

The Effect of a Dance and Music Programme on the Functional Ability of the Residents of an Old Age Home in Pietermaritzburg, KwaZulu-Natal.

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ABSTRACT

Life expectancy has increased rapidly since the beginning of the twentieth century and people aged 65 and older form the fastest growing segment of the population. With the onset of old age, comes social, physical and psychological challenges that result in morbidity and loss of independent life. For some of the socially and economically marginalized elderly this often means living in a long term facility. This study determined the effect of a dance and music programme on balance and function in the residents of a selected old age home in Pietermaritzburg.

Aim of the study

The study determined the effect of a dance and music programme on the balance and functional ability of the residents of the old age home.

Methodology

A pre-test/post-test experimental design was used in this study. The eligible participants were randomly assigned to two groups, the experimental and the control groups. The experimental group participated in the 12 week programme of a dance and music programme offered twice weekly while the control group received standard care. Both groups' functional abilities and balance capabilities were assessed before and after the intervention.

Results

The results revealed that dance and music programme did not statistically improve balance and function. Function improved in the experimental group post-test compared to the pre-test. Positive feelings expressed during the classes indicate that the intervention had a positive effect on the participants.

Conclusion

The dance and music programme improved function. It is recommended that residents of the geriatric home be offered this dance and music programme as a long term activity.

DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources).

The work has not previously been submitted in any form to the Durban University of Technology or to any other institution for assessment or for any other purpose.

Signature of student

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Professor T. Puckree

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DEDICATION

I dedicate this study to God Almighty who against all odds, has made it possible for it to succeed. To my friends and colleagues for their constant support and encouragement in my studies. To my husband France, daughters Silindile, Luyanda, and Phumla for their endless support. They were the sources of inspiration and motivation during the study.

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LIST OF ACRONYMS

AARP	American Association of Retired Persons
AD	Alzheimer's disease
ADL	Activities of daily living
AIHW	Australian Institute of Health and Welfare
ADTA	American Dance Therapy Association
BBS	Berg Barthel Index
BP	Blood pressure
DM	Diabetes mellitus
DMT	Dance movement therapy
HP	Hypertension
ICF	International Classification of Diseases, Disability and Health
ICN	International Council of Nurses
IADL	Instrumental activities of daily living
IRC	International Research Communion
MBI	Modified Barthel Index
NCD	Non communicable diseases
NGO	Non-Governmental Organization
PADCA	Pietermaritzburg and District Association for the Care of the Aged
SASSA	South African Social Security Agency
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 Introduction

Medical advances in the twentieth century have led to an increase in the life expectancy of humans and for this reason people aged 65 and older form the fastest growing segment of the population in the world (Nauert 2010: 1). The International Council of Nurses (ICN) has declared that the health of an older person is best measured by function rather than pathology (ICN 2009). However in most elderly populations, chronic illnesses such as diabetes, arthritis, hypertension, depression, impairments of vision and hearing have increased the risk of developing functional impairments and disability (Greenglass, Fiksenbaum and Eaton 2006: 16). Some of the elderly fail to cope with the challenges that come with functional limitation, and this is the major reason for living in an old age home (Sulander 2005: 19). Lampman (2002: 10) asserts that decreased physical activity in the elderly can also result in changes in muscle strength, bone density and physical weakness leading to further functional decline.

According to Dunlop et al. (2005) some of the factors that were believed to be the cause of functional decline included cognitive impairment, visual impairment, diabetes, and the history of stroke. Health behaviours that were significant predictors of functional decline were lack of physical activity, alcohol abuse and advanced age (Dunlop et al. 2005: 1279). In South Africa the Human Immunodeficiency Virus and Acquired Immuno-Deficiency Syndrome (HIV and AIDS) has created a circumstance where the younger generation was dying and leaving the elderly without care and resources to care for themselves (Ramashala 2002:2). Some of the elderly who lose their ability to live independently have no option other than to seek accommodation in old age homes (Suzman and Beard 2011: 23).

1.2 Background to the study

Elderly Black South Africans typically lived in extended family systems and mostly in the rural areas during the early 20th century. However, towards the latter part of the

20th century and early 21st century the extended family system has been eroded and replaced by nuclear family structures as a result of the change in living conditions due to the modernizing influences of the —urban-industrial complexll (Amoateng and Heaton 2007: 47). The establishment of old age homes arose due to social and economic problems such as poverty, loneliness, lack of housing and family support (Perold and Muller 2000: 87). In South Africa the old age homes for socio economically disadvantaged Blacks were rare and recent developments have seen a few residential facilities that have opened their facilities to those who can afford them. The established old age homes found in previously designated White areas were mainly occupied by the White population. The situation of old age homes for elderly has not improved much in the post democratic era, because the state will only provide old age homes for those indigent and frail without any family to support them(Malherbe 2007).

1.3 Problem statement

Most elderly Blacks living in old age homes are only admitted to these facilities because of their poor health status and inability to carry out their self-care needs. In old age homes sedentary lifestyles have become the order of the day, and the lack of physical activity poses a serious threat to their health and functioning (Phaswana-Mafuya et al. 2013). Obesity is inked with development of hypertension arising from reduced physical activity. As one gets older if there continued inactivity and sedentary lifestyle, muscle strength and bone density declines and contributes to lack of balance and the inability to carry out normal functional tasks for living (Booth, Roberts and Laye 2012). Physical activity has been found to be effective in reducing chronic disease risk factors, such as elevated blood pressures, cholesterol levels and obesity and can delay functional decline (Kruk 2007).

At an old age home in Pietermaritzburg, Black South Africans from a disadvantaged background have been admitted because of nobody being available to assist them with their self-care needs. The researcher has visited the old age home under study on numerous occasions, when accompanying nursing students who were placed there for experiential learning. It was observed that the residents who have been

there for a few years had difficulty in carrying out self-care activities due to a decline in their health. There have been a few studies conducted on improving functional ability in the elderly such as: Vreugdenhil et al (2012); Forbes, Little and Candow(2012); Cyarto et al. (2008), but there are limited published studies on the use of dance and music on the functional ability of African elderly persons. The researcher identified a gap and was motivated to introduce a program of creative rehabilitation. This led to the intervention study on the use of dance and music in the rehabilitation of the elderly to improve their functional ability

1.4 Aim of the study

The aim of the study was to determine the effects of a music and dance programme on the balance and functional ability of a group of residents living in an old age home in Pietermaritzburg, KwaZulu-Natal.

1.5. Objectives of the study

The objectives of the study were:

- 1.5.1 To determine the base line functional ability of the residents of the old age home before a programme of dance and music.
- 1.5.2 To determine the baseline level of balance capability of a cohort of elderly people living in an old age home before a programme of music and dance.
- 1.5.3 To determine the levels of functional ability of the residents of the old age home after a programme of music and dance.
- 1.5.4 To determine the levels of balance capability after a programme of music and dance.
- 1.5.5 To compare balance and functional ability of the control and intervention groups at baseline.
- 1.5.6 To compare balance and functional ability of the control and intervention groups after the intervention.

1.6 Significance of the study

There has been limited published research on rehabilitation of the socially and economically marginalized South African black elderly living in old age homes. The results of this study will add to the body of knowledge on the use of dance and music as a form of rehabilitation for the elderly with functional disabilities. This intervention study is intended to motivate the elderly to engage in exercise in a fun way through a social activity of dance and music. The findings of the study, if positive, could also contribute to planning of suitable rehabilitation programs for the elderly, living with chronic conditions, in old age homes to improve their quality of their life. This research highlights the importance of the holistic approach in the health care of the elderly of the residential facility.

1.7 Definition of terms

Functional ability

Functional ability is defined as the amount of independence the elderly living in old age home display in the performance of self-care activities (Keogh 2009: 8). In this study functional ability is the ability to carry out the following activities without assistance: grooming, bathing dressing, walking, bowel control, bladder control and climbing up stairs.

Balance

Balance is the ability to maintain a controlled body position during movement or during the performance of a task. Difficulties with the maintenance of balance are common in the older persons and may result in falls with debilitating consequences (Clemson 1212).

Dance and Music programme:

The dance and music programme is a form of physical activity which uses movement of dance accompanied by music in order to enhance the individual's emotional, physical, cognitive relationship for enjoyment. (Trinity Laban Conservatoire of Music

and Dance 2010). In this study dance and music is the stimulus to engage participants in an exercise program.

Old age home

An old age home is sometimes known as a nursing home where older persons can live together and be cared for when they are too weak to take care of themselves (Hornby 2009: 1002). It is a low maintenance residence entrusted for the care of the elderly or retired persons. An old age home may be funded by government or non-governmental organizations

Resident

A resident is an older person who receives accommodation and health care in an old age home (Nakrem 2011: 1).

1.8 Structure of the dissertation

Chapter 1 provides an introduction and background to the study. The significance of the study, the aims and objectives as well as operational definitions are described.

Chapter 2 The literature from data bases is presented with a critical review of previous research which has been conducted on the rehabilitation of the elderly, using dance and music programme as a means of exercise and the instruments used to measure balance and functional ability. An overview of elderly care within the international and local context is also presented.

Chapter 3 provides the research design and methodology used in this intervention study. The steps of the intervention programme, the ethical considerations, the data collection and data analysis of the study are detailed.

Chapter 4 presents the results of the study. The results are presented in tables and graphs referring to the aims and objectives of the study.

Chapter 5 discusses the results relevant to the literature and within the context of the study either supporting or refuting findings elsewhere.

Chapter 6 provides the conclusions drawn, limitations to the study and recommendations to strengthen the study based on the limitations identified.

1.9 Conclusion

This chapter provided an introduction and background to the study. It has also outlined the aims and objectives, the problem statement, and the significance of the study. The specific terms of reference have been defined. The next chapter will present the review of the literature as well as the theoretical frameworks that guided the study.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The literature review will now be presented. According to Polit and Beck (2012: 95) the literature review provides the researcher with an overview for the new evidence. It provides informatus on status of knowledge related to the topic.

Literature was reviewed from various electronic data sources such as Medline, PubMed, Summon, Science Direct, CINAHL SABINET, EBSCO host and Google Scholar. The search strategy included using key words related to aging theories, balance and stability in the elderly, as well as the interventions used in the rehabilitation of the elderly. The literature review includes literature on aging, aging theories, elderly care, functional ability in elderly, balance and stability, functional decline, assessment of functioning, interventions to improve functioning, and the theoretical frameworks; Orem's self-care theory and Middle range theory of self-care.

2.2 Aging

Aging is the process of growing old, owing in part to a failure of body cells to function normally or to produce new body cells to replace those that are dead or malfunctioning. Normal cell function may be lost through infectious disease, malnutrition, exposure to environmental hazards, or genetic influences. Among body cells that exhibit early signs of aging are those that normally cease dividing after reaching maturity, thereby leading to aging (Mosby's Dictionary 2012:32).

There is no agreement as the age at which a person gets old (Concannon, Grierson and Harrast 2012: 833). However, the United Nations (UN) agreed that anyone above 60 may be referred to as belonging to the elderly population. Each country has its own age criteria to determine the age at which a person may qualify for pension benefits and it is usually between the ages of 55 and 65 years. The retirement age is higher for men than for women (United Nations 2013).

2.2.1 Global trends in aging

The world's population is rapidly aging. This has been brought about by successful treatment of childhood diseases, control of fertility and maternal mortality (WHO 2011) and other interventions to promote health. Globally, the portion of older persons aged 80 years and over was 14 percent in 2013, and it is projected to reach 19 percent in 2050 (United Nations 2013). According to United Nations (2013), the number of people aged 60 years and over in the world is expected to increase from 605 million to one billion between 2000 and 2050. China's older population aged 65 is likely to increase to 330 million by 2050, while the current older population of 60 million is projected to exceed 277 million in 2050 (Suzman and Beard 2011: 5). Old age is understood as a socially valuable part of life. Japanese men are forced to retire at the age of 65 and enjoy post-retirement benefits. The WHO report stipulates that more than half of the world's oldest population live in six countries which include China, Russia, United States, India, Japan and Germany. In many other countries people aged 85 and above is predicted to increase by 151% between 2005 and 2030. Japanese older individuals show higher well-being when compared with midlife adults (Dobriansky, Suzman and Hodes 2007: 10). In the United States of America (USA) discomfort with aging occurs as a result of insufficient meaningful roles and reduced competence among the elderly. The aged in the USA also have diminished profiles of personal growth relative to the midlife adults (Karasawa et al. 2011: 94).

It has been suggested that the thriving aging generation is likely to produce a great grandparent explosion. This is expected to result in some working adults supporting both their older parents and grandparents simultaneously (Dobriansky, Suzman and Hodes 2007:11). The shift in the age structure is seen in developed countries, such as France, United Kingdom and Russia. It is also noted that there is a large decline in the number of younger adults of working age. The working age population which contributes to economic growth and the pension system is shrinking whilst the nonworking population is increasing. These changes have many implications for the development of funding and social programmes. Long term care for older persons has become a key issue in the West as well as in many less developed middleincome nations. This affects support mechanisms such as community care

assisted living, residential care and the long stay hospitals for families and society (Suzman and Beard 2011:23).

Many of the oldest populations lose their ability to live independently because of limited mobility and a decline in their physical and cognitive functioning. Most of these populations require some form of long-term care, which includes home nursing and residential care. The cost associated with providing support for the care may need to be borne by families and society. The great opportunity for public health for programs in the 21st century is to keep older persons healthy longer, delaying or avoiding disability and dependence (Suzman and Beard 2011: 23).

The Study of Global Ageing and Adult Health (SAGE) in China, Ghana, India, Mexico, Russia and South Africa has received new information from the United States Health and Retirement Study (HRS) model which was developed in 1990. This comparable study was done to understand individual and societal aging in other areas such as England, Ireland, Korea, Thailand and Brazil (Suzman and Beard 2011: 24). The report by the National Institute on Aging National Institutes of Health further highlights the complexities of our aging world that may create a new economic pressure as the larger proportion of workers decline. This could negatively affect the local, regional and global economies and thus many countries have taken steps toward reforming their old-age social insurance programmes (Dobriansky, Suzman and Hodes 2007: 9) Furthermore the WHO is strategizing a five-year plan for creating improved health care systems that are aligned to the needs of the older population in the world. This global strategy and action plan on aging and health, aims to provide a comprehensive framework for action on aging and health, identifies gaps and suggests future priorities, relevant to low-middle-and high-income settings (WHO 2015).

2.2.2 Aging trends in Africa

The aging population in Africa is expected to increase further between 2010 and

2030, as more people reach the age of 65 (Nabalamba and Chikoko 2011: 2). Despite the increasing poverty and the effects of HIV and AIDS such as low life expectancy, the majority of Africans are expected to grow older and live longer than their previous generations. The continent's population of older persons 60 years and above are currently estimated to be 38 million. Future projections increase this number to 212 million by 2050 (African Union 2008: 30).

It was stated in the policy of the African Union (2008) that older persons are generally recognized to be amongst the poorest of the poor and are under-served by public provision of health, education, water and sanitation. Older women can experience violence, asset stripping and discrimination by virtue of their age and gender. In addition to the physical, mental and psychological changes associated with aging, older persons in Africa are further disadvantaged by their lack of security for everyday socio-economic needs. This is due to, among other things, the changes associated with urbanization and development in the continent have among others, weakened the traditional kinship mode of residential settlement (African Union 2008:31).

In South Africa despite the negative impact of AIDS there are rapidly growing numbers of older persons (Ramashala 2002:2). During the 2001 population census the total number of older persons made up 7.3 percent of the population. According to the revision estimates of 2010, people aged 60 years and older were 4.8 percent of the total population. In the 2013 Census the number of older persons have risen to 5.2 percent (Stats SA 2013).

2.2.3 The dynamics of aging

The aging process and its progressive changes affect both the body and the mind over a period of time (Vina, Borrás and Miquel 2007: 249). During aging structural and functional deterioration occurs in most physiological systems. The age related physiological changes affect a range of tissues, organ systems, and functions which can impact on ADL and the maintenance of physical independence (Chodzko-Zajko

2009: 2012). Firstly the changes affect cellular homeostatic mechanism, resulting in poor oxygen consumption, low body temperature and decreased fluid volume. This is followed by deterioration of functional properties that result in the loss of homeostasis and an increased vulnerability to disease and mortality (Ferdarko 2011: 27).

Secondly, the loss of muscle occurs from the age of forty and this process is accelerated after the age of seventy years (Chodzko-Zajko 2009: 1513). The decrease in organ mass will result in decreased muscle strength and a frail physique. Thirdly, the decline in body functions will occur, and this is associated with functional limitation and impaired mobility (Nigam et al. 2012). Decline is also significant for flexion at the spine, hips and ankles by the age of seventy. Speed of simple movement slows down as reaction time increases. Elasticity of the muscles and the tendons usually decrease and this increases the risk of injury, and falls. This affects performance of complex tasks and fatigue is experienced by the aging person (Chodzko-Zajko 2009: 1513).

According to Chodzko-Zajko (2009), advancing age is associated with physiologic changes that result in reductions in functional and altered body composition. The changes that affect the musculo-skeletal system include the development of arthritis and osteoporosis. Musculo-skeletal diseases are also linked to other chronic diseases such as muscular dystrophy and sarcoidosis which can directly impact a person's performance of ADLs and subsequently impair fitness level, body weight and mental health. Bone mass also decreases after the age of forty years, and after the onset of menopause (Chodzko-Zajko 2009:1513).

Other systemic changes that occur with aging affect the cardiac, renal and the respiratory systems. The aorta and its branches stiffen and the dilatation of most of the peripheral arteries decrease contributing to development of hypertension (Cecelja and Chowienczyk 2012: 11). Systolic blood pressure increases with exercise reflecting the increased work that the heart performs. At the beginning of exercise, the cardiac output declines with the slowing of the heart rate and reduced blood and plasma volume. Respiratory threshold increases with age causing early fatigue and

preventing the elderly from doing high-intensity exercise. The renal sodium and water-conserving capacities are impaired and this leads to dehydration. Body fat increases from the age of thirty to sixty years, especially in the visceral region for males. After the age of seventy years, fat from all sites of the body decrease (Chodzko-Zajko 2009: 1513).

2.2.4 Aging theories

Many aging theories explain why and how the aging process occurs and a few will be discussed to illustrate how it affects the person's functional status. According to literature the main theories thought to control the aging process are the theory of —wear and tearll, the immunological theory and the damage accumulation theories.

2.2.4.1 The theory of “Wear and tear”

According to Stibich (2014) the effects of aging are caused by damage to cells and body systems over time. These cells and body systems wear out due to overuse and lose their proper functioning. The degeneration of the cartilaginous connective tissue and the reduction of synovial fluid between bones allow the grinding of bone on bone and this is the leading cause of arthritis in old age contributing to mobility impairment and disability.

2.2.4.2 Immunological theory of aging

The immunological theory of aging proposes that the processes of aging involve gradual decline of organ function and the body systems' regulation from a decline in the immunological system. The defence system weakens with age and it is ineffective in repairing cell damage caused by the free radicals. These free radicals are the end results of —respiration metabolizing nutrientsll (Hung 2011).This could be the reason that older persons are more likely to get pneumonia and tuberculosis than younger individuals. Physiological changes occurring in the heart, the blood

vessels and the immune system also make the elderly less likely to fight infections (Vina, Borras and Miquel 2007: 250).

2.2.4.3 The damage-accumulation theories

The damage-accumulation theories propose that aging is the accumulation of faults in the cells. Wang et al. (2009) affirm aging as a consequence of disrepair. It has been proposed that genetic regulation and damage accumulation of faults account for aging and that aging results from the accumulation of faults at cellular and molecular level causing limitation of maintenance and repair. These faults result from failure of the cells to repair leading to neurological disorders that result in degenerative disorders of the brain such as strokes and dementia (Hung 2011).

Strokes are injuries to the blood vessels of the brain while dementia affects mental function. A stroke is a common cause of functional disability and death in older persons. Memory problems and dementia that occur in people over 65 years are greater for people who are 85 years and more. Fifteen percent of people affected by dementia may be found living in old age homes. The degenerative changes that occur in the blood vessels, heart, bones, muscles, brain and the liver are responsible for age-related diseases such as heart disease, dementia, diabetes and Alzheimer's disease. In summary the damage-based theories confirm that aging is the result of cell damage which starts at the molecular level, and moves to the tissues to affect the function of the body organs. (Wang et al. 2009: 2).

2.3 Cultural context of aging

Culture is regarded as the set of distinctive linguistic, spiritual, intellectual and emotional features of the society, and it encompasses lifestyles, rules of living together and value systems (African Union 2006: 2). It includes the group's symbols that are accepted generally without thinking about them and that are passed along by communication and imitation from one generation to the next (Miedema and Roebben 2007: 2). Culture is viewed by Zimmerman, Shier and Saliba (2014) as the characteristics and knowledge of a particular group of people including language,

religion, social habits, music and arts. Thus culture cannot be understood independent of those who live in it.

Research evidence reveals that much cultural variation in well-being is tied to fundamental cultural differences in conceptions of self-relationships. In independent cultural contexts such as the USA, the aging person is regarded as separate from others and individual personal goals are often accorded priority over in-group goals, whereas in more dependent cultural contexts such as Japan and South Africa a person is understood as connected to others and as part of a social unit (Karasawa et al. 2011). It has been argued that differences in the macro socio-political structures are responsible for individual health across countries. Other aspects that play a role in the psychological wellbeing of individuals is relative to the apparent power or lack of external constraints and individual perceptions of control (Karasawa et al. 2011).

