



THE IMPACT OF ANIMAL ASSISTED THERAPY ON QUALITY OF LIFE AND PARTICIPATION IN ACTIVITIES OF DAILY LIVING OF PERSONS WITH DEMENTIA IN PRETORIA.

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University of the Witwatersrand, Johannesburg, in partial fulfilment of the
requirements for the degree of Master of Science in Occupational
Therapy.**

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Declaration

I, Nanette van der Merwe, hereby declare that this research report is my own work. It is being submitted for the degree of Master of Science in Occupational Therapy at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

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Abstract

Introduction:

There is an increase in the elderly population in South Africa with an estimation that one fifth of the elderly population will be aged 80 years and older within the 21st century. With this, comes an increase in dementia diagnoses and people living in assisted care facilities. Problems with disruptive and social behaviour are difficult for the care facility staff to address with limited availability of therapy services available, animal assisted therapy can be used to improve quality of life and participation in activities of daily.

Aim:

The aim of the research is to investigate the effect of animal assisted therapy on quality of life and participation in activities of daily living of patients with dementia in a private retirement assisted care facility.

Methodology:

A single-subject design tested the effects of AAT on QoL and participation in activities of daily living of four participants. The study consisted of three 10-week phases. Data collection took place at fortnightly intervals. A blinded rater collected data using the Dementia-Specific Quality of Life Instrument (QUALIDEM) and the Disability Assessment for Dementia (DAD). Analysis of the data used graphs and tables. Excel was used for data analysis and trends were established using visual analysis. Statistical methods specific to single subject research were used to demonstrate the impact of the intervention.

Results:

The study yielded mixed results and each participant showed varied responses. For two of the four participants AAT was beneficial with significant improvement in QoL during the intervention period, while for the other two participants QoL decreased. Results displayed no significant outcomes in the overall score.

None of the participants showed improvement over the three phases with participants 1, 2, and 4 showing varying scores for DAD over the study period. The participants

scores varied greatly in the baseline phase indicating that their function changed from week to week even before the intervention started.

Discussion:

The QUALIDEM scores for the participants ranged from 5.5-10.5. There was a greater difference in the DAD scores with an average score of 8 and the lowest score at 1.

Two participants had significant positive changes in QoL during AAT intervention, the change was only positive at withdrawal for one participant with the other having a significant decrease in QUALIDEM scores. Both these participants had a significant decrease in DAD scores during intervention and withdrawal phases. The other two participants had negative changes during AAT intervention for QoL on the QUALIDEM.

The change in QoL was positive for both participants at withdrawal with Participant 3 found to have significant increase in QUALIDEM scores. Both these participants had a very small decrease in DAD scores indicating they maintained their level of initiation, planning and effective performance in basic and instrumental activities in daily activities during the intervention phase. There was a significant decrease and no change for DAD scores during the withdrawal phase for Participant 2 and 3 respectively. The null hypothesis was accepted for QoL but not participation in ADL for Participants 2 and 3.

Conclusion:

The study indicated the effects of AAT on participants differed in terms of components which constitute their quality of life and the need to consider the duration and intensity of AAT intervention. The study provided detailed information about changes in QoL and ADL in patients with moderate and severe dementia that indicated both improvement and deterioration that has not been reported in other studies. Further research is required with a larger sample size and a mixed-method study design is recommended.

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Operational Definitions

Activities of daily living	Essential tasks that each person needs to perform, on a regular basis, to sustain basic survival and well-being applied to people with dementia needing care. These activities can include everyday tasks in basic ADL such as dressing, self-feeding, bathing and those in instrumental ADL such as laundry, meal preparation, cleaning and leisure (American Occupational Therapy Association, 2014; Gélinas, Gauthier and McIntyre, 1999).
Aging	An inevitable process is commonly measured by chronological age and, as a convention, a person aged 65 years or more is often referred to as 'elderly'. However, the ageing process is not uniform across the population due to differences in genetics, lifestyle, and overall health (World Health Organisation, 2013).
Animal assisted intervention	The utilisation of various species of animals in diverse manners beneficial to humans. Animal assisted therapy, education, and activities are examples of types of animal assisted intervention (Kamioka <i>et al.</i> , 2014).
Animal assisted therapy	A goal directed intervention in which an animal meeting specific criteria is an integral part of the treatment process. Animal-assisted therapy is delivered and/or directed by health or human service providers working within the scope of their profession. Animal-assisted therapy is designed to promote improvement in human physical, social, emotional, or cognitive function. Animal-assisted therapy is provided in a variety of settings and

may be group or individual in nature. The process is documented and evaluated (Kamioka *et al.*, 2014).

Dementia	A syndrome, usually of a chronic or progressive nature, that leads to deterioration in cognitive function beyond what might be expected from the usual consequences of biological ageing. It affects memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement. Consciousness is not affected. The impairment in cognitive function is commonly accompanied, and occasionally preceded, by changes in mood, emotional control, and behaviour (World Health Organisation, 2017).
Quality of life specific to dementia	A multidimensional notion with various factors with different significance to different people (Holopainen <i>et al.</i> , 2017). An individual's perception on their experience of their values, goals, expectations and standards in relation to their environment and culture (Holopainen <i>et al.</i> , 2017).
Residential assisted care facilities	Include long term care or extended care facilities or nursing homes. These include assisted living is for people who need help with daily care, usually in separate rooms with common areas. There is access to meals, assistance with personal care; help with medications, housekeeping, and laundry and 24-hour supervision, from on-site staff. Nursing homes may include rehabilitation services (National Institute on Aging, 2022)

Abbreviations

AAA	Animal Assisted Activity
AAI	Animal Assisted Intervention
AAT	Animal Assisted Therapy
ADL	Activities of daily living
DAD	Disability Assessment for Dementia
GDS	Global Deterioration Scale
IADL	Instrumental Activities of Daily living
MIPAA	Madrid International Plan of Ageing on Ageing
MMSE	Mini-Mental State Examination
QoL	Quality of life
SAP	Service Animal Programs
WHO	World Health Organisation

CHAPTER 1: INTRODUCTION

This chapter provides the context for the development of the research project. The background to the project will be described with reference to the aging population, the aging population in South Africa, health and social trends in aging, assisted care facilities, animal assisted therapy, and occupational therapy. The research problem is outlined, and the purpose of the study articulated. The justification for the study and the significance of the project is described. Finally, the research question, aim and objectives are stated, and the null hypothesis defined.

1.1 Background to the study

1.1.1 Aging

The world's elderly population is steadily growing in numbers and increasing in age (SIFAR, 2016). Population aging describes the rapid increase of older people in the population due to decreasing level of fertility (SIFAR, 2016). As fewer children are born the elderly are becoming a larger proportion of the total population and according to literature, this tendency will likely continue in the future. By mid-21st century, the proportion of people aged 80 years and older will be one fifth of the elderly population (Phaswana-Mafuya *et al.*, 2012).

Within the southern African sub-region, South Africa has the highest proportion of elderly people (Phaswana-Mafuya *et al.*, 2012). There is an increase in the growth of the elderly population in South Africa. Statistics South Africa estimated the population for those over 60 years to be 9,2% or 5,51 million people in 2021 (Statistics South Africa, 2021). The growing elderly population influences various social and economic areas and all aspects of life. This includes increased financial dependency due to changes in the labour market, more individuals on pension, changes in family structures with more families needing to care for the elderly at home or in care facilities (Goodrick, 2013).

The increasing population of the elderly also has an impact on the public support systems available which may result in overwhelming demands on the public health care system as well as other medical and social services (Phaswana-Mafuya *et al.*, 2012). The high burden of care is impacted by the poor capacity of health care systems

to provide for the elderly (Goodrick, 2013). In the South African health care system, there are limited resources and time, increased costs and a history of limited health care professional-patient interactions in both private and public settings during which acceptable care for the elderly is provided (Phaswana-Mafuya *et al.*, 2012).

The need to deal with more chronic and degenerative diseases with trends towards long-term disability and care is due to the higher incidence of individuals living with dementia which is the leading cause of disability among the elderly worldwide (Goodrick, 2013).

1.1.2 Dementia

Dementia is a term to describe many progressive diseases that affect the brain, including memory and other cognitive functions, it influences a person's ability to participate in activities of daily living (ADL). Symptoms of dementia include anxiety, agitation, depression and hallucinations or delusions (World Health Organisation, 2017). Globally it has been indicated that 11.9% of years lived with a disability is due to dementia and is one of the leading causes of dependency in the elderly (McGrath and O'Callaghan, 2014). It is predicted that by 2050, 115 million people will be living with Alzheimer's disease or other dementias; and that 71% of those with dementia will be living in low- and middle-income countries (Goodrick, 2013). The increase in the age and number of the elderly living in South Africa will support this trend with an increased prevalence of dementia in this country as well (Aboderin, 2008; Phaswana-Mafuya *et al.*, 2012; Statistics South Africa, 2021).

Dementia has a substantial impact on the person living with the condition, their families and carers and the communities in which they live. Thus, there is an increased demand of long-term care and rehabilitation (Raber *et al.*, 2010). Most countries however are not prepared to care for people living with dementia regardless of the increased incidence (McGrath and O'Callaghan, 2014). Internationally between 23% to 42% of residents in care facilities or assisted living facilities as well as more than 50% of people living in nursing homes, have moderate or severe cognitive impairment associated with dementia (Zimmerman *et al.*, 2005).

1.1.3 Assisted care facilities

The need for care facilities is emphasised since moving a person living with the dementia from home into care may become unavoidable during the later stages of the condition when family and caregivers are no longer able to provide adequate care (Nikmat, Hawthorne and Al-Mashoor, 2015). Care provided by the family was reported to be becoming the less preferred option for the elderly with 90% of people living with dementia residing in care facilities prior to death (Alavi *et al.*, 2011; Yaffe *et al.*, 2002).

However, placement in care facilities may result in a decrease in quality of life (QoL) and an increase in mortality (Goldstein-Levitas, 2019). Strong predictors of placement in a care facility included increased age, low health status, functional impairment, cognitive impairment and dementia diagnosis (Goldstein-Levitas, 2019). Poor predictors of placement included being unmarried, unemployed and having a limited social support system (Luppa *et al.*, 2009). Negative consequences of residing in a care facility may include feelings of depression, loneliness, estrangement, and can lead to an increase in functional dependence although research indicates QoL may also be dependent on the type of care facility and care provided (Beerens *et al.*, 2013; Nikmat, Hawthorne and Al-Mashoor, 2015). People with dementia living in care facilities are reported to present with increased dependence in ADL, social isolation and lower QoL (Nikmat, Hawthorne and Al-Mashoor, 2015). A study by Nikmat, Hawthorne and Al-Mashoor (2015) indicated that older people with mild dementia experience a higher QoL and greater social connections while living in the community compared to living in a care facility or nursing home.

The reason for placement in care facilities is often due to behavioural symptoms of dementia (Yaffe *et al.*, 2002). People with dementia living in care facilities therefore, present with a high prevalence of distressed or challenging behaviours which are well described in literature. Some of those behaviours include aggression, low mood, depression or apathy, lability, limited communication, feelings of anxiousness, irritability, bizarre motor behaviours and unusual elation (Yaffe *et al.*, 2002). These behaviours often reduce QoL for the residents themselves, other residents and staff (van Wyk, Manthorpe and Clark, 2017).

The use of activities has been effective in preventing boredom leading to a reduction in distressing behaviours in a study by van Wyk *et al.* (2017). None of the participating

nursing homes reported any structured activities or therapeutic services for residents. Thus, therapeutic services should be provided by occupational therapists to address physical and cognitive limitations, limited support system, and poor health status of people with dementia in residential care.

1.1.4 Occupational Therapy

Occupational therapy uses everyday life activities with individuals or groups in a therapeutic manner to support participation in daily life (American Occupational Therapy Association, 2014). Occupational therapists provide effective intervention in various settings with the elderly including hospitals, homes, out-patient settings, and of interest for this study, nursing homes or care facilities (Bennett, Shand and Liddle, 2011). They deliver therapeutic services which include reminiscence or cognitive stimulation to increase cognition, improve affect and mood for people with dementia leading to an increased QoL (Field, Coates and Mountain, 2018). These interventions include environmental modifications, compensatory techniques, enabling participation in ADL, leisure or social activities, as well as education and training of caregivers and families for people living with dementia addressing the basic need for socialisation and interaction with others (Bennett, Shand and Liddle, 2011). One of the treatment modalities available to occupational therapists to achieve these goals is the use of animals in therapy (Filan and Llewellyn-Jones, 2006).

1.1.5 Animal Assisted Therapy

Animal assisted therapy (AAT) is an intervention in which animals are included in therapy to meet specific goal directed criteria as part of the treatment process (Kamioka *et al.*, 2014). The programme is carried out by amongst others, occupational therapists working within their professional scope (Kamioka *et al.*, 2014). Animal Assisted Therapy is used with people with dementia to facilitate a human-animal bond which has a positive effect on socialisation and increased communication which is thought to improve their QoL. This form of therapy has been shown to evoke a positive emotional response from clients. There is evidence that the presence of a dog in a care facility improves wellbeing overall and moderate evidence that AAT increases QoL (Lai *et al.*, 2019; Nordgren and Engström, 2014a). Evidence of change in social functioning and self-care in ADLs is limited and even more limited for decrease agitation and aggressive behaviours in people living with dementia in residential care

(Baek, Lee and Sohng, 2020; Nordgren and Engström, 2014b; Peluso *et al.*, 2018; Yakimicki *et al.*, 2019). The effect of AAT on participation in ADLs has mostly been limited to two studies found that participants' ability improved after AAT with an increase in physical activity and social participation reported in reviews by Friedmann *et al.* (2015), Nordgren, Engström and Engstro (2012) and Yakimicki *et al.* (2019). Some studies however have reported no change or an increase in negative behaviour with no change in quality of life or ADL participation (Motomura *et al.*, 2004; Yakimicki *et al.*, 2019).

1.2 Statement of the problem and purpose of the study

Residents with dementia living in assisted living and frail care units at a retirement facility in Pretoria have limited access to therapeutic services which may result in low or poor QoL associated with behavioural and psychological symptoms of dementia which impact on care and participation in ADL. Problems with disruptive and social behaviour and increased dependency in ADL are difficult for the staff to address Since only a limited occupational therapy service is available and the use of AAT is unexplored within this facility, research indicates AAT may be a means to affect an increase in QoL in care facilities for the growing population of people living with dementia. The purpose of this study was therefore to evaluate the use of an activity such as AAT, which can be completed on an intermittent basis for a short period, to address residents' behaviours in relation to their QoL and participation in ADL.

1.3 Research question

What effect does AAT have on QoL and participation in ADL of persons with dementia in an assisted residential care facility in Pretoria.

1.4 Aim of research

To investigate the effect of AAT on persons with dementia in a private assisted residential care facility in Pretoria.

1.4.1 Objectives of research

- To determine the effects of AAT on the QoL of persons with dementia living in a private retirement assisted care facility in Pretoria.

- To determine the effects of AAT on the participation in ADL of persons with dementia living in a private retirement assisted care facility in Pretoria.

1.5 Null Hypothesis

There will be no improvement in the QoL and participation in ADL of people living with dementia in a private retirement assisted care facility in Pretoria after intervention using AAT.

1.6 Justification for a new investigation of the problem

Due to the growing population of the elderly in South Africa, intervention programs to benefit the population needs to be researched and evaluated (Alzheimer's in Action, 2012; Alzheimer's South Africa, 1999). There has been limited research done in South Africa with regards to QoL and participation in ADL of people living with dementia. Literature available on dementia, QoL and AAT in occupational therapy tends to be from outside of South Africa. The data obtained during the study may contribute to the limited literature available on AAT and occupational therapy in South Africa. By contributing to the research in South Africa, the results may be used to assist with development of guidelines for the use of AAT in nursing homes as there is currently no occupational therapy guidelines for using AAT. The results of this research may also assist with the development of intervention protocols for the management of people with dementia in care facilities. The results of the research may be used in future research studies of a larger scale.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Chapter 2 is focused on the past and current literature available related to the research. This chapter will discuss the elderly and aging in South Africa, and policies affecting the elderly population worldwide as well as in South Africa. It also focuses on dementia and specifically QoL of people living with dementia and the quality of care in residential facilities. This chapter will discuss evaluating the QoL in residential care for people with dementia; occupational therapy; and animal assisted intervention including animal assisted therapy and this specific intervention with people living with dementia.

Literature was sourced from CINAHL Complete, ProQuest Complete, Wiley and PubMed data bases as well as search in Google Scholar. No date limitations were set since some iconic studies on AAT were completed before 2010.

2.2 Aging

In 1950 the proportion of elderly people in the world was 8% and in 2000 they were 10%, it is anticipated that in 2050 the proportion will reach 21% (United Nations, 2017). If this projection is true, the amount of elderly people will surpass the young in 2050, which will be a first in history (United Nations, 2017). The “oldest-old” is a term to describe the elderly aged 80 years and older, increasing by 3.8% yearly and is currently the fastest growing age group in the world (Phaswana-Mafuya *et al.*, 2012; World Health Organisation, 2015).

The WHO describes healthy ageing or active ageing as having opportunities for optimising health, being able to participate in activities and having a sense of security which enhances QoL (World Health Organisation, 2015). This allows older people to participate in meaningful activities in their community according to their own desires, abilities, needs while feeling safe and cared for as required (World Health Organisation, 2012). With increasing age, the elderly are however, commonly diagnosed with numerous conditions such as visual and auditory impairments, muscular and orthopaedic conditions, mental disorders such as depression and anxiety which in turn, leads to functional limitations (Aboderin, 2008; Phaswana-Mafuya *et al.*, 2012). One of the most disabling conditions in adults in developing

nations is dementia (Nikmat, Hawthorne and Al-Mashoor, 2015). Due to this increase in the elderly population, there is a need for scientific research and data to provide a basis and valid information for policy development to ensure the well-being of the elderly (Phaswana-Mafuya *et al.*, 2012).

