those who do not make use of traditional medication with a medium practical effect.

- **Frequency of medication use**

The item looking at frequency of medication use offered the following options: morning (1) evening (2), two-to-three times a day (3) and not sure (4). The aim was to determine if there was a difference between frequencies of medication use with regard to self-care. Effect sizes for differences between means were calculated and are reported in table 4.11. Tukey`s comparison (Benjamini & Braun, 2002:1590) was employed here to measure differences between more than two groups ("multiple comparisons"), such as the items that measured the times at which persons take medication, namely morning, evening, two-three times and not sure (see table 4.11 and table 4.17). The responses showed on the frequency of medicine intake that 66 older persons take their medicine in the morning (1), 19 take their medicine in the evening (2), whereas 6 take medicine two-to-three times a day (3) and 19 are not sure of the frequency of medication use (4). The reader should take note that the researcher only reported on the Tukey's test with comparisons significant at the 0.05 level.

Table 4.11: Descriptive statistics and effect sizes for the factors related to self-care for the four different groups regarding frequency of medication intake (1) morning, (2) evening, (3) two to three times and (4) not sure

Factors	Group	n	Mean	SD	Tukey's comparisons significant at a 0.05 level (in case of random sampling)	d-value	
Factor 1: Healthy lifestyle	1	66	2.54	0.62	None	1-2	0.31
	2	19	2.73	0.57		1-3	0.26
	3	6	2.38	57		1-4	0.35
	4	19	2.75	40		2-3	0.62 ◊
						2-4	0.04
						3-4	0.72 ◊
Factor 2: Negligence of personal needs	1	65	2.40	0.79	None	1-2	0.51◊
	2	18	2.00	0.59		1-3	0.55 ◊
	3	6	2.83	0.75		1-4	0.01
	4	17	2.41	0.87		2-3	1.11 ♦
						2-4	0.50 ◊
						3-4	0.50 ◊
Factor 3: Use of home remedies	1	66	2.67	1.00	None	1-2	0.29
	2	19	2.32	1.20		1-3	0.50 ◊
	3	6	3.17	3.17		1-4	0.16
	4	18	2.50	1.04		2-3	0,71 ◊
						2-4	0.15
						3-4	0.54 ◊
Factor 4: Significance of taking care of self	1	66	3.12	0.53	None	1-2	0.04
	2	19	3.14	0.49		1-3	0.50 ◊
	3	6	3.38	0.21		1-4	0.07
	4	18	3.08	0.44		2-3	0.50 ◊
						2-4	0.12
						3-4	0.67 ◊
Factor 5: Accountable for own health	1	66	3.00	0.43	None	1-2	0.33
	2	19	3.17	0.50		1-3	0.04
	3	6	3.02	0.55		1-4	0.02
	4	18	3.01	0.41		2-3	0.26
						2-4	0.31
						3-4	0.03
Factor 6: Dependence on an expert for own health	1	66	2.71	0.74	None	1-2	0.69 ◊
	2	19	3.16	0.76		1-3	0.12
	3	6	2.83	0.98		1-4	0.06
	4	18	2.67	0.59		2-3	0.33
						2-4	0.64 ◊
						3-4	0.17
Factor 7: Ability to seek help	1	66	2.88	0.54	None	1-2	0.35
	2	19	3.07	0.47		1-3	0.22
	3	6	3.00	0.37		1-4	0.20
	4	18	2.72	0.49		2-3	0.15
						2-4	0.71 ◊
						3-4	0.57 ◊

Factor 8: Seldom have time for self	1	66	2.68	0.77	None	1-2	0.05
	2	19	2.63	0.96		1-3	0.41
	3	6	3.00	0.63		1-4	0.20
	4	18	2.83	0.51		2-3	0.39
						2-4	0.21
						3-4	0.26
Factor 9: Ability to identify signs and symptoms	1	66	2.89	0.57	None	1-2	0.15
	2	19	2.98	0.76		1-3	0.30
	3	6	2.67	0.34		1-4	0.13
	4	18	0.96	0.75		2-3	0.42
						2-4	0.03
						3-4	0.39
Factor 10: Understanding of body function	1	66	2.98	0.61	None	1-2	0.06
	2	19	2.90	0.58		1-3	0.42
	3	6	2.89	0.75		1-4	0.09
	4	18	2.83	0.51		2-3	0.36
						2-4	0.16
						3-4	0.52 ◊
Factor 11: Having planned programmes for rest	1	66	2.56	0.75	None	1-2	0.07
	2	18	2.50	0.86		1-3	0.13
	3	6	2.67	0.82		1-4	0.23
	4	18	2.39	0.70		2-3	0.19
						2-4	0.13
						3-4	0.34
Factor 12: Tendency of ignoring sickness	1	66	2.55	0.84	None	1-2	0.41
	2	19	2.95	0.97		1-3	0.34
	3	6	2.83	0.75		1-4	0.26
	4	18	2.75	0.88		2-3	0.12
						2-4	0.17
						3-4	0.06

a=Tukey`s comparison (In case of random sampling significant at a level of 0.05)
*****=statistically significant at a 0.05 level in case of random sampling
◊=medium effect;
♦=large effect
Note: No differences in total number of participants due to missing values.

Please note that table 4.11 shows no significant differences in terms of Tukey's comparison. A level of 0.05 for random sampling was not reached and therefore no multiple comparisons were done.

According to table 4.11 effect sizes for the four groups regarding the factor ***"Healthy lifestyle"*** yielded a medium effect size of 0.62 and 0.72 between group 2-3 and 3-4 respectively. A comparison of the means showed that (2) was 2.73, (3) was 2.38 and (4) was 2.75. The participants that take their medication in the evening (2) agreed more than those that take their medication two to three times a day (3), it indicates that when persons take medication in the evening they lead a healthy lifestyle more than those who take their medication two to three

times a day with a medium practical effect. Group (4), the participants that are not sure when to take their medication agreed more than group (3), those that take their medication two to three times a day, in other words participants who are not sure when to take medications lead a healthy life style more than those who take medication two-to-three times a day with a medium practical effect.

The factor ***"Negligence of personal needs"*** showed a medium effect size of 0.51, 0.55, 0.50 and 0.50 for groups 1-2, 1-3, 2-4 and 3-4 respectively, and a large practical effect of 1.11 for group 2-3. The comparison of means between group 1-2 were (1) those who take medication in the morning was 2.40, and (2) those who take medication in the evening was 2.00, which indicate that (1) agreed more than (2). This result indicates that persons who take medication in the evening (2) tend to neglect their personal needs more than those who take their medication in the morning (1) with a medium practical effect. Between groups 1-3 which were participants who take medication in the morning (1) the mean was 2.40 and those who take medication two--to three times a day (3) mean was 2.83. Participants who take medication in the morning (1) agreed more than those who take medication two-to-three times a day (3) with a medium practical effect. Between groups 2-4 the mean was 2.00 for group (2) those who take medication in the evening and was 2.41 for group (4) those who are not sure when to take their medication. These results indicate that participants who take medication in the evening demonstrated a tendency to neglect their personal needs more than those who are not sure when to take their medication with a medium practical effect. The results between group 3-4 mean was 2.83 (3) those who take medication two to three times a day and (4) was 2.41 indicating that group (3) those who take medication two to three times a day agreed more than group (4) those who are not sure when to take medication regarding negligence of personal health with a medium practical effect. The mean between group 2-3 were (2) 2.00 those who take medication in the evening and (3) 2.83 those who take medication two-to-three times per day. These results indicate that participants who take their medication two to three times a day tend to neglect their personal needs more than those who take medication in the evening with a large practical effect.

The factor ***"Use of home remedies"*** had an effect size of 0.50, 0.71 and 0.54 which were medium effects respectively. The means between group1-3, persons who take medication in the morning (1) were 2.67 and those who take medication two-to-three times a day (3) was 3.17 which indicate that group three (3) those who take medication two-to-three times a day agreed more than group (1) persons who take medication in the morning. These results indicates than persons who take medication in the morning make use of home remedies more

than those who take medication two to three times a day with a medium practical effect. Between group 2-3, those who take medication in the evening (2) the mean was 2.32 and participants who take medication two to three times a day (3) had a mean of 3.17; group (3) those who take medication two to three times a day agreed more than group two those who take medication in the evening. These results indicate that participants who take medication in the evening make use of home remedies more than those who take medication two-to-three times a day with a medium practical effect. Between group 3-4, those who take medication two-to-three times a day (3) the mean was 3.17 while group (4) those who are not sure when to take medication showed a mean of 2.50 indicating that group (3), those who take medication two-to-three times a day agreed more than group (4), those who are not sure when to take medication. These results indicates that participants who take medication two to three times a day make use of home remedies more than those who are not sure when to take their medications with a medium practical effect

The item ***"Significance of self-care"*** had an effect size of 0.50, 0.50, 0.67 respectively, which yielded medium effects. Between group 1-3, (1) those who take medications in the morning showed a mean of 3.12, while the mean of persons who take their medication two-to-three times a day (3) was 3.38. Group (3) persons who take their medication two-to-three times a day agreed more than (1) those who take medications in the morning. These results indicate that persons who take their medication two-to-three times a day (3) know the significance of taking care of themselves more than those who take medications in the morning (1) with a medium practical effect. Between groups 2-3 (2) those who take medication in the evening the mean was 3.14 and (3) persons who take their medication two-to-three times a day had a mean of 3.38. Group (3) persons who take their medication two-to-three times a day agreed more than group (2) those who take medication in the evening. These results indicate that those who take their medication two-to-three times a day (3) know the significance of taking care of themselves more than those who take medications in the morning (1) with a medium practical effect. Between group 3-4 (3) persons who take their medication two-to-three times a day the mean was 3.38 and (4) those who are not sure when to take medication showed a mean of 3.08, indicating that group (3) persons who take their medication two-to-three times a day agreed more than group (4) those who are not sure when to take their medication. This results indicate that those who take their medication two to three times a day know the significance of self -care more than those who are not sure when to take medication with a medium practical effect.

"***Accountable for own health***" is of no practical effect for self-care

The item ***"Dependence on an expert for own health"*** yielded an effect size of 0.69, and 0.64 respectively which were medium effect sizes. The means between group 1-2 (1) those who take medication in the morning mean was 2.71 and (2) those who take medication in the evening mean was 3.16. These results indicate that the second group (2) participants who take medication in the evening agreed more than group (1) those who take medication in the morning. Persons who take medication in the evening depend on an expert for their own health more than those who take medication in the evening with a medium practical effect. Between group 2-4 (2) those who take medication in the evening (2) mean was 3.16 and (4) those who are not sure when to take their medication mean was 2.67. These results indicate that the second group (2) persons who take medication in the evening agreed more than group (4) those who are not sure when to take their medication. Participants who take medication in the evening depend on an expert for their health more than those who are not sure when to take their medication with a medium practical effect.

The item "***Ability to seek help"*** effect sizes were 0.71 and 0.60. The means between group 2-4 persons who take their medications in the evening (2) mean was 2.07 and (4) persons who are not sure when to take their medication had a mean of 3.00. These results indicate that group (2) persons who take their medications in the evening agreed more than group (4) those who are not sure when to take their medication. Persons who take their medication in the evening have the ability to seek help more than those who are not sure when to take their medication with a medium practical effect. Between group 3-4, persons who take their medications two to three times a day (3) had a mean of 3.00 and (4) those who are not sure when to take medication had a mean of 2.72. These results indicate that group (3) persons who take their medications two to three times a day agreed more than group (4) persons who are not sure when to take their medication. Persons who take their medications two to three times a day have the ability to seek help more than those who are not sure when to take medication with a medium practical effect.

Effect sizes for differences between the four different groups for the item ***"Seldom have time for self*** "were found to be small for self-care with no practical effect.

Effect sizes for the item***" Ability to identify signs and symptoms***" were foud to be small between the four different groups for the factors of self-care with no practical effect.

The item***" Understand body function"*** yielded a medium effect size of 0.52. The means between group 3-4, (3) persons who take their medications two to three times a day the mean was 2.89 while (4) those who are not sure when to take their medication the mean was 2.83. These results indicate that group (3) persons who take their medications two to three times a day agreed more than group (4) those who are not sure when to take their medication. Persons who take their medications two to three times a day understand their body function more than those who are not sure when to take their medication with a medium practical effect.

Effect sizes for the item" ***Have planned programmes for rest***" were found to be small between the four different groups for the factors of self-care with no practical effect.

Effect sizes for the item***" Tendency of ignoring sickness"*** were found to be small between the four different groups for the factors of self-care with no practical effect.

4.4.3 CONCLUSION STATEMENTS ON THE FACTORS RELATED TO SELF-CARE OF OLDER PERSONS

- Δ Persons who are in the age group of 81-91 will seek help more than those who are 60-80 when they are unable to care for themselves.
- Δ Gender is of no practical effect for self- care.
- Δ Relationship status is of no practical effect for self- care.
- Δ Behavioural data, meaning smokers and non-smokers is not significant for self- care.
- Δ Being on one or more chronic medication is of no practical effect for self-care.
- Δ Persons who administer their own medications are accountable for their own health more than those whose medication is administered by somebody else. Those who administer their own medication understand their body functions more than those whose medication is administered by somebody else. Participants who administer their own medication have planned programmes for rest more than those whose medication is administered by somebody else.
- Δ Persons who do not make use of traditional medications lead a healthy life style more than those who use traditional medication. Those who do not make use of traditional medications are more accountable for their own health. Participants who do not use traditional medication are able to identify signs and symptoms more than those who make use of traditional medications.

- Δ Regarding medication use when persons take medication in the evening they lead a healthy life style more than those who take medication two to three times a day. Participants who are not sure when to take medications lead a healthy lifestyle more than the ones who take medication two to three times a day.