2.3.1 Cultural context of aging in South Africa

According to Kanu (2010) a community is governed by rules and principles based on culture. Therefore, the authentic South African is identified in or by his community.

The community also becomes the custodian of the individual's ideas. In another sense the community offers the African the security as it gives its members both physical and ideological identity (Kanu 2010: 154).

2.4 Care of elderly

Care of elderly is an important aspect in the life of people that are not able to take care of themselves (Joubert and Bradshaw 2005: 216). Many people aged 60 and above often live with chronic diseases and some functional impairment. The rapid growth of this population segment creates a greater demand for care in old age homes or in long term institutions. Care services provided in most countries are inadequate and do not include prevention and rehabilitation services (Diederich and Kumpers 2009: 10).

2.4.1 Global care of elderly

The elderly have been neglected in both developed and underdeveloped countries. In Germany, which is a developed country, the care provided for elderly in old age homes was unacceptable prior to 2008. There were few services targeted for disadvantaged individuals from ethnic minority communities. A research report in 2009 revealed that innovative approaches were established to improve the health of the frail elderly. Subsequently long term care insurance was established to give coverage for the care needs of the elderly through preventive and the rehabilitative health (Diederich and Kumpers 2009: 23).

In India, a developing country, where the largest population of elderly in the world reside, the traditional joint family system formed the biggest security and support for the elderly. After urbanization, social structures changed, and the joint family system was broken down to be replaced by the nuclear family system, making elderly care problematic. Institutional care for the elderly was set up but this did not solve the problem. The modern socio economic system has made old age a serious social problem as elderly people living in old age homes face numerous problems, namely neglect during illness, loneliness and economic insecurity (Tripathi 2014:86).

Habjanic et al. (2012: 2584) confirm that Slovenia, a developed country, has one hundred and twelve (112) nursing homes with the largest having six hundred and eight beds. In a study done at a Slovenian nursing home, the apartments were found to be overcrowded with four beds in a single room. In recent years, smaller homes have been built with about one hundred to two hundred beds. In smaller nursing homes, improved care is being offered. However residents in these care facilities were found to spend most of their time in their rooms, with limited physical activity. There was no privacy provided for the residents during nursing care procedures and there was poor nurse-resident relationship. Staff shortages were apparent contributing to inadequate administration, poor communication and neglect of the residents (Habjanic et al. 2012: 2584).

In the USA and in Japan, which are considered developed countries, there has been a rapid increase of the aging population. These societal and demographic changes have put pressure on men to become care-givers in their homes. It was also noted that providing care in these countries was unique because of the growing numbers of women involved in employment, as well as the scarce availability of female caregivers. In Japan, 15 percent of caregivers were men compared with 28 percent in the USA. In both countries the elderly preferred to remain in their homes rather than to reside in a nursing home. Some, ended up in a nursing home only as a last resort. In Italy, many elderly chose care administered in their family homes by private caregivers. Although the nursing homes still formed the major elderly care services, day care and privately owned community centres were established (Harris-Kojetin et al. 2013).

2.4.2 Care of elderly in South Africa

In South Africa, care of the elderly occurs either in traditional or modern care structures. Traditional care refers to care given to elderly by family members in their homes. However many families are not able to cope with the burden of care and thus institutionalization becomes necessary. Modern care structures are either provided by the state or non-governmental organizations (Perold and Muller 2000). The old age homes are generally staffed by limited numbers of qualified nursing staff, often without any specialized training in geriatric nursing. The care for the elderly is of poor quality and is provided by informal caregivers under minimal supervision. These caregivers lack the knowledge and skills to deliver effective care to the elderly. There is very limited in-service training provided for caregivers working in the old age homes (Chabeli 2003).

Support from caregivers is provided in the categories of Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs). These include bathing, dressing and household management such as preparing meals, cleaning the home, shopping, and providing social support (Joubert and Bradshaw 2005). Demographic and social changes have seen an increasing number of women entering the labour

market, creating difficulties for families to care for their aging and disabled relatives. However many previously disadvantaged elderly people continue to remain in their homes because it is not possible for them to be accommodated in old age homes (Brodsky et al. 2005).

According to Brodsky et al. (2005), the care of the elderly in the community is important, but so too is training family members to provide quality care. Research evidence has revealed the negative implications of informal care-giving implemented by family members such as abusive and aggressive behaviour. The negative behaviour of informal care giving and the physical and mental abuse of the elderly ultimately undermines the quality of the elderly lives(Brodsky et al. 2005).

2.4.3 Structure of the care facilities for the elderly in South Africa

The formalized care for the elderly occurs in long term facilities or old age homes, while the informal care-giving occurs in the family homes of the elderly. Carers and auxiliary nurses provide care to the elderly in the formal care facilities for the elderly under the supervision of registered nurses. It is most common for women under the age of sixty to provide informal care to the elderly in their families at home. The care provided for the elderly in both instances is assistance with activities of daily living (ADLs) such as hygiene care, assistance by a bath or shower, dressing and going to the toilets. Assistance with instrumental activities of daily living (IADLs) include household management, cooking, laundry and house cleaning (Helvik, et al. 2015).

Caregivers also assist the elderly with basic medical care such as giving them their prescribed medications and providing wound care if necessary. Research evidence reveals that care may also be provided either on a daily or weekly basis. In instances where the elderly are not able to care for themselves, caregivers need to attend to them on a daily basis (Helvik, et al. 2015).

Old age homes exist mainly in towns and cities and few in the rural areas. The facilities may be privately run or operated by an NGO. Whites live in towns and are advantaged than persons of the other racial groups. Only a number of whites prefer to live independently if they are functionally able to. Communal living arrangements are common among elderly Black and Coloured South Africans if they lack family. Elderly Indians traditionally stay in the homes of their sons or in retirement villages for Indian group. There are also communal residential complexes that are developed and managed by NGOs. Each residence is occupied by six or nine older persons. The care and management of these residential complexes are supervised by the parent NGO (Chui et al. 2009).

2.5 Functioning in elderly

Functioning in the elderly is described as a person's individual's capacity for independent performance of self-care activities. It can also be considered as all those functions of activities of daily living (ADLS) that a person carries out to be an independent person. ADLs are the physical activities which include bathing, dressing, eating and going to the toilet as part of daily life. Independent functioning in the elderly is important because it indicates the current health status of the individual (Sulander et al. 2012: 78).

According to Shelkey and Wallace (2012), any other activities carried out to continue with independent living are called IADLs. IADLs are activities that measure independent living in the environment and include housekeeping, handling of finance, shopping and preparation of meals (Graf 2013). He further asserts that assessing someone's capacity to complete certain activities is a measure of their health and is not specific to any particular disease.

A person's functioning is believed to be an interaction between his or her health conditions with the environmental and personal factors such as age, gender, race, education and social status (Jette 2006). Body structures are anatomical parts of the body such as organs, limbs and their components that support functioning.

Therefore body functions are the physiological functions of body systems, including psychological functions.

2.5.1 Health conditions affecting functioning in elderly

Health conditions have a major impact on the physical, psychological and social functioning of the elderly. Illnesses are often accompanied by chronic conditions such as cancer, diabetes mellitus, pain and heart disease contributing to poor health-related quality of life (Hu and Gruber 2008). The chronic conditions and accompanying ill-health cause impairments in body functions or structures resulting in significant deviation or loss of function.

Impairments of body functions have been classified by the World Health Organisation (WHO) (2001) as the International Classification of Functioning, Disability, and Health (ICF). The ICF framework includes deviations from generally accepted population standards in the biomedical status of the body and their function that may be temporary or permanent (Jette 2006). Therefore a person's health condition in old age is normally viewed according to the limitations caused by diseases, such as osteoarthritis, dementia, depression and Alzheimer's disease (Factora 2013). In a study conducted in Finland, trends of improvements of functional ability among the elderly were related to age differences. It was also discovered that higher rates of functional decline were prevalent among —older persons than among younger elderly people (Sulander 2005: 20).

2.5.2 Environmental factors affecting functioning

Environmental factors refer to all aspects of the external world that form an impact on a person's life. These environmental factors can either be facilitators or barriers in the environment. Health condition diminutions such as disability and mobility impairments, are a product of a dynamic interaction between personal factors and health conditions in the environmental contexts (Badley 2008). These environmental

factors include society's attitude towards disability, rehabilitation programmes availability, policies and laws (WHO 2001: 8). The environmental facilitators that can improve functioning and reduce disability were positive attitudes towards disability, or the absence of stigmatization may promote participation in the environment.

Barriers are those factors that limit healthy functioning in the environment. Adults that reported poor health as a major barrier towards exercise were less likely to engage in physical activity (Rantakokko et al. 2013: 783). Barriers can also be the negative attitudes towards disability such as when the healthy person despises an individual with a disability. Environmental barriers may also be the lack of assistive devices that may hinder people with a health condition interacting with their environment (WHO 2008). The barriers can present themselves at various levels, i.e. from the level of clients, level of provider and at the level of organization of health services. Thus the health care system itself can be a barrier. Barriers at the personal level refer to factors related to the elderly's characteristics, such as sex, age and illness. Provider level barriers could be related to provider characteristics, such as sex, skills and attitudes. System level barriers could be relevant to system characteristics, such as policy, organizational factors, structural factors, and others (Rantakokko et al. 2013: 783).

According to the ICF model (WHO 2001) human functioning can be understood as a continuum of health status, and every human being exhibits one or another degree of functioning in each domain at the level of body, person and society. The health continuum is a tool that health practitioners can use to help guide their clients in the illness-wellness continuum. The illness-wellness continuum is an illustration that draws a connection between the treatment paradigm and the wellness paradigm. The lower down the continuum that clients go towards illness, the closer they are to functional decline, whereas the further up the continuum the clients move towards well-being, the closer they are to optimal health (Lewis 2003-2015).

According to WHO (2006) a number of chronic illnesses such as stroke, diabetes, and obesity, affect the body of a person and this is considered to be at the top of the continuum as illustrated in figure 2.1.

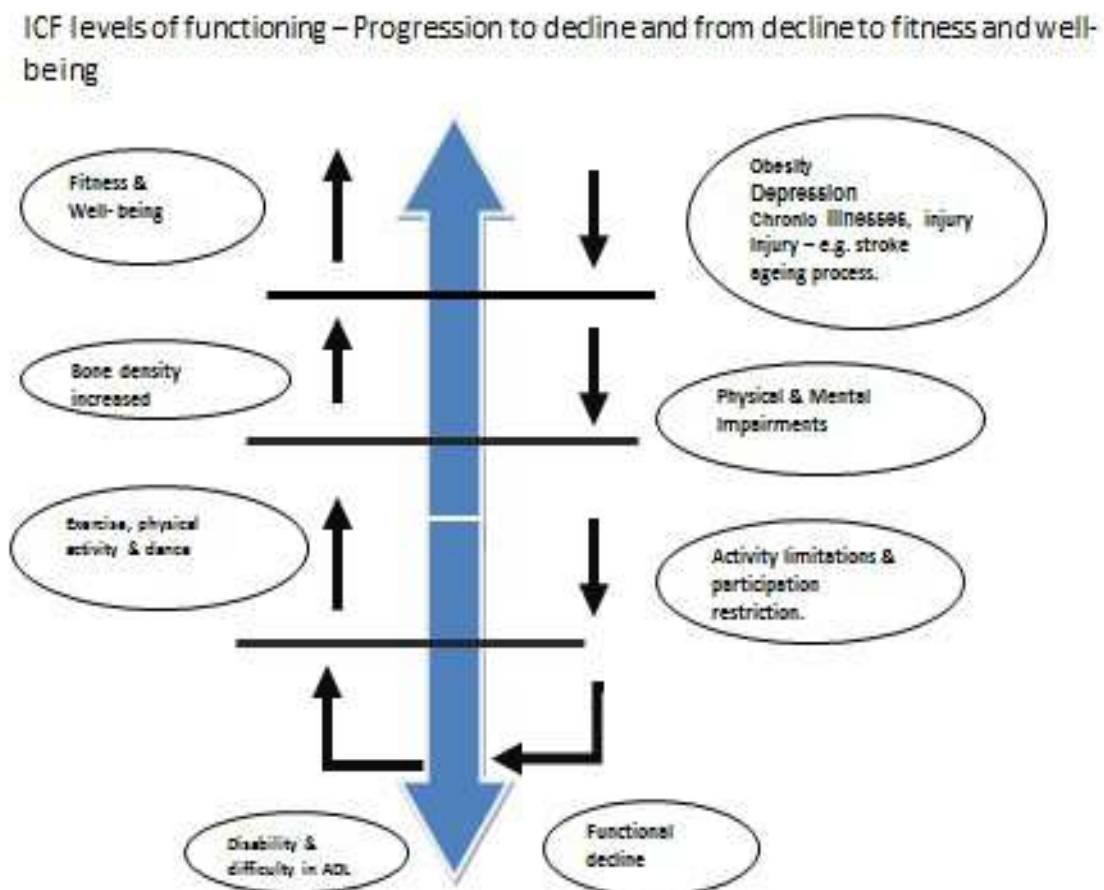


Figure: 2.1 human functioning on a continuum for understanding of health and disability adapted from the ICF Model (WHO, 2001)

2.6 Functioning and disability

Functioning and disability are regarded as a dynamic interaction between a person's health condition and contextual factors (Gladman 2008; Salvador-Carulla and Gasca 2010). Imrie (2004) on the other hand views functioning and disability as terms that indicate the positive and negative aspects of functioning from a biological, individual and social perspective. The complex relationship between the construct of disability

and functioning has not been properly addressed by the current ICF in spite of their relevant care policy and planning. Disability and functioning has been used with two different meanings in the health sector. These meanings correspond to separate models which use different approaches to evaluate disability and functioning. The first one is the ADL approach and the second is the WHO environmental approach.

2.6.1 The ADL approach to functioning and disability

The ADL model was developed in the 1960s by Katz et al. (1963) and Lawton and Brody (1969) distinguished the two major groups of ADLs. The first group is the basic activities related to self-care such as bathing, dressing, eating, control of bladder and bowel, grooming and walking. The second group is the instrumental activities of daily living which includes preparation of meals, shopping, use of telephone and managing money. The ADL model was used to develop the Katz ADL and the Barthel Index which is still used as a standard scale to measure disability (Katz 2003).

2.6.1.1 Distinguishing characteristics for the components of functioning and disability

According to Badley (2008) there are four components of functioning, disability and health that are distinguishable characteristics. These characteristics are labelled as follows:

- Body functions and structures that include both physiological function and mental function of body systems and the anatomical parts of the body such as organs and limbs.
- Acts that define the description of the general things that a person can do independent of purpose. Examples of acts include walking, dressing, and acts that relate to the functioning of the person as a whole.
- Tasks performance that are determined from the impact of impairments on the functioning of the body. Consequently an impairment in one of the body systems may result in the person experiencing difficulty in performing a task.
- Societal involvement includes work, employment, rehabilitation programmes and others. A person is a social being and has a social role in society.

Societal involvement can also signify the patterns of behaviour that takes place in an appropriate environment over a period of time. The choice of the place of the task may maximize performance and as a result minimize difficulty in performing the task (Badley 2008).

The meaningful context is a major feature in the environment because it affects both the type of task and the way it is carried out for example activities of daily living such as bathing, dressing depend on the environmental factors (Badley 2008: 2341).

2.6.2 The WHO environmental approach to functioning and disability

The WHO approach is based on a broader concept of functioning. The original 1980 classification of WHO, the International Classification of Impairments, Disabilities and Handicaps (ICIDH), was replaced with the current ICF (WHO 2001). The ICIDH was largely discredited for its medical nature that focused on the limitations of people's abilities as the key determinant of disability. Thus ICIDH became problematic since it failed to acknowledge the presence of social barriers in influencing disability (Imrie, 2004: 2). The ICF shifted the relationship of health on functioning from the consequences of diseases to the result of complex interactions among the individual, the environment and the disease or condition (Salvado-Carulla and Gasca 2010: 11). Therefore the lack of ability to perform a normal activity which in turn manifests as a handicap may be considered as a limitation in fulfilling a role.

According to Stucki, Cieza and Melvin (2007) the ICF's approach has three components; body functions and structures, activities and participation, and contextual factors or environmental and personal factors. The environmental factors are the physical and social environment, including the attitudes of people who live in it (Salvador-Carulla and Gasco 2010: 11). It also indicates that positive interaction between the individual with a health condition and the contextual factors. It is also emphasized that the ICF was accepted internationally as a comprehensive system even though it has been criticized by the research expertson its difficult applicability

in routine clinical practice necessitating improvement. (Imrie 2004; Littbrand 2011; Badley 2008). The ICF was also difficult to convey capacity and performance in practice (WHO 2010: 13). One of the problems of the ICF was the objective meaning of performance, excluding the subjective meaning of performance but according to ICF, performance can be understood as an involvement in a life situation (Hemmingsson and Jonsson 2010: 570).

2.6.2.1 Environmental factors in the ICF model

The environmental factors form the physical and attitudinal environment in which people live and conduct their lives. These factors can have a positive or negative influence on the individual's performance. They are also classified into personal and societal levels (Salvador-Carulla and Gasco 2010). Badley (2008: 2339) asserts that the environmental factors play a role in determining the meaning of the certain aspects of functioning.

2.6.2.2 Personal factors in the ICF model

Personal factors depict social and demographic factors which include gender, race and age. Hence the individual functioning is influenced by personal contextual factors that are different from environmental factors and that have not been classified at the current version of the ICF due to problems in their standard categorization. Functioning indicates the positive aspects of the interaction between the individual, with the health condition and its contextual factors. Disability serves as an umbrella term for impairments, activity limitation or participation restrictions (Littbrand 2011).

The ICF model illustrates the interaction between the health condition and components of disability as well as personal and environmental factors and is displayed in Figure 2.2.

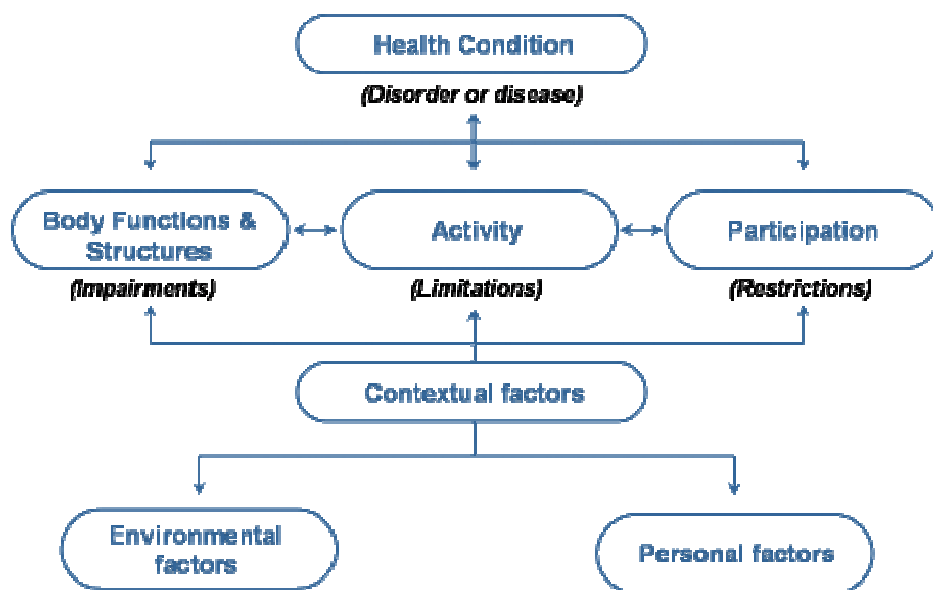


Figure 2.2 the ICF model illustrating the interaction between the health condition and components of disability as well as personal and environmental factors, adapted from WHO (2001)

2.7 Balance and stability

Balance and stability also have an effect on a person's functional ability. Having a good balance means being able to control and maintain the body's position, whether one is moving or remaining still. It helps one get around, stay independent and carry out daily activities. As people get older, they may experience problems with their sense of balance experiencing dizziness and unsteadiness, or they may feel as if they or their surroundings are in motion. Balance disorders are one reason older persons over the age of 65 find it hard to maintain an upright position (Clemson et al. 2012).

Balance and stability are important to prevent falls in the elderly. The aging process is marked by deterioration of balance capability which is a result from the loss of neuro-muscular connections. This can lead to the slowing down of reaction times,

and prevention of smooth movement of joints which assist with maintenance of balance. Balance training is a combination of activities designed to increase lower body strength and reduce the likelihood of falling (Clemson 2012). Effective options with gait and balance disorders include exercise and physical therapy (Salzmann 2010).

2.8 Functional decline

Functional decline is the loss of certain functional abilities or the diminished physical and/or cognitive functioning and results in a person being unable to engage in activities of daily living (Stibich 2014). This may present with physical, psychological or social symptoms.

Physical symptoms are embedded in physical inactivity leading to fatigue, loss of appetite, weakness, incontinence and death. Psychological symptoms are related to loss of interest and motivation. Social symptoms may be identified if the person is isolated and is withdrawn from the self-care activities. According to Landi et al. (2010), physical inactivity causes the acceleration of functional decline. The gradual loss of physical function decreases the capability of older individuals in carrying out ADLs, and this then affects their independence.

On the ICF framework the term decline refers to the presence of an activity limitation and a participation restriction. While these concepts may seem to follow a progression, where an impairment leads to an activity limitation that consequently leads to a participation restriction in society, this is not always the case as a person leading a sedentary life may not have an evident impairment like an injury or disease, but may be unable to carry out self-care activities (Burkhause and Houtenville 2006: 5). Thus according to Burkhouse and Houtenville (2006) the ICF classification of health conditions should not be distinct between activity limitation and participation restriction.