2.2.1 The elderly in South Africa

According to the United Nations Department of Economic and Social Affairs, the percentage of older people in South Africa is likely to increase to 17.4% in 2050 (SIFAR, 2016; Wakefield, 2015). With the rapid increase in the elderly population in South Africa, other issues such as dependency and difficulties with daily activities may arise. According to reports by the World Health Organisation (WHO), 38.4% of the elderly in South Africa between the ages of 65 and 74 struggle with daily activities such as getting dressed, washing, eating, mobilising in and out of bed, and being able to use the toilet (Wakefield, 2015; World Health Organisation, 2017a). The proportion of people who struggle with those same problems increase as they age, and it is estimated that 49.2% of the elderly over the age of 75 have difficulties with ADL (Wakefield, 2015). The increasing age of the elderly and their difficulties with daily activities have a direct influence on their health and independence.

Thus, the growing elderly population places an increase on the demand for long-term and chronic health care. The need for long term health care is associated with increased life expectancy and with advanced age frailty (Goodrick and Pelser, 2014). The study by Goodrick and Pelser (2014), suggests that the services provided to the elderly in South Africa must be re-evaluated. Geriatric or specialised care for the elderly is limited in South Africa in undergraduate medical training (SIFAR, 2016). It is also suspected that healthcare workers may have negative attitudes towards the elderly, and this may have an undesirable influence on their care. This leads to preventable and manageable difficulties being overlooked and credited to old age, with subsequent decreased independence, poor health and overall low QoL (SIFAR, 2016).

2.3 Policies affecting the elderly

The WHO reports that healthy ageing is high on the global policy (World Health Organisation, 2012). The WHO European region has identified four strategic areas for implementation into health policies. These include healthy ageing with focus on

cognitive health and well-being; appropriate long-term care for the elderly; supportive communities and environments; and increased research to build a stronger evidence base for the ageing population (World Health Organisation, 2012). Five priority interventions were also identified namely fall prevention, improved physical activity, prevention of infectious diseases and use of vaccinations, improved support for informal care giving at home and self-care as well as improved geriatric health care and capacity with social care (World Health Organisation, 2012). Care, especially informal home care is emphasized since care for the elderly is often expensive, if there is even care available that is properly organised (World Health Organisation, 2012).

The WHO therefore has prioritised improving the evidence supporting informal care, home care as well as private and public care in the various environments in which the elderly are cared for (World Health Organisation, 2012). The importance of increased training in geriatrics and gerontology to further the care of the elderly is also emphasised (World Health Organisation, 2012). According to WHO the knowledge base of doctors and health care practitioners with regards to geriatric care and special training is limited (World Health Organisation, 2012).

The United Nations Madrid International Plan of Ageing on Ageing (MIPAA) of 2002 as well as the African Union Regional Policy Framework and Plan of Action on Ageing of 2003 are two policies that governments are urged to utilise in establishing their own policies and care guidelines for the elderly (Kenya Help Age International., 2003; United Nations, 2002). According to MIPAA, governments must emphasize ageing concerns and issues in policy, and this should have recommendations to meet the needs of the elderly while also improving their QoL (Goodrick, 2013). Goodrick (2013) reports that the South African policy requires revision to suit the needs of the elderly.

2.3.1 South African ageing policy

The South African government has worked on policy for active population from 1974 and a more thorough national policy, known as the Nation Population Policy of South Africa, was developed in 1998 (Republic of South Africa, 1998a). It was only in 2008, with the review of the 1998 Population Policy that population aging in South Africa was prominently acknowledged (Republic of South Africa, 1998a). Goodrick (2013) states that it is of concern that ageing is not a primary objective in policy but rather comes as an add on to other objectives and is not effectively realised into policy.

Although there are limited policies that directly address the population ageing the South African Policy of Older Persons in 2006 attempted to accommodate for the care and needs of the elderly population in the country (Republic of South Africa, 2006). The primary focus of the South African Policy of Older Persons is to ensure accessible, affordable, and reasonable services for the elderly population and it deals efficiently with older person's needs by emphasising empowerment and protection of older persons (Republic of South Africa, 2006). It also addresses the fact that existing laws related to older people need to be reviewed to enable accessible, fair and affordable services (Republic of South Africa, 2006). This, in turn, may allow older persons to live productively in society and be identified as sources of wisdom and expertise (Republic of South Africa, 2006). The management and maintenance of services is also addressed in the policy which highlights the rights of older persons to access opportunities which promote their social, physical, psychological, and emotional well-being (Mark, 2016). Although this comprehensive policy suggests that South Africa is responsive to the special needs, care and wellbeing of the elderly, it however lacks specific strategies that can be implemented for elderly care and needs (Goodrick, 2013).

Some of the other policies addressing care of the elderly in South Africa are the South Africa's Social Assistance Act of 1992 which guarantees social grants and pension funds are paid out to the elderly population (Republic of South Africa, 1992). The South African Police Force is responsible for responding to suspected abuse of the elderly according to the Domestic Violence Act of 1998 (Republic of South Africa, 1998b). Also, according to the South African Constitution, everyone in South Africa, including the elderly, have the right to access healthcare and emergency medical services may not be refused (Goodrick, 2013). These acts are provided by the Department of Social Development and the Department of Health (Goodrick, 2013).

These policies emphasise the family unit which maintains the societal values, customs, and traditions including those of older people. The South African Policy of Older Persons identifies as an objective the shifting of the stress of care to community-based care in order for older persons to remain at home for as long as possible. Therefore, the growth of community-based programmes falling into promotion and prevention of independent living of older persons in the community, which ensures optimal care

within that community, are emphasised. These programmes are aimed at establishment of recreational opportunities for older persons (Mark, 2016).

However, when community care is no longer an option, services at residential facilities may include care and supervision of older persons who are dependent and are suffering from dementia and other related diseases.

2.4 Dementia

Dementia is a chronic progressive disease caused by neurodegeneration. It affects various cognitive abilities such as memory, the ability to communicate, orientation, and higher executive functions. People with dementia have difficulties managing their behaviour, controlling their mood and their inability to participate in ADL, often requiring assistance with tasks (de Jager *et al.*, 2015). Dementia therefore leads to an increase in dependence and care with various comorbidities and frailty which approximately 80% of people living with dementia in nursing homes and 50% of people with dementia in the community experiencing these symptoms (McGrath and O'Callaghan, 2014).

Although dementia mostly affects the elderly population, it is not necessarily part of the normal aging process. There are various types of dementia including, Alzheimer's disease, vascular dementia, frontotemporal dementia, and Lewy body type dementia (de Jager *et al.*, 2015). Alzheimer's disease is the most common type of dementia, contributing 60% to 70% of all dementia cases (de Jager *et al.*, 2015). Dementia has three stages namely, early, middle and late stage with various symptoms classifying each stage (Holopainen *et al.*, 2017). During the early stage, people with dementia usually have difficulties with memory, they tend to forget words and have difficulties with managing instrumental activities of daily living (IADL) such as financial management or domestic work (Holopainen *et al.*, 2017). The middle stage shows symptoms which include problems with communication, not being orientated to time and place, and an increase in dependence in activities such as personal hygiene and meal preparation (Holopainen *et al.*, 2017). During the final or late stage, people with dementia tend to be fully dependent on assistance with self-care tasks, they are unable to live independently, struggle severely with communication and self-expression leading to misunderstandings and behavioural difficulties (Holopainen *et al.*, 2017). People with dementia also often show neuropsychiatric symptoms such as apathy,

feelings of depression, anxiety or agitation, wandering, and feeling restless (Holopainen *et al.*, 2017). These symptoms can all affect QoL (Olsen *et al.*, 2016).

The worldwide estimate indicates there are approximately 44 million people with dementia and according to the WHO, about 7.7 million people are diagnosed with dementia each year (World Health Organisation, 2017a). This leads to an increase in the cost incurred due to diagnosis, care, and treatment of people with dementia worldwide (World Health Organisation, 2017b).

2.4.1 Dementia and dementia care in South Africa

In 2015 Mkhonto and Hanssen (2018) reported that an estimated 730,000 people in South Africa were diagnosed with Alzheimer's disease. This study indicated that due to the perception that people who present with dementia are bewitched, dementia is underdiagnosed in South Africa and the prevalence is probably higher than stated. This supported a research study by Benade (2012) who researched the services for people living with dementia in Kwa-Zulu Natal and found that there is a lack of recognition of dementia in South Africa for the same reason. Research by Mkhonto and Hanssen (2018), further described the stigma involved with dementia including the discrimination, social isolation and possible violence and murder of people living with dementia associated with the belief the condition is caused by a curse or bewitchment. Gurayah (2015) who investigated caring for people with dementia in a rural context in South Africa found that in an African culture, people believed they should care for their parents. Participants in this study reported that dementia was a normal part of ageing and were unaware that it was considered a medical diagnosis. This resulted in patients with difficult behaviours such as incontinence, wandering away, or talking gibberish as they felt the person was not in control of their behaviours (Gurayah, 2015). Borochowitz (2011) thus emphasised the importance of increased awareness and education for policy makers, medical aids, government officials, health care professionals and caregivers in addressing the stigma and challenges for people with dementia in South Africa. Therefore, advocacy groups such as Alzheimer's South Africa are promoting the education of dementia and care for people living with dementia.

De Jager *et al.* (2015) reported a prevalence of about 6% of people diagnosed with dementia in a small sample of 200 people in a South African urban black community.

There is an expected increase in people over the age of 60 in the South African population and thus an increase in people with dementia is also expected (de Jager *et al.*, 2015). To ensure that their QoL does not deteriorate as they age, and their health deteriorates, the need for long term care and assistance increases (Phaswana-Mafuya *et al.*, 2012). Health care and social services in South Africa often however fail to meet the needs of people with dementia since the healthcare system tends to prioritise acute rather than chronic diseases like dementia (Goodrick, 2013).

Borochowitz (2011) confirmed that elderly care is not a priority in South Africa due to the other social and economic priorities, including poverty, unemployment and diseases such as HIV and AIDS. There is a lack of mental health care services and specialised geriatric medical care for older people in South Africa. The skills of health care professionals who want to work in geriatrics, access to health care services, and safe housing for people living with dementia is insufficient and inadequate (Borochowitz, 2011). Mkhonto and Hanssen (2018) support this notion and indicate limited skills and knowledge of the professionals involved about dementia is also a challenge.

In South Africa long term care needs, for more affluent older people of all races are met by paid carers at home in preference to residential assisted care institutional settings (Lloyd-Sherlock, 2019). Older South Africans with dementia however, are vulnerable due to poor socio-economic conditions and challenges such as other health and social problems caused by poverty where lack of access to any care or care by family members, is a reality (Mkhonto and Hanssen, 2018). While these family caregivers report a decreased QoL and increased depression symptoms many of the elderly in South Africa including those living with dementia are living in “skip generation households”. There is the burden of looking after their grandchildren and family members, without the support of their own children who may have been lost to illness (Borochowitz, 2011; Gurayah, 2015). There is therefore a need for family support and care services for problems encountered in daily living and behaviour for those with dementia (de Jager *et al.*, 2015). A growing need for community-based services to support people living with dementia along with their caregivers and increased social services support from the government has been identified (Borochowitz, 2011). However, limited resources to provide sufficient home care, or to provide facilities for

people living with dementia, education to the public and inadequate health care support affect implementation of such services (Mkhonto and Hanssen, 2018).

Of the over 400 residential care homes for the elderly on official registers in South Africa, most are run by non-governmental organisations (NGO's) or religious organisations which are difficult to fund (Lloyd-Sherlock, 2019). This limits the services offered with few stimulation and rehabilitation and therapy programmes prioritised. There is little recent research on the quality of life in residential care facilities in South Africa but Chipps and Jarvis (2015) found moderate ratings of mental well-being of older people in an urban environment in South Africa. They reported the strongest predictor for mental well-being was interaction and the ability to participate in activities outside of the facility.

2.5 Quality of Life and Dementia

According to the WHO, QoL is defined as an “individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, and standards and concerns” (World Health Organisation, 1997, p.1). The QoL in persons with dementia is difficult to define and there are various definitions to describe the concept. Quality of life specific to dementia can be explained as having two facets namely, the behaviour, external environment and interactions with the surroundings; and the individuals’ experiences of their life and well-being associated with their sense of self (Holopainen *et al.*, 2017; Nordgren and Engström, 2014a; Yamamoto-Mitani *et al.*, 2004). Nordgren and Engström (2014b) suggest meaningful experiences to someone living with dementia may not be detected in scores, but only in a lived experience, establishing the lived experience of QoL in people with dementia is difficult, as usually, self-reports are used to evaluate these constructs (Holopainen *et al.*, 2017; Nordgren and Engström, 2014a; Yamamoto-Mitani *et al.*, 2004). Since most people with dementia often cannot describe what the concepts related to QoL mean to them, objective reports from family or nursing staff need to be used to determine the QoL of people with dementia (Klapwijk *et al.*, 2016).

Factors associated with a lower QoL include early onset dementia and Lewy Body disease, a history of depression, being anxious and agitated and experiencing pain (Holopainen *et al.*, 2017). For people with dementia, a low QoL is related to limitations

in functional mobility, a decrease in social engagement and increased dependence in ADL such as washing and dressing also seem to affect QoL negatively (Holopainen *et al.*, 2017; Olsen *et al.*, 2016). Feelings of loneliness, a lack of communication and interaction and feeling as if not belonging also have the effect of reducing QoL (Holopainen *et al.*, 2017). However, being in a homely environment as well as participation in activities that are important to the individual is associated with a good QoL (Holopainen *et al.*, 2017). Being able to participate in activities is especially beneficial for people in the later stages of dementia (Nordgren and Engström, 2014a). Social engagement with family as well as feeling understood, heard, and accepted also improves QoL (Holopainen *et al.*, 2017).

2.5.1 Evaluating Quality of life in Residential Care for People with Dementia

When evaluating the QoL of people with dementia living in an assisted care institution a broad multidimensional concept should be considered because their living environment is dramatically different from community living with lack of privacy, and low social support affecting QoL (Ettema *et al.*, 2007). Klapwijk *et al.* (2016) suggest that all dimensions of QoL including physical and psychological wellbeing, social interaction with family and other residents in a care facility and positive or negative affect be considered in assessment. They reported the characteristics associated with QoL in people living with dementia in care facilities, and found that for this population, QoL is independently associated with age, severity of dementia, independence in ADL, pain and other psychiatric and health conditions. The resources in the environment may also impact QoL with poor functional mobility and falling affected by the burden of care on limited nursing staff. An increase in QoL may be seen with sufficient staff who are trained for the special needs of people with dementia (Holopainen *et al.*, 2017).

The following domains were then identified as important for QoL of people with dementia in residential assisted care “affect, self-esteem/self-image, attachment, social contact, enjoyment of activities, sense of aesthetics in living environments, physical and mental health, financial situation, security and privacy, self-determination and freedom, being useful/giving meaning to life and spirituality” (Dichter *et al.*, 2016). These concepts were used to develop a multidimensional QoL assessment, the QUALIDEM for people with dementia based on the 14 factors described by O’Rourke

et al. (2015) as important for QoL in residential care: family, social contact and relationships, self-determination and freedom, living environment, positive emotions, negative emotions, privacy, security, self-esteem, health, spirituality, care relationship, pleasant activities and future prospects. Research suggests that knowledge of low QOL scores affected by these specific concepts might support interventions to improve or maintain QOL. When dependency in ADL increases, positive affect and social relations may be at risk increasing vulnerability to social isolation.

2.6 Intervention for Dementia

2.6.1 Quality of life in residential care

Since there is no cure for dementia intervention focuses on care and management (Lloyd-Sherlock, 2019). In residential assisted care facilities improving or maintaining QOL should be the highest priority. Exercises and physical activity in a group setting such as walking or dancing, along with cognitive stimulation have a positive effect on the QoL with an overall improvement in physical condition and behaviour in people with dementia. The use of music that the person enjoys, and the presence of animals has also been reported to have a calming effect and a positive influence on QoL. However, these activities have increased agitation in some people with dementia which may decrease QoL (Lloyd-Sherlock, 2019). It is essential therefore, that treatment be based on individual needs, considering the client or patient as an expert in their own life and retaining their human dignity (Holopainen *et al.*, 2017).

Guidance to family members of how to handle and prevent agitation or anxiety in people with dementia is important since family members who can manage the person without conflict and are supportive and reminisce about positive life events improve QoL (Holopainen *et al.*, 2017). This helps to strengthen the person's belief that they are important to others in the family and reminiscence decreases apathy by increasing social interaction with loved ones (Holopainen *et al.*, 2017).

Nordgren and Engström (2014a) report that pharmaceutical interventions for people with dementia can often influence QoL due to side effects. Thus, it is important to find alternative or complementary interventions to medication. Occupational therapy provides non pharmaceutical intervention based on the participation in meaningful

activities which satisfy a basic need and drive potential in humans (Harmer and Orrell, 2008). Harmer and Orrell (2008) describe the link between the importance of engagement in meaningful activity and well-being for people living with dementia. The person with dementia should have a variety of activities to choose from, as it is important for them to still be able to make choices about meaningful activities in which they want to partake (Holopainen *et al.*, 2017).