- Δ Persons who take medication in the morning tend to neglect their personal needs more than those who take medication in the evening. Those who take medication two-to-three times a day neglect their personal needs more than those who take medication in the morning. Those who take medication two-to-three times a day tend to neglect their personal needs more than those who take medication in the evening. Participants who are not sure when to take their medication demonstrated a tendency to neglect their personal needs more than those who take medication in the evening. Participants who take medication two-to-three times a day neglect their personal needs more than the ones who are not sure when to take medication.

- Δ Participants who take medication two-to-three times a day make use of home remedies more than the ones who take medication in the morning only. Participants who take medicine two-to-three times a day make use of home remedies more than those who take medication in the evening and the ones who are not sure when to take their medication.

- Δ Persons who take their medication two-to-three times a day know the significance of taking care of themselves more than those who take their medication in the morning. Participants who take medication two-to-three times' day know the significance of self-care more than those who take medication in the evening and than those who are not sure when to take their medication.

- Δ Being accountable for own health has no practical influence on self-care.

- Δ Persons who take medication in the evening depend on an expert for their own health more than the ones who take medication in the morning. Participants who take medication two-to-three times a day depend on an expert for their health more than those who are not sure when to take the medication.

- Δ Persons who take their medications in the evening and two-to-three times a day have the ability to seek help when they are ill more than those who are not sure when to take medication.

- Δ Whether the older participant has seldom time for self or have the ability to identify signs

and symptoms has no practical effect on self-care.

- Δ Persons who take their medications two to three times a day understand their body functions more than those who take medication in the evening.
- Δ Having planned programs for rest and a tendency to ignore sickness has no influence on self-care.

4.5 RESULTS ON FACTORS OF MEDICATION ADHERENCE OF OLDER PERSONS IN A RURAL AREA

The reader should take note that the demographic data of older persons also applies to medication adherence (refer back to paragraph 4.3 and table 4.2). Table 4.2 indicates that 143 older persons of 60 years and older living in a rural area participated in the study. The researcher used chronological markers to group the older persons in two main groups for systematic discussions of results.

After 95 % of the participants (see paragraph 4.2) completed the questionnaires the analysis with the necessary consultation to interpret the findings was done by the Statistical Consultation Services of North West-University (Potchefstroom Campus). The results obtained from the medication adherence questionnaire will be discussed.

4.5.1 Exploratory factor analysis of medication adherence of older person

An exploratory factor analysis was done to reduce the data (see paragraph 4.4.1 and table 4.12). Descriptive statistics and Cohen's effect sizes were calculated to determine the differences between means and the results are consequently reported (see paragraph 4.5.2). Items were clustered when they were closely linked and were called factors (Burns & Grove, 2005:489). Items that did not cluster meaningfully on a specific factor were regarded as a factor on its own. In case of factors with two or more items, Chronbach Alpha`s coefficients were calculated to determine the reliability of the specific factor. In the following table (see table 4.12) factors of medication adherence will be reported and discussed.

Table 4.12 Factor analysis for medication adherence

FACTOR	ITEM	CRONBACH`S ALPHA VALUES
Factor 1: Knowledge and understanding of medication	11,12,13,17,27,2,1	0.76
Factor 2: Ignorance by taking medication when not feeling sick	16	a
Factor 3: Easiness in swallowing medications	18	a
Factor 4: Causes of not taking medication as prescribed	21,30,19,29,23	0.60
Factor 5: Lack of medications at PHC facility	31	a
Factor 6: Suffer from side-effects	25,24,23,28, 27	0.60
Factor 7: Regular hospitalization	32	a
Factor 8: Memory loss	5,4,3	0.58
Factor 9: When not sure always ask	15	a
Factor 10: Omits medication on purpose	14	a
Factor 11: Difficulty remembering two doses per day	9,7,8, 6	0.50
Factor 12: Difficulty falling asleep at night	26	a
Factor13: Culturally the use of lifelong medications are prohibited	22	a
Factor 14: Use of over-the-counter medications (OTC)	20	a

a = Please note that a Chronbach Alpha`s value could not be calculated as a results of the fact that the factor consists only of one item

As a result of the fact that no random sampling was done, interpretation of comparisons between group's means were done according to Cohen's effect sizes, d (Cohen, 1988). Effect sizes indicate practical significance; that is the extent to which a difference is large enough to have an effect in practice (Ellis & Steyn, 2003). No inferential statistics was used, although p-values are reported as if random sampling was assumed. The following guidelines were used for d-values regarding differences between means: small effect: d = |0.2|; medium effect (noticeable with the naked eye): d = |0.5|; large effect (practically significant): d ≥ |0.8|.

Five factors showed an acceptable reliability with values of 0.76, 0.60, 0.60 0.58 and 0.50 respectively, as the items 16, 18, 31, 32, 15, 14, 26, 22 and 20 did not cluster together with other items and will be discussed as factors on its own. For the purpose of this study, the total count on similarity for the following items was too low; however, they were analyzed as factors because in the context of social science they were found to have an acceptable level of reliability.

Knowledge and understanding of medication: seven factors were clustered together namely "older persons take the correct amount of medications", "know the reasons for taking medications", "know the benefits of taking medications", "medication labels are clear", "know the names of the medications", and "older persons have enough information on medication use from health care professionals". These items yielded a Chronbach Alpha`s value of 0.76, which is acceptable and shows a moderate reliability (Pietersen & Maree, 2007:215-216). This shows that older persons know and understand their medications.

Causes of not taking medication as prescribed: five items were clustered together, namely "use of herbs", "it is difficult to break tablets into halves", "do not take medication if unable to swallow", "when they feel sick they do not take their medications", "they suffer from nausea and vomiting after taking medications". These items yielded a Chronbach Alpha`s value of 0.60, which indicates acceptable reliability according to Field (2005:675).

Suffer from side-effects: five items were clustered together, namely "older persons suffer from diarhoea", "they suffer from constipation", "they suffer from nausea and vomiting", "they suffer from dizziness" and "they suffer from palpitations", with a Chronbach`s Alpha value of 0.60, which is a moderate reliability.

Memory loss: three items were loaded together, namely "it is difficult to remember the names of the medications", "they do not want to remember the names of their medications" and "they sometimes forget the names of their medications". This factor is reported as important to older persons because it yielded a Chronbach`s Alpha value of 0.60.

Difficulty remembering two doses per day: four items were loaded together, namely "it is difficult to remember to take medications at night", "it is difficult to remember what the nurse is saying because she talks fast", "it is easy to remember to take the medications" and they "usually remember only one medication", with a Chronbach`s Alpha value of 0.50, which is acceptable.

Due to the fact that factors 16, 18, 31, 32, 15, 14, 26, 22 and 20 did not cluster and that the their Chronbach`s Alpha values were too low, they were analyzed item by item as factors because in the context of social science they can still indicate practical significance and should not be ignored. Older persons have a likelihood *of "ignoring to take their medications when they do not feel sick", "it is easy to swallow the medications", "they do not get medication at health care settings", "they are regularly hospitalized", "they always ask when they are not sure why medication should be taken", "they omit medication on purpose", they suffer from difficulty*

falling asleep at night" and "their culture does not allow them to use medication for the rest of their lives".

4.5.2 Descriptive statistics and effect sizes for the factors related to medication adherence of older persons

The data collected from older persons was analyzed by both the researcher and a statistician from the Statistical Consultation Services, NWU, Potchefstroom Campus, after the completed questionnaires were captured and computed. The measure of a mean and standard deviation of groups were used to describe the differences in the data (Burns & Grove, 2005:463-465). Data of older persons that participated included variables such as age, gender, relationship status, behavioural data such as smoking, medication use (when medication is taken, who administers medication to the older person, the older person is on more than one chronic medication and sometimes uses traditional medications).

As a result of the fact that no random sampling was done, interpretation of comparisons between group's means were done according to Cohen's effect sizes, d (Cohen, 1988). Effect sizes indicate practical significance; that is the extent to which a difference is large enough to have an effect in practice (Ellis & Steyn, 2003). Thus no inferential statistics were interpreted, although p-values are reported as if random sampling was assumed. The following guidelines were used for d-values regarding differences between means: small effect: d = |0.2|; medium effect (noticeable with the naked eye): d = |0.5|; large effect (practically significant): d ≥ |0.8| as discussed in paragraph 4.4.2.

Effect sizes not only makes the difference independent of units and size but also relates it to the spread of data (Ellis & Steyn, 2003). The indications of 60-80 and 81-91 for age, male and female, as well as single and married for marital status were utilized for effect sizes. Tukey`s comparison was used to measure differences between more than two groups (see table 4.11 and table 4.20), such as the number of times that medication is taken. The level of significance for this study was defined at a probability value of p=<0.05; signifying a significant difference, and p=<0.01; signifying a highly significant difference. In addition to the statistical significance, effect sizes were calculated to determine the practical significance of the results. The best method to comment on the practical significance of this study is to use the difference between the two means of the two sets of data, divided by the estimate for standard deviation, which is the effect size. Burns and Grove (2005:580) indicate that the results do not have to be necessarily statistically significant to have importance in clinical practice. The practical significance of the results is also important in nursing practice. Effect sizes for difference

between ages of older persons for medication adherence will be displayed in table 4.13 and discussed in the paragraphs to follow.

4.5.2.1 Descriptive statistics and effect sizes for the factors related to medication adherence for the two different age groups

To determine if there was a difference between age group 60-80 (1) and age group 81-91(2) regarding the factors related to medication adherence, Cohen`s effect sizes for differences between means were calculated and reported in table 4.13. For group (1) a total of 107 older persons within the age group of (60-80) responded, compared to group (2) that amount to 28 who were within the age group of (81-91).

Table 4.13: Descriptive statistics and effect sizes for the factors related to medication adherence for the two different age groups

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Knowledge and understanding of medication	1	107	2.86	0.58	0.06	0.40
	2	28	2.60	0.65		
Factor 2: Ignorance by taking medication when not feeling sick	1	107	2.10	0.90	0.04*	0.44
	2	28	2.50	0.86		
Factor 3: Easiness in swallowing medications	1	107	2.64	0.93	0.17	0.27
	2	28	2.89	0.83		
Factor 4: Causes of not taking medication as prescribed	1	107	2.19	0.56	0.88	0.03
	2	28	2.21	0.59		
Factor 5: Lack of medications at PHC facility	1	107	2.28	0.88	0.53	0.13
	2	28	2.39	0.83		
Factor 6: Suffer from side-effects	1	107	2.13	0.67	0.81	0.03
	2	28	2.15	0.63		
Factor 7: Regular hospitalization	1	107	2.02	1.10	0.83	0.05
	2	28	2.07	1.15		
Factor 8: Memory loss	1	107	2.32	0.46	0.76	0.00
	2	28	2.32	0.39		
Factor 9: When not sure, always ask	1	107	2.71	0.71	0.45	0.16
	2	28	2.86	0.86		
Factor 10: Omits medication on purpose	1	105	2.57	0.82	0.99	0.60
	2	28	2.75	0.75		
Factor 11: Difficulty remembering two doses per day	1	107	2.51	0.51	0.34	0.20
	2	28	2.40	0.40		
Factor 12: Difficulty falling asleep at night	1	107	2.66	0.97	0.23	0.24
	2	28	2.43	0.88		
Factor 13: Culturally the use of lifelong medications is prohibited	1	107	2.06	2.00	0.27	0.18
	2	28	1.89	0.63		
Factor 14: Use of over-the-counter medications (OTC)	1	104	2.60	1.03	0.81	0.02
	2	28	2.57	0.88		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect; ♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.13 Cohen's effect sizes for the difference between the two age groups were found to be small for all the factors on medication adherence, thus no practical effect.

4.5.2.2 Descriptive statistics and effect sizes for the factors related to medication adherence for the two different gender groups

This factor aimed to determine if there was a difference between gender group (1) males and (2) females regarding the factors related to medication adherence. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.14. A total of 57 males (1) responded compared to 86 females (2).

Table 4.14: Descriptive statistics and effect sizes of the factors related to medication adherence for the two different gender groups.

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Knowledge and understanding of medication	1	57	2.80	0.53	0.86	0.03
	2	86	2.82	0.65		
Factor 2: Ignorance by taking medication when not feeling sick	1	55	2,64	0.91	0.60	0.08
	2	84	2.56	0.78		
Factor 3: Easiness in swallowing medications	1	107	255	0.91	0.30	0.17
	2	28	2.78	0.94		
Factor 4: Causes of not taking medication as prescribed	1	57	2.23	0.59	0.57	0.09
	2	86	2.17	0.58		
Factor 5: Lack of medications PHC facility	1	57	2.47	0.85	0.50	0.33
	2	86	2.17	0.91		
Factor 6: Suffer from side-effects	1	57	2.17	0.61	0.57	0.08
	2	86	2.10	0.70		
Factor 7: Regular hospitalization	1	57	2.05	1.14	0.60	0.09
	2	86	1.95	1.07		
Factor 8: Memory loss	1	57	2.31	0.45	0.77	0.05
	2	28	2.34	0.43		
Factor 9: When not sure, always ask	1	57	2.65	0.81	0.24	0.19
	2	86	2.81	0.85		
Factor 10: Omits medication on purpose	1	57	2.64	0.91	0.60	0.08
	2	28	2.6	3.78		
Factor 11: Difficulty remembering two doses per day	1	57	2.44	0.56	0.40	0.14
	2	86	2.52	0.47		
Factor 12: Difficulty falling asleep at night	1	55	2.38	0.85	0.00*	0.42
	2	85	2.80	1.00		
Factor 14: Culturally the use of lifelong medications is prohibited	1	57	2.12	0.83	0.63	0.21
	2	86	1.94	0.87		
Factor 16: Use of over-the-counter medications (OTC)	1	57	2.42	1.02	0.12	0.26
	2	83	2.69	0.97		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect; ♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.14 cohen`s effect sizes for the difference between the two gender groups were found to be small for all the factors on medication adherence with no practical effect.

4.5.2.3 Descriptive statistics and effect sizes for the factors related to medication adherence for the two different relationship status

On the question of current relationship, *single, divorced, separated* and *widowed* were clustered together to form single, while *live in a relationship* and *married* were clustered together to form married.