Contrary to the above (Mont 2007: 9) proposes that functional decline is a result of physical or psychological problems, such as, dehydration, malnutrition and

depression, which limit the person's self-care activities. Some of the other factors believed to be associated with functional decline are being unmarried, having a low education and a low economic standard (Mont 2007).

2.8.1 Causes of functional decline

The most common causes of functional decline are impairments and disability. Disability includes chronic diseases such as diabetes, dementia and cardiovascular conditions. Impairments are defined as long-lasting health conditions that limit a person's ability to see, hear, limiting a person's basic physical movement, or mental capability (Disability And Rehabilitation(DAR) team 2006). However research findings by Heikkinen (2003: 8) identify chronic illnesses, injuries and processes of aging as some of the main causes of functional decline. The risk factors that contribute to the development of these conditions include physical inactivity, hypertension, elevated blood cholesterol, depression, and alcohol and drug misuse (Heikkinen 2003: 8).

Physical inactivity is considered a health risk for people of all age groups. It accounts for poor performance of all organs in the body, including the heart. According to WHO (2010) physical inactivity is the fourth leading risk factor for mortality in the whole world. About two million people in the world die from conditions related to physical inactivity. It is also estimated that twenty-one to twenty-five percent of breast and colon cancers, twenty-seven percent of diabetes and thirty percent of heart disease cases are caused by a lack of physical activity. In Canada it is estimated that 10.3 out of sixty one percent of premature deaths are due to physical inactivity. Direct and indirect physical inactivity due to premature deaths and disability are estimated at 573 million dollars every year. The estimation in the whole world indicates that 430 million people out of 537 million people are inactive.

Bauman et al. (2012) propose that the risk factors for non-communicable diseases and functional decline in developing countries like China, Cameroon, India and Sub Saharan Africa, are low activity levels arising from lifestyle changes that occur with

demographic and socio-economic changes. The continued economic development, industrialization, urbanization and motor car ownership have led to the development of physical inactivity leading to non-communicable diseases (NCD's) such as obesity, diabetes, cardio-vascular disease and others.

2.8.2 The consequences of functional decline

Functional decline contributes to loss of muscle and bone mass, weakness, and contractures which result in loss of independence and quality of life. Failure to address the problems of immobility, chronic diseases and behavioural risk factors in old age can result in frailty, diminution of quality of life and an economic burden on society.

2.9 Assessing functional ability, balance and stability

Among the instruments chosen for assessing functional ability, balance and stability, the Katz Index of Independence in Activities of Daily Living, the Modified Barthel Index (MBI) and the Berg Balance Scale (BBS) will be discussed.

2.9.1 The Katz Index of Independence in Activities of Daily Living

This instrument is referred to as —Katz ADLII. It is used to measure the client's ability to perform the following activities: feeding, continence, bathing, and dressing, toileting, including transferring from chair to bed and from bed to chair. This instrument has no formal reliability and validity reports in literature (Shelkey and Wallace, 2012).

2.9.2 The Modified Barthel Index (MBI)

The MBI is a scale that is used for assessing mobility and self-care activities of a client. The assessment can be used to determine the baseline level of functioning and monitoring activities of life over time. The MBI has been found to be reliable when it was used in a number of settings. Other advantages are its

comprehensiveness, and its sensitivity to change can be easily manipulated statistically (Wong, Yap and Chan 1998). It is also found to measure what it is supposed to measure and is noted for its accuracy (Polit and Becker 2012: 336). This instrument was used by Wong, Yap and Chan (1998) on elderly clients (30 males and 34 females) at Singapore Rehabilitation hospital and it was reported to be valid and reliable. According to Wong, Yap and Chan (1998) there was a significant difference in the —mean of the Barthel Index scores of MBI.

2.9.3 The Berg Balance Scale (BBS)

The BBS measures the balance and mobility of the elderly. It is shown to have excellent inter-rater reliability (ICC= 0.98) and is consistent. The Berg Balance Scale is an instrument that measures balance by assessing the performance of functional tasks in the elderly. It has proven to be reliable and valid. According to Langley and Mckintosh (2007: 5) the reliability and validity of the BBS was assessed with elders in five studies at the Australia University (Langley and Mackintosh 2007: 8).

2.10 Interventions to improve functioning in elderly

Interventions to improve function include promoting interest for physical activity and discouraging sedentary behaviour. Research evidence shows that physical activity is effective in reducing chronic disease risk factors, such as, elevated blood pressures, cholesterol levels and obesity. It is noted that physical activity can delay functional decline and death (Phillips, Schneider and Mercer 2004). Some of the aims of physical activity are to reduce pain, improve muscle strength and joint stability, and to improve the quality of life. A modification of environment, modification of the diet and physical activity can address problems of physical inactivity. In 2004 a Global Strategy on diet, physical activity and health was implemented by the WHO for a better diet and more physical activity (Norum 2005).

2.10.1 Modification of the environment

Modification of the environment is an ideal measure to improve mobility and address some of the health care needs of the elderly and the prevention of falls. This is essential to prevent falls. This can be achieved by provision of bright lighting in areas of the rooms at night, the removal of loose and thick carpets, and the removal of obstacles from any pathways (Czerniewicz and Nicholson 2004: 634). Other examples of environment modification would be providing chairs with arm rests, elevated toilet seats, and replacing door knobs with levers to promote an active life in the elderly (Krešević 2008: 21).

2.10.2 Dietary modification

Modification of the diet was discovered to play an important role in the life of the elderly. Restrictions on foods such as salt and sugar was adopted by the world countries (Norum 2004). Ten years of the inception of the Global strategy, nationally non communicable diseases (NCDs) are now receiving stronger attention especially in the low and middle income countries with limited resources (Puska 2014). The reduced use of dairy fats in the diet and frequent intake of fruits and vegetables are promoted to protect people from various cancers and heart diseases and increase functional status (Sulander 2005: 24).

2.10.3 Physical activity

Physical activity is neglected by the elderly and thus it is important to help them understand that physical activity can reduce their dependence on others in functional status (Jonse'n et al. 2006: 6). The strategy to fight physical inactivity was adopted by the World Health Organization in 2004. The global strategy on diet, physical activity and health was endorsed at the Fifty-Seventh World Health Assembly to overcome the life threatening NCDs in the developing countries (Norum 2005). Some of the strategies recommended were; effective government policies and strong health promotion needed for the good implementation of the recommendations of the WHO Global Strategy. Strong promotion by Non-Governmental Organizations

(NGOs) health services and educational institutions to push governments and industry for sustainable change.

Addressing the main risk factors for non-communicable diseases, recommendations of physical activity required for different health outcomes, such as, rehabilitation in the form of 30 minute exercise is assumed to reduce the risk of obesity, cardiovascular disease, diabetes, and colon cancer. Muscle strengthening and balance training were affirmed to reduce falls (Norum 2005).

Exercise can be planned and structured to improve or maintain one or more components of physical fitness. There is evidence that participation in regular exercise can minimize the physiological effects of an otherwise sedentary lifestyle and increase active life expectancy by limiting the development and progression of chronic diseases and disabling conditions (Chodzko-Zajko et al. 2009: 1515).

It is often difficult to understand why the older adults are reluctant to exercise. It is believed that stereotypes from surrounding culture are learnt by individuals as they grow older. As individuals age, negative aging stereotypes are directed at themselves and these negative perceptions may contribute to the low rate of participation in exercise (Graham 2012: 19). According to Levy (2009: 320) stereotypes are embodied when their assimilation leads to self-definitions that, in turn, influence functioning and health (Chalabaev et al. 2013: 320).

Age stereotypes have an effect on the health of the elderly either in a negative or positive way. Those elderly who think that their lives are useless, helpless and devalued are less likely to seek preventive care and are more likely to suffer poor physical functioning. When stereotypes are positive, people who have stronger will to live are more likely to eat a balanced diet, exercise and have a higher level of functioning towards end of life (Graham 2012: 19).

2.11 Rehabilitation programmes to improve functional ability

WHO (2011: 96) defines rehabilitation as the act of restoring something to its original state such as the act of restoring something or someone to a satisfactory state. Rehabilitation may mean restoration to good health or useful therapy and education. It is also defined as a set of measures used to assist an individual with a disability to achieve and maintain optimal functioning and interaction with his or her environment. It involves identification of a person's problems and needs and occurs over a specific period of time. The goal of rehabilitation is to improve a person's ability to function independently. A good example would be to help a person with functional disabilities carry out activities of daily living without help (WHO 2011: 96). Rehabilitation will never be complete without changes in the environment. Improving outcomes is a matter of investing in changes to the person's capacity levels, by means of medical or rehabilitative interventions, or investing in accessibility, accommodation and other environmental changes as specified in the ICF framework (WHO 2001). The rehabilitation program may be delivered by one person or a team of workers (WHO Report 2011). Many forms of rehabilitation have been used in elderly care to improve their health by either reducing the impairments or by promoting the performance of activities in the presence of physical limitations. Dance and music are among the many interventions used internationally as rehabilitation measures.

2.11.1 Dance as a rehabilitation programme

Dance can be described as a significant psychosocial exercise which is able to penetrate many aspects of human existence. Dancing is used as a form of art which may enhance emotional behavioural patterns and has been used as a training and rehabilitation exercise (Foster 2014). Dancing is comprised of many traditional and modern dances, with different styles in the world. Some of the dance styles used in rehabilitation programmes are described below:

2.11.1.1 Social dancing

Social dancing is a dance style that focusses on socializing the individuals of all ages. Most of the social dances are partner dances namely ballroom dances, foxtrot tango and others. Social dance can be a health enhancing physical activity that promotes a playful and spontaneous activity. It also adds a positive connection for older adults with one's memory, youth and history (Roberson and Penclova 2014). Dancing was found to be one social activity that can be of benefit to the physical health and to emotional well-being of the elderly (Nauert 2010: 8). It has been verified that dance exercise of the head and body, and the shifting of the centre of gravity in every direction, contributes to allow the movements to maintain balance (Federici, Bellagamba and Rocchi 2005: 385). According to Marks (2005), dance-based exercise is a low-risk activity and that can be potentially effective in promoting mobility and participation on physical activity among people with chronic diseases.

2.11.1.2 Traditional dance

Each traditional dance has its own history, language, song, and cultural background. It is widely known that traditional dance originates from inherited traditions. Dancers learn informally by observation and through guidance by others in social functions. It is a conscious way of human expression through rhythmic movements of the body bearing a meaning for the specific society (Pusnik 2010: 5). The benefits of traditional dance style explored were: improvement of balance, improvement of attitude towards physical activity and reduction in body weight, heart rate and blood pressure in the elderly. In most countries traditional dance styles have been reported to be an appropriate physical activity for the elderly among various population groups. In countries like Scotland, Ireland, Greece and Turkey, it is revealed that traditional dance has the benefit of re-awakening a sense of cultural identity of youth for the elderly (Trinity Laban Conservatoire of Music and Dance 2010: 14).

2.11.1.3 African traditional dance

African traditional dance refers mainly to dances of Sub-Saharan Africa with many cultural differences in musical and movement styles. It utilizes the concept of many rhythms as well as total body articulation. The African traditional dance was used as a functional tool of expression which is used for a variety of reasons such as ritualistic, enjoyment, courtship and for physical exercise. Each dance form focuses more on a certain part of the human anatomy for movement and expression. African dance is participatory in nature which includes the audience and the performer. It is stated that these dances are used for social purposes like communal ceremonies, funerals, including coronations (Adegbite 2010).

2.11.1.4 Therapeutic dance

Therapeutic dance is a method of psychological treatment in which movement and dance are used to deal with positive and negative feelings and experiences. Its psychological treatment is beneficial for both physical and mental health. These dance movements are used for stress reduction, disease prevention, and mood management. Therapeutic dance is classified into dance therapy or dance movement therapy and psychomotor dance-based exercise.

- **The dance therapy or dance movement therapy (DMT)**

Dance therapy is the use of movement as a way of treating social, emotional, cognitive and physical problems. Dance uses the power of movement to promote personal growth and well-being in therapeutic setting. The dance movements ease muscular rigidity and improve health (Brauninger et al. 2014).

DMT was started in the US in the 1960's as a profession. By the 1970's it had been established as a vocation combining its creative process with the human movement into a holistic approach. In Australia the DMT practitioners were drawn from backgrounds in dance, education or the health science namely teaching, physiotherapy and psychology. Practitioners were required to undergo extensive dance movement therapy. They may be employed as dance movement therapists or

integrate their work with dance movement therapy. The dance movement therapy professionals are growing in number of practitioners. These practitioners work in clinical, educational and community health centres (The American Heritage Dictionary of the English Language 2012).

DMT is practiced in mental health, rehabilitation, medical, educational, and in nursing homes, day care centers, and in health promotion programs. It is effective for individuals with developmental, medical, social, physical and psychological impairments. It may be used with people of all ages, races and ethnic backgrounds. It may be used individual, couples, family and group therapy formats. Research findings of the —Dance Therapy with Older Individuals Who Have Sustained Neurological Insultll revealed that balance, mood and social interaction were increased (Brauninger et al. 2014).

- **Psychomotor dance-based exercise**

Psychomotor dance-based exercise is a type of physical activity which integrates physical movement with the musical rhythm. The dance unites the body and spirit bringing about permanent change in psychological development. This exercise may reduce symptoms of depression and disturbed behaviour in persons with Alzheimer's disease and dementia (Aldemir et al. 2011).

2.11.2 Music as a restoration programme

Music is an art that expresses ideas and emotions in significant forms through the elements of rhythm, melody, harmony and musical instruments (Collins English dictionary 2012). The music incorporates natural sounds into music. It utilizes drums gourds strung with beads and accompanied by clapping of hands, stamping of feet and singing. According to Sun (2012), music promotes relaxation and distracts older persons from unpleasant experiences and contributes to their quality of life.

Music is beneficial to people with health conditions namely depression, pain, anger, emotional disturbances and others (Sun 2012). The middle-range theory combines

psychological and physiological responses of music to increase physical activity, health outcomes across adult population and settings (Sun 2012). Exercising to music can increase enjoyment and promote initiation and maintenance of physical activity that leads to the improved health outcomes of weight and blood sugar.

It is also proposed that music is a non-pharmacological intervention which is safe, cost-effective and could decrease the use of narcotics. This is affirmed by the study which revealed that music can help reduce chronic pain. Music can be implemented in different settings such as hospitals, nursing homes, surgical rooms and others (Murrock and Higgins 2009: 2255). Music plays an important role in African society and is an integral part of the life of every African person from birth. It allows entertainment an activity that allows older persons to interact with others and aspects of their life and gives them an opportunity to connect with a sense of spirituality (Hays and Minichiello 2005).

2.11.3 Dance and music programme

Dance and music are important social activities used by many cultural traditions for rituals, weddings, ceremonies and daily life. Music affects people in different ways depending on each person's culture or personality. Music rhythms facilitate the coordination of movement and arouses the feelings of joy, freedom and sorrow (Schafer 2011: 30). Music therapy is discovered to be effective in physical rehabilitation and facilitation of movement. Music provides a healing effect for the physically, mentally and emotionally challenged individuals (Raglio and Gianelli 2009).

The use of a dance and music programme is used as an exercise activity, where movements of dance accompanied by music, to improve the individual's physical activity with enjoyment (Trinity Laban Conservatoire of Music and Dance 2010: 8). The health benefits of dancing include fitness and healthy aging (AARP 2005: 6). Hokkanen et al. (2008) as cited in Nauert (2010: 7) assert that dance movement with

music is effective in exercise, sensory stimulation and improving behaviour of patients with dementia and those having problems with self-care activities.

2.12 Theoretical frameworksguiding the study

The theoretical frameworks that guided this study are Orem's theory of self-care and the Middle Range theory of self-care.

2.12.1 Orem's self-care theory

The Orem's of self-care refers to the ability to carry out self-care activities to fulfil universal, developmental and health deviation requisites. Self-care requisites determine what care needs to be given to the client. In this study universal requisites mean basic functions carried out to maintain health, for example, eating, bathing, dressing, grooming amongst others. Secondly, the theory of self-care deficit implies the difficulty in carrying out self-care activities, and when applied to this study it will refer to a condition of functional decline affecting elderly with chronic conditions who experience difficulty in carrying out activities of daily living. Thirdly, the theory of nursing systems refers to nursing care for identified needs of the patient. These nursing systems are classified as wholly compensatory, which is care for patients who need total care. The partly compensatory category will cater for some needs while the patient is doing the rest under the nurse's supervision. Supportive and educative system refers to care rendered to patients who need support and cannot respond to effective functioning (Burns and Grove 2010:186). In this study the nursing systems will be of educative and supportive care for the elderly residents to help them carry out activities of daily living.

Self-care theory is typically applied in the practice of rehabilitation nursing, and has been used in this study. The theory of self-care starts with the assumption that everyone is willing and capable of caring for themselves and when encouraged to do so, this can boost the person's self-esteem. It proposes that teaching would help to guide, support, and provide necessary conditions to promote self-care (Kumar 2007). Furthermore the universal self-care requisites are used as a framework for client

assessment so as to identify self-care deficits. The self-care deficits identified were the problems with bathing, dressing, and other self-care activities.

2.12.2 The Middle Range theory of self-care

The Middle Range theory of Self-care addresses the process of maintaining health, with health-promoting practices within the context of chronic illness management. Self-care maintenance, self-care monitoring and self-care management are the key concepts of this theory. The factors that influence self-care focus on experience, motivation, culture, confidence, functional ability and support from others. Self-help is essential in the management of the self-care for the clients with chronic illnesses and the healthy individuals (Jaarma, Riegel and Stromberg 2012: 194).

Jaarma, Riegel and Stromberg (2012: 194) describes self-care maintenance in relation to lifestyle behaviours performed to improve well-being, preserve health, or to maintain physical and emotional stability. Examples of these behaviours are discontinuing smoking, eating healthily, and physical exercise. Self-care maintenance benefits clients from reflection about the usefulness of the behaviour and the ongoing evaluation of benefits and the effectiveness of the activities. Adherence is the essential ingredient in self-care maintenance. Motivation plays a very important role in driving humans to achieve their goals. Motivation is partly from the wish to perform a task for pleasure or to improve health.

2.13 Conclusion

This chapter presented a detailed literature review on aging, aging theories, care of elderly, the cultural context of aging, functioning in elderly, functioning and disability, the rehabilitation programmes for improving physical functioning in the elderly and assessment of functional ability. The theoretical frameworks that guided this study were also described. The next chapter will present the methodology used for this study.

CHAPTER 3: METHODS

3.1 Introduction

This chapter presents the research methodology used to guide the study. It describes the research design, research setting, and selection of the sample, the research instruments used to collect data, the validity and the reliability of the instruments, the data collection process, and the techniques used to analyze the data.

3.2 Research design

Polit and Beck (2012: 58) describe a research design as an overall plan for obtaining answers to the research questions. The researcher selected a research design and identified strategies to minimize bias. According to Burns and Grove (2009: 22), quantitative research is a formal objective and a systematic process in which numerical data is used to obtain information. According to Polit and Beck (2012: 55), intervention studies test whether an intervention resulted in changes in the dependent variable or not. For this study a quantitative pre-test post-test intervention design was selected. According to Polit and Beck (2012: 55), experimental studies have three salient features, that is, manipulation of an intervention, random selection of participants and experimental control over the intervention. In this study there was random assignment of participants to the intervention and control groups. The control of the intervention is through consistent participation in the intervention. In this study the use of the pre-test / post-test interventional design was used to achieve the aims and objectives of this study (Dimitrov and Rumrill 2003: 159). Dimitrov and Rumrill (2003: 159) state that the design may be used when the participants are randomly

assigned to the experimental and control groups. Both groups were measured before and after the intervention.

The intervention group in this study was subjected to the programme of dance and music while the control group was not given any activity during this time. The participants of control group received routine care by the care givers of the residence, or were either sitting or lying down in their bedrooms.

On completion of 12 weeks of the intervention, both groups were measured again for the BP, pulse, and blood glucose as well as their balance and functional ability. The researcher compared the pre-test and post-test scores of the intervention group with those of the control group. Thereafter the researcher assessed whether the intervention made any difference to the scores of the intervention group. All the participants who had consented to participate in the study were assessed prior to entry into the intervention to determine the baseline data of their health status. On consideration of the prevalence of obesity, hypertension and diabetes, health assessments were done to ascertain the effects of dance and music on weight, blood glucose and blood pressure (Murrock and Gary 2008).

3.3 Research setting

This study was conducted at an old age home in Pietermaritzburg, KwaZulu-Natal. The old age home was established in the 1960s by a non-governmental group (NGO) and admits Black males and females from low socio-economic areas. It is situated about a kilometre away from the district and regional hospital. According to the information obtained from the registered nurse in charge of the home, the location makes it easy to transport sick residents to the hospital in case of medical emergencies. The building complex consists of eight blocks of apartments, and includes a reception area which also serves as a dining room for the residents. There is a television room and a spacious hall where most of the events, such as Christmas parties and religious activities are held. It was in this hall that the study intervention was conducted. The home is subsidized by the South African Social Security Agency (SASSA) and the residents pay a third of their state funded pension fund towards the running costs. The home also receives donations from the public, non-governmental organizations, and the National Lottery Distribution Trust Fund.

There are environmental constraints in this old age home and these do not allow residents to fully engage in activities of daily living even if they are capable of performing those tasks. The passages are narrow and two of the staircases do not have any side rails. The bath tubs in the bathrooms do not have the grab rails. The facility is poorly equipped to provide physical activities to these residents. There are no resources for physiotherapy or occupational therapy services. There is one hall which is used for different activities for example board meetings, church service, clinic health workers' treatment area. This does not allow for a dedicated space for any rehabilitation programmes.