2.6.2 Occupational Therapy

A multidisciplinary team approach is suggested for the care of people living with dementia including early diagnosis, ensuring physical and cognitive health, wellbeing, and activity participation, managing behaviours and psychological symptoms with education and support for families and carers (World Health Organisation, 2012). There is evidence to suggest that occupational therapy input in the diagnosis process can assist with the long-term follow-up of patients. Chung (2004) explains that occupational therapists have the knowledge and skills to analyse and design activity programs suited to the ability of the person and thus, should actively contribute to the activity programs for people living with dementia in care facilities. According to McGrath and O'Callaghan (2014) there is a significant body of evidence to support OT services for people living with dementia which will be demonstrated in this section.

Occupational therapy intervention in terms of environmental adaption and modification as well as carer training influence psychological and behavioural symptoms in people with dementia such as depression, anxiety, agitation and hallucinations (McGrath and O'Callaghan, 2014). Activity modifications are implemented to ensure people living with dementia are still able to participate in meaningful ADL and leisure activities (McGrath and O'Callaghan, 2014). There is also evidence to support occupational therapy home-based programmes which teach compensatory strategies and assist with adapting the environment are of value to people living with early-stage dementia and to their families or caregivers. These skills were still used at a two-year follow-up (McGrath and O'Callaghan, 2014)

Occupational therapists can provide training and education to others supporting people living with dementia to encourage participation in activities and increase enjoyment in daily tasks (Chung, 2004). There is strong evidence to support occupational therapy intervention of educating, problem-solving, task breakdown,

communication skills and environmental adaptations for people living with dementia and their carers (McGrath and O'Callaghan, 2014). Carer training was also shown to have a positive effect on the involvement on ADL and improved QoL of people with dementia living in assisted living facilities (McGrath and O'Callaghan, 2014).

The main goal for occupational therapists in dementia care should be to enhance the residents' well-being by participation in meaningful activities (Chung, 2004). People living with dementia don't lose that need to engage in meaningful activities and maintaining these activities in their routines increases well-being (Chung, 2004). The mere process of engaging in an activity is more important than the result since they retain an innate need to engage in meaningful occupation, or activities that are purposeful and meaningful to them individually (Chung, 2004). Thus, the need for meaningful activity that provides structure to life, enables opportunities for meaningful and joyful experiences, increase health and well-being and increase QoL for people living with dementia in residential settings should be emphasised (Chung, 2004). Chung (2004) explains that occupational therapists have the knowledge and skills to analyse and design activity programs suited to the ability of the person and thus, should actively contribute to the activity programs for people living with dementia in care facilities.

For people in early stages of the disease, emphasis is on the participation in everyday activities and being able to contribute to and maintain continuity in routine (Harmer and Orrell, 2008). In the later stages of the disease, well-being increased when participating in activities such as food preparation (Harmer and Orrell, 2008). Residents in care homes valued activities related to self-care or leisure and enjoyed activities that made them feel enabled (Harmer and Orrell, 2008). Occupational therapists enable this engagement in meaningful activities along with activity organisers ensuring carry over, so this becomes the responsibility of everyone involved in the care of people with dementia (Harmer and Orrell, 2008). In a qualitative study in three residential facilities Harmer and Orrell (2008) and Field, Coates and Mountain (2018) found that reminiscence activities, life story work, cognitive stimulation therapy, family and social activities as well as musical and individual activities addressed the cognitive, emotional, occupational, and functional aspects of dementia. These activities were meaningful if based on values and beliefs, interests and routines of the person with dementia, and provided enjoyment (Field, Coates and Mountain, 2018;

Harmer and Orrell, 2008). Being able to adapt the activity to ensure it was able to engage the resident was an important factor in meaningful participation (Harmer and Orrell, 2008). Animal Assisted Intervention (AAI) particularly AAT may be considered one activity that could promote engagement in meaningful tasks and promote increased well-being (Kamioka *et al.*, 2014).

2.7 Animal Assisted Therapy

Animal Assisted Intervention (AAI) includes modalities that use animals as tools for improving physical, mental and social functions, and educational and welfare aspects of humans (Kamioka *et al.*, 2014). AAI is an interaction between a patient and a trained animal which is goal orientated and structured in either health, education and human service for the purpose of therapeutic gains (Nordgren and Engström, 2014a; Olsen *et al.*, 2016). The positive and emotional response from a patient to the animal is where the efficacy of AAI lies (Nordgren and Engström, 2014a).

Animal Assisted Intervention is classified into three categories including Animal Assisted Activities (AAA), AAT and service animal programs (SAP) (Kamioka *et al.*, 2014). According Kamioka *et al.* (2014) AAA makes use of companion animals and is defined as casual and unstructured. It can be conducted by someone without specific training, and they may use uncertified animals (Kruger and Serpell, 2010; Perkins *et al.*, 2008). SAP uses service animals and AAT uses therapy animals (Kamioka *et al.*, 2014; Kruger and Serpell, 2010; Perkins *et al.*, 2008). Animal assisted therapy is goal-directed, directed and delivered by a professional with specialized expertise and within their scope of practice (Firmin *et al.*, 2016). This type of therapy has been shown to improve well-being, medical difficulties and behavioural problems and can take place in various settings including hospitals, care facilities or schools (Firmin *et al.*, 2016). Animal assisted therapy is structured and formal and conducted by someone who is specially trained using certified animals and can be presented individually or in groups (Firmin *et al.*, 2016). It requires active participation from the person and the therapist sets goals or outcomes to be achieved by the intervention (Kruger and Serpell, 2010; Perkins *et al.*, 2008).

Using animal for therapeutic purposes became popular in the 1980's (Firmin *et al.*, 2016). The use of animals in therapy assists with the therapeutic relationship as it has

a calming effect and reduces feelings of anxiety and lowers inhibitions (Firmin *et al.*, 2016). Kamioka *et al.* (2014) in a systematic review reported the physical effects of AAI included a decrease in blood pressure during and after intervention with a therapy dog in patients in hospital with heart failure. A study investigating the effectiveness of a service dog for people with severe ambulatory disability indicated significant positive improvement in community reintegration, increase in school attendance or part time employment, a decrease in assistance and an increase in well-being, self-esteem and internal locus of control (Kamioka *et al.*, 2014). In support these findings also have psychological benefits such as decreasing the cortisol levels in patients shielding them from stressors by providing safety and comfort and diverting their attention to pleasurable and calming interactions with the animals (Firmin *et al.*, 2016; Kamioka *et al.*, 2014).

Animal assisted therapy has an effect on mental health by lowering anxiety and improving a person's mood, thus leading to improved QoL and enhanced social behaviour (Kamioka *et al.*, 2014). Animals provide a sense of comfort, happiness and pleasure (Kamioka *et al.*, 2014). The change in mental health in people with clinical depression was measured in a study with farm animals (Kamioka *et al.*, 2014). Participants were involved in work and interaction with farm animals twice a week for 12 weeks with a significant change in depression and generalized self-efficacy (Kamioka *et al.*, 2014). The patients in the intervention group had more appropriate social behaviours and they interacted more with other patients (Kamioka *et al.*, 2014). The patients in the AAT group were reported to smile more and show significantly more pleasure than the control group (Kamioka *et al.*, 2014). It is assumed that the direct effects of AAT are generally improvement of mental health, elimination of the sense of isolation, and an improvement in QoL (Kamioka *et al.*, 2014). Animal assisted therapy has also been shown to offer companionship and comfort from the animal and acts as an emotional support leading to a better QoL for people with dementia (Firmin *et al.*, 2016).

However, AAT is not a suitable intervention for everyone. This includes people who have shown some form of animal cruelty, people who require some form of attention that cannot be provided by an animal, previous negative experiences with animals, and people with a dislike of animals, who have allergies or a fear of animals (Firmin *et al.*, 2016). The animals used in AAT must also be selected carefully and must be

suitable for the context (Firmin *et al.*, 2016). They should have a predictable temperament, be easy to control and reliable at all times (Firmin *et al.*, 2016).

Firmin *et al.* (2016) described six fundamentals of AAT: Firstly, animals can be used as tools to effect positive change in behaviours and to teach appropriate behaviour patterns. Trust is the second element necessary for a therapeutic relationship, and this is facilitated through the use of AAT since patients seem to trust the therapist because the animals trust the therapist (Firmin *et al.*, 2016). A third element is to care for others with empathy an important fourth element in AAT for increased awareness of emotions and being able to think from the perspective of others (Firmin *et al.*, 2016). Cooperation and responsibility is the fifth principle which may be learned through AAT (Firmin *et al.*, 2016). Lastly therapists involved must be flexible since AAT can be unpredictable and unexpected benefits may occur during AAT (Firmin *et al.*, 2016). Success in AAT was identified by therapists when there were behavioural changes, a feeling of accomplishment by the clients and when the clients were able to process their feelings effectively (Firmin *et al.*, 2016).

The characteristics of the therapists needed to make AAT successful included, “internal motivation for job satisfaction, an open and vulnerable personality, being committed to the work, and being flexible with how they work with clients” (Firmin *et al.*, 2016). Their study also reports that it is the animals who teach the skills, and the therapists is only there to facilitate this learning process (Firmin *et al.*, 2016).

2.7.1 Occupational Therapy and Animal Assisted Therapy

A study by Velde, Cipriani and Fisher (2005) which investigated the views of therapists and residents in the use of AAT, discussed the use of AAT in occupational therapy. They reported that the development and implementation of a therapy plan and using knowledge to use an animal effectively in therapy is where the occupational therapists’ role is recognised in the use of this modality (Velde, Cipriani and Fisher, 2005). Occupational therapists use animals in various ways such as to create, promote, establish, maintain, or to prevent or modify activity participation. The study used examples such as engaging in grooming with a therapy dog to establish self-care routines such as brushing hair (Velde, Cipriani and Fisher, 2005). They also discussed the facilitation of a relationship between the occupational therapist and client as they may have a common interest in animals by sharing stories of previous pets owned

(Velde, Cipriani and Fisher, 2005). Animal assisted therapy supports the person-centred philosophy as is individualised to those who like animals and positive outcomes indicate animals can be effectively used by occupational therapists (Velde, Cipriani and Fisher, 2005).

The effect of AAT on internal motivation of clients to attend occupational therapy was indicated that patients continue with therapeutic activities for a longer duration when animals were present and have increased social interaction. The therapists reported that patients recalled memories more actively increasing reminiscence with an increase in alertness with pets present (Velde, Cipriani and Fisher, 2005). They also reported increased emotional well-being and agitation reduced (Velde *et al.*, 2005). Taking care of a pet was also found to provide the individual with a sense of responsibility and ownership for which Velde, Cipriani and Fisher (2005) proposed the following scenario. Caring for an animal, feeding, grooming, talking to the animal and holding the animal is reminiscent to a parent or caregiver role, which provides a meaningful substitute to a role fulfilled for many years by some residents in a long-term care facility.

Occupational therapists need to ensure when using AAT in residential long term assisted care facilities that the intervention remain meaningful and contributes positively to QoL (Velde, Cipriani and Fisher, 2005). Pet care, animal interactions and communication with animals are all activities that have the potential to be meaningful to residents. The animal is used by the occupational therapist as a mode to achieve aims during therapy such as improved participation in ADL, increased mood or social interaction (Velde, Cipriani and Fisher, 2005).. This is supported by Cipriani *et al.* (2013) who investigated dog-assisted therapy for residents in long-term residential facilities. They emphasised in importance of the invention focusing on using meaningful activities that supporting an increase in QoL, by considering cognitive, mental and physical functions in social and personal contexts to support overall health and well-being They indicated there needed to be a direct link between the intervention goals and the practice of AAT. Furthermore, a conclusion made by Velde, Cipriani and Fisher (2005) indicated that pet care is an occupation-based activity that can be addressed by occupational therapists.

2.7.2 Animal Assisted Therapy and People with Dementia

Animal assisted therapy can be used for people with dementia to improve many deficits including social engagement affecting QoL (Nordgren and Engström, 2014a). Nordgren and Engström (2014a) report that deficits in memory, communication and language skills, higher cognitive functions such as problem solving, self-esteem and well-being, social commitment, focus and attention, balance and muscle strength, fine-motor skills, grip ability and accuracy and overall movement can all be addressed in people with dementia using a therapy dog.

It is also indicated that the presence of a therapy dog in a care facility can decrease aggression and agitated behaviour such as yelling, screaming and decrease heart rate and feelings of anxiety (Nordgren and Engström, 2014a). “AAT can decrease feelings of loneliness, depression, anxiety and improve cognition and QoL” (Le Roux and Kemp, 2009, p.23) The increased calming effect of AAT influences the QoL, reduces stress temporarily and increases well-being of people living with dementia, as Nordgren and Engström (2014a) concluded after intervention sessions with a therapy dog. Perkins *et al.* (2008) report that dogs are approachable, they provide companionship and improve social interaction, ease of touch and do not judge during interaction. This non-verbal communication is also better suited to patients with dementia due to their own impaired social skills. Individuals exposed to AAT may thus, experience benefits such as increased social interaction (Perkins *et al.*, 2008).

The engagement of participants in the dog therapy sessions lead to conversations about memories, experiences, and emotions, thus, communication was facilitated with a sort of reminiscence (Nordgren and Engström, 2014a). A study by Olsen *et al.* (2016) on the effects of AAT on mood in nursing home residents with dementia, found a significant statistical and clinical difference in the depressive mood of people with dementia between the baseline phase to the 12-week follow-up compared with the control group who did not receive the intervention. They found the control group had gradually worsening symptoms during the study (Olsen *et al.*, 2016). They concluded that the dog served to reduce the pressure for socialisation in residents in the intervention group since the dog was the centre of attention and not the person with dementia (Olsen *et al.*, 2016). The dog also served as a conversation starter (Olsen *et al.*, 2016). The results also indicated that the effects of AAT may last beyond the end

of the intervention period, increase social interaction between the staff and people with dementia and improve overall social behaviour by increasing social interaction and conversation while reducing loneliness (Olsen *et al.*, 2016). Velde, Cipriani and Fisher (2005) also report on the influence of animals on the environment. “Animals create a home-like and nurturing environment; a favourable social environment through facilitating conversations and other forms of communication; and a temporal environment by making time appear to move more pleasantly” (Velde, Cipriani and Fisher, 2005:p.47). However much of the research in AAT and dementia has been criticized due to the limitations of small sample size, various methodologies and a variety of assessments indicating that the evidence is not generalisable (Filan and Llewellyn-Jones, 2006; Marx *et al.*, 2010; Nordgren, Engström and Engstro, 2012; Richeson, 2003). In their systematic review, Yakimicki *et al.* (2019) report that ATT is not always effective in addressing affect, behaviour and engagement in occupation with all people with dementia. While in more severe dementia the maintenance rather than improvement of psychological symptoms and behaviour related QoL may be the expected outcome reported by Majić *et al.* (2013). Pope, Hunt and Ellison (2016) also found no significant change in pro-social behaviours in their study on elderly nursing home residents and Firmin *et al.* (2016) indicated AAT is not for all clients.

2.8 Summary

It is evident from the literature that dementia is a prevalent disorder which is growing in South Africa. The support and care available to those living with dementia and their caregivers are limited and expensive to access in South Africa. Resources are limited and health care professionals are under skilled which negatively influences QoL in people living with dementia.

There is a positive link between participation in meaningful activities and the improvement of QoL for people living with dementia. Occupational therapy has been shown to support the engagement in meaningful activities and one modality that can be used to achieve this is AAT which has been effective when used with people with dementia. Thus, occupational therapists may be able to use AAT to increase the QoL for people living with dementia in residential care by engaging them in this related and meaningful occupation.

CHAPTER 3: METHODS

3.1 Introduction

This chapter describes the various aspects included in the method of designing and implementing this study. The study design is outlined, and the sample selection and size discussed. The two outcome measures used to collect the data are described. Data collection procedures and analysis methods are outlined. Data management and analysis is discussed in this chapter. Finally, the ethical considerations of the study are presented.

3.2 Research design

A single-subject study design was employed. The purpose of the single-subject design was to test the effects of AAT on the QoL and participation in ADL of patients with dementia. The design looked at the specific impact of AAT on the individual patient with dementia. This indicated that one community, namely persons diagnosed with dementia, was chosen with which the researcher conducted the study (Engel and Schutt, 2012). Single subject research is used to discover a causal relationship in an intervention programme on specific individuals as opposed to the average performance across a group of participants.

The advantages of single subject research are that it:

- can be implemented within a clinical setting where therapists have access to a few participants (Engel and Schutt, 2012);
- has rigorous methods with repeated measures to track individual outcomes. It is effective at analysing a newly implemented treatment and the effectiveness of the treatment (Engel and Schutt, 2012);
- the intervention can be adapted according to individual needs (Engel and Schutt, 2012).

A disadvantage of this research design is that it is difficult to generalise results (Kinugasa, Cerin and Hooper, 2012).

This single subject design consisted of three parts, namely, a baseline phase A, a treatment phase B, and a withdrawal phase A, with repeated measurements during

each phase. Thus, a withdrawal A-B-A design was used, A indicated baseline and withdrawal phases and B indicated the intervention phase. This allowed for the dependent variables, QoL and participation in ADL, to reflect whether the AAT was effective. The participants, persons with dementia, served as their own controls as the repeated baseline measurements establish the pattern of scores expected to change due to the AAT for each participant over time (Engel and Schutt, 2012).

With this type of design, data was collected in the baseline phase without AAT, then again data collection took place during the intervention phase with AAT, and again during the withdrawal phase when no AAT took place. Thus, if AAT was effective, it is expected that QoL and ADL participation would have improved during the intervention phase and would have decreased during the withdrawal phase. Graphs were used by the researcher to describe the data obtained in the baseline, intervention and withdrawal phases (Engel and Schutt, 2012).