Table 4.15: Descriptive statistics and effect sizes for the factors related to medication adherence for the two different relationship status

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Knowledge and understanding of medication	1	52	2.72	0.66	0.20	0.21
	2	89	2.86	0.57		
Factor 2: Ignorance by taking medication when not feeling sick	1	52	2.33	0.95	0.21	0.22
	2	88	2.13	0.92		
Factor 3: Easiness in swallowing medications	1	52	2.68	0.84	0.97	0.01
	2	86	2.69	0.96		
Factor 4: Causes of not taking medication as prescribed	1	52	2.15	0.56	0.56	0.09
	2	89	2.21	0.58		
Factor 5: Lack of medications at PHC facility	1	52	2.19	1.01	0.28	0.18
	2	86	2.37	0.82		
Factor 6: Suffer from side-effects	1	52	2.10	0.73	0.60	0.09
	2	89	2.16	0.63		
Factor 7: Regular hospitalization	1	52	2.00	1.15	0.86	0.03
	2	89	1.97	1.06		
Factor 8: Memory loss	1	52	2.31	0.42	0.71	0.06
	2	89	2.32	0.45		
Factor 9: When not sure, always ask	1	52	2.69	0.87	0.65	0.08
	2	89	2.78	1.99		
Factor 10:Omits medication on purpose	1	52	2.58	0.82	0.85	0.03
	2	86	2.60	0.84		
Factor 11: Difficulty remembering two doses per day	1	52	2.40	0.51	0.14	0.26
	2	89	2.54	0.51		
Factor 12: Difficulty falling asleep at night	1	52	2.19	1.01	0.28	0.18
	2	86	2.37	0.82		
Factor 13: Culturally the use of lifelong medications is prohibited	1	52	2.06	0.87	0.65	0.08
	2	89	1.99	0.86		
Factor 14: Use of over-the-counter medications(OTC)	1	52	2.66	0.92	0.12	0.26
	2	88	2.65	1.04		

a=p-value obtained from t-test for independent groups in case of random sampling
*****=statistically significant at a 0.05 level in case of random sampling
◊=medium effect; ♦=large effect
Note: No differences in total number of participants due to missing values.

This factor aimed to determine if there was a difference between persons with a relationship status of single (1) and married (2) regarding the factors related to medication adherence. Cohen`s effect sizes for differences between means were calculated and are reported in table

4.15. A total of (1) 52 single older persons responded, compared to (2) 89 married older persons.

According to table 4.15 Cohen`s effect sizes for the difference between the relationship status was found to be small for the factors related to medication adherence with no practical effect.

4.5.2.4 Descriptive statistics and effect sizes for the factors related to medication adherence for the two different behavioural data groups; smokers and non-smokers

This factor aimed determine if there was a difference when it comes to behavioural data of smokers (1) and non-smokers (2) regarding the factors related to medication adherence. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.16.

Table 4.16: Descriptive statistics and effect sizes for the factors related to medication adherence for the two different behavioural data; smokers and non-smokers.

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Knowledge and understanding of medication	1	46	2.84	0.61	0.78	0.05
	2	79	2.81	0.58		
Factor 2: Ignorance by taking medication when not feeling sick	1	46	2.38	0.94	0.58	0.33
	2	78	2.06	0.48		
Factor 3: Easiness in swallowing medications	1	46	2.61	0.97	0.49	0.13
	2	76	2.74	0.93		
Factor 4: Causes of not taking medication as prescribed	1	46	2.19	0.50	0.89	0.02
	2	79	2.18	0.59		
Factor 5: Lack of medications PHC facility	1	46	2.18	0.71	0.46	0.19
	2	79	2.37	1.00		
Factor 6: Suffer from side-effects	1	46	2.05	0.66	0.59	0.10
	2	79	2.12	0.62		
Factor 7: Regular hospitalization	1	46	2.08	0.96	0.45	0.14
	2	79	1.91	1.18		
Factor 8: Memory loss	1	46	2.31	0.43	0.89	0.02
	2	79	2.32	0.42		
Factor 9: When not sure, always ask	1	46	2.98	0.91	0.04*	0.35
	2	79	2.66	0.78		
Factor 10: Omits medication on purpose	1	46	2.80	0.88	0.44	0.36
	2	79	2.48	0.79		
Factor 11: Difficulty remembering two doses per day	1	46	2.45	0.52	0.51	0.10
	2	79	2.50	0.49		
Factor 12: Difficulty falling asleep at night	1	46	2.80	0.91	0.32	0.19
	2	79	2.48	0.98		
Factor 13: Culturally the use of lifelong medications are prohibited	1	52	1.84	0.85	0.21	0.08
	2	89	2.15	0.83		
Factor 14: Use of over-the-counter medications(OTC)	1	44	2.98	0.81	0.65	0.70◊
	2	77	2.29	1.02		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect; ♦=large effect
Note: No differences in total number of participants due to missing values.

A total of 46 older persons in group (1) indicated that they are smokers, compared to group (2) where 79 said they were non-smokers.

According to table 4.15 Cohen's effect sizes for the difference between the two behavioral data were found to be small for all the factors related to medication adherence except for the factor ***"Use of over-the-counter (OTC) medications"*** which yielded a medium effect of 0.70. On comparison the mean of the smokers (1) was 2.98, while the mean for those who do not smoke (2) was 2.29. This result means that the first group agreed more than the second group. Persons that smoke make use of OTC medications more than those who do not smoke with a medium practical effect

4.5.2.5 Descriptive statistics and effect sizes for the factors related to medication adherence for the two different groups regarding medication use

Medication use was divided into three indicators, namely *one or more than one chronic medication*, *who administers my medication* and *use of traditional medications*.

- **Older person on one medication or on more than one medication**

This factor aimed to determine if there was a difference in the medication use of those older persons who are on one chronic medication (1) and those who are on more than one chronic medication (2) regarding the factors related to medication adherence. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.17. A total of 62 older persons responded that they use one chronic medication (1), and 79 said that they are on more than one chronic medication (2).

Table 4.17: Descriptive statistics and effect sizes for the factors related to medication adherence for the two different groups; *on one chronic medication* and *on more than one chronic medication*

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Knowledge and understanding of medication	1	62	3.07	0.44	0.00*	0.73◊
	2	79	2.61	0.63		
Factor 2: Ignorance by taking medication when not feeling sick	1	61	2.03	0.71	0.06	0.26
	2	78	2.31	1.05		
Factor 3: Easiness in swallowing medications	1	61	2.75	0.77	0.51	0.10
	2	75	2.65	1.02		
Factor 4: Causes of not taking medication as prescribed	1	62	2.12	0.53	0.15	0.23
	2	79	2.26	0.60		
Factor 5: Lack of medications at PHC facility	1	62	2.18	0.71	0.19	0.19
	2	78	2.27	1.00		
Factor 6: Suffer from side-effects	1	62	2.13	0.58	0.98	0.01
	2	79	2.13	0.71		
Factor 7: Regular hospitalization	1	62	2.08	0.96	0.35	0.14
	2	79	1.91	1.18		
Factor 8: Memory loss	1	62	2.32	0.39	0.74	0.05
	2	79	2.35	0.45		
Factor 9: When not sure, always ask	1	62	2.98	0.71	0.00*	0.50◊
	2	79	2.57	0.89		
Factor 10: Omits medication on purpose	1	60	2.70	0.59	0.14	0.20
	2	77	2.51	0.95		
Factor 11: Difficulty remembering two doses per day	1	62	2.60	0.46	0.01*	0.41
	2	77	2.39	0.53		
Factor 12: Difficulty falling asleep at night	1	61	2.80	0.91	0.04*	0.33
	2	77	2.48	0.98		
Factor 13: Culturally the use of lifelong medications is prohibited	1	62	1.84	0.83	0.21	0.37
	2	79	2.15	0.85		
Factor 14: Use of over-the-counter medications (OTC)	1	61	2.98	0.81	0.00*	0.70◊
	2	77	2.29	1.02		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect;
♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.17 Cohen`s effect sizes for the differences between the two groups of older persons on medication use for the factor ***"Knowledge and understanding"*** were found to be 0.73, which is a medium effect. The mean of the group on one chronic medication (1) was 3.07, while the group on more than one chronic medication (2) showed a mean of 2.61. This finding indicates that the first group agreed more than the second group. Persons that are

on one chronic medication have better knowledge and understanding of the medication than those who are on more than one chronic medication with a medium practical effect.

The effect size of the factor ***"Always ask when not sure why medication should be taken"*** was 0.50, which is a medium effect. The mean of the group on one chronic medication (1) was 2.98, while the group on more than one chronic medication (2) had a mean of 2.57. This finding indicates that the first group agreed more than the second group. Participants who are on one chronic medication always ask when they are not sure why medication should be taken more than those who are on more than one chronic medication with a medium practical effect.

The effect size for the factor testing the use of ***"OTC medication"*** was 0.70, which is a medium effect. The mean for the group on one chronic medication (1) was 2.89, while the group on more than one chronic medication (2) had a mean of 2.29. This result indicates that the first group agrees more than the second group. Persons who are on one chronic medication make use of over the counter medication (OTC) more than those who are on more than one chronic medication with a medium practical effect.

- **Who administers medication to older persons?**

The factor aimed to determine if there was a difference between who administers medication to older persons, they themselves (1) or (2) somebody else. Factors related to Cohen`s effect sizes for differences between means were calculated and are reported in table 4.18. The factor measuring who administers medications to older persons, received a response of 78 older persons saying that they administer their own medications (1), while 7 said that somebody else administers their medication (2) to them.

Table 4.18: Descriptive statistics and effect sizes for the factors related to medication adherence for the two different groups on who administers medications to older persons.

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Knowledge and understanding of medication	1	78	3.10	0.48	0.52	0.23
	2	7	2.99	0.42		
Factor 2: Ignorance by taking medication when not feeling sick	1	77	2.17	0.83	0.96	0.02
	2	7	2.14	1.23		
Factor 3: Easiness in swallowing medications	1	78	2.86	0.80	0.23	0.36
	2	7	2.53	0.53		
Factor 4: Causes of not taking medication as prescribed	1	78	2.05	0.55	0.21	0.50◊
	2	7	2.31	0.49		
Factor 5: Lack of medications at PHC facility	1	78	2.31	0.76	0.46	0.31
	2	7	1.81	1.00		
Factor 6: Suffer from side-effects	1	78	2.00	0.64	0.75	0.13
	2	7	2.10	0.74		
Factor 7: Regular hospitalization	1	78	1.81	0.93	0.04*	0.98♦
	2	78	2.86	1.07		
Factor 8: Memory loss	1	78	2.25	0.38	0.23	0.51◊
	2	7	2.52	0.54		
Factor 9: When not sure, always ask	1	78	2.92	0.75	0.67	0.09
	2	79	2.86	0.38		
Factor 10: Omits medication on purpose	1	76	2.67	0.74	0.29	0.25
	2	7	2.86	0.38		
Factor 11: Difficulty remembering two doses per day	1	78	2.56	0.46	0.66	0.13
	2	7	2.62	0.30		
Factor 12: Difficulty falling asleep at night	1	77	2.69	0.92	0.46	0.31
	2	7	2.71	1.25		
Factor 13: Culturally the use of lifelong medications is prohibited	1	78	1.83	0.86	0.70	0.14
	2	7	1.71	0.76		
Factor 14: Use of over-the-counter medications (OTC)	1	77	2.68	1.01	0.01*	0.61◊
	2	77	3.29	0.49		

a=p-value obtained from t-test for independent groups in case of random sampling
*****=statistically significant at a 0.05 level in case of random sampling
◊=medium effect;
♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.18 Cohen`s effect sizes for the differences between the two groups on who administers medications to older persons for the factor ***"Causes of not taking medications as prescribed"*** yielded a medium effect of 0.50. The mean of group (1) was 2.05, while that of group (2) was 2.31. The results indicate that the second group agreed more than the first group. Persons whose medication is administered by somebody else have causes for not taking medication as prescribed more than the ones who administer their own medication with a medium practical effect.

For the factor ***"Regular hospitalization"*** the effect size was 0.98, which is a large effect. The mean of group (1) was 1.81, while group (2) had a mean of 2.86, meaning the second group agreed more than the first group. A person whose medication is administered by somebody else is more regularly hospitalized than those whose medication is administered by themselves with a large practical effect.

Regarding ***"Memory loss"*** the effect size was 0.50, which is a medium effect. The mean of group (1) was 2.25, while that of group (2) was 2.52. This indicates that the second group agreed more than the first group. It is more often that the person suffers from memory loss when the medication is administered by somebody else than when they administer their own medication with a medium practical effect.

The effect size of ***"Use of OTC"*** was 0.61, which is a medium effect. The mean of group (1) was 2.68, while that of group (2) was 3.29. This result indicates that the second group agreed more than the first group. Persons whose medication is administered by someone else make use of over the counter (OTC) medication more than when they administer their own medication with a medium practical effect.

- **Use of traditional medications**

This factor aimed to determine if there was a difference between the two groups regarding use of traditional medications for older persons. The group was divided into those who make use of traditional medications (1) and those who do not use traditional medications (2) related to medication adherence. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.19. A total of 68 older persons responded by saying they do use traditional medications (1), compared to 73 who responded by saying they do not make use of traditional medications (2).

Table 4.19: Descriptive statistics and effect sizes on the factors related to medication adherence for two groups; use of traditional medication and not using traditional medications.