3.4 Population

The study population is, according to Polit and Beck (2012: 273) the entire population that meets the criteria which the researcher is interested in studying. In this study the entire population at the time of the study was made up of 53 Black male and female elderly people above the age of 54 years. Most of the residents were on medication for one or two of the following chronic conditions: diabetes, arthritis, hypertension and stroke. Some of the residents had senile dementia, visual or hearing deficits. The population for the study included all permanent residents who agreed to participate in the study.

3.4.1 Inclusion criteria

Residents who were included in the study had obtained normal readings of blood glucose and blood pressure after being checked for base line data of their health status.

3.4.2 Exclusion criteria

The residents who were excluded from the study were the elderly with severe frailty, cardiovascular conditions that might need intensive medical assessment, and those residents for whom excessive physical activity was contraindicated.

3.5 Sampling process

Sampling is a process by which a portion of the participants are selected from the population to form the sample for the study (Polit and Beck 2012: 742). From the eligible participants simple random sampling, using the fish bowl technique, allowed the researcher to allocate participants to either the intervention or comparison groups. One group of 22 participants made up the intervention group and the other group of 20 participants were in the comparison group.

3.6 Instruments used for data collection

The instruments used for data collection were the Modified Barthel Index (MBI) and the Berg Balance Scale (BBS), sphygmomanometer and a stethoscope, Accu-chek Blood Glucose Meter, and a digital scale for measuring body weight. These instruments were chosen for their validity as they were able to measure what they were supposed to measure (Polit and Beck 2012: 745). The instruments used for physiologic variables such as BP, weight were used on one participant by two raters to check they would produce the same results. The instruments were found to cover all the important factors related to the topic. The instruments used in this study have been used in previous studies with success. The MBI had been used to measure function in occupational therapy (Wyatt 2013). The BBS had been used in a number of studies for measuring balance impairment (Stevenson 2001, Blum and Korner Bitensky, 2008, Mancini and Horak, 2005).

3.6.1 Barthel Index

The Barthel Index (BI) is an instrument which is used to assess physical functions, specifically self-care and ambulation for example stair climbing (Katz 2003). Wyatt (2013) identified more than one version of the Barthel Index instrument. The original BI, developed by Mahoney and Barthel in 1965, is a standardized functional assessment tool widely used in hospital and community setting rehabilitation, with various patient groups. Katz (2003) further states that the original BI measures ten areas of activities of daily living (ADL) related to functional independence or dependence in self-care tasks and mobility. These include bathing, dressing, walking, stair climbing, bladder and bowel control and grooming (Wyatt 2013). According to Wyatt (2013) the original BI uses an ordinal scale scoring system

ranging from zero to 100 points in five-point increments. A score closer to 100 indicates full functionality whereas scores closer to zero represent complete dependency.

Wyatt (2013) also mentions a recently used BI version which is the Modified Barthel Index (MBI). According to Wyatt (2013) Shah and colleagues adapted the original BI to have increased sensitivity to change and named this version the Modified Barthel index (MBI) (Annexure D)

3.6.2 Berg Balance Scale (BBS)

The Berg Balance Scale is an instrument which provides a quantitative assessment of balance in older adults. It is used for monitoring effectiveness of interventions over time. The scale consists of 14 items requiring subjects to participate in movement tasks of varying levels of difficulty (Annexure C). It quantitatively assesses balance and risk for falls in older adults, through direct observation of their performance. The BBS measures both static and dynamic balance. The BBS was designed to help determine change in functional standing balance over time (Stevenson 2001: 29). Administration of the BBS requires a ruler, a stopwatch and a chair step.

Static and dynamic activities of varying difficulty are performed. Item-level scores range from zero to four determined by the ability to perform the assessed activity. A score of zero represents an inability to complete the task. It takes 10 to 20 minutes to measure the client's ability to maintain balance while performing various activities for a specified duration of time (Blum and Korner-Bitensky 2008). Zero to 20 indicates impairment of balance and 41- 56 represent good balance.

The items are scored from zero to four with a score of zero representing an inability to complete the task while a score of 4 representing independent performance. A global score totals up to 56 points. Zero to 20 indicates impairment of balance 21 – 40 acceptable balance and 41 – 56 represent good balance.

The Berg Balance Scale was identified as the most commonly used assessment tool for the measurement of balance impairment (Blum and Korner-Bitensky, 2008). It is a reliable clinical and research tool when working with adults (Mancini and Horak 2005).

In this study the BBS was used in conjunction with the MBI. According to Blum and Korner-Bitensky (2008), the BBS was found to be a valid tool and was found to show excellent correlation with the Barthel Index.

3.6.3 Sphygmomanometer

The sphygmomanometer was used to measure the blood pressure (BP) of the participants. Blood pressure was measured in a standardized fashion using a well maintained monitor (Sever 2006). The regular sphygmomanometer was used even though there was no calibration done. They were recently purchased for use in the old age home. Ideally all sphygmomanometers should be checked and calibrated by an accredited laboratory at least annually (Turner et al. 2008).

3.6.4 Blood glucose monitoring device

A blood glucose monitoring device, the Accu-Chek (@ 2013 Rocha Diagnostics model) was used for checking the blood glucose level of the diabetic clients in the old age home. Blood glucose checking was done to screen for abnormal blood sugar levels. The Accu-chek unit of calibration is in millimol per litre (mmol/L).

3.6.5 Digital Scale for weight measurement

A digital scale (Taylor model 7506) was used for measuring the weight of each participant who consented to participate in the dance programme. The unit of calibration kilograms. The digital scale was found to provide accurate results for use in public health research (Yorkin et al. 2013).

As with all scales, digital weight scales need to be calibrated every few months so that they can keep on reading accurately. Most digital scales come pre-calibrated from the manufacturing company, but with time and continued use and handling, its reading can drift slightly. Therefore calibration of the scale was done before using it.

3.7 Reliability and validity of the instruments used

According to Polit and Beck (2012: 741), reliability is concerned with the extent to which a repeated measurement yields the same result. Validity is also the extent to which an instrument measures what it is intended to measure. To ensure the reliability and the validity of the results of the current study method was followed (Wyatt 2013: 10). The assessments of health indicators were done by two trained people, the researcher who is a registered nurses and the same enrolled nurse from the residential facility assisted with the health measurements. Two assessments using the same instruments on one participant was done in the beginning to check if it gave the same results. Once it was confirmed to be reliable, the same instruments were used for relevant assessments on all the participants of both groups pre and post intervention.

3.8 Steps of the intervention

The steps of the intervention were carried out after obtaining the participants' voluntarily signed consents. The pre-test assessments measurements taken were BP, pulse, body weight, blood glucose, assessments of balance and ADL. All participants in the intervention or comparison group were given a number code so that their pre and post-test assessments could be recorded.

3.8.1 Pre intervention assessments

Pre-test assessments were carried out four (4) days prior to the intervention.

Assessments of the participant's health status that were done were on their balance, activities of daily living, blood pressure, pulse rate, weight and blood sugar level estimation were recorded. The pre-test helped to ascertain whether the participants met the criteria for inclusion in the study (Polit and Beck 2012: 209). The assessments were carried out in the hall of the old age home and some assessments were conducted in the participants' private rooms.

3.8.1.1 Assessment of blood pressure (BP)

The blood pressure measurements were done using an electronic sphygmomanometer. The blood pressure was taken according to the protocol for blood pressure measurement as recommended by the American Heart Association, namely measuring blood pressure in a sitting position, back supported; legs

uncrossed and the patient being relaxed (O'Brien, 2006). The cuff of the sphygmomanometer BP machine was wrapped around the upper arm, directly over the area of the brachial artery and two centimetres above the antecubital fossa. The blood pressure readings were undertaken in a quiet room. The BP was taken and the readings were recorded in the assessment records book kept by the researcher. The readings of systolic BP above 120 were considered as abnormally high and diastolic readings below 50 were considered as abnormally low.

3.8.1.2 Pulse rate estimation

The pulse is the rhythmical beating or vibration movement produced by the regular, recurrent expansion and contraction of an artery produced by waves of pressure caused by the contraction and relaxation of the heart muscle. The normal pulse rate per minute in the average adult varies from 50 to 80 with fluctuations occurring with exercise, injury, illness and emotional reactions (Mosby's Medical Dictionary 2013).

During assessment of the pulse rate the participant's arm was supported and the radial pulse site was located. The pulse was taken by placing two middle and fore fingers on the area where the artery lies over the wrist bone and counted for one minute using a wrist watch with a second hand. The pulse rate was recorded in the assessment book. A pulse rate over 90 or less than 50 beats per minute was viewed as abnormally high and abnormally low respectively.

3.8.1.3 Body weight measurement

When the weights of the participants were taken, the scale was placed on a hard, flat surface. No jerseys, jackets or shoes were allowed to be worn. Readings of the weight were taken while the participants were standing on the scale and their weights were recorded in the assessment book.

3.8.1.4 Blood glucose measurement

The blood sugar concentration or the blood glucose level is the amount of glucose (sugar) present in the blood of a human or animal. The body naturally tightly regulates blood glucose levels as a part of metabolic homeostasis. With some exceptions, glucose is the primary source of energy for the body's cells, and blood

lipids (in the form of fats and oils) are primarily a compact energy store. Glucose levels are usually lowest in the morning, before the first meal of the day (termed the fasting level), and rise after first meals for an hour or two by a few mill molar. Blood sugar levels outside the normal range may be an indication of a medical condition (Mayo Clinic 2015).

The normal blood glucose level for non-diabetics should be between 3.9 and 6.9 mmol/L. This level fluctuates throughout the day. The blood glucose target range for diabetics should be 5 – 7.2 mmol/L before meals, and less than 10mmol/L after meals. Glucose level of below 2.8 mmol/L or above 13.9 mmol/L would be a serious medical condition requiring medical attention (American Diabetes Association 2013). All diabetic participants were randomly tested for glucose readings.

3.8.1.5 Assessment of balance

The assessments for balance were done using the BBS by the researcher with the help of an auxiliary nurse who recorded the findings. The equipment used for checking balance were as follows: Two standard chairs (one with arm rests, one without), one 30cm ruler, one footstool 23cm of height, and 20 meter walk way. Each participant was asked to perform activities as shown in the BBS manual (see Annexure D) and were timed using a wrist watch with a second hand. Time taken to fulfil the task was recorded and four points were recorded if the task was completed at the set time. All participants had to complete 14 activities related to balance. The scoring of participants balance is in Annexure

3.8.1.6 Assessment of activities of daily living (ADL)

The baseline functional levels of each participant were determined on entry into the study. The modified Barthel Index (MBI) scale, (see Annexure C) was used to measure the functional status of all the participants involved in the study before the dance and music programme. The participant had to self-report when asked about the activities of daily living. The researcher was assisted by the auxiliary nurse who knew the participants well. These physical performances such as ability in stair climbing or walking a distance, dressing, bathing and bladder and bowel control were scored in the following manner, for an example if the participant was unable to

perform a task a zero was given, if moderate help was required five points were allocated and for those who were fully independent ten points were allocated. The scores for each item were summed up to create a total score which was out of 70. The percentage of score obtained was finally calculated for each participant.

3.8.2 Intervention

At the beginning of the intervention, the participants were informed that the intervention, a dance and music programme, will be conducted twice a week for twelve weeks. In the first two weeks the duration of the dance sessions lasted for 20 minutes or to the tolerance of the participant, with the rest intervals of 2 minutes inbetween the music tracks. After the first two weeks of the dance and music programme, the length of the session was increased to 40 minutes. At the end of each dance session, the participants were asked to do deep breathing exercises and stretch their limbs ten times. A warm up prepares the body to adjust to the demands of exercise. Cool down gives the body time to recover after exercise (Ortho Info 2012).

3.8.2.1 Assessment of the environment prior to intervention

Floors were checked for uneven surface to ensure that the residents would not fall during the dance activity. Cleaners were asked to warn the participants not to walk on floors during cleaning time. The participants were advised to wear comfortable clothing and close-toed, or non-slippery shoes to facilitate ease of movement on the tiled floor. During the intervention sessions the supervision of the participants by the researcher and her assistant was done while the participants were walking and dancing.

3.8.2.2 Dance and music programme

Dance is a form of physical activity that can be performed in many different places and does not require expensive equipment. It also offers the elderly fun, enjoyment and interaction (Keogh et al. 2012: 15). The dance programme took place in the big hall of the home which is approximately 20 x 15 sq. metres in size, and allowed the participants to move freely. Before the dance programme commenced, the cushioned chairs with armrests were arranged against the walls of the hall. The

chairs were for resting of participants as needed. Caregivers were invited to participate in the dance programme to encourage participants. The participants were welcomed and appreciated for coming to take part in the programme.

The dance and music started and proceeded as follows:

- **Warm up session**

A five minutes warm-up session was carried as an orientation of the intervention group to the programme of dance and music. According to Keogh et al. (2012: 16) the warm up session of two to five minutes is important to condition the participants to the programme. The warm-up session included stretching of the limbs and breathing exercises prior to the commencement of the dancing sessions (Van der Merwe 2010: 50). Every participant was given a glass of water to drink to prevent loss of fluids that might occur during the dance activity.

- **Dance sequence**

The dance routine consisted of simple traditional Zulu dance steps that were demonstrated by the researcher. Gospel music was played on a compact disc player whilst the dance intervention took place. Dance movements involved stamping of feet in a rhythmic fashion with the participants arranged in a circle. The participants had one foot in contact with the floor at all times. The dance also involved repetitive movement of the legs and trunk and intermittent movement of the arms. These steps took about two to three minutes until each gospel music track completed. Parts of the body such as shoulders, chest, pelvis, arms and legs moved with the different rhythms in the music. Arms were raised high while shaking the body in a snake-like motion according to the ability of the individual participant. The stamping dance is usually done by groups of Nguni tribes from Southern KwaZulu-Natal (<http://www.drumcafe.co.za/traditionalmusicdance.php>). In total, there were five music tracks played per session and participants danced to the music with rest intervals between the tracks. The Zulu gospel music chosen was a recording of the group called the —Ncandweni Christ Ambassadors. It was appropriate, pleasurable and of a low tempo. In the first two weeks the duration of the dance sessions lasted for twenty minutes or to the tolerance of the participants, with rest intervals in between the music tracks

- **Continuation of the programme**

After the first two weeks of the dance programme, the length of the sessions was increased to forty minutes. At the end of each dance session the participants were allowed about five minutes for the cool down session. During the cool down session participants were asked to breathe deeply and stretch their limbs again. At the end of each session the participants were given snacks in the form of fruits or chips as a reward for their participation in the programme. The total number of sessions was twenty-four in a period of three months.

3.8.3 Post intervention assessments

Post intervention assessments were carried out four days after the intervention was completed. The same assessments of the blood pressure, blood glucose levels, weight measurements, abalance capability and functional abilities were taken and recorded using the same measuring instruments as was used in the pre-intervention assessments.

3.9 Data recording

All data obtained from pre and post intervention assessments were captured on an excel file using codes for participants in the interventionand comparison groups.

3.10 Data analysis

Data analysis occurred in several stages. All data entered was reviewed and corrections were made where necessary to ensure accuracy. The data obtained were coded and captured into IBM Statistical Package for the Social Sciences (SPSS) programme Windows version 21.0 (IBM Corp., Armonk, NY2012) before analysis to obtain descriptive statistics such as frequencies.

Descriptive statistics were used to analyse all the data. The t-test was used to calculate paired sample differences of the mean and standard deviation of the differences. In the addition, the paired differences t-test, degrees of freedom and 2tailed significance was calculated. Effect sizes were also calculated. The statistical

analysis were conducted using Statistical Package for the Social Sciences (SPSS) version 21.0 with significance set at $p \leq 0.05$.

3.11 Ethical considerations

The research proposal for this study was reviewed by the Faculty of Health Sciences Research and Higher Degrees Committee and approved by the Institutional Research Ethics Committee at the Durban University of Technology (Annexure E). The study was commenced after obtaining written permission from the chairperson (Annexure H) and the Nursing Manager in charge of the old age home (Annexure: F).

Ethical issues focused on maintenance of confidentiality, informed consent and the respect for each participant. Participants were assured that their participation was completely voluntary. The purpose of the study was made known to the participants including the information letter (Annexure B) (King's College London 2015).

The willing participants were asked to sign consent forms (Annexure B (1)). For those participants who were unable to write, a thumb print of their right hand was used where a signature was required. The participants were also advised that their participation was entirely voluntary and that they had the right to withdraw from the study at any time. Each participant was identified by code numbers and they were assured that their identity will be protected even during the publication of the study. The population of the old age home is a vulnerable population and thus privacy was strictly maintained during the intervention. The researcher had requested the staff not to allow visitors during the intervention.

The researcher observed whether any participants were not coping with the dance activity during the intervention. Participants who verbalized they were feeling weak were asked to sit on chairs the sides and their blood glucose, BP and pulse was taken. If all were within normal parameters they were encouraged to continue with the dance programme. As incentives for the participation the researcher offered participants a small snack after each intervention. The participants were applauded by the resident care givers and the researcher at the end of each session. The

researcher thanked each one of the participants after each day's session and invited them to attend the next session. Minor incentives were used in order to encourage continued participation in the programme (Ruth, Grant and Sugarman, 2004).

The storage of data complied with the DUT guidelines of data protection. Data collected was managed by the researcher and her supervisors (Hawkes 2007). The collected data was kept in the locked up cupboard at DUT when not in use. The researcher kept accurate records of all procedures followed during the research process. The participants were informed about the storage period of the data and what the data will be used for. The data will be stored for 15 years at the Durban University of Technology and destroyed after this period by shredding. The participants of this group received routine care that was administered by the care givers of the residence.

3.12 Conclusion

Based on the research methodology described above the following chapter presents an analysis of the results of the pre-test and post-test intervention conducted with the intervention and the comparison groups.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter provides a description of the results from the study. The 42 participants included 14 males and 28 females, 20 served in the comparison group and 22 in the experimental group. There was one drop-out from each group resulting in 19 and 21 participants in the comparison group and intervention group respectively Figure 4.1.

4.2 Study flow in relation to participation

The figure below shows the study flow in relation to participation

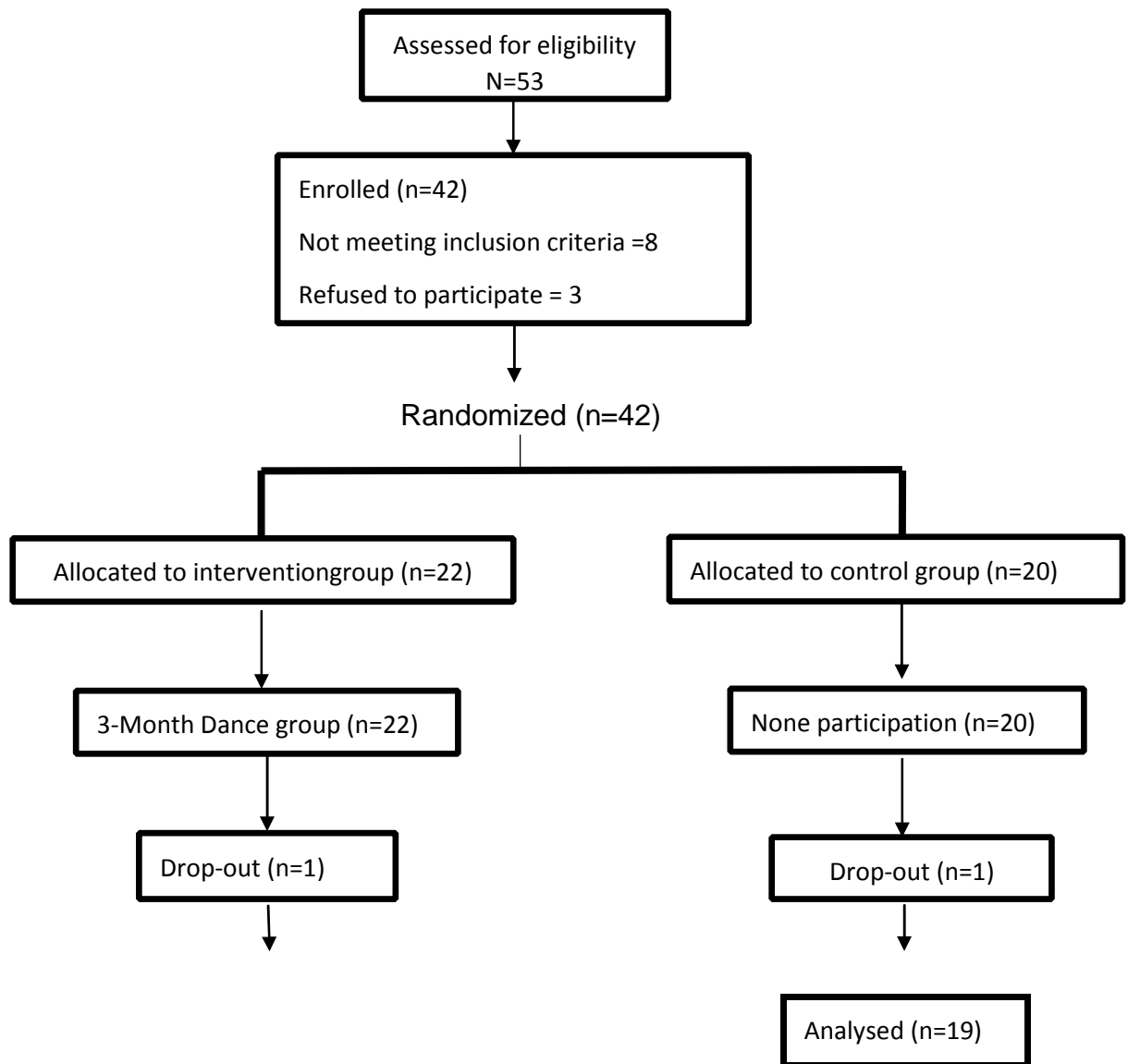


Figure 4.1 Participation profile

Every attempt was made to keep participants in the control and experimental groups as similar as possible.