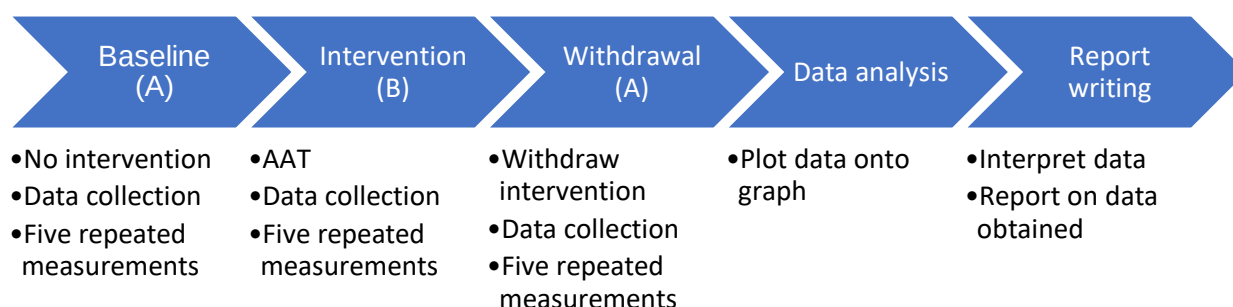


Figure 3.1: Study design

The repeated measurement of the QoL and participation in ADL were the dependent variables. This measurement was taken prior to starting the AAT and at regular intervals during the intervention fortnightly for the duration of the phases.

During the baseline phase A, the patients with dementia did not receive any intervention. Data collection was taken at five opportunities to establish a pattern during each phase. Any threats to validity were controlled by collection of data using a proxy rather than self-report from the participants who were compromised cognitively.

The treatment phase B represented the period of intervention, namely, AAT. Repeated measurements of the same dependent variables, QoL and participation in ADL, using

the same measures were obtained. The patterns and magnitude of the data points were compared to the data points of the baseline phase to determine change and the effect of the intervention. It was recommended that the length of baseline phase be equal to the length of the treatment phase.

To enhance external validity three replications of the study were required, thus at least three participants were required. The study was replicated with four participants who are diagnosed with dementia and living in the same retirement facility using the same intervention procedures, the researcher provided intervention for all four participants and the blind rater remained consistent throughout the study period (Engel and Schutt, 2012).

3.3 Population and sampling

3.3.1 Study setting and population

This study sample of patients with dementia was taken from residents of a private retirement facility with assisted living and frail care units in Pretoria. Patients in the assisted living units have access to caregiver staff to assist with ADL, management of medication and meal preparation. Patients in frail care had access to full time assistance from caregivers and hourly rounds are done. These patients are dependent on assistance for ADL, mobility and management of medication to ensure safety and promote optimal care. The facility had basic medical care available from nursing sisters and caregiver staff. Access to consistent allied health services namely occupational therapy, physiotherapy, speech therapy or psychology are private services and residents are expected to pay for these services if not covered by medical aids.

3.3.2 Sample

The sample was conveniently selected based on the residents available in the residential facility and the inclusion criteria. The matron of the retirement village was approached to suggest participants. Contact details for the participant's family members was used to make contact. The researcher was able to explain the study and establish the participants history with pets and interest in animals before obtaining informed consent from the participant and/or proxy (a family member). The first four patients whose families provided signed informed consent were included in the study.

Sample selection criteria involved the following:

3.3.2.1 Inclusion criteria:

- The patient must have a formal diagnosis of dementia confirmed by cognitive dysfunction and dependence in some ADL or IADL
- The patient must be 65 years or older.
- The patient must have a history of interest in animals (previous pet owners or history from a family member).
- Must have no known allergies to dogs.
- The patient must have no known dislike or fear of dogs.

3.3.3 Sample size

The sample consisted of four participants. It is typical for single subject designs to have three to eight participants. Due to the design of the study, a minimum of three replications of the experiment are required. To ensure adequate data were collected, four participations were included in the sample (Kinugasa, Cerin and Hooper, 2012).

3.4 Research instruments

3.4.1 Outcome measures

The researcher selected instruments specifically designed to measure the QoL of patients with dementia and the level of independence of ADL. These instruments were reliable and valid for the chosen population (Engel and Schutt, 2012). These instruments include:

3.4.1.1 The QUALIDEM (dementia-specific quality of life instrument)

The QUALIDEM is a measure the QoL for people with dementia in residential care and was constructed based on definition of dementia specific QoL from the literature and observational field data. It takes approximately 10 minutes to complete (Appendix A). Two versions are available, one for people with mild to severe dementia and one for people with very severe dementia. The version for people with mild to severe dementia was used in this study. The QUALIDEM consists of 37 items describing observable behaviour. It has a response scale with four options: never, seldom, sometimes, and often with an option for not applicable (Dichter *et al.*, 2016).

There are 16 indicative and 21 contra-indicative items which are scored on nine homogeneous subscales Care relationship, Positive Affect, Negative Affect, Restless tense behaviour, Positive self-image, Social Relations, Social Isolation, Feeling at home and Occupation (Having something to do). These subscales are used to establish a QoL profile for each individual which is used to more accurately assess the outcome of an intervention. The assessment is a proxy rating carried out by staff and is based on the observations and interactions with the individual being assessed (Dichter *et al.*, 2016).

The QUALIDEM was developed and standardized in Germany (Dichter *et al.*, 2016). The researcher was unable to find literature stating the use of the QUALIDEM in South Africa. The QUALIDEM has a strong internal consistency of the subscales and test-retest reliability that has been confirmed by other studies (Dichter *et al.*, 2016). The Cronbach's alpha is > 0.7 regardless of the severity of dementia. The assessment also has good inter-rater reliability on a heterogeneous sample. "One study produced evidence for the construct validity of this measurement, however, further research is needed to investigate how the instrument performs in various situations for continuous validation" (Dichter *et al.*, 2016).

3.4.1.2 The Disability Assessment for Dementia

The Disability Assessment for Dementia (DAD) was used to establish independence in ADL (Appendix B) (Gélinas, Gauthier and McIntyre, 1999). This outcome measure was developed and standardised in Canada (Gélinas, Gauthier and McIntyre, 1999). It describes the functional characteristics in ADL of people with dementia. Basic and instrumental ADL is examined along with cognitive abilities such as initiation, planning, organization and task completion. It is a proxy assessment completed by the caregiver taking approximately 15 minutes to administer and score. Of the items 17 address basic ADL (hygiene, dressing, continence, and eating), and 23 instrumental ADL (meal preparation, telephoning, going on an outing, finance and correspondence, medications, and leisure and housework). Items are scored yes, no or non-applicable. Scores range from 0 to 100%, with a higher percentage indicating greater competence in ADLs (Gélinas, Gauthier and McIntyre, 1999).

Content validity for the DAD was established by both a panel of experts and caregivers who were the end users (Gélinas, Gauthier and McIntyre, 1999). "The criterion-related

validity was established by the rapid disability rating scale and known-groups procedures with results of the known-groups procedure indicating that severity of the illness has an effect on the scores” (Gélinas, Gauthier and McIntyre, 1999, p. 6). “Construct validity was established with the Mini Mental State Examination as ($r = .54$), $n = 55$ ” (Gélinas, Gauthier and McIntyre, 1999, p. 6). “Test-retest reliability is intraclass correlation coefficient (ICC) = 0.96 ($n = 45$); Interrater reliability ICC = 0.95 ($n = 31$); and internal consistency Cronbach’s alpha = 0.96 ($n = 59$)” (Gélinas, Gauthier and McIntyre, 1999, p. 6). The researcher was unable to find literature where the DAD was used previously in South Africa.

3.4.2 Measures to determine cognitive decline in participants

To ensure patients met the selection criteria two assessments were used to confirm their suitability for the study. The assessments measured cognitive dysfunction as well as indicated dependency in ADL or IADL. The results of these assessments also allowed for individual intervention planning for each participant.

3.4.2.1 The Mini Mental State Examination (MMSE)

The Mini Mental State Examination (MMSE) is used to determine cognitive impairments in adults (Appendix C). A global score of cognitive ability is provided and this also correlates with functional abilities of an older adult. This outcome measure requires roughly 10 minutes to administer and provides a baseline of cognitive functioning. A score of 20-25 indicates mild cognitive impairment (Vertesi *et al.*, 2001). A score of 20-10 indicates moderate cognitive impairment and may start to have difficulties with ADL (Vertesi *et al.*, 2001). Accuracy of the MMSE has in identifying cognitive impairment in dementia includes a sensitivity of 89.2% (95% CI: 85.4 to 92.4) and specificity of 45.1% (95% CI: 39.2 to 51.1)(Mitchell, 2009).

3.4.2.2 Global Deterioration Scale (GDS)

Global Deterioration Scale (GDS) is used to described the clinical characteristics of the progression of the disease in identifiable phases (Reisberg *et al.*, 1982). The GDS is able to delineate all the stages of dementia throughout the course of the disease (Reisberg *et al.*, 1982). The GDS is believed to be able to accurately assess the cognitive decline associated with dementia and classifies dementia into seven stages, with only concurrent validity against other measures reported (Reisberg *et al.*, 1982).

3.5 Research Procedure

3.5.1 Selection of participants

Four patients were conveniently recruited for this study. The rationale for the number of participants was determined by the study design. The participants were unable to sign for informed consent. Their families were contacted, the research explained, and informed consent obtained for each of the four participants.

The participants were all residents in the assisted care facility and to ensure they met the inclusion criteria the scores for the Mini-Mental State Examination (MMSE) and Global Deterioration Scale (GDS) were determined and are listed in Table 3.1. Two participants (3 and 4) were unable to complete a MMSE. The MMSE scores were 18 and 20 for two participants (1 and 2) indicating moderate cognitive impairment and may start to have difficulties with ADL (Vertesi *et al.*, 2001). For the GDS, two participants (1 and 2) scored 5, indicating moderately severe cognitive decline (moderate dementia) which means they are unable to recall major relevant aspects of their lives, they are disorientated often, they require no assistance for ADL (such as toileting) but do require assistance with IADL (Reisberg *et al.*, 1982). The other two participants (3 and 4) scored 7 indicating very severe cognitive decline or severe dementia with a loss of verbal abilities, incontinence, assistance required for feeding and toileting and progressive loss of basic psychomotor skills (Reisberg *et al.*, 1982).

Table 3.1 Scores confirming inclusion criteria

Participant	Mini-Mental State Examination	Global Deterioration Scale
1	18	5
2	20	5
3	N/A	7
4	N/A	7

3.5.2 Data collection

The MMSE and GDS were completed by the Matron of the facility at the start of the study and the results were shared with the researcher. The first phase of the research was the baseline phase during which no intervention took place. A blind rater, a social

worker, administered the QUALIDEM and the DAD to eliminate any bias since the researcher administered the intervention.

The care staff at the facility were assisted by the social worker to collect data. The social worker collected data from the care staff working with the participants daily. The QUALIDEM and DAD were completed every two weeks for each resident for ten weeks, resulting in five data collection points per phase. The baseline, intervention and withdrawal phase were of equal length (Engel and Schutt, 2012).

During phase B, the intervention phase, the researcher introduced the intervention of AAT. The researcher visited the facility and started with therapy sessions with each participant. The therapy sessions lasted approximately 30 minutes. This was adjusted to the time the participant was able to attend. Initially the researcher planned for 45 minutes to 60-minute sessions. However, due to the advanced level of dementia the participants were diagnosed with, they were unable to attend to 45 to 60-minute sessions. The therapist was only able to maintain their attention in a session for a maximum of 30 minutes. The sessions varied from participant to participant according to their severity of dementia.

The proposed intervention is presented in Appendix E. The sessions comprised of various activities to elicit participation from the participants. The first session for all the participants were an introductory session to explain what the researcher was doing and that she would be visiting each week. The researcher was aware that due to the symptoms of the condition, she would likely explain the purpose to the participants each week. The sessions following the first introductory sessions included grooming sessions, play session with ball throwing, feeding sessions and walking sessions. These sessions were repeated and chosen to fit the abilities of each individual participant. The researcher used her clinical reasoning skills as an occupational therapist to decide which type of session would fit which participant. The social worker continued to collect data from the care workers during this phase every two weeks using the QUALIDEM and DAD.

After the ten-week intervention phase B, the withdrawal phase started. During this phase the AAT was withdrawn, and the participants received no intervention. The social worker continued to collect data from the care workers using the QUALIDEM and DAD for another ten weeks.

The total time of the study took 30 weeks to complete resulting in 15 data collection points.

3.6 Data management and analysis

Data were managed by the researcher by recording all scores on an Excel spread sheet. Demographic information was presented for each participant separately. All data were stored on a password protected computer and data were de-identified by using participant codes.

Analysis of the data used graphs and tables (Engel and Schutt, 2012). Excel was used for data analysis. Trends between results from the participants were established for the QUALIDEM and DAD. Trends over the three phases were established using visual analysis of the data established changes in slope, trend and level.

Statistical methods specific to single subject research were utilised to demonstrate the impact of the intervention on the dependent variable with the assistance of a statistician to determine the significance of change for each participant (Nourbakhsh *et al.*, 1994; Ottenbacher and York, 1984). This included calculating the mean shift, celeration line, variability, change in level, percentage of overlap as well as the 2-band standard deviation and ANOVA for scores between the phases – Baseline (A) and Intervention (B) as well as between Intervention (B) and Withdrawal (A), for the total scores on the QUALIDEM and DAD.

3.6.1 Mean shift

The analysis of the data included calculating the mean shift. This is the degree of shift referred to the percentage of mean change from the A phase to the B phase. This was calculated by finding the difference between the two phases ($B - A$) and dividing this number by the first phase A. A positive value indicates an increase in the mean level across the two phases. A negative value indicates a decrease in the mean level from the A phase to the B phase.

3.6.2 Variability

Variability indicates the number of fluctuations that occurred within a phase or across the various phases. The measure of variability for each phase was obtained by calculating the standard deviation for the data points contained in each phase of the

study design. To calculate the degree of change in variability across the baseline and treatment phases, the standard deviation for phase A, baseline, was subtracted from the standard deviation of phase B, the intervention phase.

3.6.3 Change in level

The level was also determined for the data. Change in level was quantified by taking the last data point in phase A and the first data point in phase B and dividing the large number by the smaller number. For example, if the last data point in phase A was 3, and the first data point in phase B was 4, then the level was $4/3$, or 1.33. This produces a ratio that expressed the absolute change in level across the two phases.

3.6.4 Celeration line

The celeration line for the data points in each phase indicates how rapidly the change occurs in the various phases. The celeration line test, is a quasi-statistical technique for evaluating change. The test utilises of graphed data with a trend line to establish proportional change.

3.6.5 Percentage overlap

Percentage of overlap indicates the number of values that are in the same range for the various phases. To determine the percentage of overlap the following was done. The spread for the data points in the A phase was computed. Secondly, the number of data points in the next phase, B, that fell within the spread of phase A was obtained and then divided by the total number of data points in phase B. This resulting value can be multiplied by 100 to provide a percentage-of-overlap measure.

3.6.6 ANOVA

ANOVA, analysis of variance, was used to compare the means to indicate if they are equal. If it is not equal, then some change has occurred. The p-value must be <0.05 for there to be significance which means that we reject the H_0 and say that the means value are not equal, therefore, there has been an improvement or deterioration depending on the difference. This tests if the means are equal between to data sets and if the null hypothesis was accepted.

The change between Baseline (A) and Intervention (B) as well as between Intervention (B) and Withdrawal (A) for each subtest on the QUALIDEM and DAD were represented graphically for visual analysis.

3.7 Ethical considerations

Approval for the study was obtained from the Human Research Ethics Committee (Medical) at the University of the Witwatersrand (M170909) (Appendix F) prior to commencing the study. Permission was obtained from the facility and management (Appendix G), and family members of the person with dementia received an information sheet explaining the study (Appendix H). The family members signed proxy informed consent for the person with dementia (Appendix H).

Given participants' advanced age and condition (dementia), which results in cognitive impairment, they were considered to be particularly vulnerable participants. In order to protect their rights, the following principles was used to guide the researchers' approach:

3.7.1 Confidentiality

Participants were assigned a code by the blind rater to ensure confidentiality. This number was used with each participant's scores during data collection for evaluation at the end of the study. The data collected was scanned and stored on the researcher's personal password protected computer. The electronic data was stored on a compact disc following the study and electronic data will be removed from the computer. The hard copies of the data will then be stored by the researcher and destroyed six years after the completion of the study. The blind rater was asked to complete a confidentiality agreement prior to the data collection.

3.7.2 Anonymity

An information sheet (Appendix H) was provided to each participant's proxy and discussed with the participant to facilitate understanding of the process of the research project. This form contained information regarding the nature of the study to allow participants and proxy, who was a family member, to make an educated, independent decision whether to participate or not. Participants were able to withdraw at any stage

during the study without negative consequences. The family member proxy signed informed consent (Appendix H) for the participant.

3.7.3 Beneficence and non-maleficence

The researcher planned to have the therapy dog's handler present during each intervention session to ensure non-maleficence. A trained dog was used for intervention sessions only. The intervention took place in safe and secure environments only within the private retirement facility. The research population is considered a vulnerable group as they are elderly and diagnosed with a progressive disease. The researcher committed herself to refraining of taking advantage of their vulnerability by obtaining informed consent from a proxy. A meeting was planned to be scheduled with the participant and their proxy to gain informed consent from both parties if requested by the family or participant.

3.7.4 Justice

The research aimed to investigate an appropriate intervention method for a vulnerable and growing population. All participants were able to leave the study at any point in time without consequences.

3.7.5 Possible risks/benefits from the research

Various risks and benefits were involved in the research study. Participants received intervention from a trained occupational therapist. Participants had the opportunity to contribute to data which may have been used to establish intervention methods for the elderly diagnosed with dementia. Potential benefits may also have included feelings of belonging, companionship and increased social interaction during the intervention period.