Factors	Group	n	Mean	SD	p-value (a)	d-value
Factor 1: Knowledge and understanding of medication	1	68	2.77	0.54	0.58	0.09
	2	73	2.83	0.65		
Factor 2: Ignorance by taking medication when not feeling sick	1	66	2.45	0.84	0.00*	0.54◊
	2	73	0.96	0.99		
Factor 3: Easiness in swallowing medications	1	67	2.81	0.84	0.15	0.23
	2	79	2.58	0.99		
Factor 4: Causes of not taking medication as prescribed	1	68	2.30	0.53	0.03*	0.34
	2	73	2.09	0.61		
Factor 5: Lack of medications at PHC facility	1	68	2.28	0.73	0.96	0.01
	2	73	2.29	1.03		
Factor 6: Suffer from side-effects	1	68	2.17	0.62	0.53	0.10
	2	73	2.10	0.69		
Factor 7: Regular hospitalization	1	68	2.07	1.08	0.40	0.14
	2	73	1.93	1.11		
Factor 8: Memory loss	1	69	2.30	0.42	0.48	0.11
	2	73	2.36	0.46		
Factor 9: When not sure, always ask	1	68	2.84	0.78	0.20	0.20
	2	73	2.66	0.89		
Factor 10: Omits medication on purpose	1	67	2.57	0.82	0.66	0.07
	2	70	2.63	0.84		
Factor 11: Difficulty remembering two doses per day	1	67	2.55	0.47	0.10	0.26
	2	71	2.42	0.54		
Factor 12: Difficulty falling asleep at night	1	67	2.55	0.89	0.31	0.16
	2	71	2.72	1.03		
Factor 13:Culturally the use of lifelong medications is prohibited	1	68	2.12	0.86	0.16	0.23
	2	73	1.92	0.85		
Factor 14:Use of over-the-counter medications(OTC)	1	65	2.83	0.91	0.00*	0.50◊
	2	73	2.37	1.02		

a=p-value obtained from t-test for independent groups in case of random sampling
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect; ♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.19 Cohen's effect sizes for the differences between the two groups on use of traditional medications for the factor ***"Ignorance by taking medication when not feeling sick"*** yielded a medium effect of 0.54. The mean for group (1) was 2.45, while that of group (2) was 0.96, that indicates that the first group agreed more than the second group. Persons

who make use of traditional medication ignore to take their chronic medication when they do not feel sick more than those who do not make use of traditional medication with a medium practical effect.

For the factor ***"Use of OTC medications",*** the effect size was 0.50, which is a medium effect. The mean for group (1) was 2.83, while group (2) had a mean of 2.37. These results indicate that the first group agreed more than the second group. Persons who make use of traditional medications make use of OTC more than those who do not make use of traditional medication with a medium practical effect.

- **Frequency of medication use**

The aim of the factor was to determine if there was a difference determined by how frequent frequency of medication intakes are taken, morning (1) evening (2), two-three times a day (3) and not sure (4). Tukey`s comparison was used for frequency of medication intake (Benjamini & Braun, 2002:1590) to measure differences between more than two groups ("multiple comparisons"). As a result of the fact that in this study non-random sampling was used, interpretation of the results was based on effect sizes (Ellis & Steyn, 2003).

Frequency of medication intakes were divided into morning (1) evening (2), two-to-three times a day (3) and not sure (4). The responses were respectively (1) 66, (2) 19, (3) 6 and (4) 18. Cohen`s effect sizes for differences between means were calculated and are reported in table 4.20. The reader should take note that the researcher only reported on the Tukey's test with a comparison significant at the 0.05 level, otherwise it is indicated as "none" in the applicable table (see table 4.11 hereafter):

Table 4.20: Descriptive statistics and effect sizes of the factors related to medication adherence for the different groups on frequency of medication intake

Factors	Group	n	Mean	SD	Tukey's comparisons significant at a 0.05 level (in case of random sampling)	d-value	
Factor 1: Knowledge and understanding of medication	1	66	2.93	0.58	2-4 3-4	1-2	0.37
						1-3	0.62◊
	2	19	3.14	0.39		1-4	0.52◊
	3	6	3.29	0.20		2-3	0.37
	4	18	2.63	0.53		2-4	0.96♦
						3-4	1.24♦
Factor 2: Ignorance by taking medication when not feeling sick	1	65	1.89	0.82	3-1 3-4 3-2	1-2	0.26
	2	19	3.33	0.88		1-3	1.50◊
	3	6	2.06	0.82		1-4	0.06
						2-3	1.64♦
	4	18	2.67	1.11		2-4	0.14
						3-4	1.15♦
Factor 3: Easiness in swallowing medications	1	63	2.67	0.82	None	1-2	0.40
	2	18	3.00	0.77		1-3	0.20
	3	6	2.83	0.75		1-4	0.05
	4	18	2.61	1.14		2-3	0.22
						2-4	0.34
						3-4	0.19
Factor 4: Causes of not taking medication as prescribed	1	66	2.10	0.52	2-4	1-2	0.45
	2	19	1.83	0.61		1-3	0.14
	3	6	2.18	0.45		1-4	0.35
	4	18	2.30	0.57		2-3	0.57◊
						2-4	0.77♦
						3-4	0.22
Factor 5: Lack of medications at PHC facilities	1	66	2.30	0.84	None	1-2	0.07
	2	19	2.37	0.90		1-3	0.14
	3	6	2.17	0.98		1-4	0.43
	4	18	1.89	0.96		2-3	0.21
						2-4	0.50◊
						3-4	0.28
Factor 6: Suffer from side-effects	1	66	2.09	0.66	4-2	1-2	0.59◊
	2	19	1.07	0.51		1-3	0.03
	3	6	2.11	0.50		1-4	0.31
	4	18	2.34	0.82		2-3	0.81♦
						2-4	0.78♦
						3-4	0.28
Factor 7: Regular hospitalization	1	66	1.82	0.89	None	1-2	0.30
	2	19	2.21	1.32		1-3	0.17
	3	6	1.67	0.82		1-4	0.06
	4	18	1.89	1.13		2-3	0.41
						2-4	0.24
						3-4	0.20
Factor 8: Memory loss	1	66	2.30	0.40	None	1-2	0.06
	2	19	2.32	0.42		1-3	0.15
	3	6	2.39	0.57		1-4	0.07
	4	18	2.33	0.47		2-3	0.11
						2-4	0.02
						3-4	0.10

Factor 9: When not sure, always ask	1	66	2.79	0.79	None	1-2	0.26
	2	19	3.00	0.75		1-3	0.28
	3	6	3.00	0.82		1-4	0.25
	4	18	2.56	1.11		2-3	0.00
						2-4	0.50◊
						3-4	0.50
Factor 10: Omits medication on purpose	1	64	2.55	0.75	None	1-2	0.26
	2	19	2.63	0.90		1-3	1.48◊
	3	5	3.20	0.45		1-4	0.06
	4	18	2.50	0.79		2-3	1.64
						2-4	0.14
						3-4	1.15♦
Factor 11: Difficulty remembering two doses per day	1	66	2.52	0.47	None	1-2	0.37
	2	19	2.69	0.33		1-3	0.04
	3	6	2.50	0.51		1-4	0.01
	4	18	2.53	0.61		2-3	0.38
						2-4	0.27
						3-4	0.05
Factor 12: Difficulty falling asleep at night	1	65	2.75	0.97	None	1-2	0.22
	2	19	2.53	1.02		1-3	0.95♦
	3	6	1.83	0.75		1-4	0.03
	4	18	2.72	0.89		2-3	0.68◊
						2-4	0.19
						3-4	0.99♦
Factor 13: Culturally the use of lifelong medications is prohibited	1	66	2.00	0.89	4-2	1-2	0.53◊
	2	19	1.53	0.77		1-3	0.56◊
	3	6	1.50	0.55		1-4	0.50◊
	4	18	2.44	0.86		2-3	0.03
						2-4	1.07♦
						3-4	1.10♦
Factor 14: Use of over-the-counter medications(OTC)	1	64	2.59	1.03	None	1-2	0.15
	2	19	2.42	1.17		1-3	0.55◊
	3	6	3.17	0.75		1-4	0.18
	4	18	2.78	0.81		2-3	0.64◊
						2-4	0.30
						3-4	0.50◊

a=**Tukey`s comparisons (in case of random sampling significant at a level of 0.05)**
***=statistically significant at a 0.05 level in case of random sampling
◊=medium effect; ♦=large effect
Note: No differences in total number of participants due to missing values.

According to table 4.20 effect sizes for the differences for the groups regarding the factor ***"Knowledge and understanding"*** were 0.62, 0.52 for groups 1-3 and 1-4 respectively, which were medium effects; 0.96 and 1.24 for groups 2-4 and 3-4 respectively which were large effects. A comparison of means between 1-3 (1) those who take their medications in the morning, the mean was 2.93 and group (3) persons who take their medications two to three times a day, mean was 3.29. These results indicate that group (3) those who take medication two to three times a day agreed more than group (1), those who take their medications in the

morning. Persons who take their medications two to three times a day have knowledge and understanding of their medication more than those who take medication in the morning with a medium practical effect. Between group 1-4 (1) those who take their medications in the morning the mean was 2.93 and (4) those who are not sure when to take their medication mean was 2.83 indicating that group (1) those who take their medications in the morning agreed more than group (4) those who are not sure when to take medication. Participants who take medication in the morning have knowledge and understanding of their medication more than those who are not sure when to take their medication with a medium practical effect. Between group 2-4 (2) those who take medication in the evening mean was 3.14 and (4) those who are not sure when to take medication mean was 2.83 indicating that group (2) agreed more than group (4) those who are not sure when to take medication. These results indicate that persons who take their medications in the evening have knowledge and understanding of their medications more than those who are not sure when to take medication with a large practical effect. Between group 3-4 (3) participants who take medication two to three times a day mean was 3.29 and (4) those who are not sure when to take their medication mean was 2.83. Indicating that group (3) agreed more than group (4) those who are not sure when to take their medication. These results indicate that participants who take medication two to three times a day demonstrated knowledge and understanding of medication more than those who are not sure when to take their medication with a large practical effect.

Regarding ***"Ignorance of taking medications when not feeling sick"*** the effect sizes were 1.48, 1.64, and1.15 which are large and practical significant effects. A comparison of means were between group 1-3 (1) those who take their medication in the morning mean was 1.89 and group (3) persons who take their medications two to three times a day mean was 2.06. These results indicate that group (3) those who take their medication two to three times a day agreed more than group (1) those who take medication in the morning. Persons who take their medications two to three times a day demonstrated a tendency to ignore their medications when they do not feel sick more than those who take their medication in the morning with a large practical effect. Between group 2-3 (2) participants who take medication in the evening mean was 3.33 and (3) those who take their medication two to three times a day mean was 2.06. These results indicate that group (2) participants who take medication in the evening agreed more than group (3) persons who take their medications two to three times a day. Participants who take medication in the evening have a tendency to ignore their chronic medication when they do not feel sick more than those who take their medication two to three times a day with a large practical effect. Between group 3-4 (3) those who take their medication two to three times a day mean was 2.06 and (4) those who are not sure when to

take their medication mean was 2.87 indicating that group (4) those who are not sure when to take their medication agreed more than group (3) those who take their medication two to three times a day. Participants who are not sure when to take medication ignore their medications when they do not feel sick more than those who take their medication two to three times a day with a large practical effect.

The factor ***"Easiness in swallowing medications***" has no practical effect on medication adherence.

For the factor ***"Causes of not taking prescribed medications"*** effect sizes were 0.57 and 0.77 which were medium effect sizes. The means between 2-3 (2) those who take medication in the evening mean was 1.83 and (3) those who take medication two to three times a day mean was 2.18 indicating that group (3)) those who take medication two to three times a day agreed more than group (2) those who take medication in the evening. Participants who take medication two to three times a day demonstrated causes for not taking medication as prescribe more than those who take medication in the evening with a medium practical effect. Between groups 2-4 (2) those who take medication in the evening mean was 1.83 and (4) those who are not sure when to take their medication mean was 2.30. These results indicate that group (4) who are not sure when to take their medication agrees more than group (2) those who take medication in the evening. Those who are not sure when to take their medication have causes for not taking medication as prescribed more than those who take medication in the evening with a medium practical effect.

The effect sizes for ***"Lack of medications in PHC facilities"*** were 0.50 which was medium effect size. The mean between group 2-4 (2) persons who take medications in the evening was 2.37 and (4) those who are not sure when to take medication mean was1.89 indicating that group (2) persons who take medications in the evening agreed more than group (4) those who are not sure when to take medication. This indicates that persons who take medications in the evening experiences shortage of medications in PHC facilities more than those who are not sure when to take medication with a medium effect.

The effect size for the factor ***"Suffer from side-effects"*** was 0.59 which were medium effect sizes and 0.81, 0.78 and 0.81, which are large and practically significant. The means between group 1-2 (1) persons who take medications in the morning was 2.07 and (2) those who take medication in the evening mean was 1.07 which indicate that group (1) agree more than group (2).Participants who take between 2-3 were (2) 1.07 and (3) 2.11 and between 2-4 which were (2) those who take medication in the evening mean was 1.07. These results indicate that group (1) persons who take medications in the morning agreed more than group (2) those who

take medication in the evening with a medium practical effect. Between group 2-3 (2) persons who take medications in the evening mean was 1.07 and (3) those who take medication two to three times a day mean was 2.11 indicating that group (3) those who take medication two to three times a day agreed more than group (2) those who take medication in the evening. Participants who take medication two to three times a day suffer from side effects more than those who take medication in the evening with large practical effect. Between group 2-4 (2) those who take medication in the evening mean was 2.07 and (4) participants who are not sure when to take medication mean was 2.34. Group (4) participants who are not sure when to take medication agreed more than group (2) those who take medication in the evening. Those who are not sure when to take their medications as prescribed suffer from side effects more than those who take medication in the evening with a large practical effect.

"***Regular hospitalization***" has no practical effect on medication adherence.

The factor ***"Memory loss"*** has no practical effect on medication adherence.

For the factor ***"Always ask when not sure why medication should be taken"*** the effect sizes were 0.50 and 0.50 which were medium effect. The means between 2-4 were (2) 3.00 (4) 2.56 this indicate that group (2) persons who take their medications in the evening agreed more than group(4) those who are not sure when to take medication. These results indicate that persons who take their medications in the evening always ask when they are not sure why medications should be taken more than those who are not sure when to take medication with a medium practical effect. Between group3-4 (3) participants who take medication two to three times a day means was 3.00 and (4) those who are not sure when to take medication mean was 2.56. Participants who take medication two to three times a day always ask when they are not sure why medication should be taken more than those who are not sure when to take medication with a medium practical effect.