4.3 Attendance record of the study

The number of sessions for the dance and music programme was 24 over a period of three months. The mean number of sessions attended by the participants who adhered to the dance programme was 14.1 (67%) in the range of 16 to 24 sessions. Seventy six percent of the participants attended 17 (71%) or more sessions. About 42% of the participants attended 22 (92%) sessions. Therefore few of the participants were not regular in attending the dance sessions.

4.4 Demographical profile of participants

As shown in Figure 4.2 the highest number of the participants in both groups were single. With reference to gender, there was an unequal distribution of males and females within the groups, with each group having an unequal male and female participants.

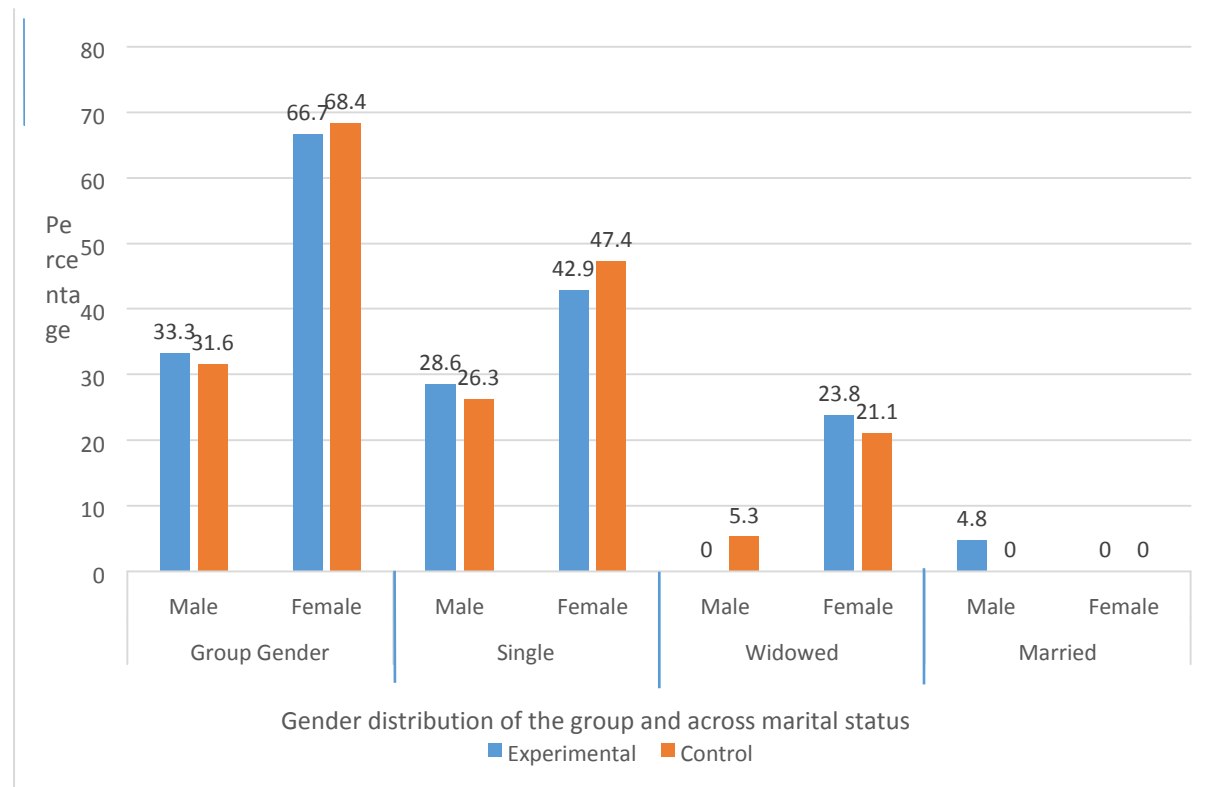


Figure 4.2: Gender and marital status distribution of participants in each group.

4.5 Age distribution of the participants

Table 4.1 Number of participants in each group by age

Age in years	Comparison group (n = 19)		Intervention group (n = 12)	
	N	%	N	%
55 – 60	1	5.3	1	4.8
61 – 65	2	10.5	6	28.6

66 – 70	3	15.8	4	19.0
71 – 75	4	21.1	1	4.8
76 – 80	6	31.1	3	14.3
81 – 85	3	15.8	4	19.0
86 – 90	0	0	1	4.8
91 – 95	0	0	1	4.8
Total	19	100	21	100
Mean ± SD	73.9 ± 7.3		72.6 ± 10.3	
Age range	58 – 85		55 – 94	

The mean age between the groups was not significantly different. The age range in the intervention group was wider than that of the comparison group

Table: 4.2 chronic conditions affecting the participants in the two groups

	Intervention group (n=21)		Comparison group (n=19)	
Chronic condition	N	%	N	%
Asthma	2	9.5	1	5.3

Stroke	4	19.0	3	15.8
Alzheimer's disease (AD)	1	4.8	0	0
Epilepsy	0	0	2	10.5
Dementia	4	19.0	3	15.8
Arthritis	2	9.5	5	26.3
Hypertension (HP)	7	33.3	5	26.3
Diabetes Mellitus DM	3	14.3	3	15.8
Partial blindness	2	9.5	1	5.3
Depression	2	9.5	3	15.8

The most common chronic condition that affected the participants was hypertension (33%) in the intervention group, and (26%) in the comparison group. The second common condition was arthritis measuring 26.3% in the comparison group followed by the stroke measuring 19.0% in the intervention group

4.6 Physiological parameters indicating health status measurements of weight, pulse and blood glucose of the control and the intervention groups, pre and post-test are shown below

Table 4.3 Comparison of the weight, pulse and blood glucose levels of the control and intervention groups pre and post-test.

Group		Control			Experimental		
		Pre-test	Post-test	P value	Pre-test	Post-test	P value
Weight	Mean \pm SD	68.4 \pm 15.2	67.6 \pm 15.8	>0.05	66.0 \pm 10.9	65.1 \pm 10.9	>0.05
Pulse	Mean \pm SD	75.0 \pm 10.6	74.7 \pm 12.5	>0.05	72.8 \pm 10.6	74.8 \pm 8.9	>0.05
Blood glucose	Mean \pm SD	5.6 \pm 0.8	8.7 \pm 1.7	<0.05	11.9 \pm 2.1	11.3 \pm 2.4	>0.05

There was a decrease in weight from pre to post intervention for the sample taken as a whole ($p=.031$). The average post-test body weight for the intervention group is not significantly different to the average post-test body weight measure for the comparison group.

There was no statistical difference in relation to the pulse of the pre and post intervention as indicated by the p -value of >0.05 both in the comparison and in the intervention groups.

For blood glucose there was significant difference in the pre and post intervention only in the comparison group as indicated by the p -value of <0.05.

Table: 4.4 Comparison of systolic and diastolic blood pressure in the control and intervention groups.

Systolic blood pressure (SBP)							
		Comparison group			Interventiongroup		
		Pre	Post	P value	Pre	Post	P value
SBP	Mean \pm SD	131.0 \pm 24.4	122.0 \pm 16.5	0.026	138.1 \pm 24.9	130.5 \pm 23.3	0.036
Diastolic blood pressure (DBP)							
DBP	Mean \pm SD	72.1 \pm 14.6	66.6 \pm 15.3	0.02	70.1 \pm 10.1	70.4 \pm 11.8	0.06

The SBP decreased significantly from pre to post-test the comparison group p-value= 0.026 and p-value =0.036 in the intervention group. For the DBP of the comparison group a significant difference was indicated by the p-value= 0.02. No significant difference was found in DBP measurements of the intervention group the p-value= 0.06.

4.7 Comparison of the functional ability and balance capability of participants before (pre) and after (post) intervention

The results did not show a significant effect of dance and music programme on the functional ability and balance capability of participants of the intervention group when compared to participants of the comparison group post-test. However, balance improved significantly in the intervention group from pre to post-test and function improved significantly in both groups from pre to post test. The effect size (Cohen's d) was low.

Table 4.5: Balance and function Means \pm SD, p values, effect sizes and correlations

	Control (Mean \pm SD)	Experimental (Mean \pm SD)	P value	Cohen's d
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	pre-test	post-test	P	Cohen's d	pre-test	post-test	p	Cohen's d		
Balance %	55.79 ±21.78	57.58 ±20.07	.26	.09	56.24 ±22.88	60.10± 25.53	.01	.28	.73	.11
Function %	72.37 ±22.36	72.42 ±16.40	.93	.003	71.67 ±17.67	76.62± 17.67	.03	.16	.55	.25
Correlation	.720 (p<.001)				.706 (p=.001)					

there were no significant differences in the balance and functional ability measurements in the pre and test of the comparison group and the intervention groups as indicated as indicated by the p-values in table 4.5

4.8 Psychological effects of dance and music

The participants verbalized that they experienced positive emotional stimulation through gospel music played during their dance sessions. The majority of the participants also reported an improvement in the quality of their sleep after the dance sessions. Participants also reported a slight ease of movement especially when walking about indoors. Even those participants who, according to the old age home staff, were in a state of depression, reported an emotional upliftment.

4.9 Conclusion

The results from the intervention suggest that the physical abilities and balance capability remained stable in the comparison group and improved for the intervention group (See Table 4.5).

CHAPTER 5: DISCUSSION

5.1 Introduction

This chapter presents the discussion of the findings of the study. Although this study did not find statistical support for the hypothesis that the dance and music programme can improve the functional ability and balance capability of participants who participated in the dance and music intervention when compared with participants who did not, participants verbalized positive feelings and were motivated to be functional.

5.2 Demographic profile

The intervention and the comparison groups were similar and representative of their age groups. Similarly, Holmerova et al. (2010), reported that exercise and dance programme for Seniors (EXDASE), received participation that was representative of the elderly age group. In their study the intervention group of 27 participants had a mean age of 81.0 years, standard deviation (SD) = 9.7. In the comparison group of 25 participants, the mean age was 82.8 years, SD = 7.5.

With reference to gender, there was an unequal distribution of males and females in this study. The findings of the study are in line with the world statistics which states that, the elderly women outnumber the elderly men in every country as taken from the statistics issued by the United Nations Department of Economic and Social Affairs Population Division (2014: 26). There were 85 men per 100 women aged 60 years or older and 61 men per 100 women aged 80 years or older globally. Also, findings of the resolution of the Government of the Czech Republic (2008: 14) revealed that at the age of 100 years the ratio of females to males is 4:1. These statistics confirm that women live longer life than men. However, longevity is associated with the challenges of the health status. These women have to endure age related diseases and disability which put them at a higher risk of social isolation and institutionalization (Stahl and Patrick 2011: 27). Therefore many residents in this old age home are females with chronic diseases and reduced physical capabilities of different degrees.

Poor intervention outcomes are associated with increasing age (Wong, Yap and Chan 1998: 471). A study done in the Day Hospital for rehabilitation in Singapore for the subjects who were independent in ADL, showed that although significant improvement was found, age was an important determinant of ADL. The study revealed that the subjects who were less than 75 years improved more with rehabilitation. So according to Wong, Yap and Chan (1998) there is an evidence that as the person ages functioning naturally deteriorates and it is difficult to separate the impact of age from the effects of disability itself. Similarly in this study the effect of

the intervention was not significant because the age range of the participants in the intervention group was wider and higher than the cut-off of 75 years.

5.3 Health indicators

Health screening of body weights, pulse rates, systolic blood pressure (SBP) and diastolic blood pressure (DBP) was done before the intervention. The SBP and pulse recording were lower in the post-test than in the pre-test which presumably indicates an exercise benefit for the intervention group see table (4.3). Forsén et al. (2012) reported different results but they measured SBP and DBP three times, and used the mean of the second and third blood pressure measurements in the analysis. The average post blood glucose levels for the intervention group is not significantly different to the average post blood glucose level measure for the comparison group. This is congruent to the results of 8-18 studies reported by Snowling and Hopkins (2006). The effect exercise time and other measures of glucose control was trivial.

5.4 Intervention results

The overall average scores on the ADL were lower than expected, and this indicated a substantial level of impairment. This was expected because firstly, the participants had been in a sedentary state for a long time. Secondly, the sample consisted of the elderly with different types of chronic conditions. Thirdly, the form of exercise, which is dance in this intervention, is a mild type of movement and the participants moved at their comfortable and tolerable pace. Fourthly, the intervention lasted for a short while for statistically significant results to be noted. A similar study conducted by Fahlman et al. (2011) with a longer period of 16 weeks, as compared to the 12 weeks of the current, yielded positive results.

5.4.1 Functional ability

The functional ability of the participants was checked before and after the intervention and the MBI scores show a slight improvement in the intervention group, as reflected in Table 4.5. There was a slight difference between the control and the

intervention groups in relation to function as indicated by the p-value of .720 ($p < .001$) for the control and .706 ($p = .001$) for the intervention group. There was also a significant difference in p-value which decreased in the post test compared to that of the pre-test. This was noted in the control and intervention groups and it indicated a positive effect of the intervention.

This old age home under study is of low socio-economic condition and lacking even the basic equipment for support namely commodes, good-working wheel chairs and grab rails along the corridors and in the bathroom. This type of environment encourages a sedentary lifestyle in the sense that the residents cannot assist themselves or participate while being assisted. Findings of some studies indicated that incidences of functional decline were higher in lower socio-economic classes than in higher socio-economic classes (Simsek et al. 2014; Sulander, 2005; Kikafunda and Lukwago, 2005). However studies examining differences in functional ability between institutions of higher and lower socio-economic standards have not been conducted. Furthermore, there are limited investigations examining chronic conditions and lifestyle among elderly from black old age homes in South Africa. The present study contributed to these issues.

There is no resident or visiting physiotherapist at this old age home and the staff showed no commitment to continue with the dance and music programme after the study completed even when some of the participants demonstrated interest to continue. This contributed to the residents' sedentary lifestyle. According to Badley's (2008) comment on the ICF's model of functioning, environmental and personal factors were found to play a role in determining meaning of certain aspects of functioning. He further explained the importance of the context in the environment for the performance of a task. The meaningful context is a major feature in the environment as it affects both the type of task and the way it is carried out. An example is how the activities of daily living such as bathing, dressing and others depend on environmental factors.

Badley (2008) is of a similar view that disability may not only reflect the underlying medical conditions, but also features of the physical environment in which daily activities occur, such as, the grab rails on a bath tub or side rails along the stair cases. These were not present in the old age home under study. The environmental constraints did not allow the residents to fully engage in activities of daily living even if they were capable of performing those tasks. Therefore, residents faced changed roles with limited opportunities. This may be reflected in the findings of this study. Any gains achieved during the activity sessions were lost due to the fact that participants were unable to follow through and perform the activities due to a paucity and support.

When considering the size of the effects in the total MBI score, it is important to relate it to what it could mean for the individual when performing any ADL. The MBI measures what a person actually does in daily life and each point is clearly separated for each item in terms of dependence in ADL. However, the scale is limited in that minor differences are not detectable, such as, whether a person is able to perform some activities in daily living faster, more safely, or with less help from someone else. This implies that the dance exercise programme could have an overall effect in the total sample but the scale used in the present study was not sufficiently sensitive to detect it (Littbrand, 2011: 72). It is imperative to adopt an objectively measured outcome that discriminates between being able or unable to perform a task of daily living (Manini and Pahor, 2009).

Chadzko-Zajko et al. (2009: 1520) argue that the effect of exercise and physical activity on physical functioning and daily life activities cannot be generalized. The degree to which participation in exercise and physical activity translates into improved physical functioning and enhanced performance of everyday life activities is not yet clear. Contrasting findings of improved versus unchanged physical performance after a variety of exercise activities, for example, walking, stair climbing and standing have been reported and there is not a simple linear relationship between participation and physical activity and changes in disability. They proposed that, although some studies demonstrated improvements across a variety of

functional tasks, other studies suggest functional performance adaptation as more specific, resulting in changes in one functional measure for example, walking, but not others for example, stair climb performance. Keysor (2003) argues that it is less clear that physical activity or exercise minimizes physical disability. Manini and Pahor (2009) are on a similar view that further research with a longer follow-up time is needed to definitely conclude on the effects of physical activity on the onset of disability.

Physical activity presents a promising intervention yet evidence for prevention of mobility and outright disability remains inconclusive. An active research programme aimed at discovering methodologies to improve physical function remains ongoing. Scientists aim at incorporating task-specific exercise which involves practicing tasks of everyday life (Manini and Pahor, 2009: 30), similar to what was offered in this study. The limitation of the current study namely the duration of the intervention, and the inability to offer the intervention on an ongoing basis could have affected the outcomes observed.

5.4.2 Balance capability

The balance capability level of the participants was checked using the BBS before and after the intervention. According to the BBS scores, there was a slight improvement in the intervention group when compared to the comparison group, see Table 4.4. This indicates a positive effect of the intervention. Although the researcher did not obtain a report about the occurrence of falls in the old age home, during the dance sessions there were no falls for the period of twelve (12) weeks which totalled to 24 sessions, as falls are common in the elderly (Scott 2010). Dance was found to be helpful in improving subjective feelings of improved balance and movement in the intervention group. This is congruent with the findings of Keogh et al. (2009) who concluded in their study that dancing can significantly improve physical function, balance, strength, flexibility and gait as well as reduce the prevalence of falls in the older adults. This is also similar to the randomized controlled trial of Turkish

folklore dance on the physical performance of healthy women conducted by Eyigor et al. (2009) which revealed a positive effect on balance, depression and quality of life.

5.5 Psychological wellbeing and other benefits

Although this was not an intended objective of the study, some of the participants enjoyed each session of the intervention and this is congruent with the study done by Murrock and Higgins (2009). Dance exercise has both physical and psychological effects on the individual (Sharma, Madaan and Petty 2006). They proposed that music, mood and movement have psychological and physiological benefits on older adults. Physical activity becomes enjoyable leading to improved health outcomes and quality of life.

Depression symptoms are among the most common mental health problems affecting the elderly especially those in the long term care (Chan et al. 2011). Research into correlation between functional status and depressive symptoms among adults in old age homes has found that poor mobility was most strongly related to depressive symptoms. Listening to music and dancing were all highlighted as important aspect of old age home residents' life. The main factors identified that made activities meaningful for residents' were the ones which were based on memories from their past and interests in types of music. This is congruent to the study done on individuals with dementia which highlighted that music is a key element in creating a positive emotional responses when listening to music that has some particular significance to them (Raglio 2014).

5.6 Theoretical implications

The Orem's self-care and the Jaarma's middle-range theory are based on minimizing the effect of negative functioning and promoting quality of life for older adults. Goals for these theories are to help the vulnerable older adults recover from illness and maintain or improve their level of functioning. For long-term care self-care activities address the multiple risk factors that interfere with functioning such as lack of

confidence and lack of motivation. Both theories are influenced by experience, motivation, cultural beliefs and support from others (Seben 2005).

5.6.1 Orem's theory of self-care

Based on the self-care theory of Orem, self-care is the practice of activities that individuals initiate and perform on their own to maintain health and well-being. The people are willing to perform self-care. Should maintenance of self-care require special techniques, nursing is required in providing the care. Nurses need to empower the older adults for self-care. This will help the older adults become active participants and not passive recipients of care (Clarke and Bennet 2012). According to Wilkinson and Whethead (2009), self-care is viewed as situational and culture specific. It involves the capacity to act and make choices and is influenced by motivation, knowledge and skills to prevent illness. In summary Orem's theory is based on the assumption that persons (including the older adults) are capable and willing to perform self-care. Self-care is learned through human interaction and communication.

5.6.2 Jaarma's middle range theory of self-care

Jaarma's middle-range theory of self-care focuses on the self-care that occurs in the context of a chronic disease. The key concepts include self-care maintenance, selfcare monitoring and self-care management. Thus the intended outcome of self-care is illness stability, health and well-being. According to Riegel, Jaarma and Stromberg (2012), intended outcomes of self-care include a perceived control over the illness and decrease anxiety associated with chronic illness.

Cultural beliefs and values in self-care might be seen as highly important in countries and cultures where independence is valued but in some cultures, self-care is not important. Daily routines or habits are important factors affecting self-care. Some older adults get used to performing certain self-care behaviors and self-care becomes part of their daily routine. For other older adults however, self-care is considered work (Riegel, Jaarma and Stromberg 2012: 15). Similarly in this study,

according to the old age home staff, the participants were not keen to do minor chores when asked, like looking after the flower garden, table laying and others, residents considered that as the staff members' duty.

The concept of confidence is the component of self-care. Confidence in the ability to perform self-care is also important in each stage of the self-care process, which are self-care maintenance, self-care monitoring and self-care management. (Riegel, Jaarma and Stromberg 2012: 15). Performing self-care requires the functional ability to engage in the required behaviours, for example, balancing on a scale, participating in exercise programmes and others. Problems with hearing, vision, mobility and energy can make self-care difficult. In addition, research illustrates that illnesses are commonly associated with functional deficits that can make self-care particularly challenging.