Potential risks involved negative feelings towards the animal. Should this have occurred, the intervention session would have been terminated immediately and the animal would have been removed from the location. The data collected up until this point would have been excluded from the study. As this research involves a trained dog, the handler would be present throughout all intervention sessions to handle the animal. The handler would be able to remove the animal should they feel there was potential risk.

3.7.6 Veracity

The researcher committed herself to accurately portraying the information gathered during the study. The purpose of the study was to be explained to the participants and their proxy. An informed consent document was given to all participants and their proxy containing all relevant information. The results will be made available to participants if they wish to obtain access.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter reports the results obtained in the study. A brief demographic profile of each participant is presented first. The results pertaining to the two objectives are described namely;

- Results from the QUALIDEM and statistical analysis are described to determine the effects of AAT on the QoL of persons with dementia living in a private retirement assisted care facility in Pretoria.
- Results from the DAD and statistical analysis are described to determine the effects of AAT on the participation in ADL of persons with dementia living in a private retirement assisted care facility in Pretoria.

4.2 Demographics

Three of the four participants were female, and one was male. The age range was from 70 years to 88 years old. The average age was 77,25 years old. All participants were of a Caucasian heritage. One participant was English speaking and three were Afrikaans speaking.

Table 4.1 Demographics

Participant	Age	Gender	Age of onset of Dementia	Length of stay in care
1	70	Female	65	1 year
2	75	Female	73	6 months
3	76	Male	73	4 months
4	88	Female	86	2 months

A brief summary of the participants and observations of their reaction to the dog during therapy sessions is provided to contextualise the results.

4.2.1 Participant 1

This participant was a 70-year-old female who was widowed. She had been diagnosed with dementia at the age of 65 and had been living in the assisted care facility for one year. Her MMSE and GDS scores indicated an inability to recall important information about her life, such as names of family members, telephone numbers with disorientation to time and place (Reisberg *et al.*, 1982). Participant 1 required assistance with ADL including toileting, managing her clothing and wiping. Participant 1 was disorientated to time and was often uncertain of the day or time. She was unable to recall telephone numbers of family members or recall names of family members such as those of her grandchildren. She was unable to recall names of her caregivers or the facility where she was living.

4.2.1.1 Observations during intervention

The researcher noticed that Participant 1 was able to participate in physical and verbal interaction during intervention. She was one of the participants who, in the researcher's opinion, seemed less interested in AAT. She was able to participate in conversation, physical activities such as walking, petting and grooming the therapy dog, and following basic instructions to interact with the dog. She was able to give the therapy dog instructions. It is also the researcher's opinion that Participant 1 was able to recall the dog from previous sessions, even if she did not remember the dog's name. Participant 1 engaged in conversation with the researcher as well as ADL such as preparing a meal or treat for the therapy dog. Participant 1 was less interested in grooming or playing with the dog. The sessions also included sitting outside with the participant while the dog explored the environment or sat next to the participant. She was able to observe the dog at all times. The researcher observed that the participant engaged for short time periods with the dog and seemed more interested in engaging in conversation with the researcher. Participant 1 was able to recall the dog from one session to the next, however, was not able to recall names such as the dog or researcher's names.

4.4.2 Participant 2

Participant 2 was a 75-year-old female. She was a widow. She was diagnosed with dementia at the age of 73 and was living in a care facility for the 6 months indicating moderately severe cognitive decline or moderate dementia. Her GDS of 5 indicated

that she could not survive without some assistance (Reisberg *et al.*, 1982). She was still able to participate in all ADL and physical activities. She was able to engage in conversation and follow basic instructions for a basic task. Her MMSE score was 20/30 indicating mild cognitive impairment and her GDS score was 5. She was frequently disorientated and struggled to recall major relevant aspects of her life. Participant 2 was unable to recall names of familiar people such as family members or staff. She was disorientated to time and place and would often pack her belongings in her bag to go home. Participant 2 often indicated feelings of being unhappy and upset by throwing things around in her room. She often indicated that things did not belong to her in her room as she was disorientated to her environment.

4.2.1.2 Observations during intervention

It is the researcher's opinion that participant 2 was eager and willing to participate in the research intervention. She enjoyed the company of the therapy dog. Participant 2 enjoyed having the intervention sessions and displayed a happy demeanour whenever the researcher arrived with the therapy dog. Participant 2 was always eager to care for the therapy dog by providing him with snacks and water. Her actions with the therapy dog were appropriate. It is the researcher's opinion that she enjoyed the intervention sessions. Participant 2 was able to recall knowing the therapy dog when he arrived for intervention sessions.

4.2.3 Participant 3

This participant was a 76-year-old male who lived at the facility. He was diagnosed with dementia at the age of 73 and had been living in the care facility for approximately 4 months. His wife was still alive and was independent and still living in their home. His MMSE score was not determined as he was non-verbal and unable to follow instructions. His GDS score indicated severe dementia with a loss of verbal abilities and assistance required for all ADL and he was incontinent. Psychomotor skills such as walking were lost with generalised rigidity and developmental neurological reflexes seen in his movements (Reisberg *et al.*, 1982). Participant 3 was dependent on assistance to mobilise and required the use of a wheelchair. He needed support from two people to mobilise in and out of his bed/chair/commode.

4.2.3.1 Observations during intervention

Participant 3 required hand over hand guidance to interact with the therapy dog while seated or lying in his bed. Participant 3 did, however, display some interaction with the therapy dog and did not communicate any signs of discomfort during intervention sessions except for one session when he pushed the therapy dog's face away. This happened only once, and the intervention session was ended as this was a sign from the participant that he did not want to interact with the therapy dog further. He was able to hold dog treats (assisted by the therapist to take a hold of and hand over hand guidance for reaching towards the therapy dog) and was able to allow the therapy dog to take the dog treats from him. The participant also allowed the therapy dog to sit close to him.

4.2.4 Participant 4

Participant 4 was an 88-year-old widowed female diagnosed with dementia at the age of 86. She had been living in the care centre for approximately 2 months. Her MMSE score was unable to be determined as the participant is essentially non-verbal. Her GDS score confirmed all verbal abilities were lost with only unintelligible utterances and rare emergence of seemingly forgotten words. She was incontinent with reliance on assistance for toileting and feeding (Reisberg *et al.*, 1982). However, she did not present with a loss of psychomotor skills. Participant 4 was able to mobilise independently. She was able to engage physically with ADL with assistance. This included choosing the correct clothing for the weather and needing minimal assistance to get dressed. The participant was incontinent and needed assistance with meals. Participant 4 wandered around the facility for most of the day without a purpose. She did not sit down to have meals which meant staff followed her to feed her.

4.2.4.1 Observations during intervention

Although Participant 4 was a wanderer she participated well during intervention sessions. She preferred to engage for short bursts at a time, wander off and return to the researcher and dog. She was able to follow basic one step instructions to throw a ball for the therapy dog, to give him treats and to pet him. She also participated in grooming sessions with the therapy dog. During the intervention sessions Participant 4 verbalised by saying 'yes' when asked if she would like to throw the ball to the therapy dog by the researcher. This was a major event for the researcher as the participant

had never verbalised prior to this with the researcher. This indicated that the participant was interested in the therapy sessions and wanted to engage with the therapy dog. She would throw the ball multiple times for the dog to fetch, she engaged in grooming and giving treats.

This was observed after intervention sessions by the staff when Participant 4 would spend more time in the lounge area and less time in her bedroom. Staff reported that Participant 4 would go to other residents to observe what they were doing, indicating an interest in her social environment. Social isolation also showed improvement with less rejection of contact with others. This was observed when Participant 4 would return to the therapy dog and researcher. She would often walk away during the session after throwing the ball and giving the dog treats but would return after a few minutes to re-engage.

4.3 Quality of life

The assessment of QoL considered social care relationships, mood and comfort within the facility as well as participation in occupations.

4.3.1 Overall change on the QUALIDEM

Graphic representation of the overall change for the QUALIDEM for each participant is presented in Figure 4.1. The trend lines in the figures above indicate the overall trend for improvement or deterioration in QoL in the participants over the three phases baseline (A), intervention (B) and withdrawal (A) of the study. Only participant 1 showed improvement with participants 2, 3 and 4 showing varying decrease in QoL over the 15-week period. Both participants 2 and 4 had lower QoL scores at baseline (A) and over the period of the study with most scores below 10.

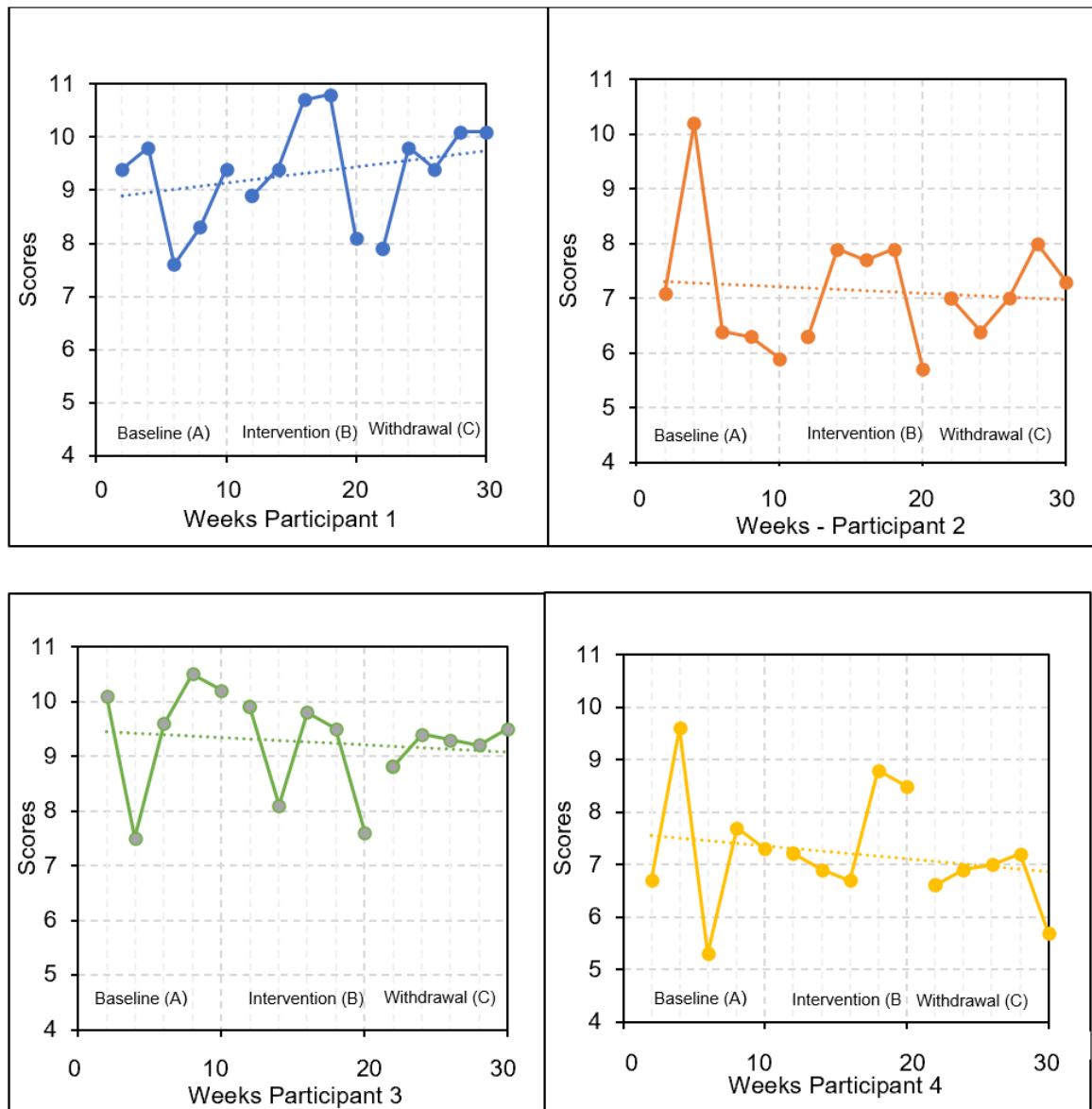


Figure 4.1 Participant overall QUALIDEM scores for baseline (A), intervention (B) and withdrawal (A) phases over 30 weeks

It can be seen that the participants scores varied greatly in the baseline phase indicating that their QoL scores changed from week to week even before the intervention started. Therefore, average scores in each phase were used in the analysis for the overall change within each phase of the study. Overall percentage change from baseline and withdrawal on the QUALIDEM for the baseline (A), intervention (B) and withdrawal (A) phases is indicated in Table 4.2.

Table 4.2 Overall change for the QUALIDEM for baseline (A), intervention (B) and withdrawal phases (A)

Participant	Change from baseline (A) to intervention (B)	Change from intervention (B) to withdrawal (A)	Overall change from baseline (A) to withdrawal (A)
1	7.4	0.4	7.8
2	-3.6	3.2	-0.6
3	-10.9	5.8	-5.1
4	6.5	-18.9	-12.4

For participant 1 between baseline (A) and intervention (B) improvement was found overall the scores indicated a positive 7.4% change overall. For the same participant there was a change from intervention (B) and withdrawal phase (A) indicating continued positive change of 0.4%. The results for participant 4 also showed a positive improvement from the baseline (A) to intervention (B) but this was not retained in the withdrawal (A) where a negative 18.9% deterioration was seen with the change from baseline (A) to withdrawal (A) being negative 12.4%.

Both participant 2 and participant 3 demonstrated deterioration of -3.6% and -10.9% from the baseline (A) to intervention (B). However, both participants had a positive 3.2% and 5.8% change from intervention (B) to withdrawal (A) although their scores from baseline (A) to withdrawal (A) showed deterioration of -0.6% and -5.1% respectively.

4.3.2 Indicators of change between phases for the QUALIDEM

In the tables below the change in each phase is considered separately with various statistics to determine if the improvement of deterioration in QoL was significant.

4.3.2.1 Baseline (A) to intervention (B) phases

Table 4.3 indicates the change between baseline (A) and intervention (B) phases for all four participants for the overall scores on the QUALIDEM.

Table 4.3 Indicators of change between the baseline (A) and intervention (B) phases for the QUALIDEM

Participant	Description	Mean Shift (%)	Celeration Line	Variability	Level (Ratio)	Overlap (%)	2 STD.DEV Band	ANOVA P value
1	Overall scores	7.4	1.1	0.5	1.05	76.0	NS	<0.05
2	Overall scores	-3.6	0.9	1.3	0.93	86.0	NS	>0.05
3	Overall scores	-10.9	0.7	0.7	1.03	88.0	NS	<0.05
4	Overall scores	6.5	1.1	1.1	1.01	88.0	NS	<0.05

The mean percentage shift confirmed the improvement or and deterioration reported in the overall scores for participants as described above. Participant 2 and 3 displayed deteriorations in QoL from baseline (A) to intervention (B) while participants 1 and 4 displayed improvement. These results also were confirmed by the celeration line which is also used to observe whether the participant has improved or not when comparing the baseline (A) to the intervention (B) phase. Participants 2 and 3 (50%), had a score < than 1 with a definite deterioration from baseline (A) to the intervention (B) phase.

The level ratio looked at the ratio between the last score baseline (A) which is divided by the first score in intervention (B). Across the participants, the score was greater than 1 for participants 1, 3 and 4 who had a lower first QUALIDEM score in intervention (B) than they had at the end of baseline (A) and thus did not experience a positive change after their first session with the dog.

The overlap is used to describe how much of the data from intervention (B) falls into the range of baseline (A). It was observed that there was greater than 75% for the overall results for participants 2, 3 and 4 only with participant 1 displaying a lower overlap as the improvement seen placed the intervention (B) scores outside the range of the baseline scores (A). This is related to the marked variation in scores in the two phases and confirms the variability value which was less for participants 1 and 3. These participants had the greatest overall change with less variation in their

QUALIDEM scores at baseline (A). The variation was further used in the form of 2 standard deviations and ANOVA to determine if change from baseline (A) to intervention (B) phase was significant.

The 2 standard deviations band test has a strict criterion and requires that two successive data points in the intervention (B) phase be 2 standard deviations greater than the mean for the baseline (A) mean. Thus, due to the small overall improvements found in the current study, the 2 standard deviation band test results displayed no significant outcomes in the overall score. Although the 2 standard deviations band test showed no significance the ANOVA which tested whether the difference in mean values at baseline (A) and intervention (B) indicated some significant change. A p-value of <0.05 was accepted as indicting a significant positive or negative change. Participant B displayed the only non-significant change when comparing baseline (A) to intervention (B) however participants 1 and 4 had a significant positive change between the baseline (A) to intervention (B) phase while participant 3 had a significant negative change in QoL.

4.3.2.2 Intervention(B) to withdrawal (A) phases

Table 4.4 indicates the change between intervention(B) to withdrawal (A) phases for all four participants. for the overall scores on the QUALIDEM.

Table 4.4 Indicators of change between the intervention(B) to withdrawal (A) phases for the QUALIDEM

Participant	Description	Mean Shift (%)	Celeration Line	Variability	Level (Ratio)	Overlap (%)	2 STD.DEV Band	ANOVA p value
1	Overall scores	0.4	1.0	0.8	1.3	72.0	NS	>0.05
2	Overall scores	3.2	1.1	0.3	0.8	80.0	NS	>0.05
3	Overall scores	5.8	1.1	0.2	0.8	92.0	NS	<0.05
4	Overall scores	-18.9	0.5	0.3	2.0	82.0	NS	<0.05

The mean percentage shift confirmed the improvement in the QoL of three out of the four overall scores with participants 1, 2 and 3 with participant 4 displaying a deterioration in QoL. These results also were confirmed by the celeration line which supports the results and for the three out of four participants indicated positive change with a score >1 with an improvement from intervention (B) to the withdrawal (A) phase.