The effect size for the factor ***"Omits medication on purpose"*** was 1.48, 1.64 and 1.15 which were large and practically significant. The means between group 1-3 were (1) those who take medication in the morning mean was 2.55 and (3) persons who take medications two to three times a day mean was 3.20. These results indicate that group (3) persons who take medications two to three times a day agreed more than group (1) those who take medication in the morning. Persons who take medications two to three times a day omits to take their medications purposely more than those who take medication in the morning with a large practical effect. Between group 2-3 (2) those who take medication in the evening mean was 2.68 and (3) participants who take medication two to three times a day mean was 3.20 indicating that group (3) agreed more than group (2) those who take medication in the evening.

Participants who take medication two to three times a day omits to take their medication as prescribed more than those who take medication in the evening with a large practical effect. Between group 3-4 (3) participants who take medication two to three times a day mean was 3.20 (4) who are not sure when to take medications mean was 2.50 indicating that group (3) participants who take medication two to three times a day agreed more than group (2) those who take medication in the evening. Participants who take medication two to three times a day omits to take their medication as prescribed more than those who take medication in the evening with a large practical effect.

For the factor ***"Difficulty remembering two doses per day"*** has no practical effect on medication adherence.

The effect size for the factor ***"Difficulty falling asleep at night"*** was 0.68 which is medium practical effect and 0.98 and 0.99 which were large and practically significant. The means between group 1-3 was (1) those who take medication in the morning mean was 2.75 and (3) those who take medication two to three times a day mean was 1.83 indicating that group(1) agreed more than group (3). These results indicates that persons who take medications in the morning suffer from difficulty falling asleep at night more than those who take medication two to three times a day with a large practical effect. Between group 2-3 (2) those who take medication in the evening mean was 2.53 and (3) those who take medication two to three times a day mean was 1.83 indicating that group (2) those who take medication in the evening agreed more than group (3) those who take medication two to three times a day. Participants who take medication in the evening suffer from difficulty falling asleep at night more than their counterparts who take medication two to three times a day with a medium practical effect. Between group 3-4 (3) those who take medication two to three times a day mean was 1.83 and (4) participants who are not sure when to take medication mean was 2.73 indicating that group (4) participants who are not sure when to take medication agreed more than group (3) those who take medication two to three times a day. Participants who are not sure when to take medication suffer from difficulty falling asleep at night more than those who take medication two to three times a day with a large practical effect.

For the factor ***"Culturally the use of lifelong medication is prohibited"***, the effect sizes were 0.53, 0.56, 0.50 which were medium effects and 1.07 which is large and practical significance. The means between group 1-2 were (1) those who take medications in the morning mean was 2.00 and (2) those who take medications in the evening mean was 1.53 indicating that group (1) agreed more than group (2). These indicate that participants who take medication in the morning are culturally not allowed to use lifelong medication more than those who take

medication in the evening with a medium practical effect. Between group 1-3 (1) those who take medications in the morning mean was 2.00 and (3) those who take medication two to three times a day mean was 1.50. This indicates that group (1) participants who take medication in the morning agreed more than group (3) those who take medication two to three times a day. Participants who take medication in the morning are culturally not allowed to use lifelong medication more than those who take medication two to three times a day with a medium practical effect. Between group 2-4 (2) participants who take medication in the evening mean was 1.53 and (4) those who are not sure when to take medication mean was 2.44 indicating that group (4) those who are not sure when to take medication agreed more than group (3) those who take medication two to three times. Participants who are not sure when to take medication are culturally not allowed to use lifelong medication more than those who to take medication in the morning with a large practical effect. Between group 3-4 (3) those who take medication two to three times a day mean was 1.50 and (4) those who are not sure when to take their medications mean was 2.44 indicating that group (4) those who are not sure when to take medication agreed more than group (3) those who take medication two to three times. These results indicate that and those who are not sure when to take their medications are those who take medication in the culturally prohibited from using medications for the rest of their lives more than those who take medication two to three times a day with a large practical effect

The effect size of the factor ***"Use of OTC medications"*** was 0.55, 0.64 and 0.50 which were medium effect sizes. The means between group 1-3 (1) those who take medication in the morning mean was 2.59 and (3) those who take medication two to three times a day mean was 3.17 indicating that group (3) agreed more than group (1) participants who take medication two to three times a day make use of OTC more than morning with a medium practical effect. Between group 2-3 (2) those who take medication in the evening mean was 2.42 and (3) those who take medication two to three times a day mean was 2.17 indicating that group (3)) those who take medication two to three times a day agreed more than group (2) those who take medication in the evening. Persons who take medication two to three times a day make use of OTC more than those who take medication in the evening with a medium practical effect. Between group 3-4 (3) those who take medication two to three times a day 2.17 mean was and (4) those who are not sure when to take medication mean was 2.78 indicating that group (4) those who are not sure when to take medication agreed more than group (3) participants who take medication two to three times a day. This result indicates that participants who are not sure when to take their medication make use of OTC more than those who take medication two to three times a day with a medium practical effect

4.5.3 CONCLUSION STATEMENTS ON THE FACTORS RELATED TO MEDICATION ADHERENCE OF OLDER PERSONS

- Δ Age has no practical influence on medication adherence.
- Δ Gender has no practical effect on medication adherence.
- Δ Relationship status has no practical effect on medication adherence.
- Δ It was also noted that the non-smokers make use of OTC medication more than their counterparts who do not smoke.
- Δ Participants who are on one chronic medication have knowledge and understanding of their chronic medications more than the ones who are on more than one chronic medication. Those participants who are on one chronic medication will always ask when they are not sure of the indications of medication more than those who are on more than one chronic medication when they are not sure why medication should be taken. Participants who are on one chronic medication will make use of OTC medications more than their counterparts who are on more than one chronic medication.
- Δ Persons whose medication is administered by somebody else stated causes for not taking medication as prescribed more than those whose medication is administered by somebody else. Those whose medication is administered by somebody else are hospitalized regularly more than those who administer their own medication. Those whose medication is administered by somebody else suffer from memory loss more than those who administer their own medication. Those who administer their own medication make use of over the counter (OTC) more than the ones whose medication is given by somebody else to them.
- Δ Participants who do not make use of traditional medications ignore their chronic medication when they do not feel sick more than those who do not make use of traditional medications. Participants who make use of traditional medication make use of OTC more than those who do not use traditional medications.
- Δ Persons who take their medications two to three times a day demonstrated knowledge and understanding of medication more than those who take medication in the morning.

Those who take their medications in the morning have knowledge and understanding of their chronic medication more than those who are not sure when to take their medications. Those who take medication in the evening have knowledge and understanding of their medications more than those who are not sure when to take medication. Participants who take medication two to three times a day demonstrated knowledge and understanding of medication more than those who are not sure when to take their medication.

- Participants who take their medications two to three times a day demonstrated a tendency to ignore their medications when they do not feel sick more than those who take their medication in the morning. Participants who take medication in the evening have a tendency to ignore their chronic medication when they do not feel sick more than those who take their medication two to three times a day. Participants who are not sure when to take medication ignore their medications when they do not feel sick more than those who take their medication two to three times a day.

- Easiness in swallowing medications has no practical effect on medication adherence.

- Persons who are not sure when to take medications stated causes for not taking medication as prescribed more than those who take medication two to three times a day. Those who are not sure when to take their medication have causes for not taking medication as prescribed more than those who take medication in the evening.

- Persons who take medications in the evening experiences shortage of medications in PHC facilities more than those who are not sure when to take medication.

- Persons who take medications in the morning suffer from side effects more than those who take medication in the evening. Those who are not sure when to take their medications as prescribed suffer from side effects more than those who take medication in the evening. Participants who are not sure when to take medication suffer from side effects more than those who take medication in the evening.

- Regular hospitalization has no practical effect on medication adherence.

- Memory loss has no practical effect on medication adherence.

- Those participants who take their medications in the evening always ask when they are

not sure why medications should be taken more than those who are not sure when to take medication. Participants who take medication two to three times a day always ask when they are not sure why medication should be taken more than those who are not sure when to take medication.

- Persons who take medications two to three times a day omits to take their medications purposely more than those who take medication in the morning. Participants who take medication two to three times a day omits to take their medication as prescribed more than those who take medication in the evening. Those who take medication two to three times a day omits to take medication as prescribed more than those who are not sure when to take medication.

- Difficulty remembering two doses has no practical effect on medication adherence.

- Participants who take medications in the morning suffer from difficulty falling asleep at night more than those who take medication two to three times a day. Participants who take medication in the evening suffer from difficulty falling asleep at night more than their counterparts who take medication two to three times a day. Participants who are not sure when to take medication suffer from difficulty falling asleep at night more than those who take medication two to three times a day.

- Those who take medications in the morning, and those who are not sure when to take their medications are culturally prohibited from using medications for the rest of their lives more than those who take medication in the morning. Participants who take medication in the morning are culturally not allowed to use lifelong medication more than those who take medication two to three times a day. Persons who are not sure when to take medication are culturally not allowed to use lifelong medication more than those who are not sure when to take medication. Persons who are not sure when to take medication are culturally prohibited from using medications for the rest of their lives more than those who take medication two to three times a day.

- Participants who take medication two to three times a day make use of OTC more than those who take medication in the morning. Persons who take medication two to three times a day make use of OTC more than those who take medication in the evening. Participants who take medication two to three times a day make use of OTC more than those who are not sure when to take medication.

4.6 SUMMARY

The data collected during this study was presented, analyzed and interpreted by the researcher with the help of the statistician. The objectives of the study were reached with the use of descriptive statistics. The demographic data was analyzed by making use of percentages and tables. The findings were computed and interpreted using SPSS (2007) Institute Inc. The researcher determined self-care and medication adherence amongst older persons by interpretation of exploratory factor analysis, effect sizes between two groups as well as by Tukey`s comparison for more than two groups in order to reach the objectives of this study.

Reliability of the data collecting instrument was estimated by calculating Chronbach's Alpha co-efficient that measured the internal consistency of the questionnaire. During factor analysis items that had high Chronbach Alphas were clustered together and were given the same name. Those with Chronbach Alpha's that could not be determined were analyzed item by item. It is concluded that self-care is an important factor regarding medication adherence amongst older persons in a rural area to enhance their quality of life.

In the chapter that follows the researcher will present the conclusions, detect the limitations of the study, and formulate recommendations for further studies as identified from the present and previous studies in the same area of interest (Burns & Grove, 2005:582).

CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS PERTAINING TO THIS STUDY, WITH SPECIFIC REFERENCE TO SELF-CARE AND MEDICATION ADHERENCE AMONGST OLDER PERSONS IN A RURAL AREA

5.1 INTRODUCTION

In the previous chapter the study findings were discussed. In this chapter the integrated conclusions and limitations will be discussed, recommendations will be made for nursing education, nursing research, as well as for nursing practice to improve self-care and medication adherence amongst older persons in a rural area.

5.2 REVIEW OF THE STUDY

Recommendations made were based on the following objectives of the study to enhance self-care and medication adherence amongst older persons in a rural area.

Table 5.1 Objectives of the study

Objective 1	Objective 2
To explore and describe the factors of self-care in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.	To explore and describe the factors of medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.

Chapter 1 discussed background information on the challenges of ageing and chronic diseases facing older persons and which affects their self-care and medication adherence to improve their quality of life. The introduction and problem statement, research questions, objectives, theoretical perspectives, definitions, design and method as well as ethical considerations were discussed.

In chapter 2 the focus was on gaining detailed information through a literature review with special reference to self-care and medication adherence amongst older persons in a rural area with the aim of enhancing their quality of life.

In chapter 3 the methodology was outlined in detail. A quantitative non experimental study that was explorative, descriptive and contextual in nature was discussed. All inclusive sampling of older persons included in the PURE-SA study was utilized as the participants of the study. A pilot study was conducted before the actual study commenced on ten (10) older persons who met the inclusion criteria, but were not part of the actual study. The researcher reported a plan on how rigor and ethical issues will be adhered to during the study.

In chapter 4 the data collected to reach the objectives of the study, was organised and presented as analysed. Data was gathered from both populations using a structured questionnaire in order to achieve the objectives and the aim of the study. The Statistical Services of the NWU, Potchefstroom Campus, was consulted and assisted with the preparation for data analysis. Descriptive statistics allowed the researcher to summarise and describe the gathered data. Internal reliability was tested to determine how repeatable data gathered by means of the questionnaire is, i.e., stability and homogeneity, to test reliability without administering the test twice. Internal consistency was enhanced and estimated through Cronbach Alpha`s coefficient, which assesses items to determine their congruency (see chapter 4, paragraph 4.2.1).

The data from the older person's population samples was analysed through the use of explorative factor analysis and Cohen's effect sizes, means and standard deviations, and was presented in tables. The data was described and discussed in a systematic manner; the demographic data, self-care and medication adherence data used formed the main categories, followed by a description of all factors related to age, gender, relationship status, behavioural data and medication use. All the findings presented in Chapter 4 were computed and interpreted using the Statistical Analysis System (SPSS Inc., 2007; Burns & Grove, 2005:455).

Limitations were highlighted and integrated conclusions were made. In order to accomplish the aim of this study, integrated conclusions as well as recommendations based on the findings is provided regarding nursing practice, nursing education and further nursing research.

5.3 INTERGRATED CONCLUSION STATEMENTS

Conclusion statements should serve as point of departure to enhance self-care and medication adherence amongst older persons in a rural area based on the identified gaps in nursing practice, nursing education and further research. The inclusion criteria were older persons, 60 years of age and older, with chronic diseases taking chronic medications.