Nurses can incorporate wellness outcomes to address each older adult's personal aspirations towards wellbeing of body, mind and spirit. Nurses can apply the nursing process to assess age-related risk factors, identify the problems, plan the wellness outcomes and implement the interventions. A major focus of nursing care is educating older adults about interventions that will minimize the effects of risk factors. Nurses have developed a middle-range theory for fostering quality of care for older adults. The nursing interventions are based on the following aspects of the quality of life for older adults; teaching about activities that increase self-esteem, encouraging participation to social and educational activities, providing information about support services and facilitating participation in group exercises. Many older adults associate health with high level of functioning. According to Aldwin, Siro and Park (2006), it is necessary for the older adult to accept whatever level of illness and disability one has, thereby preserving mental health and social functioning within the confines of a disability.

Based on the ICF's description of human functioning and disability, human functioning is a dynamic interaction between the individual factors and contextual

factors divided into personal and environmental and contextual factors divided into personal and environmental factors (Forsen et al. 2012: 40). The environment plays a role in functioning because it can be a risk factor for a negative functioning, for example, if there is poor lighting in the room at night, this can interfere with the older person's self-care and mobility. Some older adults have misunderstanding of the fact that functional impairments are necessary consequences of old age. Education in this aspect is important for nurses to provide information about age-related changes (Lovell, 2006). Some of the participants of the old home under study were reluctant to engage in dance exercises thinking that functional limitations were normal processes of aging.

CHAPTER 6: CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter provides the conclusions drawn from the findings of the study, limitations and to suggest possible directions for future studies.

6.2 Conclusions

The researcher aimed to determine the effect of a dance and music intervention on functional ability and balance capability of a group of elderly residents in an old age home in Pietermaritzburg, KwaZulu-Natal. A quantitative study using pre-test/posttest comparison groups design was successfully carried out using the MBI and the BBS. Results showed that dance and music did not statistically improve functional ability, balance and general well-being of the elderly, but positive feelings during the classes indicates a positive effect of the intervention.

Although positive results have been achieved using dance and music programme, the functioning of the environment should be a priority. The environment should be adjusted so that those residents with mild to moderate functional impairments could live an independent life.

Well-trained professionals are needed to promote the value of exercise as well as encourage regular participation in the exercise programmes to improve function as well as minimize physical disability in the elderly. The study had the following strengths, imitations, recommendations and suggestions of a future study.

6.3 Strengths of the study

The following were found to be the strengths of the study

Checking of the vital signs for example, BP, pulse and weight was not in the objective of the study but it was done to safeguard the participants' health status against any adverse mishaps that could happen with exercise programmes on people with chronic conditions.

6.4 Limitations and recommendations

The limitations and the recommendations of the study are the following:

The intervention period was short. The intervention should be carried out for a longer period. Had it been possible to implement the intervention for a longer period the results might have been different and the impact of the dance and music intervention might have been more significant and this might have given more conclusive results. It is however worth noting that the impact of the dance rehabilitation cannot be easily measured (Hackney et al. 2007).

During the intervention a few participants were reluctant to dance and only started after being prompted by those on the stage. It is more difficult for the elderly to initiate and maintain a consistent exercise practice when they have been inactive for a long time. The researcher had to be patient in motivating the participants to participate in the programme.

The old age home staff who did not understand the importance of physical activity in improving the functional activity of the elderly, should undergo training on the suitable exercise programme for the elderly and a certified course in this regard be a prerequisite for employment in the old age homes. The study cannot be generalized to the wider population because the sample was relatively small.

The intervention included a heterogeneous group. Chronic medical conditions such as arthritis, strokes, diabetes mellitus, hypertension, mobility disorders and dementia formed the majority of the conditions experienced by the elderly in this old age home. The researcher noted that even in participants with the same chronic conditions, great variations existed in the degree of functional ability. Therefore, the programme of dance should be adjusted to suit the conditions of the individual elderly to show positive benefits (Wong, Yap and Chan 1998).

6.5 Recommendations

The following recommendations are made:

- Every long term residential old age home have a consistent and compulsory exercise routine, and the benefit of exercise must explained to the elderly to encourage their participation.
- The health care professionals in charge of older persons' care should assess their functional ability on admission to the residential facility and record the baseline data regarding of their health status. This would assist in determining the need for intense or less intense exercise programmes to improve or sustain their functional ability.
- Inspections of the residential facilities should be conducted by the health authorities to guard against neglect of older persons physically, psychologically and emotionally
- .A visiting physiotherapist and/or an occupational therapist should be employed for guidance and to oversee the progress of exercise programmes.

6.6 Suggestions of future studies

The following are suggestions of future studies:

A longitudinal study is recommended to determine the long term effects of the intervention which is sustained over a longer period.

There is a need for more dance-exercise studies evaluating both physical and mental functions and ADL among residents of an old age home. Physical and psychological disorders cannot be separated because one influences the other. This was affirmed by the findings of a study done by Hui, Chui and Woo (2008) stating that dancing has both physical and psychological benefits for older adults.

It is important to design studies that evaluate the applicability and effects of an exercise intervention in the frail older adults who were excluded from the dance and music programme.

REFERENCES

Adegbite, A. 2010. The Impact of African traditional dance: Orosun example. *In Journal Media and Communication Studies*. 2(6): 133-137.

http://www.academicjournals.org/article_xml/JMCS_19FF0B910901.xml

African Union. 2006. Charter for African Cultural Renaissance. Minutes of the Meeting held on 23rd to 24th January 2006 Khartoum, Sudan (online).

Available:

<http://www.unesco.org/new/fileadmin/MULTIMEDIA/FIELD/Dakar/pdf/CharterAfricanCulturalRenaissance.PDF> (Accessed 07 February 2014).

African Union. 2008. Social Policy Framework for Africa. 27-31 October. Windhoek, Namibia. Available (online):

<http://www.un.org/esa/socdev/egms/docs/2009/Ghana/au2.pdf> (Accessed 22 April 2013).

Aldemir, G. Y., Ramazanoglu, N. Camliliguney, A. F. and Kaya F. 2011. Effect of dance education on motor performance of children. *Education Research and Reviews*. 6(19): 979-982.

Aldwin, C.M., Siro, A. Park, C. 2006. *Health, Behaviour and Optimal Aging: A life Span Development Perspective*. New York: Elsevier Academic Press.

American Association of Retired Persons (AARP), 2005. Health Benefits of Dancing, Exercise, and Fitness...American Association (online). Available:

<http://www.aarp.Org/health/fitness/info/dance-to-health.htm> (Accessed 31 October 2011).

American Diabetes Association, 2015. *Diabetes Pro. Professional Resources*. 75th Scientific Sessions. Boston. USA. (online). Available:

<http://adascisessions.civi-go.com> (Accessed 29 June 2015).

Amoateng, A.Y. and Heaton, T.B. 2007. Families and households in post-apartheid South Africa; Socio-democratic perspectives. In Heaton, T. B. (Ed.). 2007.

Families and households in post-apartheid South Africa: Socio-demographic perspectives (pp. 1-25). Cape Towns: HSRC Press.

Badley, E.M. 2008. Enhancing the conceptual Clarity of the Activity and Participation Components of the International Classification of Functioning, Disability and Health. *Social Science and Medicine*. 66: 2335-2345.

Bauman A. E., Reis, R.S., Sallis, J. F., Wells, J.C. Loos, R. J. and Martin B. W. 2012. Correlates of physical activity: why are some people active and others not? *The Lancet*. 380 (9838): 258-271.

Bengtson, V.L., Silverstein, M., Putney, N.M., Gans, D. 2009. *Handbook of Theories of Aging*. New York: Springer Publishing Company.

Blum, L. and Korner-Bitensky, N. 2008. Usefulness of the Berg Balance Scale in stroke rehabilitation: a systematic review. *Journal of the American Physical Therapy Association*. 88(5): 559-566.

Booth, F.W., Roberts, C.K. and Laye, M.J.2012. Lack of exercise is a major cause of chronic diseases, *Physiology*, 2(2):1143-1211. *Comprehensive*
Doi:10.1002/cphy.c110025.

Brauninger, I. 2014. Dance Movement Therapy with Elderly: An international Internet-based survey undertaken with practitioners, body, movement and dance Psychotherapy: *An International Journal for Theory, Research and Practice* (online), 9(3): 138 – 153.

Brodsky, J., Naon, D., Resnizky, S.B. and Citron, D. 2005. *Issues in Family Care of the Elderly: Characteristics of Care Burden on Family Members and Support Programs*. Research Report. Jerusalem: Centre for Research on Aging.

- Burkhouse, R.V. and Houtenville A.J. 2006. *A Guide to Disability Statistics from the Current Population Survey – Annual Social and Economic Supplement (March CPS)*. New York: Cornell University Press.
- Burns, N. and Grove, S.K. 2009. *The Practice of Nursing Research: conduct, critique and utilization*. 3rd Edition. Philadelphia: WB Saunders.
- Buurman, B.M., Van Munster, B.C., Korevaarb, R.J., de Haan, R.J. and de Roij, S.E. 2011. Variability in Measuring (instrumental) activities of daily living, functioning and functional decline in hospitalized older medical patients: A Systematic Review. *Journal of Clinical Epidemiology*. 64(6): 619-627.
- Cecelja, M., & Chowienczyk, P. (2012). Role of arterial stiffness in cardiovascular disease. *JRSM cardiovascular disease*. 1(4): 11.
- Chabeli, M. M. (2003). Health care needs of older persons living permanently in a residential home setting in Gauteng. *Curations*. 26(4): 14-21.
- Chalabaev, A., Emile, M., Corrion, K., Stephan, Y., Clement-Guillotin, C., Pradier, C. and d'Arripe-Longueville, F. 2013. Development and validating of the aging stereotypes and exercise scale. *Journal of Aging and Physical Activity*. 21: 319-334.
- Chan, M.F., Wong, Z.Y., Onishi, H., Thayala, N.V. 2011. Effects of music on depression in older persons: a randomized controlled trial. *Journal of Clinical Nursing*. 21: 776-783.
- Chodzko-Zajko, W.J., Proctor, D.N., Fiatarone, M.A., Minson, C.T., Nigg, C.R., Salem, G.J. and Skinner, J.S. 2009. Exercise and Physical Activity for Older Adults. *Official Journal of the American College of Sports Medicine*. 3 (1): 101 - 106.

- Chui, W.E., Chan, K., Chong, M.A., Ko, S.L., Law, C.S., Law, C., Leung, M.E., Leung, Y.A., Lou, W.V., Ng, Y.S. 2009. *Elderly Commission's Study on Residential Care Services for the Elderly*. Hong Kong: University of Hong Kong Press.
- Clarke, L. H. and Bennet, E. V. 2012. Constructing the moral body: self-care among older adults with multiple chronic conditions health. *An interdisciplinary Journal for the Social Study of Health, Illness and Medicine*. 17(3): 211-228.
- Clemson, L., Singh, M.A., Bundy, A. Cumming, R.G., Manollaras, K., O'Loughlin, P., Black, D. 2012. Integration of balance and strength training into daily life activity to reduce rate of falls in older persons (the LIFE study): randomised parallel trial. *Biomedical Journal (BMJ)* (online), 345: 45-47. Available: <http://www.bmj.com/content/345/bmj.e4547> (Accessed 11 August 2014).
- Collins English Dictionary*, 2015. Glasgow: Harper Collins.
- Concannon, L.G., Grierson, M. J. and Harrast M. A. 2012. Exercise in the Older Adult: From the Sedentary Elderly to the Masters Athlete. *The American Academy of Physical Medicine and Rehabilitation*. 4: 833- 839,
- Cyarto, E.V, Brown, W.J. Marshall, AL and Trost, S.G. 2008. Comparison of the effects of a home-based and group-based resistance training program on functional ability in older adults, *American Journal of health Promotion*, 23 (1):13-17.
- Czech Republic. 2008. Ministry of Labour and Social Affairs. *National Programme of Preparation for Ageing for 2008-2012*. Resolution of the Government of the Czech Republic. 1st Ed. Czech Hart Press.
- Czerniewicz, S., & Nicholson, C. M. (2004). Hale and hearty—the benefits of exercise in the elderly. *Continuing Medical Education*. 22(11): 629 - 635.

Dieterich, A. and Kumpers, S. 2009. *Prevention and Rehabilitation for Older persons with Long Term Care Needs*. German National Report. Berlin: EU - Seventh Framework Programme.

Dimitrov, D. M., & Rumrill, P.D. (2003). Pretest-posttest designs and measurement of change. *WORK*.20(2): 159-165.

Disability And Rehabilitation (DAR) Team. 2006. Disability and Rehabilitation WHO Action Plan 2006 – 2011. Geneva: World Health Organisation.

Dobriansky, P.J., Suzman, R.M. and Hodes, R.J. 2007. Why Population Aging Matters. A global. WHO: National Institute on Aging.

Dunlop, D.D., Semanik, P., Song, J., Manheim, L.M., Shih, V. and Chang, W. 2005. Risk factors for functional decline in older adults with Arthritis. *Arthritis and Rheumatism* (online), 52(4): 1274 – 1282. DOI 10.1002/art.20968. American College of Rheumatology.

Eyigor, S., Karapolat, H., Durmaz, B., Ibisoglu, U. and Cakir, S. 2008. A randomised controlled trial of Turkish dance on the physical performance, balance, depression and quality of life in older women. *Archives of Gerontology and Geriatrics* (online), 48(1): 84-88.

Factora, R. 2013. Aging and Preventive Health. *Cleveland Clinic Center for Continuing Education* (online). Available: <http://www.cleveland clinic meded.com/medicalpubs/diseasemanagement/preventive-health/default.htm> (Accessed 12 May 2015).

- Fahlman, M.M., McNevin, N., Boardley D., Morgan, A. and Topp, R. (2011). Effects of Resistance Training on Functional Ability in Elderly Individuals. *American Journal of Health Promotion*. 25(4): 237-243.
- Federici, A., Bellagamba, S., & Rocchi, M. B. (2005). Does dance-based training improve balance in adult and young old subjects? A pilot randomized controlled trial. *Aging clinical and interventionresearch*. 17(5): 385-389.
- Ferdarko, N.S. 2011. The Biology of Aging and Frailty. *Clinics in Geriatric Medicine*. 27(1): 27-37.
- Forbes, S. C., Little. J. P. and Candow, D. G. 2012. Exercise and nutritional interventions for improving aging muscle health, *Endocrine* 42, 29–38
DOI 10.1007/s12020-012-9676-1
- Forsen, L., Bjornelv, G.M.W., Bentzen, H. Sogaard, A.J. and Graff-Iversen, S. 2012. Functional Ability, Physical Activity and Self-rated Health In Old Age: A Cross- sectional Population-based Study in Norway. *The Open Public Health Journal*. 5: 40-51.
- Foster, P.P. 2014. *How does dancing promote brain reconditioning in the elderly?* (online), Academic Papers, Aging, Health and Medicine, Healthspan Enhancement, Longevity. Available:
<http://hplusmagazine.com/2014/05/02/how-does-dancing-promote-brainreconditioning-in-the-elderly/> (Accessed 11 March 2014).
- Gans-Combe, C., Chairperson. 2009. *European Commission of Data protection and privacy ethical guidelines*. Ethical review in F P 7 (online). Available:
http://ec.europa.eu/research/participants/data/ref/fp7/89827/privacy_en.pdf (Accessed 27 December 2014).

- Gladman, J.R. 2008. The international classification of functioning, disability and health and its value to rehabilitation and geriatric medicine. *Journal of the Chinese Medical Association*. 71(6): 275-278.
- Graf, C. 2013. *The Lawton Instrumental Activities of Daily Living (IADL) Scale* (online). New York University, College of Nursing: The Hartford Institute for Geriatric Nursing. Available: http://consultgerirn.org/uploads/File/trythis/try_this_23.pdf (Accessed 28 April 2014).
- Graham, J. 2012. The New Old Age Caring and Coping. Older persons Become whatthey think, Study Shows. *The New YorkTimes* (online),12: 19. Available: http://newoldage.blogs.nytimes.com/2012/12/19/older-people-are-what-theythink-study-shows/?_r=0elderly. (Accessed 11 March 2014)
- Greenglass, E., Fiksenbaum, L. and Eaton, J. 2006. *The relationship between coping, social support, functional disability and depression in the elderly*. York University, Canada (online), 19(1): 1531. Available: <http://search.tb.ask.com/search/GGmain.jhtml?searchfor=the+reltionship+betweencoping+social+support%2C+functional+disabilitytpr=hpsb&p2=%SEXF> (Accessed 25 October 2013).
- Habjanic, A., Saamio, R., Elo, S., Turk, D.M., Isola, A. 2012. Challenges for institutional elder care in Slovenian nursing homes. *Journal of Clinical Nursing*. 21(17-18): 2579-89.
- Hackney, M.E., Kantorovich, S., Levin, R. and Earhart, G.M. 2007. Effects of Tango on functional Mobility in Parkinson's disease: A Preliminary Study: *Journal of Neurological Physical Therapy* (online), 41(6): 475 - 481. Available: www.ncbi.nih.gov/pubmed/18172414 (Accessed 12 June 2013).

- Harris-Kojetin, L., Sengupta, M., Park-Lee, E. and Valverde, R. 2013. Long term care services in the United States:2014 overview. *National Center for Health Statistics*. 3: 3-7.
- Hays, T. and Minichiello, V. 2005. The contribution of music to quality of life in older people: an Australian qualitative study. *Ageing and Society*. 25(2): 261-278.
- Hawkes, B. (2007). Data protection guidelines on research in the health sector.Dublin: Data Protection Commissioner.
- Heikkinen, E. 2003. *What are the main risk factors for disability in old age and how can disability be prevented*: Health Evidence Network report (online).Copenhagen. Available: <http://www.euro.who.int/document/E82970.pdf> (Accessed 10 March 2011).
- Helvik, A., Hogseth, L.D., Bergh, S., Saltyte, J., Kirkvold, O., Selbaek, G. 2015. A 36-month follow-up of decline in activities of daily living in individuals receiving domiciliary care. *BioMed Central Geriatrics*.15: 4-7.
- Hemmingsson, H. and Jonsson, H. 2005. The issue is – Occupational Perspective on the Concept of Participation in the International Classification of Functioning, Disability and Health – Some Critical Remarks. *American Journal of Occupational Therapy*. 59: 569-576.
- Holmerová, I., Macháčová, K., Vanková, H.,Veleta,P.,Jurasková, B., Hrnčiariková, D., Volicer, L. and Ross, A. 2010. Effect of the Exercise Dance for Seniors (EXDASE) Program on Lower-Body Functioning Among Institutionalized Older Adults. *Journal of Aging and Health*. 22(1): 106-119.
- Hornby A.S. 2009.*Oxford Advanced Learner's Dictionary of Current English*. 7th Ed. New York: Oxford University Press.

- Hu, J, and Gruber, K.J. 2008. Positive and Negative Affect and Health Functioning Indicators among Older Adults with Chronic Illnesses. *Issues in Mental Health Nursing*. 29(8): 895-911.
- Hui, E., Chui, B.T., Woo, J. 2008. Effects of dance on physical and psychological well-being in older persons. *National Centre for Biotechnology Information*. 49(1): 45-50.
- Hung, A. 2011. Damage-Based Theories of Age and Future Treatment Schemes. *International Journal of Scientific Engineering Research* 2(1) ISSN 22295518.
- Imrie, R. 2004. Demystifying disability: A review of the International Classification disability and Health: a case of London University. *Sociology of Health and Illness*. 26(3): 1-19.
- International Council of Nurses (ICN). 2009. *on Healthy Ageing: A Public Health and Nursing Challenge*. Nursing Matters, Geneva, Switzerland: (online). Available: http://www.ordemenfermeiros.pt/relacoesinternacionais/gri_documentacao/ICN_FolhasInformativas_vsINGePT/FI_versao_ING/Ageing/2d_FSHealthy_Ageing.pdf (Accessed 26 June 2015).
- Jaarma, T., Riegel B. and Stromberg, A. 2012. A Middle Range Theory of Self-care of Chronic Illness. *Advances in Nursing Science*. 35(3): 194-204.
- Jette, A.M. 2006. Towards a Common Language for Function, Disability and Health. *Journal of the American Physical Therapy Association*. 86(5): 726-734.
- Jonse'n, E. Ljunggren, G. Jo'nsson, P.V. & Gosta, B. 2006. Functional Status in Elderly People After Acute Care and Quality of Life at One Year Follow UP. *Health Science Journal*, (online). Available: <http://www.hsj.gr/volume/issuel/issuel-original-> (Accessed 14 January 2014).
- Joubert, J. and Bradshaw, D. 2005. Population Ageing and Health Challenges in South Africa. In *Chronic Diseases of Lifestyle in South Africa* (online).

Available: <http://www.mrc.co.za/chronic/cdlchapter15.pdf> (Accessed 06 March 2014).

Kanu, M. A. 2010. The Indispensability of the Basic Social Values in African Tradition: A Philosophical Appraisal (online). Available: <http://www.ajol.info/index.php/og/article/viewFile/57930/46296> (Accessed 15 October 2014).

Karasawa, M., Curhan, K.B., Markus, H.R., Kitayama, S.S., Love G.D., Redler, B.T. and Ryff, C.D. 2011. Cultural Perspectives on Aging and Wellbeing: A comparison of Japan and the United States (online). Available: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3183740/> (Accessed 10 May 2014).

Katz, S., Ford, A.B., Moskowitz, R.W., Jackson, B.A. and Jaffe M.W. 1963. Studies of illness in the aged. The Index of ADL: A standardized measure of biological and psychological function. *Jama* 185(12): 914 – 919.