The level ratio across two participants (2 and 3), with a score < 1 indicated the level increased from the intervention (B) to the withdrawal (A) phase (Figure 3.2) indicating carry over improving their QoL after the intervention was withdrawn.

The overlap was greater than 72% with participant 1 who presented with the lowest overlap in scores as the change seen placed the withdrawal (A) scores outside the range of the intervention scores (B). This is related to the marked variation in scores in the two phases and confirms the variability value which was greater for participants 2, 3 and 4 with greater overall change and less variation in QUALIDEM scores in intervention (B) phases than participant A. The variation was further analysed and due to the small overall improvements found in the current study, the 2 standard deviation test results displayed no significant outcomes in the overall score. The ANOVA indicated that when comparing intervention (B) to the withdrawal (A) phase participant 3 had a significant positive change between the intervention (B) and withdrawal (A) phase while participant 4 had a significant negative change.

4.3.3 Change between baseline (A), intervention (B) and withdrawal (A) phases for the subtests of the QUALIDEM

Graphic representation of the change in the subtests of the QUALIDEM for each participant between baseline (A) and intervention (B) as well as intervention (B) and withdrawal (A) is presented in Figures 4.2- 4.5.

4.3.3.1 Participant 1

Figure 4.2 indicates that participant 1 showed improvement for all subtests except occupation during the intervention phase between baseline (A), intervention (B). The subtest with the greatest improvement was care relationship and feeling at home. Negative affect also showed change during this phase. An increased score for negative affect indicated a decrease in anxious behaviour, low mood and crying

(Dichter *et al.*, 2016). Occupation which considers doing activities and chores on the ward showed the only deterioration for participant 1.

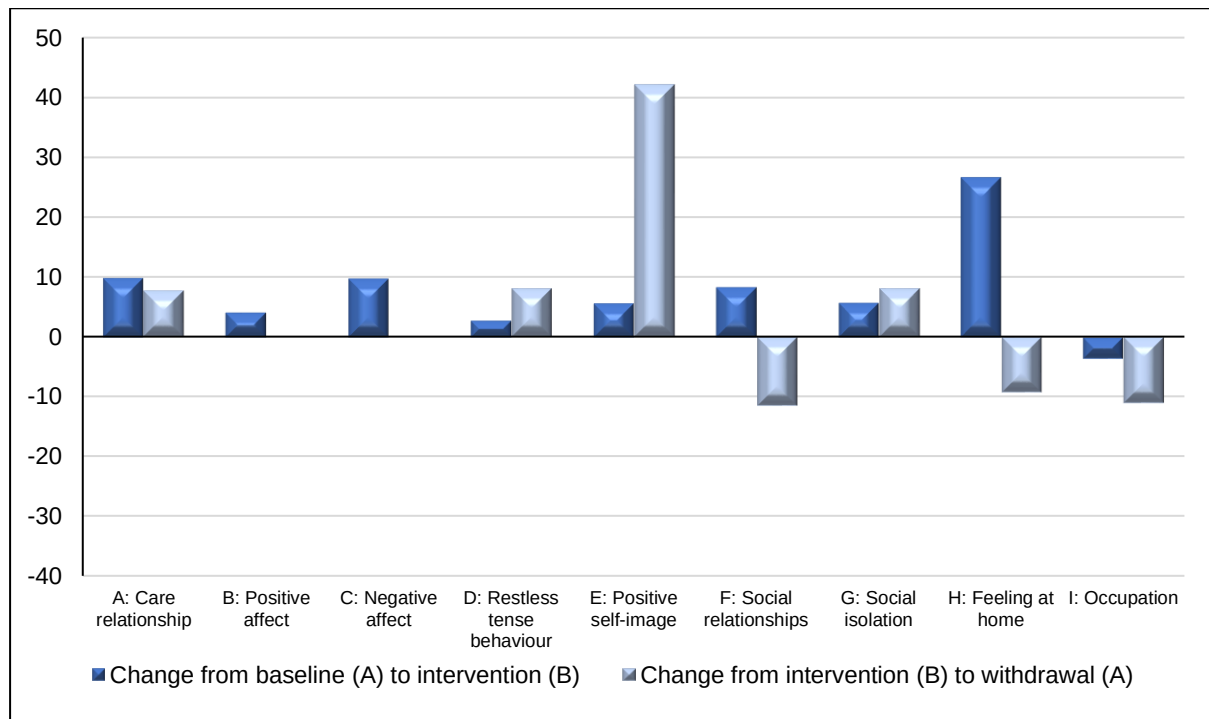


Figure 4.2 Change for the subtests of the QUALIDEM for baseline (A), intervention (B) and withdrawal phases (A) for Participant 1

Positive self-esteem care relationships and restless behaviour as well as social isolation increased from the intervention (B) to withdrawal (A), while social relationships, feeling at home decreased and there was a further decrease in occupation.

4.3.3.2 Participant 2

Participant 2 had an increase in positive affect and was more cheerful and smiling from baseline (A) to intervention (B). This was accompanied by a greater decrease in negative affect related to increased anxiety and crying as well as restless behaviour. This participant also had an increase of over 20% for occupation or involvement in activities. There was however a decrease in feeling at home with the participant indicating the need to leave the ward (Figure 4.3).

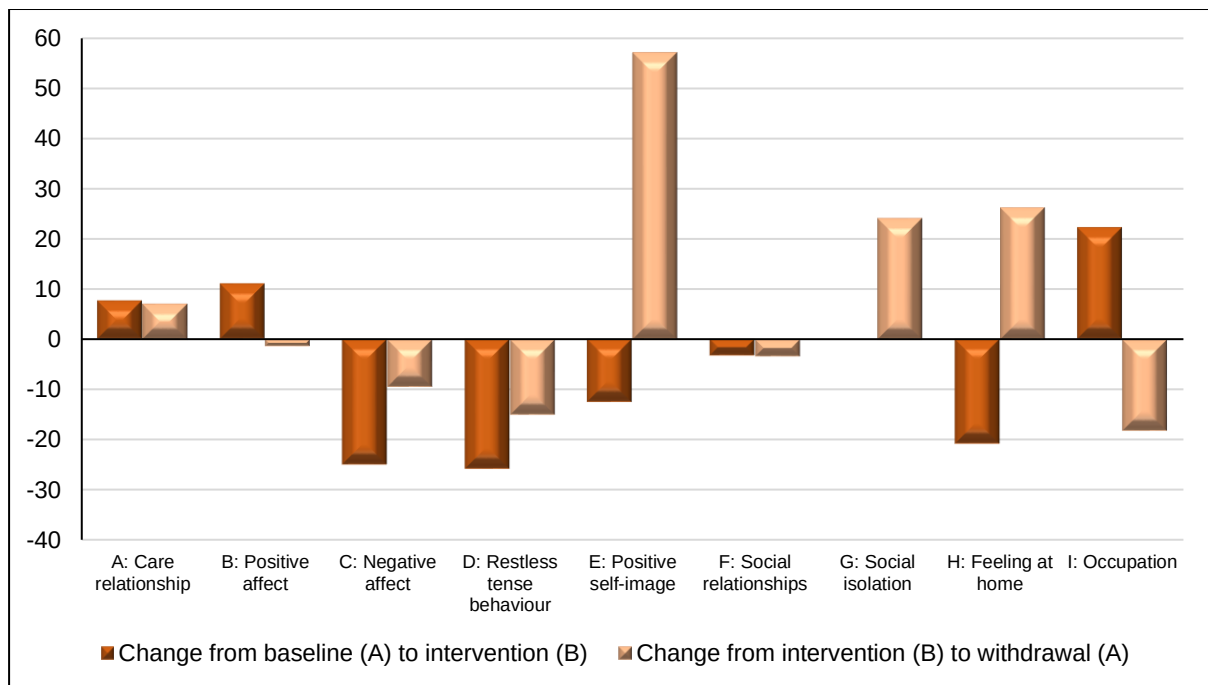


Figure 4.3 Change for the subtests of the QUALIDEM for baseline (A), intervention (B) and withdrawal phases (A) for Participant 2

From the intervention (B) to withdrawal (A) the deterioration which was seen in negative affect and restless behaviour decreased in the withdrawal phase but did not return to levels recorded at baseline (A), Occupation showed marked decrease in this phase with a marked improvement in positive self-esteem, feeling at home and social isolation.

4.3.3.3 Participant 3

For Participant 3 there was a marked deterioration in scores from baseline (A) to intervention (B) for positive affect, restless behaviour and social isolation. Occupation showed the greatest deterioration (Figure 4.4).

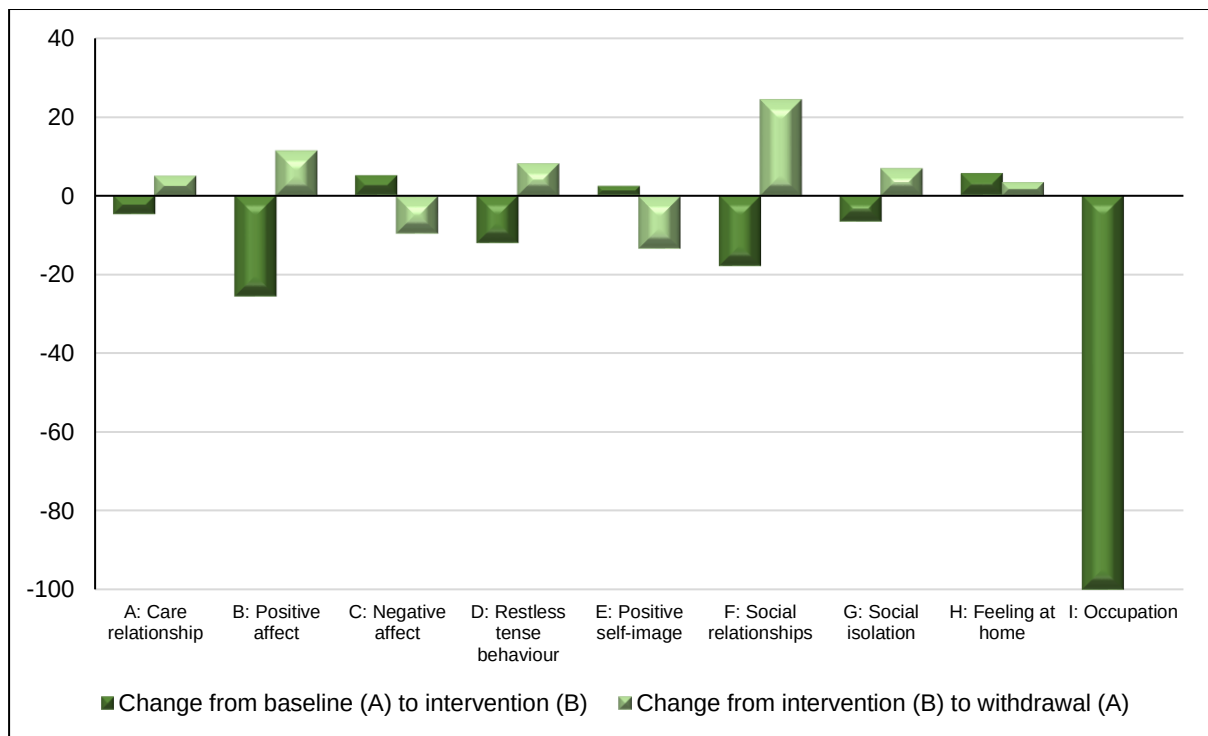


Figure 4.4 Change for the subtests of the QUALIDEM for baseline (A), intervention (B) and withdrawal phases (A) for Participant 3

Positive affect, social isolation, restless behaviour and social relationship showed improvement from the intervention (B) to withdrawal (A). There was a decrease in negative affect and positive self-image.

4.3.3.4 Participant 4

Participant 4 had an improvement in negative affect, positive self-esteem restless behaviour as well as social relationships and social isolation from baseline (A) to intervention (B). There was also an increase in occupation. All these subtests showed deterioration from the intervention (B) to withdrawal (A) except for social isolation. occupation, negative affect and restless behaviour showed the most deterioration in this phase (Figure 4.5).

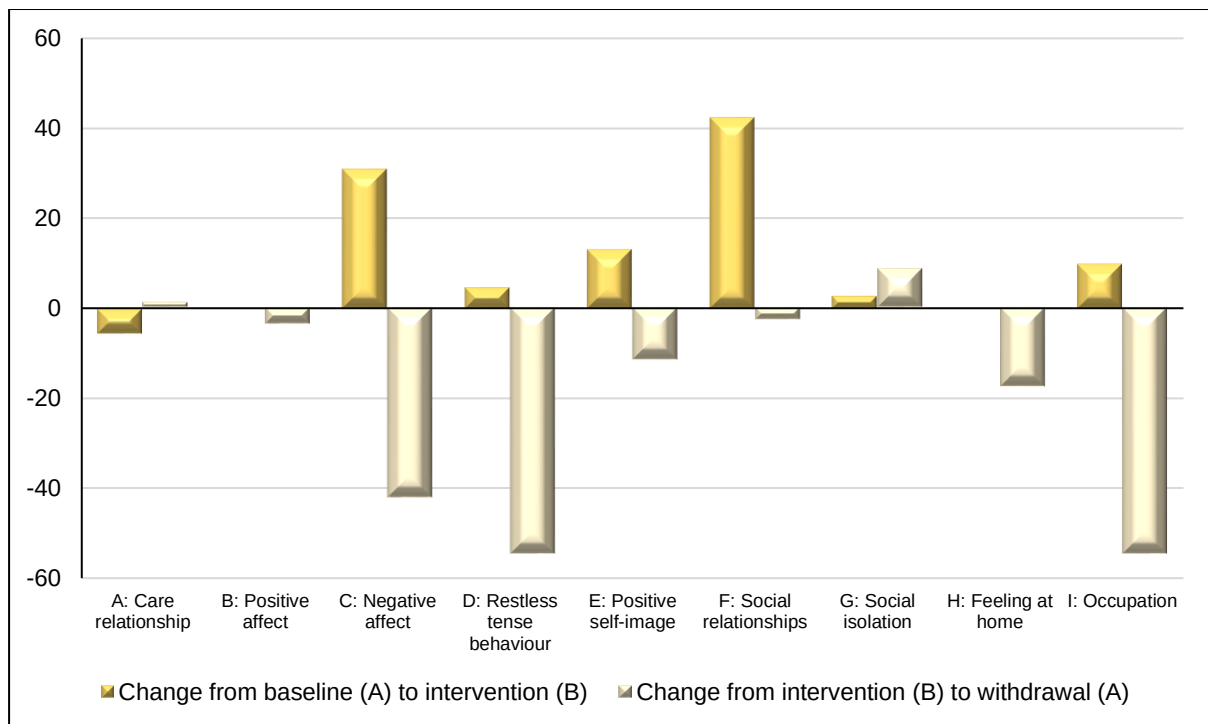


Figure 4.5 Change for the subtests of the QUALIDEM for baseline (A), intervention (B) and withdrawal phases (A) for Participant 4

4.4 Activities of daily Living

Basic and instrumental ADL are examined along with cognitive abilities such as initiation, planning, organization and task completion using the Disability Assessment for Dementia (DAD).

4.4.1 Overall change for ADL Scores on the Disability Assessment for Dementia

The Disability Assessment for Dementia (DAD) was used to determine the change in ADL for baseline (A), intervention (B) and withdrawal (A) phases. The trend lines in the figures above indicate improvement or deterioration in dementia in the participants over the three phases baseline (A), intervention (B) and withdrawal (A) of the study (Figure 4.6). None of the participants showed improvement over the three phases participants 1, 2, and 4 showing varying scores for dementia over the 15-week period. Both participants 3 and 4 had lower dementia scores at baseline (A) and over the period of the study with most scores below 3.

It can be seen that the participants scores varied greatly in the baseline phase indicating that their ADL participation changed from week to week even before the intervention started. Therefore, average scores in each phase were used in the analysis for the overall change within in each phase of the study.