The literature review (see Chapter 2) gave the researcher a better understanding of the applicable themes on **ageing** as a biological, psychological, and social life long developmental process, **chronic diseases** that develop slowly and persist over a long period, often for the remainder of a person's lifetime, necessitating that he/she should be put on chronic medication to improve health of older persons as well as to alleviate symptoms. However, there are not only challenges that are associated with medication use, such as medication interaction, drug side effects, polyphamacy, over-the-counter (OTC) medications and use of herbs, but also **non-medication** activities such as lifestyle modification behaviour, such as smoking cessation that is beneficial in the management of chronic diseases. **Quality of life** is multi-dimensional and allows older persons to cope successfully with different life challenges, including physical, psychological and social roles. Self-care and medication adherence as applied in this study can be enhanced through the correct support and education where registered nurses and the family members of the older person are involved and engage in the consultation room of the PHC facility or during home-based care.

Based on the results of the study there was demographic data and factors from the self-care and medication adherence that apply. The **demographic data** (see paragraph 4.3 and table 4.2) revealed that most of the 143 older persons that participated in the study were in the age group 60-80 years, there were fewer males than female, most of them spoke Setswana, they were married and their source of income was from government social grants (old person's pension or other social grants).

The results from the **self-care** questionnaire revealed that although the oldest participants, those older than 80 years, will seek help when they are unable to care for themselves, the gender, and relationship status and whether they smoke or not, showed no practical effect on self-care. Notable that when the older person in the rural area administer their own medication rather than to let somebody else administer the medication to them, has planned programs to rest. The frequency of medication use can have an influence on the self-care abilities of older persons, like to seek help when they are ill, for the results revealed that those who take medication two-to-three times a day leads a lesser healthy lifestyle than those who take their medication only in the evening. In addition another finding confirms that the persons who take medications two-to-three times a day tend to neglect their personal needs more than those who take their medication in the evening. The conclusion can be made that it is better for older persons to take their medication in the evening. This also confirms the findings that the older participants who take their medication in the evening have more knowledge and understanding of their medication.

Medication adherence results showed a similarity to that of self-care in relation to age, gender and relationship status, with no practical influence on medication adherence. However with behaviour it was clear that when older persons smoke they tend to make use of over the counter (OTC) medication. Noteworthy is that when medication is administered by somebody else to the older persons they tend to be more often admitted to hospital than those who administer their medication themselves. It is more often that older persons who administer their medication self, make use of traditional medication which shows that they control their own medication use. It is important to note that knowledge and understanding revealed a large practical effect on medication adherence regardless the frequency of medication use. Another result that should be noted is that when the older persons do not feel sick they ignore to take their medication that can have a large influence on their medication adherence. From the results it was clear that certain factors can attribute to older persons not adhering to their chronic medications such as uncertainty, and when they suffer from side-effects of the medications. In addition to this finding it was found that when older persons should take their medication more frequently tend to omit to take their medication and they prefer to take their all their medication in the evening to be able to fall asleep at night. Uncertainty on medication use strengthens traditional uses and some of the participants' believe that they should omit the use of medication for life.

5.4 SIGNIFICANCE OF THE STUDY

Based on conclusions, statements and recommendations (see paragraph 5.6), the findings of the study regarding self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area, can assist family members, registered nurses in PHC facilities as well as older persons themselves to enhance their quality of life.

5.5 LIMITATIONS

The following limitations were identified during the study:

- The population was too small for the results to be generalized, because the study was conducted in the rural area on the PURE-SA study population only.
- The population consisted only of older persons who had chronic diseases and who are on chronic medications, and therefore the results cannot be generalized for self-care of the entire population of older persons in a rural area.
- The population only included participants from a previously disadvantaged, black, older community of persons speaking Setswana, thus other ethnic groups were not represented.

- The structured questionnaire used for medication adherence in the study was not validated and standardized, thus could have influenced internal consistency.

5.6 RECOMMENDATIONS

Based on the results gained from the questionnaire on demographic data, self-care and medication adherence as well as the literature review conducted on the applicable themes, the researcher was able to reach the aim of the study to make recommendations to enhance self-care and medication adherence amongst older persons in a rural area to improve their quality of life. Recommendations for health science practice, nursing education and nursing research are provided.

5.6.1 Recommendations for nursing practice

The implementation of the recommendations will assist registered nurses, family members and older persons themselves to enhance self-care and medication adherence:

- The findings of the study should be communicated to all registered nurses working in PHC facilities of the rural area that applies so that they will know on what aspect to focus when they consult older persons, namely:
    - To encourage older persons to administer their own medication rather than to let somebody else such as a family member administer medication to them during consultation to prevent regular hospitalization.
    - They should avoid prescribing more than one dose a day because it leads to negligence of personal needs and omission to take the medicine.
    - They should prescribe medication in the evenings only for better adherence because older persons prefer to take medication only in the evening.
    - They should ensure that older persons know when to take their medication because when they do not know and are uncertain when to take medication, they suffer from side effects and they omit medication on purpose.
    - The contra-indications and side-effects that could apply when they use over-the-counter medication, traditional medications and herbs in relation to self-care and medication adherence should be taught at all times to avoid non-adherence to medication.
    - Registered nurses should focus on road shows and awareness campaigns with the aim of educating older persons on the importance of self-care and medication adherence since their culture does not allow them to be on chronic medications for the rest of their lives.

    - Health education on behaviours like the dangers of smoking and the importance of frequency of some medication use should be stressed during each visit to the PHC facility.
    - They should educate older persons on the importance of chronic medication adherence even in the absence of symptoms of illness.
- The registered nurses should take responsibility to influence policy and procedures in the PHC facilities where they work to implement an “Older Person Friendly Environment”.
- Training courses should be implemented in the PHC facilities on the ageing process for all levels of health care workers for a better understanding of the older persons to improve their quality of life through self-care and medication adherence.
- Health care professionals who are appointed in PHC facilities should have a qualification in older persons care as part of the diagnosing, treatment and care course so that they are aware of challenges that older persons are faced with such as chronic diseases and impaired self-care.
- The ward-based outreach teams employed in PHC re-engineering should be invited to the various facilities to attend meetings, forums and workshops that focus on the older person with regard to self-care and medication adherence to have better understating of chronic diseases of life style in order to minimize their effects on older persons.
- Community-based support groups should be formed to concentrate on care of the older person to enable them to meet with other older persons who are experiencing same challenges they are experiencing.
- Basic health education programmes for the older persons and their family members should be provided on different chronic diseases like hypertension, diabetes, cardiac diseases, respiratory diseases and musculoskeletal diseases prominent in older persons.
- There should be awareness campaigns organised from the PHC facilities on older persons care for communities to better understand the challenges that older persons are faced with and to help them enhance their quality of life.
- There should be easy to open medication containers in order to cater for decline in organs such as vision and arthritis.
- Continuous trans-disciplinary education on care of the older person should be part of the in-service training for better understanding of the ageing process and the effect thereof on self-care and medication adherence.

- Older persons in rural areas should be supplied with pamphlets in the local language and that has got pictures on different aspects of self-care and medication adherence during consultations.
- Transport should be made available to older persons in rural areas twice a month to collect medication at health care facilities since PHC facilities are situated far from homes of older persons. This will enhance self-care as well as medication adherence of the older persons.

5.6.2 Recommendations for nursing education

Recommendations for nursing education include important aspects identified in the study that should be included in the curriculum:

- Curriculum should include a module on gerontology for both basic and post-basic education, with special reference to self-care and medication adherence since older persons tend to make use of over the counter medicine (OTC) and traditional medication or they omit medication when they do not feel sick. Aspects like this should be taken into consideration when teaching of nursing students that will work with older persons take place.
- Regular workshops on the importance of self-care abilities of the older person and aspects of medication adherence should be offered at training institutions in gerontology nursing.
- Students should be involved from their first year in community-engagement programmes for empowerment of the older person to prevent irresponsible medication use, like OTC medication and herbs.
- Lecturers and students in nursing programmes should be instrumental in the engagement of other members of the health-disciplinary team.

5.6.3 Recommendations for nursing research

Based on the findings supported by the literature review the following recommendations for further research are made:

- Factors that impede on self-care and medication adherence of older persons in relation to age, relationship status, behaviour such as smoking and medication use should be explored through qualitative research like focus groups and personal in-depth interviews.
- Self-care and medication adherence of older persons in both urban and rural areas could be compared to underline the importance of self-care and medication adherence in old age.

- The perceptions of health care professionals regarding self-care and medication adherence of older persons should be investigated for an in-depth understanding of the everyday experiences of the health care professionals working with the older person.
- Beliefs and cultural influences on self-care and medication use by older persons should be explored for better understanding of medication adherence practices.
- Intervention studies should be conducted on management of the older person in the community.

5.7 SUMMARY

The objectives of the research namely to explore and describe the factors of self-care and medication adherence in relation to age, gender, relationship status, behaviour and medication use amongst older persons in a rural area were reached. Literature was reviewed to serve as a basis for data collection and data analysis for this study. Conclusions statements on findings, limitations as well as recommendations for nursing practice, education and research based on self-care and medication adherence amongst older persons were successfully discussed.

BIBLIOGRAPHY

Agyarko, R.D., Kalache, A. & Kowal, P. 2000. Older people, children and the HIV/AIDS Nexus: the African situation. (Paper presented at the 13th International AIDS Conference in Durban, 9-14 July 2000). South Africa. (Unpublished.)

Altun, I. 2008. Effect of health promotion course on health promoting behaviours of university students. *La Revue de Santé la Méditerranée orientale,* 14(4):880-887.

American Medical Network. 2007. Treatment options help you take control of urinary incontinence. Gynaecology News, Sept 2007. http://www.health.am/gyneco/more/take-control-of-urinary-incontinence/ Date of access: 22 November 2011

Anastasi, A. & Urbina, S. 1997. Psychological testing. 7TH ed. New York: Prentice Hall, Inc.

ANC. African National Congress. 1994. A national health care plan for South Africa. Johannesburg: ANC.

Babbie, E. 2010. The practice of social research. 12th ed. Wadsworth: Cengage Learning.

Baird, C.L. & Sands, L.P. 2006. Effect of guided imagery with relaxation on health- related quality of life in older women with Osteoarthritis. *Research in Nursing & Health*, 29: 442-451.

Beers, M.H., Porter, R.S. Jones, T.V., Kaplan, J.L. & Berkwits, M. 2006. The MERCK MANUAL. 8th ed. Whitehouse Station, N.J.: Merck Research Laboratories.

Benjamini, Y. & Braun, H. 2002. John W. Tukey's contributions to multiple comparisons. *The Annals of Statistics,* 30(6):1576–1594. http://www.stat.pitt.edu/krafty/stat2132/tukey_annals.pdf. Date of access: 3 Dec 2011.

Bergman-evans, B. 2006. AIDES to improving medication adherence in older adults. *Geriatric Nursing,* 27(3):174-180.

Bradshaw, D. & Steyn, K. 2001. Poverty and chronic diseases in South Africa. (Technical report.)

Brink, H. 2006. Fundamentals of research methodology for health care professionals. 2nd ed., revised by Van der Walt, C. & Van Rensburg, G. Cape Town: Juta.

Brooker, C., *ed*. 2006. Churchill Livingstone`s dictionary of nursing. Philadelphia, PA: Elsevier.

Brown, V.A., Bartholomew, L.K., Naik, A.D. 2007. Management of chronic hypertension in older men: an exploration of patient goal setting. *Patient Education and counselling,* 69 (1-3): 93-99.

Burns, N. & Grove, S.K. 2005. The practice of nursing research: conduct, critique and utilization. 5th ed. St. Louis: Elsevier Saunders.

Burns, N. & Grove, S.K. 2009. The practice of nursing research: appraisal, synthesis and generation of evidence. 6th ed. St. Louis: Elsevier Saunders.

Cassim, B. 2007. Ageing and health–challenges and opportunities. *CME*, 25 (9):414-416.

Chang, S. 2009. Beliefs about self-Care among nursing home staff and residents in Taiwan. *Geriatric Nursing,* 30(2): 90-98.

Chia, L.S., Schlenk, E.A. & Dunbar-Jacob, J. 2006. Effect of Personal and cultural beliefs on medication adherence in the Elderly. *Leading article*, 23(3): 191-202.

Chucks, J. 2003. Living arrangements of the elderly women of Lesotho. *BOLD*, 14(1): 3-20.

Chucks, J. 2004. Older persons of Ghana. *BOLD*, 14 (1):14-18.

Clark, M.J. 1996. Nursing in the community. 2nd ed. California: Appleton & Lange.

Clark, M.J. 1999. Nursing in the community: dimensions in community health nursing. 3rd ed. New Jersey: Appleton & Lange.

Clark, M.J. 2003. Community health nursing: caring for populations. New Jersey: Pearson Education, Inc.

Clark, M.J. 2008. Community health nursing: advocacy for population health. Upper Saddle River, N.J. Pearson Education.

Cohen, J. 1988. Statistical power analysis for the behavioural sciences. 2nd ed. Hillsdale, N.J: Erlbaum

Consice Oxford Dictionary. 2002. South African Concise Oxford Dictionary. Oxford: Oxford University Press.

Coulson, N. Goldstein, S. Ntuli, A. 2002. Promoting health in South Africa. Heinemann Higher and Further Education. Cape Town.

Covington, W.G. 1998. Creativity and general systems theory. Http:// www.upublish.com/books/covington.htm. Date of access: 06 June 2011.

Cresswell, J.W. 2003. Research design: Qualitative and quantitative and mixed methods approach. 2nd ed. London: Sage Publications.

De Vos, A.S., Strydom, H. & Fouche, C.B. 2007. Research at grassroots: for the social sciences and human service professions. 3rd ed. Pretoria: Van Schaik.

Dennill, K., King, L. & Swanepoel, T. 1999. Aspects of primary health care: community health care in South Africa. 2nd ed. Cape Town: Oxford University Press Southern Africa.

Department of Health ***see*** South Africa (SA)

Department of Social Development ***see*** South Africa (SA)

Drewnowski, A., Monsen, E., Birkett, D., Gunther, S., Vendeland, S., Su, J. & Marshall, G. 2003. Health screening and health promotion program`s for the elderly. *Disease Management Health outcomes*, 11(5):299-309, September.