Katz, P.P. 2003. Measures of Adult General Functional Status. *Arthritis & Rheumatism (Arthritis & Research)* (online), 49(5S): S15-S27. Available: http://www.medal.org/adocs/docs_ch37/doc_ch37.05.html#A37.0504 (Accessed 14 June 2015).

Keogh, J.W.L., Kilding, A., Pidgeon. P., Ashley, L. and Gillis T. 2009. Can Dancing Improve Physical Activity Levels, Functional Ability and Reduce Falls in Older Adults? *A comparison of the Benefits of Once Versus Twice Weekly for Healthy Older Adults* (online). Available: <http://www.sportnz.org.nz/documents/Research/>. (Accessed 29 January 2013).

Keogh, J.W.L., Kilding, A., Pidgeon. P., Ashley, L. and Gillis T. 2012. Effects of different weekly frequencies of dance on older adults' functional performance and physical activity patterns. *European Journal of Sports and Exercise*

Science (online), 1(1): 14 - 23. Available: www.scholarsresearch library.com
(Accessed 17 March 2014).

Keysor, J.J. 2003. Does late-life physical activity or exercise prevent or minimize disablement? A critical review of the scientific evidence. *American journal of preventive medicine*. 25(3): 129-136.

Kikafunda, J.K. and Lukwago, F.B. 2005. Nutritional status and functional ability of the elderly aged 60 to 90 years in the Mpigi district of central Uganda. *Nutrition*. 21(1): 59-66.

Kim S, Kim, M, Ahn, Y, Lim, H., Kang, S., Cho. J., Park, S., Song, S. 2011. Effect of Dance Exercise on Cognitive Function in Elderly Patients with Metabolic Syndrome: A Pilot Study. *Journal of Sports Science and Medicine*. 10(4): 671678.

King's College London. 2015. Training and Guidance (online). Available: <http://www.kcl.ac.uk/innovation/research/support/ethics/training/infosheet.aspx>
(Accessed 21 August 2015)

Kresevic, D. M. 2008. *Evidence Based Geriatric Nursing Protocols for best Practice*. 3rd Ed. New York. Springer Publishing Company Inco.

Kruk, J. 2007. Physical activity in the prevention of the most frequent chronic diseases: an analysis of the recent evidence. *Asian Pac J Cancer Prev*. 8 (1): 325-38.

Kumar, C.P. 2007. Application of Orem's self-care deficit theory and standardized nursing languages in a case study of a woman with diabetes. *International journal of nursing terminologies and classification: the official journal of NANDA International*. 18(3): 103-110.

Lampman, R. 2000. Position Statement: Importance of Physical Activity for the

Elderly. *Michigan Governor's Council on Physical Fitness, Health and Sports* (online). Available: www.michiganfitness.org/Publications/Adult.pdf (Accessed 22 October 2011).

Landi, F., Abbatecola, A., Provinciali, M., Corsonello, A., Bustacchini, S., Manigrasso, L., Cherubini, A., Bernabei, R., Lattanzio, F. 2010. Moving against frailty: does physical activity matter? *Biogerontology*. 11(5): 537-545.

Langley, F.A. and Mckintosh, S.F.H. 2007. Functional Balance Assessment of Older Adults: A systematic review of the literature. *The Internet Journal of Allied Health Sciences and practice* (online), 5(4). Available: <http://ijahsp.nova.edu/articles/vol5num/pdf/lang> (Accessed 21 December 2013).

Lawton, M.P. and Brody, E.M. 1969. Assessment of Older persons: Self-Maintaining and Instrumental Activities of Daily Living

Levy, B. 2009. Stereotypes Embodiment: A Psychosocial Approach to Aging. *US National Library of Medicine National Institutes of Health*. 18(6): 332-336.

Lewis, E. 2003-2015. *Understanding the Health Continuum: A Guide for Nurses*, from Nursing 101: Fundamentals of Nursing /science courses. Study.com. (online). Available: <http://study.com/academy/lesson/understanding-the-health-continuum-a-guide-for-nurses.html> (Accessed 13 December 2014)

Littbrand, H. 2011. Physical exercise for older persons – focusing on people living in residential care facilities and people with dementia (online), Medical Dissertation. Umea University. Available: <http://www.diva-portal.org/smash/get/diva2:396463/FULLTEXT01.pdf> (Accessed 24 June 2015)

Lovell, M. 2006. Caring for the elderly: Changing perceptions and attitudes. *Journal of Vascular Nursing*. 24(1): 22-26.

- Malherbe, K. 2007. Older Persons Act 13 of 2006. *Out with the old and in with the older*. South Africa (online). Available: <http://www.saflii.org/za/journals/LDD/2007/5.pdf> (Accessed 18 August 2014).
- Mancini, M. and Horak, F.B. 2011. The relevance of clinical balance assessment tools to differentiate balance deficits. *Eur J Phys Rehabil Med* (online), 46(2): 239 – 248. Available: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3033730/> (Accessed 13 February 2014)
- Manini, T.M. and Pahor, M. 2009. Physical activity and maintaining physical function in older adults. *British Journal of Sports Medicine*. 43: 28-31.
- Marks, R. 2005. *Dance-based exercise and Tai Chi and their benefits for people with arthritis: A review*. (105) New York, (online). Available: [www.deepdyve.com, com/.../dance-based-exercise-and-tai-chi-their-b](http://www.deepdyve.com/.../dance-based-exercise-and-tai-chi-their-b) (Accessed 22 October 2011).
- Mayo Clinic, 2015. *Hyperglycaemia in diabetes: Diseases and Conditions*. Mayo Foundation for Medical Education and Research. Mayo Clinic Staff (online) Available: <http://www.mayoclinic.org/diseases-conditions/hyperglycemia/basics/tests-diagnosis/con-20034795> (Accessed 07 April 2013).
- Miedema, S. and Roebben, B.H.M. 2007. Culture and Tradition: Two Contested Concepts in Religious Education (online). Amsterdam: VU University of Amsterdam. Available: <http://old.religiouseducation.net/Resources/Proceedings/33REA2007MiedemaandRoebbenrtf.pdf> (Accessed 21 May 2014).
- Miller, C.A. 2012. *Nursing for Wellness in Older Adults*. Sixth Edition. Lippincott Williams and Wilkins (online). Available:

<http://www.rhc.ac.ir/Files/Download/pdf/nursingbooks/Nursing%20for%20Wellness%20in%20Older%20Adults-2012-cd.pdf>(Accessed 25 November 2013)

Mont, D. 2007. Measuring Disability Prevalence. *Social protection on the World Bank* (online). Available: www.worldbank.org/sp(Accessed 15 October 2011).

Mosby's Medical Dictionary. 2013. 9th Ed. St. Louis: Mosby Elsevier.

Murrock, C.J. and Gary, F.A. 2008. A Culturally-Specific Dance Intervention to Increase Functional Capacity in Africa. *Journal of the Cultural Diversity*. 15 (4): 168-173.

Murrock, C. J. and Higgins, P. A. 2009. The theory of music, mood and movement to improve health outcomes). *Journal of advanced Nursing*(online), 65 (10): 2249-2257

Nabalamba, A. and Chikoko, M. 2011. Aging Population Challenges in Africa. *African Development Bank. Chief Economist Complex*.1 (1): 1-12.

Nakrem, S. 2011. *Measuring quality of care in nursing homes—matters?* (online) Philosophiae Doctor. Norwegian University of Science and Technology.
<http://www.diva-portal.org/smash/get/diva2:460566/FULLTEXT02.pdf>
(Accessed 20 January 2015).

National Institute on Aging National Institute of Health. 2007. *Why People Aging Matters A Global Perspective*. United States: Department of State(online). Available:
https://www.google.co.za/?gws_rd=ssl#q=why+population+aging+matters+a+global+perspective(Accessed 14 August 2015).

Nauert, R. 2010. *Adaptive Music/Dance Therapy: An activity to improve quality of life in Long Term Care Setting* (online). Texas State University: San Marcos.

Available: ijw.cgpublisher.com/product/pup.198/prod.18. (Accessed 10 March 2011).

Norum, K.R. 2005. World Health Organisation's Global Strategy on diet, physical activity and health: the process behind the scenes. *Scandinavian Journal of Nutrition* (online), 49(2): 83 – 88.

Nigam, Y., Knight, T., Battacharya, S. and Bayer, A. 2012. Physiological Changes associated with Aging and Immobility (online). Available: www.hindawi.com/journals/jar/2012/468469 (Accessed 14 July 2013).

O'Brien, 2006. *Manual of Hypertension of the European Society of Hypertension*, (online). United States: CRC Press. Available: https://books.google.co.za/books?id=sTncBQAAQBAJ&pg=PA447&lpg=PA447&dq=O'brien+2006+blood+pressure+checking&source=bl&ots=JnEkqb2NY1&sig=QIZB1EeJRePrqwx14rSZ7yifuc8&hl=en&sa=X&ei=EtWiVcSJO4r_UKaWgeAL&ved=0CDUQ6AEwAw#v=onepage&q=O'brien%202006%20blood%20pressure%20checking&f=false (Accessed 15 June 2014).

O'Donoghue, CE, Botha, A.D.H., Van Rensburg, G.H. 2014. Culturally diverse care for older persons; what do we expect of caregivers? *Prof Nurs Today*. 18(1): 3-6.

OrthoInfo. 2012. Warm Up, Cool Down and Be Flexible. *American Academy of Orthopedic Surgeons (AAOS) f Like* (online), 35 (9). Available: <http://orthoinfo.aaos.org/topic.cfm?topic=a00310>

Perold, A. and Muller, M. 2000. The Composition of Old Age Homes In South Africa in Relation to the Residents and Nursing Personnel. *Curations* (online) Available:

https://www.google.co.za/?gws_rd=ssl#q=Ramashala+2002+Living+Arrangements+Poverty+and+the+Health+of+Older+Persons+in+Africa

(Accessed 28 January 2013).

Phaswana-Mafuya, N., Peltzer, k., Ram Lagan, S., Chirinda, W. and Kose, Z. 2013. Social and health determinants of gender differences in South Africa, *Health S S Gesondheid* (online), 18 (1), Art. #728, 9 pp. Available: <http://dx.doi.org/10.4/hsag.v18i1.728> (Accessed 15 April 2015).

Phillips, E.M., Schneider, J.C., Mercer, G.R. 2004. Motivating elders to initiate and maintain exercise. *Achieves of Physical Medicine and Rehabilitation*. 85(3): 52-57.

Polit, D.S. and Beck, C.T. 2012. *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. 9th Ed. Philadelphia: Lippincott Williams & Wilkin

Puska, P. 2014. *The Global Strategy on Diet, Physical Activity and health: 10 Years on World Cancer Research Fund International* (online). Available: <http://blog.wcrf.org/global-strategy-diet-physical> (Accessed 26 May 2015).

Pusnik, M. 2010. Introduction: Dance as Social Life and Cultural Practice. *Anthropological Notebooks*. 16(3): 5-8.

Raglio, A. and Gianelli, V.G. 2014. Music therapy for Individuals with Dementia: Areas of Interventions and Research Perspectives http://www.researchgate.net/publication/26285423_Music_Therapy_for_Individuals_with_Dementia_Areas_of_Interventions_and_Research_Perspectives (Accessed 11 November 2014)

Ramashala, M.F. 2002. *Living Arrangements, Poverty and the Health of Older Persons in Africa* (online). University of Durban-Westville. Available:

https://www.google.co.za/?gws_rd=ssl#q=Ramashala+2002+Living+Arrangements+Poverty+and+the+Health+of+Older+Persons+in+Africa(Accessed 11 April 2014).

Rantakokko, M., Tormakangas, T., Rantanen, T., Haak, M. and Iwasson S. 2013. Environmental barriers, person-environment fit and mortality among community-dwelling very older persons *BioMed Central*. 13: 783. Available: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3765774/>(Accessed 24 May 2014).

Riegel, B., Jaarma, T. and Stromberg, A. 2012. A Middle-Range Theory of Self-Care of Chronic Illness. *Advances in Nursing Science*. 35(3): 194-204.

Roberson, D.N. and Pelclova, J. 2014. Social dancing and Older Adults: Playground for physical Activity. *Aging International*. 39(2): 124-143.

Ruth W., Grant and Jeremy Sugarman. 2004. Ethics in Human Subjects Research: Do Incentives Matter? *Journal of Medicine and Philosophy*, 29(6): 717-738.

Salvador-Carulla, L. and Gasca, V.I. 2010. Defining disability, functioning, autonomy and dependency in person-centred medicine and integrated care. *International Journal of integrated care*, 29 January 2010 – ISSN 1568-4156 (online). Available: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2834916/>(Accessed 12 March 2015).

Salzmann, B. 2010. Gait and Balance Disorders in Older Adults. *American Family Physician*. 82(1): 61-68.

Schafer, K.K. 2011. Importance of a Creative Dance Program for the Quality of Life of Long Term Care Residents (online). Master of Arts in Occupational Therapy, St. Catherine University Sophia. Available: http://sophia.stkate.edu/ma_osot/4/(Accessed 12 March 2014).

Scott, V. 2010. *Senior's Falls Prevention*. BC Injury Research and prevention unit (online). Available: <http://www.injuryresearch.bc.ca/quick-facts/seniors-fallsprevention/>(Accessed 25 March 2015).

Sebern, M. 2005. Shared Care, Elder and Family Member Skills Used to Manage Burden. *Journal of Advanced Nursing*. 52(2): 170-179.

Sever, P. 2006. New Hypertension Guidelines from the National Institute for Health and Clinical excellence and the British Hypertension Society. *Journal of the Renin Angiotensin Aldosterone System*. 7(2): 61-63.

Shah, S. 1998. Modified Barthel Index in Salek, S. 6th ed. *Compendium of quality of instruments Par+ 11 Chichester* (online). Available: https://www.google.co.za/?gws_rd=ssl#q=shah+1998+modified+barthel+index(Accessed 12 April 2011).

Sharma, A., Madaan, V. and Petty, F.D. 2006. Exercise for Mental Health. *Official journal of the Association of Medicine and Psychiatry* (online), 8(2): 106. Available: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1470658/>(Accessed 18 July 2015).

Shelkey, M. and Wallace, M. 2012. Katz Index of Independence in Activities of Daily Living (ADL). *Best Practices in Nursing Care to Older Adults* (online). New York University College of Nursing: The Hartford Institute for Geriatric Nursing. Available: http://consultgerirn.org/uploads/File/trythis/try_this_2.pdf(Accessed 19 May 2014).

Simsek, H., Doganay, S., Budak, R. and Ucku R. 2014. Relationship of socioeconomic status with health behaviours and self –perceived health in the elderly: A community-based study, Turkey. *Geriatrics & Gerontology International*. 14(4): 960-968.

Snowling, N.J. and Hopkins, G. 2006. Effects of Different Modes of Exercise Training on Glucose Control and Risk factors for Factors for Complications in Type 2 Diabetic Patients(online). Available:

<http://care.diabetesjournals.org/content/29/11/2518.full.pdf>

(Accessed 24 May 2015)

Stahl, S and .T. Patrick J.H. 2011. Perceived Functional Limitation and Health Promotion during Mid to Late Life:The Mediating Role of Effect. *The New SchoolPsychology Bulletin* 2011 (online), 8(2): 27.NB0 Available:

<http://scholar.google.com/citations?user=v4i881AAAAAJ&hl=en>(Accessed 12 January 2013)

Statistics South Africa. 2013. Mid-year population estimates. Embargoed until: 14 May 2013 (online). Available:

<http://www.statssa.gov.za/publications/P0302/P03022013.pdf>(Accessed 10 February 2014).

Stevenson, T.J. 2001. Detecting change in patients with stroke using the Berg Balance Scale. *Australian Journal of Physiotherapy*. 7(1): 29-38.

Stibich, M. 2014. The Wear and Tear Theory of Aging (online). Available:

<http://longevity.about.com/od/longevityandillness/f/functional-declineaging.htm>(Accessed 01 June 2015)

Stucki, G., Cieza, A. and Melvin, P. 2007. The International Classification of Functioning, Disability and Health (ICF): a unifying model for the conceptual description of the rehabilitation strategy. *Journal of rehabilitation medicine*. 39: 279-285.

Sulander, T. 2005. Functional Ability and Health Behaviours. Trends and associations among elderly people, 1985-2003. Academic dissertation.

Finland University of Helsinki.

Sulander, T., Heinonen, H., Pajunen, T., Karisto, A., Pohjolainen, P. and Fogelholm, M. 2012. Longitudinal changes in functional capacity: effects of socio-economic position among ageing adults. *International Journal for Equity in Health* (online) 11: 78. Available: <http://link.springer.com/article/10.1186%2F1475-9276-11-78#> (Accessed 26 June 2014).

Sun, Y.L. 2012. The Effect of Music Therapy Interventions to Increase the Psychological Well-Being of Older Adults Living in Independent and Assisted Living Communities (online). Master in Music. The Florida State University. Available: <http://diginole.lib.fsu.edu/cgi/viewcontent.cgi?article=6929&context=etd> (Accessed 15 December 2014).

Suzman, R. and Beard, J. 2011. Global Health and Aging. WHO; United States National Institute of Aging.

The American Heritage Dictionary of the English Language. 2015. Houghton Mifflin Alarcourt. Available: <https://www.hmhco.com/bookstore/authors/Editors-ofthe-American-Heritage-Dictionaries/2247651>. (Accessed 27 May 2014).

The Free Dictionary, 2012. Available: <http://www.thefreedictionary.com/about.htm> (Accessed 07 January 2013).

Trinity Laban Conservatoire of Music and Dance. 2010. *Dancing towards well-being in the Third Age*. Arts Council England (online). Available: <http://www.ageuk.org.uk/health-wellbeing/> (Accessed 12 April 2011).

Tripathi, P. 2014. Elderly: Care and Crisis in Old Age Home – *International. IRC's International Journal of Multidisciplinary Research in Social and Management Sciences* (online), ISSN: 2320 – 8236 (2) Available: <http://www.ircjournals.org/vol2issue2/86-90.pdf> (Accessed 23 April 2013).

Turner, M., Burns, S.M., Chaney, C., Conaway, M., Dame, M., Parks, C., Staggers, S., Stell, M., Zarzyski, M. 2008. Measuring Blood Pressure Accurately in an Ambulatory Cardiology Clinic Setting: Do Patient Position and Timing Really Matter. *MedSurg Nursing*. 17(2): 93.

United Nations, Department of Economic and Social Affairs, Population Division
2013. *World Population Ageing 2013*. New York. ST/ESA>/SER.A/34 (online).
Available:
<http://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2013.pdf> (Accessed 12 June 2015)

Van der Merwe. S. 2010. Effect of a dance and movement intervention program on the perceived emotional well-being and self-esteem of a clinical sample of adolescents A mini dissertation submitted in partial fulfilment of the requirements of the degree (online). M A Clinical Psychology, University of Pretoria.

Vina, J., Borrás, C. and Miquel, 2007. Theories of Aging. *Critical review IUBMB Life* (online), 59 (4-5): 3 Jan 2008. Available:
<http://onlinelibrary.wiley.com/doi/10.1080/15216540601178067/pdf> (Accessed 25 July 2014).

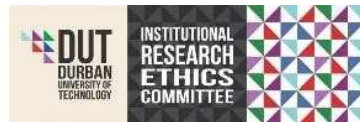
Vreugdenhil, A., Cannell, J., Davies, A. and Razay, G. 2012. A communitybased exercise programme to improve functional ability in people with Alzheimer's disease: a randomized controlled trial, *Scandinavian Journal of Caring Sciences*, 26, 12–19.

Wang J., Michelitsch, T.M., Wunderlin, A. and Mahadeva, R. 2009. *Aging as a Consequence of Misrepair – A Novel Theory of Aging* Cornell, University Library (online). Available: <http://arxiv.org/abs/0904.0575> (Accessed 10 June 2014).

- Wilkinson, A. and Whitehead, L. 2009. Evolution of the concept of self-care and implications for nurses: a literature review. *International Journal of Nursing Studies*. 46(8): 1143-1147.
- Wong, S. F., Yap, K.B. and Chan, K.M. 1998. *Day hospital Rehabilitation for the Elderly: a Retrospective study* (online). Available: <http://www.ncbi.nlm.nih.gov/pubmed/?cmd=hton> (Accessed 30 April 2012).
- World Health Organisation (WHO). 2001. International Classification of Functioning, Disability and Health. Geneva: World Health Organisation.
- World Health Organisation (WHO). 2010. Global Recommendation on Physical Activity for Health.
- World Health Organization 2011. Rehabilitation. In: *World Report* (online). Available: http://www.who.int/disabilities/world_report/2011/chapter4.pdf (Accessed 14 April 2015)
- World Health Organisation (WHO). 2015. WHO Global strategy and action Plan on Ageing and Health (online). Available: <http://www.who.int/ageing/en/> (Accessed 17 October 2015)
- Wyatt, E. 2013. The measurement properties of the original Barthel Index and its applicability to measure function with older adults: A systemic review. Masters Dissertation. Occupational Therapy, University of Sydney.
- Yorkin, M., Spaccarotella, K., Martin-Biggers, J., Quick, V., & Byrd-Bredbenner, C. (2013). Accuracy and consistency of weights provided by home bathroom scales. *BMC public health*. (online), 13(1): 1194. Available: <http://www.biomedcentral.com/1471-2458/13/1194>. (Accessed 20 October 2014).
- Zimmerman, S., Shier, V., & Saliba, D. 2014. Transforming nursing home culture:

Evidence for practice and policy. *The Gerontologist*, 54 (Suppl 1), S1-S5.