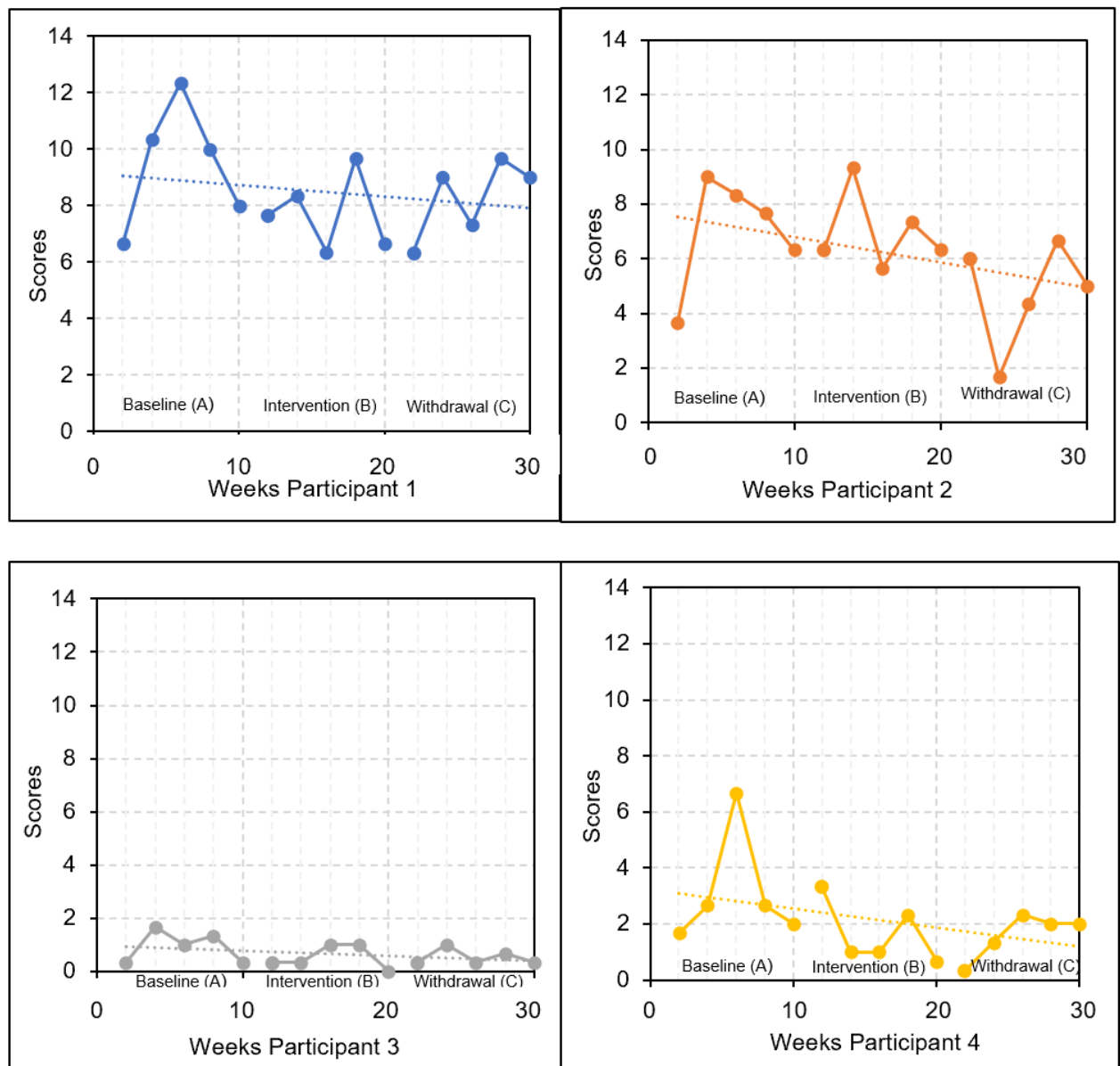


Figure 4.6 Participants overall DAD scores for baseline (A), intervention (B) and withdrawal (A) phases over 15 weeks

For participant 1 and 4 between baseline (A) and intervention (B) the greatest deterioration was found with overall the DAD scores which indicated a negative 12.8% and 11.6% change respectively. For the same participants there was a small change

from intervention (B) and withdrawal phase (A) with a positive change of 3.2% for participant 1 and a negative change of 0.7% for participant 4 (Table 4.5).

Table 4.5 Overall change for the Disability Assessment for Dementia for baseline (A), intervention (B) and withdrawal phases (A)

Participant	Change from baseline (A) to intervention (B)	Change from intervention (B) to withdrawal (A)	Change from baseline (A) to withdrawal (A)
1	-12.8	3.2	-9.6
2	-0.5	-16.2	-16.7
3	-2.7	0.0	-2.7
4	-11.6	-0.7	-12.1

4.4.2 Indicators of change between phase for the Disability Assessment for Dementia

The results for participant 2 showed little change from the baseline (A) to intervention (B) but this was not retained in the withdrawal (A) where a negative 16.2% deterioration was seen with the change from baseline (A) to withdrawal (A). Participant 3 demonstrated the least change overall with deterioration of -2.7% from the baseline (A) to intervention (B) and no change from intervention (B) to withdrawal (A).

In the tables below the change in each phase in the DAD is considered separately with various statistics to determine if the improvement or deterioration in dementia was significant.

4.4.2.1 Baseline (A) to intervention (B) phases

Table 4.6 indicates the change between baseline (A) and intervention (B) phases for all four participants for the total scores on the DAD.

All participants displayed deterioration in involvement in ADL assessed by the DAD from baseline (A) to intervention (B). These results also were confirmed by the deterioration line which is also used to observe whether the participant has improved or

not when comparing the baseline (A) to the intervention (B) phase. All participants had a score < 1 with a definite deterioration from baseline (A) to the intervention (B) phase.

Table 4.6 Indicators of change between the intervention(B) to withdrawal (A) phases for the Disability Assessment for Dementia

Participant	Description	Mean Shift (%)	Celeration Line	Variability	Level (Ratio)	Overlap (%)	2 STD.DEV Band	ANOVA p value
1	Total score	-12.8	0.7	1.1	1.1	75.6	NS	<0.05
2	Total score	-0.5	0.9	1.1	0	80	NS	>0.05
3	Total score	-2.7	0.8	0.6	0	93.3	NS	>0.05S
4	Total score	-11.6	0.7	1.1	0.97	66.6	NS	<0.05

The level ratio was greater than 1 for participants 1 who had a lower first DEM score in intervention (B) than they had at the end of baseline (A) and thus this participant did not experience a first positive session with the dog. For participants 2 and 3 the ratio score was 0 with no change on the DAD after their first session with the dog. Only participant 4 had a ratio score of less than one indication a positive change last score baseline (A) which is divided by the first score in intervention (B) (Figure 3.7).

The overlap was used to describe how much of the data from intervention (B) falls into the range of baseline (A). It was observed that there was greater than 75% for the overall results for participants 1, 2 and 3 only with participant 4 displaying a lower overlap as the change seen placed the intervention (B) scores outside the range of the baseline scores (A). This is related to the marked variation in scores in the two phases and confirms the variability value which was less for participant 3. This participant had less variation in their DAD scores at baseline (A).

The variation was further used in the form of 2 Standard deviations and ANOVA to determine if change from baseline (A) to intervention (B) phase was significant. Due to the small overall improvements found in the current study the 2 standard deviation test results displayed no significant outcomes in the overall score. The ANOVA tested whether the mean values at baseline (A) and intervention (B) are equal. Two participants (1 and 4) displayed a significant change when comparing baseline (A) to intervention (B).

4.4.2.2 Intervention(B) to withdrawal (A) phases

Table 4.7 indicates the change between intervention (B) to withdrawal (A) phases for all four participants for the total scores on the DAD.

Table 4.7 Indicators of change between the intervention(B) to withdrawal (A) phases for the Disability Assessment for Dementia

Participant	Description	Mean Shift (%)	Celeration Line	Variability	Level (Ratio)	Overlap (%)	2 STD.DEV Band	ANOVA p value
1	Total score	3.2	1.1	0.0	1.0	86.7	NS	>0.05
2	Total score	-16.2	0.7	-0.5	1.2	60.0	NS	<0.05
3	Total score	0.0	1.0	0.2	0.9	100.0	NS	>0.05
4	Total score	-0.7	0.9	0.1	1.0	100.0	NS	>0.05

The mean percentage shift confirmed the improvement in one out of the four overall scores with participants 2 and participant 4 displaying a deterioration in involvement in activities of daily life and participant 3 showing no change. These results also were confirmed by the celeration line which supports the results with two out of four participants having negative change with a score <1 from intervention (B) to the withdrawal (A) phase.

The level ratio looked at the ratio between the last DAD score intervention (B) and first score in withdrawal (A). Participants 1, 2 and 4 scores greater than 1 indicated the level decreased from the intervention (B) to the withdrawal (A) phase (Figure 4.6) indicating carry over improving their QoL after the intervention was withdrawn.

The overlap described how much of the data from withdrawal (A) falls into the range of intervention (B). It was observed that this was 60% with participant 2 who presented with the lowest overlap in scores. This is related to the marked variation in scores in the two phases and confirms the variability value which was similar for all participants since those with overall change had great variation in the DAD scores in intervention (B) phase. The variation was further analysed and due to the small overall improvements found in the current study the 2 standard deviation test results displayed no significant outcomes in the overall score. The ANOVA indicated that when

comparing intervention (B) to the withdrawal (A) phase only participant 2 had a significant negative change between the intervention (B) and withdrawal (A) phase.

4.4.3 Change in ADL between baseline (A), intervention (B) and withdrawal (A) phases for the subtests of the Disability Assessment for Dementia

Graphic representation of the change in the subtests of the DAD is presented in Figures 4.7-4.11.

4.4.3.1 Participant 1

Figure 4.7 indicates that participant 1 showed deterioration for all subscales during the intervention phase between baseline (A) and intervention (B). The subscales with the greatest deterioration were planning and organisation and effective performance while initiation also showed negative change during this phase.

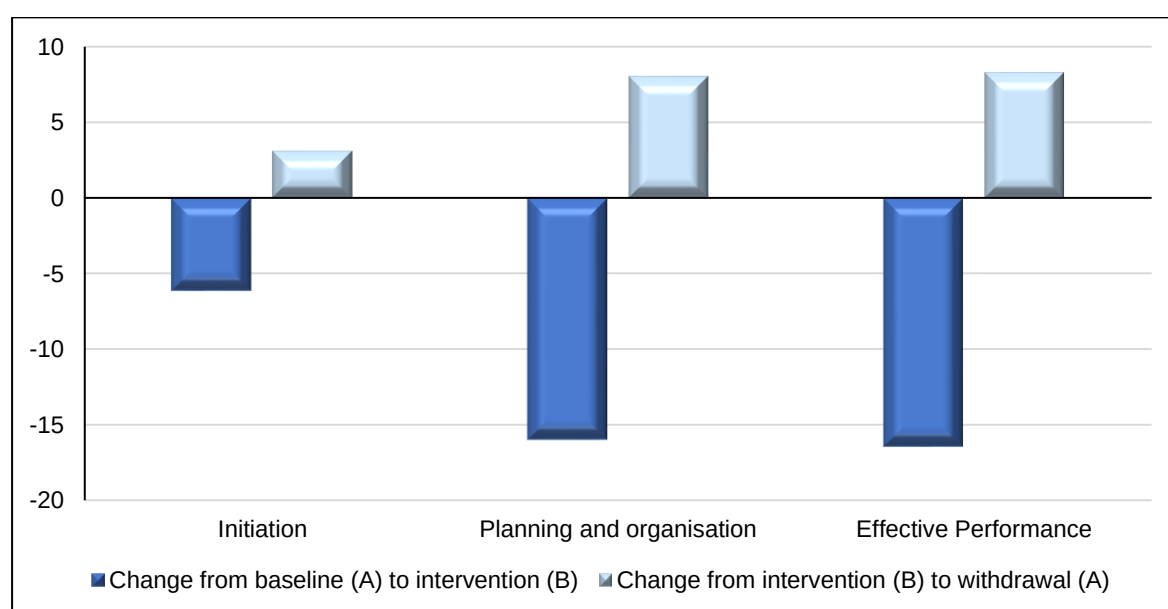


Figure 4.7 Change for the subtests of the Disability Assessment for Dementia for baseline (A), intervention (B) and withdrawal phases (A) for Participant 1

The scores for all the subscale's showed positive change from the intervention (B) to withdrawal (A) but this change was less than the negative change seen in between baseline (A) and intervention (B).

4.4.3.2 Participant 2

Although Participant 2 had an increase in initiation from baseline (A) to intervention (B) this was accompanied by a decrease in planning and organisation (Figure 4.8).

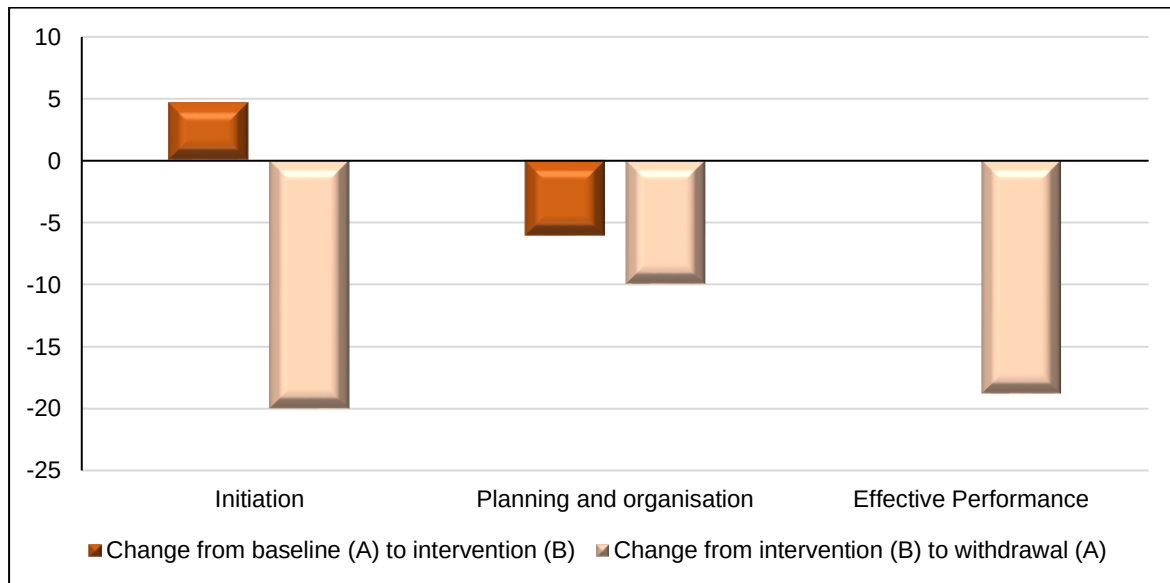


Figure 4.8 Change for the subtests of the Disability Assessment for Dementia for baseline (A), intervention (B) and withdrawal phases (A) for Participant 2

From the intervention (B) to withdrawal (A) the deterioration was seen in initiation and effective performance with a small further decrease in planning and organisation.

4.4.3.3 Participant 3

Figure 4.9 indicates participant 3 had a marked deterioration in scores for initiation and effective performance from baseline (A) to intervention (B). No other change was seen in this phase or from the intervention (B) to withdrawal (A).

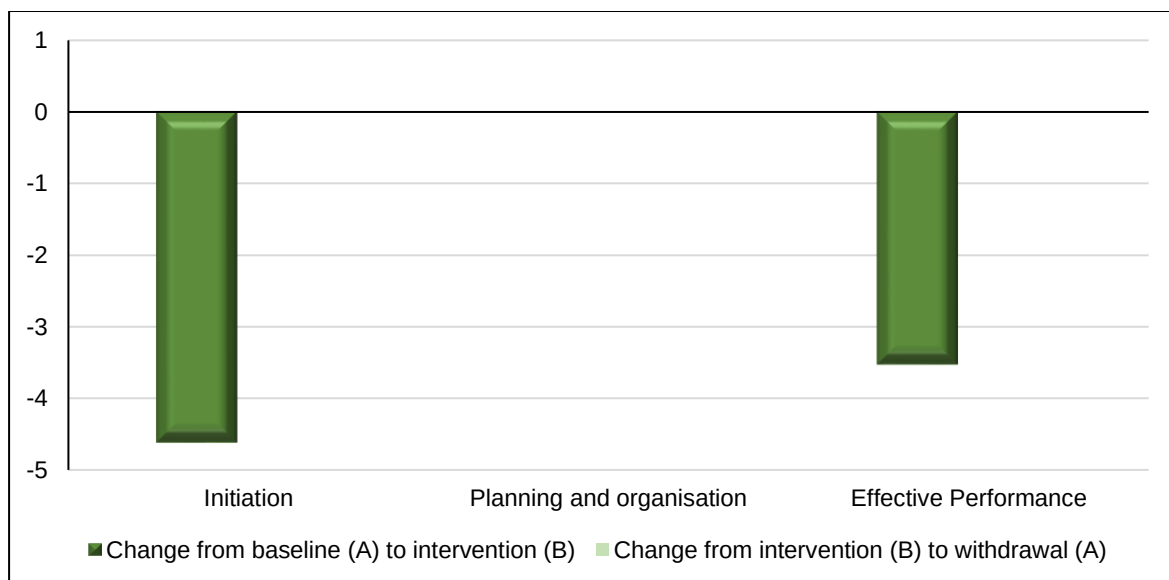


Figure 4.9 Change for the subtests of the Disability Assessment for Dementia for baseline (A), intervention (B) and withdrawal phases (A) for Participant 3

4.4.3.4 Participant 4

Participant 4 had a greater deterioration in initiation with less deterioration for planning and organisation and the least deterioration for effective performance from baseline (A) to intervention (B) (Figure 4.10).

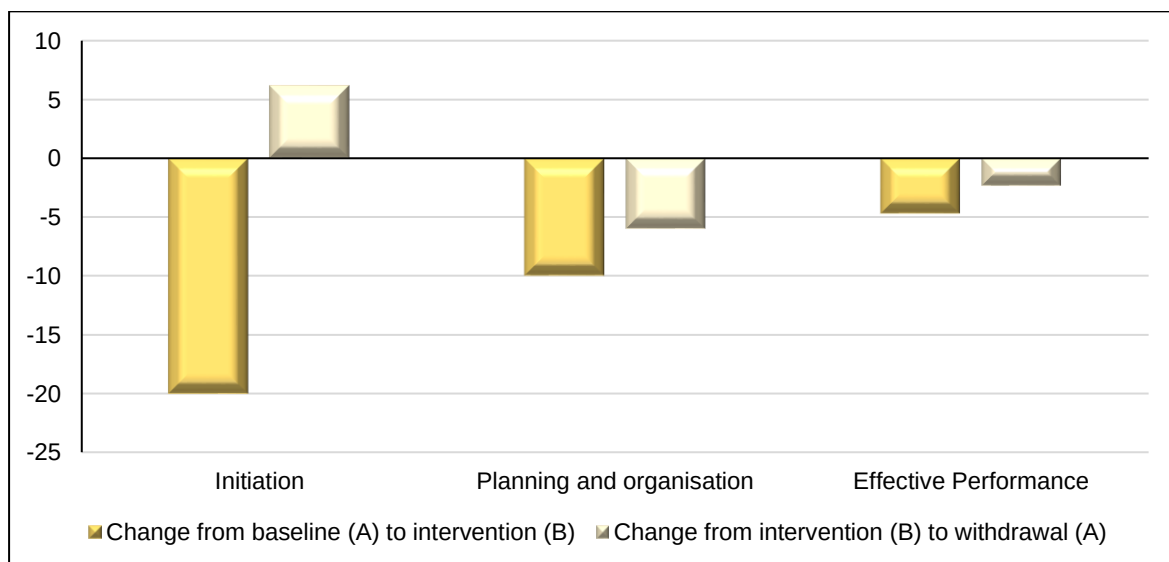


Figure 4.10 Change for the subtests of the Disability Assessment for Dementia for baseline (A), intervention (B) and withdrawal phases (A) for Participant 4

There was an increase in the scores for initiation with further deterioration for planning and organisation and effective performance from the intervention (B) to withdrawal (A)

4.5 Summary

The QUALIDEM scores for the participants ranged from 5.5-10.5 with greater variation seen in the scores of participants 2 and 4. There was a greater difference in the DAD scores with Participant 1 having an average score of 8 for engagement in basic and instrumental activities in daily activities and Participant 3 the lowest score at 1.