Eason, S.J. 1991. Why generalisability theory yields better results than classical test theory: a primer with concrete examples. (*In* Thompson B. (*ed*.), *Advances in educational research: Substantive findings, methodological developments,* vol. 1, JAI Press, Greenwich, CT. pp. 83-98.)

Ebersole, P., Hess, P., Touhy, T.A., Jett, K. & Luggen, A.S. 2008. Towards healthy aging, human needs and nursing response. 7th ed. St. Louis: Mosby Elsevier.

Ellis, S.M. & Steyn, H.S. 2003. Practical significance (effect sizes) versus or in combination with statistical significance (p- values). Potchefstroom: Potchefstroom University for CHE. (Unpublished).

Elzen, H., Joris, P.J.S., Tom, A.B & Snijders, N.S. 2007. Evaluation of the chronic disease self-management programme among chronically ill older people in the Netherlands. *Social Science and Medicine,* 64:1832-1833.

Evers, G.C.C., Isenberg, M.A., Philipsen, H., Senten, M. & Brousens, G. 1993. Validity testing of Dutch translation of the appraisal of self-care agency A.S.A. scale. *International Journal for Nursing Studies,* 30(4):331-342.

Ferreira, M. & Kowal, P. 2006. A minimum data set on ageing and older persons in sub-Saharan Africa: process and outcome. *African Population Studies,* 21(1):19-36.

Field, A. 2005. Discovering statistics using SPSS. London: Sage.

Fish, T. & Ramjee, S. 2007. Unaffordable medical scheme contributions: a barrier to access to private health cover in South Africa. *South African Journal of Business Management,* 38(3):29-37.

Geldenhuys, J. 2007. Social security for an ageing population. *Codicillus,* 48(2):54-58.

Gibbon, C.J. 2005. South African Medicine Formulary. 6th ed. South Africa.

Gibbons, S. 2006. Primary care assessment of older adults with self-care challenges. *The Journal for Nurse Practitioners,* 2(5):323-328, May.

GoyaL, R.S. 2004. Disease and disability burden of elderly women in India. *BOLD*, 15(1):19-26.

Guinn, M.J. 2004. A daughter's journey promoting geriatric self-care: promoting positive health care interactions. *Geriatric Nursing,* 25(5):267-271.

Haas, D.C., Groupp, E., Muench, J., Kraemer, D., Brummel-Smit, K., Shama, R., Ganger, B., Attwood, M. & Fairweather, A. 2005. Chronic disease self-management programme for low back pain in the elderly. *Journal of Manipulative and Physiological Therapeutics*, 28(4):228-237, May.

Harion, N. 2007. Clinical update: evidence on effectiveness of self-care support strategies. http://nursingtimes.net/nursingpractice-clinicalresearch/update-evidence Date of access: 28 March 2012

HELPAGE. 1999. The contribution of older people to development: national research dissemination workshop. South Africa: HelpAge International. 83 p. http://www.helpage.org/ Date of access: 28 November 2011.

Joubert, J. & Bradshaw, D. 2004. Health of older persons. *South African Medical Research Council,* 147-162.

Joubert, J.D. & Bradshaw, D. 2006. Growing numbers of older persons in South Africa: MRC Burden of Disease Research Unit. http://www.sahealthinfo.org/bod/older.htm Date of access: 3 May 2012.

Kalula, S.Z. 2007. Multiple pathology often means multiple medications in the older person. *Continuing Medical Education,* 25(9):422-446, Sept.

Kay,R. s.a. The status of older persons in South Africa. (The 2011 report presented to the Portfolio Committee on Social Development by the National Coordinator.) Pretoria.

Kearny, B.Y. & Fleischer, B.J. 1979. Development of an instrument to measure exercise of self-care agencies. *Research in Nursing Health*, 2(1):25-34.

Kendall, E. & Rogers, A. 2007. Extinguishing the social state sponsored self-care policy and the chronic disease self-management programme. *Disability and Society,* 22(2):129-143, March.

Kimuna, S.R. 2005. Socio economic support of older people in Zimbabwe. *BOLD,* 15(4):13-27.

Kinsella, K. & Phillips, D.R. 2005. Global aging: the challenge of success. *Population bulletin*, 60 (1):42, March.

Kuzuya, M., Hirakawa, Y., Suzuki, Y., Iwata, M., Enoki, H., Hasegawa, M.D. & Iguchi, A. 2008. Association between Unmet needs for Medication Support and All-Cause hospitalization in Community-Dwelling disabled elderly people. *The American Geriatrics Society*, 56(5):881-886, May.

Laditka, J.N. 2004. Physician supply, physician diversity, and outcomes of primary health care for older persons in the United States. *Health & Place,* 10:231-244.

Landefeld, C.S., Palmer R.M., Johnson, M.A., Johnston, C.B. & Lyons, W.L. 2004. Current Geriatric diagnosis & treatment .New York: McGraw-Hill Companies.

Lauder, W. 2001. The utility of self-care theory as a theoretical basis for self- neglect. *Journal Of Advanced Nursing*, 34(4):545-550.

Lawn, J.E., Walley, J., De Frandsco, A., Chopra, M., Risdan, I., Bhutto, Z.A., Black, R.E. & Lancet Alma-Ata Working Group. 2008. Primary health care: making Alma-ata a reality. *Lancet*, 372(13):1001-1007, September.

Leenerts, M.H., Teel, C. S., Pendleton, M. K. 2002. Building a model of self-care for health promotion in ageing. *Journal of Nursing Scholarship, 34 (4): 355-361.*

Linn, R.L. 1989. Educational Measurement. New York: Macmillan Publishing Company.

Lloyd-Sherlock, P., Barrientos, A., Moller, V. & Saboia, J. 2012. Pensions, poverty and wellbeing in later life: Comparative research from South Africa and Brazil. *Journal of Aging Studies* (2012).

Lobiondo-Wood, G. & Haber, J. 2006. Nursing research: methods and critical appraisal for evidence-based practice. St. Louis: Mosby.

Louw, D. & Louw, A. 2009. Adult development and ageing. Bloemfontein: ABC Printers.

Maree, K. & Pietersen, J. 2007. The quantitative research process. (*In* Maree, K., *ed.* First steps in research. Pretoria: Van Schaik Publishers. P.145-153.).

Martin, C.M. 2007. Chronic disease and illness care: adding principles of family medicine to address ongoing health system redesign. *Canadian Family Physician*, 53:2086-2091.

May, J. 2003. Chronic poverty and older people in South Africa. (CPRC working paper 25, Commissioned by HelpAge International in February 2003.) Durban: UKZN. 42 p.

Miller, C.A. 2004. Teaching older adults medication self- care. *Geriatric Nursing,* 25 (5):318-319.

Mouton, J. 2006. How to succeed in your masters and doctoral studies: a South African guide and resource book. Pretoria: Van Schaik Publishers.

Nau, D.P., Aikens, J.E. & Pacholski, A.M. 2007. Effects of gender and depression on oral medication adherence in persons with Type 2 diabetes mellitus. *Gender Medicine*, 4(3):205-213

Nay, R. Garrat, S. 2010. 3rd ed. Older people issues and innovations in care. Australia. Churchill Livingstone: Elsevier.

Nilsson P.M. 2009. Adverse social factors can predict hypertension, but how? *European Heart Journal,* 30:1306-1306.

Ntusi, N. & Ferreira, M. 2004. South African doctors and elderly patients. *BOLD*, 15(1):3-13.

Orem, D.E. 2001. Nursing concepts of practice. 6th ed. St. Louis, Missouri: Mosby`s, Inc.

Osterberg, L. Blaschke, T. 2005. Adherence to medication. *The New Journal of English Medication.* 353(5):487-497.

Pein, L., Buchmann, E., Stratling, A.P. & Prangley, J. *eds*. 2010. Primary Clinical Care Manual: a practical guide for primary health care personnel in the clinical setting. (Developed by the Soweto Trust for Clinical Training). 6th ed. Mellville: Jacana Media.

Peu, M.D. *ed*. 2008. Home/community-based care. Pretoria: Van Schaik Publishers.

Pietersen, J. & Maree, K. 2007. Standardisation of a questionnaire. (*In* Maree, K., *ed.* First steps in research. Pretoria: Van Schaik Publishers. p. 215-223).

Plummer, M. & Molzahn, A.E. 2009. Quality of life in contemporary nursing theory: a concept analysis. *Nursing Science Quarterly,* 22:134-140.

Polit, D.F., Beck, C.T. & Hungler, B.P. 2001. Essential of nursing research: methods, appraisal and utilization. 5th ed. Philadelphia, PA: Lippincott.

Polit, D.F. & Beck, C.T. 2006. Essentials of nursing research: methods, appraisal and utilization. 6th ed. Philadelphia, Pa.: Lippincott Williams & Wilkens.

Rabie, T. 2009. Self-care of older persons in the Potchefstroom district. Potchefstroom: North-West University. (Dissertation-MCur).

Reid, M., Clark, A., Murdoch, D.L., Capewell, S. & Mcmurray, J. 2006. Patients strategies for managing medication for chronic heart failure. *International Journal Of Cardiology, 109(1):66-73, April.*

Rossiter, D. 2010. South African Medicines Formulary. 9th ed. Cape Town: FA Print.

Rossouw, D. 2005. Intellectual tools: skills for human sciences. 2nd ed. Pretoria: Van Schaik Publishers.

Soanes, C. & Angus, A. 2004. Concise Oxford English Dictionary. 11th ed. New York. Oxford University Press.

Smeltzer, S.C., Bare, B.G., Hinkle, J.L. & Cheever, K.H. 2008. Brunner and Suddarth`s Textbook of Medical-Surgical Nursing. 11th ed. Philadelphia, PA: Lippincott Williams & Wilkins.

Smeltzer, S.C., Bare, B.G., Hinkle, J.L. & Cheever, K.H. 2010. Brunner and Suddarth`s Textbook of Medical-Surgical Nursing. 12th ed. Philadelphia, PA: Lippincott Williams & Wilkins.

South Africa. Department of Health. 2003. National guideline: primary prevention of chronic diseases of lifestyle (CDL). Pretoria: The National department of Health.

South Africa. Department of Health. 2008. Standard treatment guidelines and essential medicines list. Pretoria: The National Department of Health.

South Africa. Department of Social Development. 2009. Old age pension: old persons grant. http://www.westerncape.gov.za/eng/directories/services/11586/47491 Date of access: 28 November 2011.

South Africa. 2005. Nursing Act 33 of 2005. Pretoria: Government Printer.

SPSS INC. 2007. SPSS® 16.0 for Windows, Release 16.0.0, Copyright© by SPSS Inc., Chicago, Illinois. www.spss.com.

Steyn, H.S., (jr.). 2002. Practically significant relationships between two variables. *SA Journal of industrial psychology*, 28(3):10-15.

Thompson, B. 1994. Guidelines for constructors. *Educational and Psychological Measurement*, 54:837-847.

Tierney, L.M., McPhee, S.J. & Papadakis, M.A. 2005. Current medical diagnosis and treatment. 44th *ed*. New York: McGraw-Hill Companies.

Tomey, A.N. & Alligood, M.R. 2006. Nursing theorists and their work. 6th *ed*. Philadelphia: Elsevier.

Touhy, T. A. & Jett, K. F. 2010. Erbersole and Hess gerontological nursing healthy aging. 3rd ed. UK: Mosby Elsevier.

Tsai, Y.F. 2006. Self -care management and risk factors for depressive symptoms among elderly nursing home residents in Taiwan. *Journal for Pain and Symptoms Management*, 32(2):140-147.

Van Rensburg, H.C.J. 2004. Health and health care in South Africa. Pretoria: Van Schaik Publishers.

Van Staden, A.M. & Weich, D.J.V. 2007. Profile of the geriatric patient hospitalised at Universitas Hospital, South Africa. *South African Pharmacy Practice*, 49(2):14-14c.

VerganI, C. 2005. The burden of chronic diseases in the elderly. *International Congress Series*, 1280:8-10.

Walsh, M. & Crumbie, A. 2007. Watson`s clinical nursing and related sciences. 7th ed. London: Elsevier.

Ward-Griffen, C. & Bramwell, L. 1990. The congruence of elderly client and nurse perceptions of the client`s self-care agency. *Journal of Advanced Nursing*, 15:1070-107.

Watson, M.J. 2008. Community-based collaboration to support the older person in the world of HIV/AIDS. Potchefstroom: North-West University. (Thesis – PHD).

Wengström, Y., Häggmark, C., Strander, H. & Forsberg, C. 1999. Effects of a nursing intervention on subjective distress, side-effects and quality of life of breast cancer patients receiving curative radiation therapy. *Acta Oncologica,* 38(5):763-770.

Westaway, M.S. 2010. The impact of chronic diseases on the health and well-being of South Africans in early and later old age. *Archives of Gerontology and Geriatrics,* 50:213–221.

White, S.M., Wo`Jcicki, T.R. & Mcauley, E. 2009. Physical activity and quality of life in community dwelling older adults: health and quality of life outcomes. http/www.hqlo.com/content. Date of access 16 April 2009.

Willison, K.D. 2006. Integrating self-care and chronic disease management through a community based research approach. *Ontario Health Promotion E Bulletin.* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1876441. Date of access: 21 May 2009.

Wilson, P. M., Kendall, S. & Brooks, F. 2007. The expert patient`s programme: a paradox of patient empowerment and medical dominance. *Health and Social Care in the Community,* 15(4):426-438.

Wolvaardt, E. 2005. Better care for our older persons. MRC News. http://www.mrc.ac.za/mrcnews/july2005/care.htm. Date of access: 20 November 2011.

World Health Organization. 2004. The world health report 2004: changing history. Geneva: WHO.

World Health Organization. 2008. World Health Statistics 2008. Geneva: WHO.