Annexure A



INFORMATION LETTER

Research Topic: The use of dance and music program on the functional ability of the residents of an old age home in Pietermaritzburg KwaZulu-Natal

Dear Participant,

I, Nomusa Gqada registered as a Masters student at the Durban University of Technology, will be conducting a research study on the use of dance and music on functional ability of the residents of your home.

I hereby invite your participation in this research study. The study will use dance movements as a form of exercise and this might improve your health. The study does not have any risk or discomfort but you will be expected to sign informed consent before participating in the study. Assessment of your health status including your balance will be done before the study commences. Any person with a heart disease or is very weak will not be allowed to take part in the dance and music programme. Your participation in this study is totally voluntary and your nonparticipation will not have any consequences. You can withdraw at any time even after signing the consent.

The study will take place in the old age home, twice a week for about 20 minutes for the period of three months. If your age is between 60 and 85 years, male or female you will be assigned to one of the two groups of participants. One group will

participate to dance and music program while the other group will receive the standard care. Your anonymity is guaranteed, which means that your name and the name of your old age home will not appear in any document. All information obtained will be stored safely in locked up cupboards. The results of the study will be available from the Durban University of technology.

For any injuries related to this study, you will be given immediate attention or referred to the relevant health providers. The researcher will ensure that the participants are monitored and assisted during participation in the dance program to prevent injuries.

If you have any queries or questions about this study please feel free to contact me at the following number;

The Researcher: Nomusa Constance Gqada - Telephone No.: 033 845 9045

My co-supervisor: Professor T. Puckree (PHD) - Telephone No.: 0313732704

My supervisor: Mrs S. Govender (Master's Degree) - Telephone No.: 033 845 9013

Annexure A (1)



Consent form

Statement of Agreement to Participate in the Research Study:

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

Full Name of Participant Date Time Signature/Right Thumbprint

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

Full Name of Researcher Date Signature

Full Name of Witness

Date

Signature

Annexure B



INCWADIYEMINININGWANE YOCWANINGO

Isihloko socwaningo:

Ukusetshenziswa komdando nomculo ukuthuthukisa izinga lempilo yabantu abahlala ekhaya labadala endaweni KaMasipala wase Msunduzi eMgungundlovu.

Ngiyabingelela,

Mina, Nomusa Gqada ngingumfundi oqeqeshelwa iziqu ze (Masters), enyuvesi yaseThekwini (DUT). Ngicela ukuba ube ngomunye ozongenela ucwaningo lapho kusetshenziswa umdando nomculo uma kuvocwavocwa umzimba ekhaya labadala lapho uhlala khona Lena enye yezindlela zokukhuphula izinga lempilo eselintekenteke ngenxa yokukhula ngeminyaka kanye nezifo ekuphilwa nazo.

Uma uzongenela lolucwaningo kuzodingeka uhlolwe ngumcwaningi ngokwezempilo ukuze kubonakale ukuthi ayikho inkinga engavimba ukuba ungenele ucwaningo. Okunye ungabuye uhlolwe ukuthi ungakwazi ukuzenzela izinto ezinjenga lezi, ukuzigeza, ukuzigqokisa, nokukhuphuka izitebhisi kanye nokuzimelela ungaketuki kalula uma uzimele wedwa (balance). Konke lokhu kwenziwa lungakaqali ucwaningo). Umuntu ungenela lolucwaningo ngokuthanda kwakhe engaphoqwe muntu, kodwa kudingeka asayine imvume uma ethanda ukungenela lolucwaningo. Uma ungasathandi ukuqhubeka nocwaningo uyaphuma ngaphandle ngokukhululeka.

Abazongenela ucwaningo bazohlukaniswa amaqembu amabili, iqembu elizodansa neqembu elizozihlalela lizibukele umabonakude kwelinye lamakamelo. Umgomo walolucwaningo ukufaka noma ubani kulamaqembu oneminyaka ewu 60 kuya ku 85. Awuzikhetheli iqembu olithandayo kepha ngokuthi inombolo yakho ikufaka ngakuliphi iqembu. Iqembu elizodansa, lidansa kabili ngesonto isikhathi esingangemizuzu engaba amashumi amabili (20) kuze kuphele izinyanga ezintathu.

Ilungelo lakho liyahlonishwa, okusho ukuthi igama lakho kanye negama lekhaya labadala ohlala kulona kuyimfihlo akutshelwa muntu uma sekukhishwa imiphumela. Uma kwenzeka ulimala umcwaningi uyokwenza okusemandleni akhe ukuthi uthole usizo olusheshayo kodwa akukho nkokhelo ongayithola ngokulimala kwakho.

Abangezuvunyelwa ukuthi bangelele umcwaningo:

- Abangazimisele ukuhlolwa kuqala ngokwempilo
- Abangazange basayina isivumelwano
- Ababonakala benempilo ebucayi Kanye □ Nalabo abanesifo senhliziyo

Uma unemibuzo ngalolucwaningo shayela umcwaningi

Nomusa Gqada kulenamba: 033-845 9045

Abaphathi bomcwaningi:

USolwazi (Professor) T. Puckree (Owenze izifundo zobuDokotela) 031-3732382

Mrs.S. Govender (oneziqu zemfundo ephakeme: (Masters) 033- 845 9013

Annexure B (1)



Imvume yokubamba iqhaza kulolucwaningo oluzokwenziwa

Lapha ngiyaqinisa ukuthi ngazisiwe umcwaningi
u.....ngalolucwaningo, indlela elizokwenziwa ngalo,
nokungaba izinqinamba ngokuphepha kwempilo. Ngiyitholile incwadi, ngayifunda
futhi ngiyaqonda uhlelo locwaningo. Ngiyaqonda futhi ukuthi umcwaningi uzohlola
izinga lempilo yami, konke engikwazi ukuzenzela kona kanye nokungaketuki kalula
uma ngimile.

Okunye ngiyazi ukuthi konke okuphathelene negama lami, ubulili, kanye neminyaka
yami kuzogcinwa kuyimfihlo noma sekukhishwa imininingwane. Kukho konke
okudingakala kulolucwaningo ngiyavuma ukulungenela nokuthi imininingwane yalo
ifakwe kwi- khomputha. Lapho ngingasathandi ukuqhubeka nocwaningo ngiyophuma
ngaphandle kwenkinga.

Nginethuba lokubuza konke engifuna ukukwazi ngakhoke ngizimisele ukungenela
lolucwaningo

. Ngiyaqonda futhi ukubaluleka kwemiphumela yocwaningo nokuthi ngingaziswa
ngayo njengoba ngizobamba leliqhaza.

Igama lobamba iqhaza

Usuku

Isikhathi

Uphawu lokusayina

Mina _____ (Mcwaningi) ngiyazibophezela kulomuntu
 osayine ngenhla ngoba ezobamba iqhaza ukuthi, wazisiwe ngalolonke uhlelo
 nezinkinga ezingaba khona uma kuqhutshwa lolucwaningo. _____

Igama lowenza ucwaningo

Usuku

Isikhathi Uphawu lokusayina

Igama lomuntu ongufakazi

Usuku

Isikhathi

Uphawu lokusayina

Annexure: C

BERG BALANCE SCALE (BBS)

The Berg Balance scale is a 14-item scale designed to measure balance of the older adult in a clinical setting. It takes about 15 to 20 minutes to complete the 14-item scoring of the adult person.

BBS RATING SCALE

Equipment:

- Ruler
- Two standard chairs (one with arm rests, one without)
- Footstool
- Stopwatch –or wristwatch with a second hand

Scoring:

A five-point scale, ranging from 0-4, —0|| indicates the lowest level of function and —4|| the highest level of function. Total Score = 56.

Interpretation:

41 – 56 = low fall risk

21 – 40 = medium fall risk

0 – 20 = high fall risk

A change of 8 points is required to reveal a genuine change in function between the assessments before and after intervention

Name.....Date.....

Place.....Rater.....

<u>Item description</u>	<u>Score (0-4)</u>
1. Sitting to standing
2. Standing unsupported
3. Sitting unsupported
4. Standing to sitting
5. Transfers
6. Standing with eyes closed
7. Standing with feet together
.....8. Reaching forward with outstretched arm
.....
9. Retrieving object from floor
10. Turning to look behind
11. Turning 360 degrees
12. Placing alternate foot on stool
13. 13. Standing with one foot in front
14. Standing on one foot
TOTAL

RATING SCALE

1. Sitting to standing

Instruction: Please stand up without using your hands for support

- Able to stand without using hands and stabilize independently = 4
- Able to stand independently using hands = 3
- Able to stand using hands after several = 2
- Needs minimal aid to stand or stabilize = 1
- Needs moderate or maximal assist to stand = 0

□

=

□

=

2. Standing unsupported

Instruction: Please stand up for 2 minutes without holding on

- Able to stand safely for 2 minutes = 4
- Able to stand 2 minutes with supervision = 3
- Able to stand 30 seconds unsupported = 2
- Needs several tries to stand 30 seconds unsupported = 1
- Unable to stand 30 seconds unsupported = 0

3. Sitting with back unsupported but feet supported on floor or stool

Instruction: Please sit with arms folded for 2 minutes

- Able to sit safely and securely for 2 minutes = 4
- Able to sit 2 minutes under supervision = 3
- Able to sit 30 seconds = 2
- Able to sit 10 seconds = 1
- Unable to sit without support 10 seconds = 0

4. Standing to sitting

Instruction: Please sit down

- Able to sit safely with minimal use of hands = 4
- Able to control descent by using hands = 3
- Uses back of legs against chair to control descent = 2
- Sits independently but has uncontrolled descent = 1
- Needs assist to sit = 0

5. Transfers

Instruction: Arrange two chairs one with and one without armrests. The participant is asked to transfer one way toward a seat with armrests and one way toward a seat without armrests.

- Able to transfer safely with minor use of hands = 4

□

=

□ =

- Able to transfer safely definite need of hands = 3
- Able to transfer with verbal cuing and or supervision = 2
- Needs one person to assist = 1
- Needs help to keep from = 0

6. Standing unsupported with eyes closed

Instruction: Please close your eyes and stand still for 10 seconds

- Able to stand 10 seconds safely = 4
- Able to stand 10 seconds with supervision = 3
- Able to stand 3 seconds = 2
- Unable to keep eyes closed for 3 seconds but stays safely = 1
- Needs help to keep from falling = 0

7. Standing unsupported with feet together

Instruction: Place your feet together and stand without holding on

- Able to place feet together independently and stand 1 minute safe = 4
- Able to place feet together independently and stand 1 minute with supervision = 3
- Able to place feet together independently but unable to hold for 30 seconds = 2
- Needs help to attain position but able to stand for 15seconds feet together = 1
- Needs help to attain position and unable to hold for 15 seconds = 0

□ =

□

=

8. Reaching forward with outstretched arm while standing

Instruction: The participant should lift her or his arm to 90 degrees stretching the arm forward as far as they can. The examiner places a ruler at the end of fingertips when arm is at 90 degrees. Fingers should not touch reaching forward. The recorded measure is the distance forward that the fingers reach while the subject is in the most forward position.

- Can reach forward confidently 25cm = 4
- Can reach forward 12cm = 3
- Can reach forward 5cm = 2
- Reaches forward but needs supervision = 1
- Loses balance and requires external support = 0

9. Pick up object from the floor from a standing position

Instruction: Pick up the shoe or slipper, which is in front of your feet.

- Able to pick up shoe safely and easily = 4
- Able to pick up shoe but needs supervision = 3
- Unable to pick up but reaches 2- 5 cm from shoe and keeps balance
Independently = 2
- Unable to pick up and needs supervision while trying = 1
- Unable to try or needs assistance to keep from losing balance or
falling. = 0

10. Turning to look behind over left and right shoulders while standing

Instruction: Turn to look directly behind you over toward the left shoulder.

- Looks behind from both sides and weight shifts well = 4
- Looks behind one side only other side shows less weight shift = 3

□

=

- | | | |
|---|---|---|
| □ | | = |
| • Needs supervision when turning | | = |
| 2 | | |
| • Needs Assistance to keep from losing balance or falling | | = |
| 1 | | |
| • Needs assistance to keep from losing balance or falling | = | 0 |

11. Turn 360 degrees

Instruction: Turn to complete around 7 in a full circle. Pause. Then turn a full circle in the other direction.

- | | | |
|--|---|---|
| • Able to turn 360 degrees safely in 4 seconds or less | = | 4 |
| • Able to turn 360 degrees safely one side only in 4 seconds or less | | |
| | = | 3 |
| • Able to turn 360 degrees safely but slowly | = | 2 |
| • Needs close supervision or verbal cuing | = | 1 |
| • Needs assistance while turning | = | 0 |

12. Place alternate foot on step or stool while standing unsupported

Instructions: Place each foot alternately on the stool .continue until each foot has touched the stool four times.

- | | | |
|---|---|---|
| • Able to stand independently and safely and complete 8 steps in 20 seconds | = | 4 |
| • Able to stand independently and complete 8 steps in less than 20 seconds | = | 3 |
| • Able to complete 4 steps without aid with supervision | = | 2 |
| • Able to complete less than 2 steps needs minimal assist | = | 1 |
| • Needs assistance to keep from falling or unable to try | = | 0 |

□		=
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13. Standing unsupported one foot in front

Instructions: Examiner demonstrate to the participant. Place one foot directly in front of another foot. Step far ahead that the heel of your forward foot is ahead of the toes of the other foot.

- Able to place tandem independently and hold 30 seconds = 4
- Able to place foot ahead independently and hold 30 seconds = 3
- Able to take small step but can hold 15 seconds = 2
- Loses balance while stepping or standing = 0

14. Standing on one leg

Instructions: Stand on one leg as long as you can without holding on.

- Able to lift leg independently and hold 10 seconds = 4
- Able to lift leg independently and hold 5-10 seconds = 3
- Able to lift leg independently and hold ≥ 3 seconds = 2
- Tries to lift unable to hold 3 seconds but remains standing independently = 1
- Unable to try or needs assistance = 0

() TOTAL SCORE (Maximum = 56)

Annexure: D

A Modified Barthel Index (MBI) scale

Item	Unable to perform task	Substantial help required	Moderate help required	Minimal help required	Fully independent
1. Bathing	0	1	3	4	5
2. Grooming	0	2	5	8	10
3. Dressing	0	2	5	8	10
4. Ambulation	0	3	8	12	15
5. Stair climbing	0	2	5	8	10
6. Bladder control	0	3	8	12	15
7. Bowel control	0	2	5	8	10

The assessments are used to determine a baseline level of functioning and can be used in rating activities of daily living over time.

Modified from Shah, S. (1998)

1. **Bathing self:** The participant may use a bath tub or shower. The participant must be able to do all the steps of whichever method is employed without another person being present.

- Participant is able to complete all steps independently..... = 5
- Participant may take up to twice the normal time to complete the tasks.... = 4
- Assistance may be required to set up bathing equipment, the water washing material, etc. Some supervision with transfers may be required... =3

- Assistance is required with either transfer to shower/ bath or with washing and drying; including inability to compete task because of condition..... = 1
- Total dependence in bathing self..... = 0

2. Grooming: The participant can wash his / her hands and face, comb hair, clean teeth and shave. A male participant may use any kind of razor but must insert the blade, or retrieve it from the drawer or cabinet. A female participant must apply own make-up.

- Participant performs all personal hygiene tasks independently and safely =10
- There may be concerns about safety such as fixing a razor blade, hot water or some assistance may be required with tidy up or smoothing make-up..... = 8
- Participant may complete one or two of the above activities. Assistance is required in applying make-up, help to wash one hand, help to apply pressure to brush teeth, shave under chin and comb back of hair..... = 5
- Participant generally requires assistant to provide more effort than self for each activity..... = 2
- The participant is unable to attend to personal hygiene and is depended in all aspects..... = 0

3. Dressing: The patient is able to put on, remove and fasten clothing, tie shoe laces,

- The participant is able to put on, remove and fasten clothing, tie shoe laces..... = 10
- Only minimal assistance is required with fastening clothing, such as buttons, and shoe laces..... = 8
- Participant may wear a shirt on his upper body and thread the sleeves, but assistant brings it over the head. Patient may assist pulling the pant legs but the assistant completes the lower limb dressing..... = 5
- The participant is able to participate to some degree, but is dependent in all aspects of dressing..... = 2
- The participant is dependent in all aspects of dressing = 0

4. Ambulation: The participant is independent in ambulation and is able to walk 20m without help.

- The participant is independent in ambulation and is able to walk 20m without help..... =15
- The participant is independent in ambulation but unable to walk 20m without help or supervision is needed for confidence or safety..... = 12
- Assistance is required with reaching aids..... = 8
- Participant requires maximal assistance to ambulate..... = 3
- Participant does not ambulate. To attempt to ambulate requires two assistants..... = 0

5. Stair climbing:The participant is able to go up and down a flight of stairs safely without help or supervision. The participant is able to use hand rails, cane and is able to carry these devices as he/she ascends or descends

- The participant is able to go up and down a flight of stairs safely without help or supervision..... = 10
- At times, supervision is required for safety due to morning stiffness and shortness of breath..... = 8
- The participant is able to ascend/descend but is to carry walking aids, and needs supervision and assistance..... = 5
- Assistance is required in all aspects of stair climbing, including assistance with walking aids..... = 2
- The participant is unable to climb stairs..... = 0

6. Bladder control: Participant is independent, is continent, and independent in the use pads.

- The participant is able to control bladder day and night..... =10
- Participant voids but needs help in positioning self, equipment, pads, and other devices..... = 8
- The participant is dry by day and night but may have occasional accidents..... = 5
- The participant is generally dry by day, but not at night..... = 2
- Despite assistance, participant may be soiled frequently and necessitates wearing absorbent pads..... = 0

7. Bowel control: Participant is independent, is continent, and independent in the use pads.

- The participant can control bowels completely and has no accidents..... = 10
- The participant can assume position and is able to clean self but needs help to apply incontinent aids..... = 8
- Able to assume appropriate position, but cannot clean self without assistance..... = 5
- Despite assistance, participant may be soiled frequently and necessitates wearing of absorbent pads..... = 2
- The participant needs to wear diapers, or absorbents pads..... = 0

TOTAL = 70

Annexure: E

INSTITUTIONAL RESEARCH ETHICS COMMITTEE (IREC)

10 May 2013

IREC Reference Number: REC 56/12

Mrs N C Gqada
P O Box 11289
Dorpspruit
3206

Dear Mrs Gqada

The use of dance and music programme on the functional ability of the residents of an old age home in Pietermaritzburg, KwaZulu-Natal

I am pleased to inform you that Full Approval has been granted to your proposal REC 56/12, subject to the following:

- Please include under exclusion criteria, pg. 7: residents who are unable to consent will not be recruited.

The Proposal has been allocated the following Ethical Clearance number IREC 037/13. Please use this number in all communication with this office.

Approval has been granted for a period of one year, before the expiry of which you are required to apply for safety monitoring and annual recertification. Please use the Safety Monitoring and Annual Recertification Report form which can be found in the Standard Operating Procedures [SOP's] of the IREC. This form must be submitted to the IREC at least 3 months before the ethics approval for the study expires.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's. In addition, you will be responsible to ensure gatekeeper permission.

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely



Dr D F Naude
Chairperson: IREC

Annexure F

██████████ Old Age Home

P O Box 2512

PIETERMARITZBURG

3200

27 JUNE 2013

Dear Nomusa Gqada

I have received your request regarding your research project entitled, 'The Use of Dance and Music programme on Functional Ability of Residents of an old age home.' I am pleased to support you and your study, with the participation of the residents of ██████████ Old Age Home.

I am granting you full permission to conduct your study using ██████████ Old Age Home as your research site. I really believe some of our residents will benefit greatly from your project. We look forward to working with you.

Sincerely,

Betty Mncube

Annexure: G



13 June
2013

The Chairperson of the Management Committee/ the Nursing Manager

Emseni Old Age Home

P.O. Box 2512

Pietermaritzburg

3200

Dear Mrs Meloetsanane/ Mrs. B. Mncube

Re: request of permission to conduct a study of dance and music programme on the functional ability of the residents of your old age home

I am the investigator of a study that has a primary goal to improve mobility and the functional abilities of the residents of your old age home. It has been estimated that 50% of functional disability in elderly people can result from physical inactivity. Your institution would therefore be desirable for this research. The research would need both male and female participants. Informed consent will be obtained each participant or his guardian as appropriate in each case. All information will be kept confidential and privacy of participants will be respected. Data files will be kept for 10 years.

If feasible, I would like to approach any number of the residents to participate in the study. Participants will be randomly and equally divided into two groups of 23 each. One group of 23 participants will be the intervention group, participating in the programme of dance and music programme while the other group receives standard care. The prospective participants will be asked to sign an informed consent which will be available both in English and in Zulu. All information will be kept confidential and privacy of participants will be respected. I

Results of the study will be presented at the research conferences in Durban University of Technology.

Sincerely Yours

Nomusa Constance Gqada. Master's Degree Student (0825009167)

Contact details of supervisors: Mrs S. Govender (033-8459023)

Professor T. Puckree: (031-3732704)

Institutional Research Ethics administrator: (031-3732382)

ANNEXURE: H

To: Nomusa Constance Gqada

Dear Nomusa

AS per our discussion on the telephone yesterday, I hereby confirm that the Chairperson (Mrs Joyce Mseleku) and Committee of the Centre for the Aged have granted permission for you to conduct your study.

They would like a copy of the results, as should the study show benefit to the residents, they would like to explore methods to include some of the activities in the existing programme.

Please contact Matron Betty on 033 3981876 to arrange particulars regarding start dates and durations.

Kind regards
Norman Graaf
Secretary