WSMI (World Self-Medication Industry). **s.a.** Responsible self-care and self-medication: a worldwide review of consumer survey. http://abimip.org.br/uploads/material_de_apoio/1296056417_792.pdf Date of access: 20 November 2011.

Zagaria, M.A.E. 2005. Managing the elderly with stable COPD. *The Journal of Modern Pharmacy*, 16-19, Oct.

Zagaria, M.A.E. 2006. OTC medication use in the elderly. *The Journal of Modern Pharmacy,* 12-16, May.

Zarowitz, B.J. 2006. Management of diabetes mellitus in older persons. *Geriatric Nursing*, 27(2):77-82, Feb.

APPENDIX A

QUESTIONNAIRE

SECTION A: DEMOGRAPHIC DATA

Tell me about yourself. Please mark your answer by making a cross next to the answer that apply.

1. Gender				1	Male		2	Female	
2. Home language	1	Tswana		2	Sotho		3	Xhosa	
	4	Zulu		5	English		6	Afrikaans	
3. Please indicate your age							1	60-70	
							2	71-80	
							3	81-90	
							4	91 and above	
4. Current relationship status						1	Single		
						2	Married		
						3	Divorce		
						4	Widowed		
						5	Separated		
						6	Live in a relationship		
5. What is your source of income (You can mark more than one option)				1	State old age pensioner				
				2	Other sources pensioner (Specify)				
				3	Children				
				4	Spouse				
				5	Grant (Specify)				
				6	No income				
6. When do you take your medication						1	Only in the morning		
						2	Only in the evening		
						3	Two times a day		
						4	Three times a day		

					5	Not sure				
7. Who administer my pills to me		1	Self			2	Somebody else			
8. I smoke cigarettes / use tobacco				1	Yes		2	No		
9. I use alcohol	1	Every day		2	Only on weekends					
	3	Only on special occasions		4	Never					
10. I am on more than one chronic medication (Specify in own language e.g. sugar, high blood)				1	Yes		2	No		
11. I sometimes use traditional or other medicine like “Harlemensies”(Specify)				1	Yes		2	No		

SECTION B: SELF CARE SCALE

(**Developed by** Kearney B.Y. and Fleischer, B.J.). Adaptations were made by the researcher for this study in the context of a rural South African older population.

Directions: For each of the following, please choose the answer that best describes the degree in which you take care of your health needs. Please mark your answer by making a cross in the box. There are no right or wrong answers.

	Strongly disagree: 1	**Disagree: 2**	**Agree: 3**	**Strongly agree: 4**
1. I would gladly give up some of my set ways if it means improving my health				
2. I make sure that my environment stays clean				
3. I look for better ways to care for myself				
4. I like myself				
5. I tend to neglect my personal needs				
6. I often feel like I lack energy to care for my health needs the way I would like to				
7. I eat in a way that my weight will stay normal				
8. I make my own decisions				
9. I seek help when I am unable to care for myself				
10. I eat a balanced diet				
11. I usually try home remedies that have worked in the past rather than going to see the doctor				
12. When I have a problem I usual expect an expert to tell me what to do				
13. I get enough sleep				
14. I understand my body and how it functions				
15. I examine my body to see if there are any changes				
16. I take care of myself				
17. I seldom have time for myself				
18. I have planned programmes for rest				
19. I have planned programmes for exercise				
20. I am interested in learning about various disease processes and how they affect me				
21. I take responsibility for my own actions				
22. I can usually tell that I am coming down to something days before I get sick				
23. I have changed my old habits that made me sick				
24. I know what foods to eat and keep me healthy				
25. I seek information to care for myself				
26. Sometimes when I feel sick I ignore the feeling and hopes that it goes away				
27. I do my daily activities no matter what				
28. I understand myself and my needs well				

SECTION C: MEDICATION ADHERENCE

Directions: For each of the following, please choose the answer that best describes the statement. Please mark your answer by making a cross in the box. There are no right or wrong answers.

	Strongly disagree:1	**Disagree:2**	**Agree:3**	**Strongly agree:4**
1. I have enough information from health care workers concerning my medications				
2. I do know the names of the medication I am taking				
3. I sometimes forget the names of my medication				
4. I do not want to remember the names of my medications				
5. It is difficult to remember the names of my chronic medications				
6. I usually remember only one medication, not more than one				
7. It is difficult to remember what the nurse is saying because she talks fast				
8. It is easy to remember to take my medication				
9. It is difficult to remember to take my medication at night				
10. It is easy to open medication containers				
11. I always take the correct amount of medications				
12. I know why I am taking my medications				
13. I know the benefits of taking my medications on a regular basis				
14. I decide purposely to omit medication				
15. When I am not sure why I should take the medication I always ask				
16. When I do not feel sick I do not take my medications				
17. The label on my medication is clearly marked how it should be used				
18. It is easy to swallow my medication				
19. If I cannot swallow medication I do not take it				

20. I make use of ‘Over The Counter’ medications				
21. I make use of cultural medications like herbs				
22. My culture does not allow me to make use of lifelong medications				
23. I usually suffer from nausea and vomiting after taking medication				
24. I sometimes suffer from constipation				
25. I sometimes suffer from diarrhea				
26. I do not easily fall asleep at night				
27. My heart beat fast sometimes				
28. I sometimes suffer from dizziness				
29. When I feel sick I do not take my medication				
30. It is difficult to break a tablet in halves				
31. Sometimes I do not get medication at the health facility				
32. I am hospitalized regularly				

APPENDIX B

ETHICAL APPROVAL NORTH WEST UNIVERSITY, POTCHEFSTROOM CAMPUS TO CONDUCT THE RESEARCH

YUNIBESITI YA BOKONE-BOPHIRIMA
NORTH WEST UNIVERSITY
NOORDWES UNIVERSITEIT

Etiekkomitee
Tel (018) 299 2558
Faks (018) 297 5308
E-Pos dnvealr@puk.ac.za

2 September 2004

Dr A Kruger
Bussie 594
Noordwes-Universiteit
(Potchefstroomkampus)

Geagte dr Kruger

GOEDKEURING VIR EKSPERIMENTERING MET MENSE

Hiermee wens ek u in kennis te stel dat u projek getiteld *"PURE study (Prospective Urban and Rural Epidemiology study)"* deur die Etiekkomitee goedgekeur is met nommer 04M10.

Gebruik asseblief die nommer genoem in paragraaf 1 in alle korrespondensie rakende bogenoemde projek en let daarop dat daar van projekleiers verwag word om jaarliks in Junie aan die Etiekkomitee verslag te doen insake etiese aspekte van hulle projekte asook van publikasies wat daaruit voortgespruit het. U sal in Mei 2005 die dokumentasie hieroor ontvang.

Goedkeuring van die Etiekkomitee is vir 'n termyn van hoogstens 5 jaar geldig (volgens Senaatsbesluit van 4 November 1992, art 9.13.2). Vir die voortsetting van projekte na verstryking van hierdie tydperk moet opnuut goedkeuring verkry word.

Die Etiekkomitee wens u alle voorspoed met u werk toe.

Vriendelike groete

N.T. Malan

PROF. NT MALAN
VOORSITTER: ETIEKKOMITEE

APPENDIX C

CONSENT FROM DEPARTMENT OF HEALTH TO CONDUCT THE RESEARCH

NORTH WEST DEPARTMENT OF HEALTH

Healthy Living for All

North West Province

Republic of South Africa

3rd Floor Tirelo Building
Dr Albert Luthuli Drive
Mafikeng, 2745
Private Bag X2068
MMABATHO, 2735

OFFICE OF THE DDG

Enq: K . Mangonyane
Tel: (018) 387 5833/5
Tel: (018) 387 5816
cat@nwpg.org.za
www.nwhealth.gov.za

Fax: (018) 387 5709

29 August 2005

Dr A Kruger
North West University. Potchefstroom Campus
North West Province

SUBJECT: Approval for Research- **Prospective Urban and Rural Epidemiological Study**

Approval is granted to conduct the above study in the North West Province, kindly make relevant arrangements with the management for suitable dates and times. Detail at the bottom of this letter has to be completed by you and returned to the Knowledge Management Directorate before your study may commence.

Regards

.....

O. Mongale
NWDOH Head of Department

KMx

Page 1

1

29/08/2005

APPENDIX D

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

Enquiries: Mrs. M.W. Ramakhale
Tel: (W) 018 581 3515
Cell: 082 442 6336

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

Dear Madam

I am currently registered as a student for the M Cur Nursing degree at the North-West University (Potchefstroom Campus)**.** I plan to conduct a research on Self-care and medication adherence amongst older persons in a rural area.

The overall purpose of the study is to make recommendations to enhance self-care and medication adherence amongst older persons in a rural area in order to enhance their quality of life.

The purpose of the study is to:

- To explore and describe the relation between the factors of self-care and age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.
- To explore and describe the relation between the factors of medication adherence and age, gender, relationship status, behaviour and medication use amongst older persons in a rural area.

In order to achieve these objectives questionnaires will be distributed to older persons in a rural area who are participants of PURE-SA study. Questionnaires will be distributed in June and July 2009. Field workers of PURE-SA study will assist older persons who are unable to write in completing the questionnaires in the homes of participants. No names will be used; only codes and all information will be treated with confidentiality. For more information kindly contact me at **0824426336.**

Thanking you in advance.
Yours faithfully,

---	---
Mrs. MW Ramakhale	Dr MJ Watson
Researcher	Supervisor

CONSENT BY PARTICIPANTS

Participation in this research is voluntary. Should you decide to withdraw from this research you are most welcome to do so. Your decision regarding participation will not have any effect on your use of health care facilities.

SIGNED BY_____ON THIS DAY OF_____2009.

SIGNED BY WITNESS_____ON THIS DAY OF

_____2009

DECLARATION BY FIELD WORKERS

I declare that all information coming to my knowledge will be treated with confidentiality and that I will ensure that questionnaires given to me will all be completed in the homes of participants.

SIGNATURE: _____

DATE: _____

APPENDIX E:

PERMISSION TO USE SELF-CARE AGENCY SCALE

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: +27(18) 299-1111/2222
Web: http://www.nwu.ac.za

School of Nursing Science
Tel: +27(18) 2991838
Fax: +27(18) 2991827
Email: Mada.Watson@nwu.ac.za

Prof G Brouns
Maastricht University
P.O. Box 616
6200 MD
Maastricht
The Nederlands

17 September 2010

Dear Prof Brouns

APPROVAL TO USE SELF-CARE AGENCY SCALE

This request is on behalf of a Master degree student currently enrolled at the North-West University (Potchefstroom Campus) in the North-West Province, South Africa. I was one of the co-leaders for Ms Tinda Rabie who finished her Master's degree on Self-Care the end of 2009 at the same University. She used your "Appraisal Of Self-Care Agency Scale" to measure self-care and referred me to you.

My student, Mrs Winnie Ramakhale would like to do a similar study on self-care of the older person, but in a rural area, namely Ganyesa.

I hereby friendly request approval from you as one of the developers that Mrs Winnie Ramakhale may use the questionnaire also with slight adaptations as Ms Tinda Rabie in her research.

Yours sincerely

Dr MJ Watson
Senior Lecturer

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: +27(18) 299-1111/2222
Web: http://www.nwu.ac.za

Ms BY Kearney
Louisiana State University
New Orleans

School of Nursing Science
Tel: +27(18) 2991838
Fax: +27(18) 2991827
Email: Mada.Watson@nwu.ac.za

17 September 2010

Dear Ms Kearney

APPROVAL TO USE SELF-CARE AGENCY SCALE

This request is on behalf of a Master degree student currently enrolled at the North-West University (Potchefstroom Campus) in the North-West Province, South Africa. I was one of the co-leaders for Ms Tinda Rabie who finished her Master's degree on Self-Care the end of 2009 at the same University. She used your "Exercise of Self-Care Agency Scale" to measure self-care and referred me to you.

My student, Mrs Winnie Ramakhale would like to do a similar study on self-care of the older person in a rural area, namely Ganyesa.

I hereby friendly request approval from you as one of the developers that Mrs Winnie Ramakhale may use the questionnaire with same slight adaptations as Ms Tinda rabie in her research.

Yours sincerely

Dr MJ Watson
Senior Lecturer

PERMISSION TO USE SELF-CARE AGENCY SCALE (Cont)

E-MAIL RECEIVED ON ASA-A scale

From: "Brouns G (ZW)" <G.Brouns@ZW.unimaas.nl>

To: Mada Watson <Mada.Watson@nwu.ac.za>

Date: 2010/09/24 09:01 AM

Subject: RE: Permission to use the ASA-A scale

Dear Dr. Watson,

It is all right if Mrs. Ramakhale uses the ASA-scale for her research.

It would be nice to hear about the results of her study some day.

Kind regards,

Ger Brouns

[cid:660335606@24092010-1CE9]

Dr. G. Brouns
Department of Health Care and Nursing Science
mo-tu-thur-fri
g.brouns@zw.unimaas.nl <mailto:g.brouns@zw.unimaas.nl>
www.maastrichtuniversity.nl <http://www.maastrichtuniversity.nl/>
Universiteitssingel 40, 6229 ER Maastricht
Postbus 616, 6200 MD Maastricht
room 3.539
T 043-3881700
[cid:660335606@24092010-1CF0] Please consider your environmental responsibility before printing this e-mail.

From: Mada Watson [mailto:Mada.Watson@nwu.ac.za]

Sent: woensdag 22 september 2010 19:31

To: Brouns G (ZW)

Subject: Permission to use the ASA-A scale

Dear prof Brouns

Please see attached letter regarding permission to use the ASA-A scale in a research study.

Kind regards

Mada

Dr Mada Watson (PhD; RN; RM)
Senior Lecturer: Community Nursing Science
School of Nursing Science
Potchefstroom Campus
Tel: +27 (0) 18 299 1838
Fax: +27 (0) 18 299 1827
Email: Mada.Watson@nwu.ac.za<mailto:Mada.Watson@nwu.ac.za>
Website: www.nwu.ac.za<http://www.nwu.ac.za/>
[cid:660335606@24092010-1CF7]