While two participants (1 and 4) had significant positive changes in QoL during ATT intervention the change was only positive at withdrawal for one participant with the other found to have significant decrease in QUALIDEM scores. Both these participants had a significant decrease in DAD scores indicating lower scores for initiation, planning and effective performance in basic and instrumental activities in daily activities during the intervention phase with a small non-significant increase and a small non-significant decrease for DAD scores during the withdrawal phase for Participant 1 and 4 respectively. The null hypothesis was rejected for QoL but not participation in ADL for Participants 1 and 4.

For the other two participants (2 and 3) the ATT intervention resulted in negative change in QoL on the QUALIDEM scores which was significant for participant 3. The change in QoL was positive for both participants at withdrawal with Participant 3 found to have significant increase in QUALIDEM scores. Both these participants had a very small decrease in DAD scores indicating they maintained their level of initiation, planning and effective performance in basic and instrumental activities in daily activities during the intervention phase with a significant decrease and no change for DAD scores during the withdrawal phase for Participant 2 and 3 respectively. The null hypothesis was accepted for QoL but not participation in ADL for Participants 2 and 3.

Participant 1

In summary Participant 1 had positive change in both the intervention and withdrawal phase for QoL. Although her scores were not positive after the first encounter with the dog, she had significant improvement in QUALIDEM scores during the intervention phase. Improvement was seen in all but one subtest on the QUALIDEM during intervention except occupation with a decline in social relationships, feeling at home

and occupations in the withdrawal phase. However, in line with a decrease in occupations her scores on the DAD initiation, planning and organisation decreased significantly during the intervention phase. During the AAT intervention phase a significant positive increase in the participant's QoL was seen but basic and instrumental activities in daily activities assessed on the DAD declined during this period. There was weak positive carry over for QoL improvement into the withdrawal phase where a small improvement in basic and instrumental activities in daily activities was recorded contrary to the decrease in occupation on the QUALIDEM.

Participant 2

In summary Participant 2 had negative change in the intervention phase and some positive change in the withdrawal phase for QoL. Although her scores were positive after the first encounter with the dog, she had a non-significant decrease in QUALIDEM scores during the intervention phase. Deterioration was seen in all but three subtests on the QUALIDEM during intervention with an increase in social isolation, feeling at home and self-image in the withdrawal phase. The improvement in occupation on the QUALIDEM was reflected in her initiation score on the DAD during the intervention phase. In the withdrawal phase a significant decrease in basic and instrumental activities in daily activities assessed on the DAD was found. During the AAT intervention phase a non-significant decrease for both QoL and involvement in activities of daily life was found. There was weak positive carry over of QoL improvement into the withdrawal phase where a significant decrease in basic and instrumental activities in daily activities was recorded in line with the decrease in occupation on the QUALIDEM.

Participant 3

In summary Participant 3 had negative change in the intervention and positive change in the withdrawal phase for QoL. His scores were not positive after the first encounter with the dog, and he had a significant decline in QUALIDEM scores during the intervention phase. Decrease in scores was seen on the QUALIDEM subtests particularly for occupation, positive affect and social relationships during intervention with little improvement except for social relationships and positive affect in the withdrawal phase. However, in line with a decrease in occupations his scores on the DAD initiation and performance decreased significantly during the intervention phase.

During the AAT intervention phase a significant decrease for QoL and a non-significant decrease in involvement in activities of daily life assessed on the DAD was found. There was a significant positive increase for QoL into the withdrawal phase, with no change in basic and instrumental activities in daily activities are in line with no change in occupation on the QUALIDEM.

Participant 4

In summary Participant 4 had a significant positive change for QoL in the intervention phase and a significant decrease for QoL during the withdrawal phase. Although her scores were not positive after the first encounter with the dog, she had significant improvement in QUALIDEM scores during the intervention phase. Improvement was seen in on the QUALIDEM during intervention for negative effect, self image, social relationships and occupation while all subtests except social isolation decreased in the withdrawal phase. These findings were not reflected in her scores on the DAD scores for initiation, planning and organisation decreased significantly during the intervention phase with a small insignificant decrease during the withdrawal phase where initiation increased.

While the AAT had a positive effect on the participant's QoL particularly during the intervention phase basic and instrumental activities in daily activities assessed on the DAD declined during this period. There was no carry over for QoL with a decrease into the withdrawal phase where a small decrease in basic and instrumental activities in daily activities was recorded in line with the decrease in occupation on the QUALIDEM.

CHAPTER 5: DISCUSSION

5.1 Introduction

A single subject research design was used to determine the effects of AAT on QoL and participation in ADL of person's living with dementia in an assisted care facility in Pretoria. This chapter discusses the results for each participant individually as they presented with different results for the QUALIDEM and DAD. Each participant responded differently, and literature is used to reflect on possible reasons for differences in results.

5.2 Demographics

As indicated in Chapter 4, four participants between 70 years and 88 years took part in the study, which is in the expected age range for dementia of 68-84 years (Jalbert, Daiello and Lapane, 2008; Yakimicki *et al.*, 2019). Three participants were female, and one participant was male with the higher number of females with dementia supported by Wolters *et al.* (2020) who found all cohorts in their 27-year analysis of patients with dementia comprised more women than men, with a mean relative frequency of 59%.

The participants recruited for the study presented with moderate to severe cognitive dysfunction as indicated on results of their Mini-Mental State Examination (MMSE) and Global Deterioration Scale (GDS) scores. Participants 3 and 4 were unable to complete a MMSE which was confirmed by their GDS score indicating very severe cognitive decline or severe dementia with loss of verbal abilities, incontinence, need for assistance in basic ADLs and loss of basic psychomotor skills. Participants 1 and 2 were higher functioning with MMSE scores indicating moderate cognitive impairment (Vertesi *et al.*, 2001). The range of the MMSE scores in this study were similar to those reported by Sellers (2006) in her single subject study on the effect of AAT agitated behaviours in dementia. The participants GDS scores of 5 indicated they required assistance, were unable to recall major relevant aspects of their lives, were often disorientated and required no assistance for basic ADL but do require assistance with IADL (Reisberg *et al.*, 1982).

5.3 The effect of Animal Assisted Therapy

The objectives of the study were to determine the effect of AAT on the QoL and on the participation in ADL of persons with dementia living in a private retirement assisted care facility. The results for QoL and on the participation in ADL differed so each construct will be discussed separately. As with other studies on AAT in assisted care facilities with older adults which reported non-significant or inconsistent results (Velde, Cipriani and Fisher, 2005) this study yielded mixed results which will also be considered in this discussion.

A confounding variable in this study was the variation in baseline scores and scores during the intervention and withdrawal phases which made it difficult to see a clearly defined improvement or decrease in QoL and participation in ADL for the participants. This variation in daily behaviour of the participants which was assessed in relation to these variables can be expected in people with dementia (Rockwood *et al.*, 2014). Changes in global cognition, interest in and initiation of activities, memory, agitation, and other disruptive behaviours are reported to differ. Thus, a trend line across this variation was used to indicate overall improvement or decrease in QoL and on the participation in ADL.

Limited research has been found that directly links the effects of AAT on the participation in ADL but Cipher and Clifford (2004) reported that independence in functioning may be considered to be the best indicator of QoL. However, there was little agreement between QoL assessed by the QUALIDEM and ADL assessed by the DAD in the current study where participants QoL scores increased, and their ADL scores decreased. This may have been due in part to the mismatch in the standardised questions used since although the QULIDEM had two occupation questions they considered enjoyment in activities and initiating activities. The DAD on the other hand considers some initiation but also scores planning and effective performance of very specific ADL activities to assess the level of dementia. The assessments may thus be measuring different constructs.

5.3.1 The effect of Animal Assisted Therapy on Quality of Life.

In this study only one participant had an increase in overall QoL, the other three participants had a maintenance or small decrease in overall QoL from visual analysis in Figure 4.2. This reflects the results for QoL reported in a Cochrane review by Lai *et*

al. (2019) there were no clear difference in the QoL of people with dementia receiving AAT and control groups. They stated the low-certainty evidence for AAT means QoL results could go in either direction - positive or negative (Olsen *et al.*, 2016). Olsen *et al.* (2016) have suggested very small changes with the improvement of QoL was 0.31 points on the QUALID after AAT. She did not indicate if some participants had a decrease in QoL scores. Although Nordgren and Engström (2014a) did report a significant increase in overall QoL in their study none of the subtests on the QUALIDEM showed a significant difference due to the AAT intervention.

Other studies have reported the intervention with AAT was beneficial with some indicating significant improvement in behaviour including agitation, affect or mood, and social participation in care relationships and peer relationships (Baek, Lee and Sohng, 2020; Friedmann *et al.*, 2015; Kanamori *et al.*, 2001; Nordgren and Engström, 2014a Sellers, 2006).

The QUALIDEM used in the current study measured overall QoL but had subtests which allowed for the evaluation of affect, restless behaviour, social participation, feeling at home and participation in constructive activity. Therefore as in the current study it was important to establish significant change for overall QoL and to also analyse the subtests on the QoL assessments. Although this could only be done using visual analysis of graphs it allowed comparison to other studies which have considered the components of QoL like behaviour or mood or social participation as separate outcomes. This allowed a description for each participant of the various components of QoL where improvement and deterioration occurred to be considered specifically for each participant in the context.

The results for overall QoL did increase for two participants (1 and 4) during the intervention period while for the other two participants' (2 and 3) QoL decreased. Therefore, the discussion will consider the participants with improved QoL separately from those who experienced a decrease in QoL. The effect of AAT for each participant is discussed below in terms of their change in behaviour related to their care relationship, affect and social interaction as well as engagement in occupation in long-term care.

5.3.1.1 Participants experiencing overall improvement in Quality of Life in the intervention phase

Of the two participants who were found to have higher scores for QoL during the intervention phase of the study one (Participant 1) had moderate cognitive dysfunction while the other (Participant 4) had severe cognitive dysfunction as indicated on results of their MMSE and GDS scores.

5.3.1.1.1 Participant 1

The participant's initial score after her first encounter with the dog showed some deterioration. Overall participant 1 had the most positive and a significant improvement outcome from the intervention. She had a significant overall improvement in QoL on the QUALIDEM from the baseline to intervention phases. This improvement supports findings of other studies with a positive response to the dog used in AAT (Nordgren, Engström and Engstro, 2012; Nordgren and Engström, 2014a; Olsen *et al.*, 2019). Participant 1 had an improvement on all subtests on the QUALIDEM with the exception of occupation

Social relationships with staff and others improved (Filan and Llewellyn-Jones, 2006; Yakimicki *et al.*, 2019). Even though she engaged in all AAT intervention activities she was more interested in conversing with the researcher. She would have discussions about the dog with the staff after the intervention sessions. She would often show other residents that the dog is visiting and encourage interactions with the dog. Staff would often report to the researcher that she would engage more with others after intervention sessions leading to feeling less isolated as reported in another residential care study (Richeson, 2003). She was less socially isolated and accepted other residents and was accepted by them. This confirmed the findings of (Firmin *et al.*, 2016), who found increased social interaction between nursing home residents after the introduction of AAT with a dog.

In terms of affect, the findings for this participant with more positive, and less sad or negative affect supports the reported effect of AAT in dementia (Yakimicki *et al.*, 2019). A reduction in agitation and aggression was reported for her behaviour as she was less angry and had less conflicts with the staff (Baek, Lee and Sohng, 2020; Richeson, 2003; Sellers, 2006).

The greatest change for Participant 1 was the increase in the score for feeling more at home indicating she was feeling more comfortable in the ward. This may have contributed to her scores for occupation she then helped with fewer chores on the ward and needed help from others to find things to do (Dichter *et al.*, 2016).

The larger positive significant improvement for Participant 1 on the QUALIDEM from the intervention carried over to a small non-significant improvement in the withdrawal phases. This finding reflects that reported by Nordgren and Engström (2014b) where some improvement of QoL continued to improve beyond the end of intervention period.

The further improvements in care relationships with staff as she continued to accept their help without conflict as well as in social isolation was reported as she no longer openly rejected contact with others (Firmin *et al.*, 2016). However, the withdrawal of the intervention did result in less social contact with others as well as increase comfort in the ward. The presence of the dog appears to have facilitated conversation and interactions with others as well as feeling comfortable in the ward for this participant which decreased when removed. This participant may have benefited from further AAT sessions to maintain social relationships.

Affect remained unchanged but a further improvement in restless agitated behaviour was found during the withdrawal phase. The greatest increase was seen in positive self-image for Participant 1 as also discussed by Konstantinos *et al.* (2019) who reported increased self-confidence and less dependency in patients after AAT intervention. However, although she indicated she would like to help and she no longer felt she could not do things this did not translate to improved occupational participation scores.

5.3.1.1.2 Participant 4

An improvement in all QoL subtests was found for this participant except care relationships during the intervention with a significant overall improvement in overall QoL.

During the baseline to intervention phase Participant 4 had a deterioration in care relationships as she resisted assistance with self-care from staff. Although this has not been reported in other studies, in this case the finding may have been associated with an improvement in negative affect which may reflect fewer depressive symptoms. She

cried less and was sad and anxious less often, a finding which supports moderate evidence reported in the Cochrane review by Lai *et al.* (2019) and significant change indicated by other authors including Richeson (2003) and Friedmann *et al.* (2015).

Although she experienced an increase in her restless behaviour, she was more at ease in the company of others which meant she did show an interest in her social environment (Firmin *et al.*, 2016; Yakimicki *et al.*, 2019). Participant 4 also verbalised for the first time saying “yes” in response to a question for the researcher when asked if she wanted to throw the ball to the dog. While one other study did mention the effect of AAT on improving verbalisation this was with a stroke patient (Adams, 1997) but verbalisation in nonverbal patients may have been covered in communication in other dementia studies. The improvement in social relationships as result of AAT also resulted slightly less social isolation although this was impacted by her nonverbal state (Firmin *et al.*, 2016; Yakimicki *et al.*, 2019).

This finding was accompanied by a more positive self-image, and she was able to do some things she had not been doing. An indication of this was the participant’s engagement with the dog during therapy sessions which Konstantinos *et al.* (2019) indicates stimulates motivation impacting on self-care. This was observed after intervention sessions by the staff when Participant 4 would spend more time in the lounge area and less time in her bedroom. Staff reported that Participant 4 would go to other residents to observe what they were doing, indicating an interest in her social environment. Social isolation also showed improvement with less rejection of contact with others. This was observed when Participant 4 would return to the therapy dog and researcher. She would often walk away during the session after throwing the ball and giving the dog treats but would return after a few minutes to re-engage.

Occupation showed an improvement as well as she attempted to assist with self-care and chores in the ward and wanted less help. Staff reported this was evident in that Participant 4 engaged in activities such as putting out plates with support for mealtimes or wanting to pack away items in her cupboard. An improvement in these activities has been supported by Friedmann *et al.* (2015) who found a significant decrease in depressive symptoms with an increase in the ADL measured on the Barthel Index over three months of intensive AAT intervention.

No carryover of the improvement seen during the AAT intervention to the withdrawal phase was seen for Participant 4. With the exception of social isolation, all subtests had a deterioration which is supported by a study by Aarskog, Hunskaar and Bruvik, (2019) that looked at AAI with dogs and robotic animals for residents with dementia in nursing homes. Therefore Participant 4 had the potential to benefit from further AAT sessions.

5.3.1.1.3 Summary

The positive effect of AAT on QoL as well as affect, behaviour, and social relationships and social isolation reported for Participant 1 and Participant 4 are supported by evidence from the literature (Lai *et al.*, 2019). Although significant positive change was found for both participants in the intervention phase, carry over of positive continued change was only seen for Participant 1 (Aarskog, Hunskaar and Bruvik, 2019; Nordgren and Engström, 2014b). This may have been due to her moderate cognitive dysfunction and length of stay in an assisted care facility who had been in care for 12 months and may have been more institutionalised than Participant 4 as discussed by Andersen *et al.*, (2004).

Both participants, however had positive changes for social relationships during the intervention phase which were not retained in the withdrawal phase for the nonverbal Participant 4. However, social isolation changes were carried over in the withdrawal phase confirming as suggested by Friedmann *et al.* (2015) that nursing home residents experienced less loneliness as a result of AAT indicating contact with the animals provided the trigger for decrease in disengagement from others (Konstantinos *et al.*, 2019). In this case improvement in being accepted by others and not rejecting others related to isolation were carried over.

Factors which may have supported the greater change for negative affect in Participant 4 as suggested by Olsen *et al.* (2016) may have had a stronger affinity for animals which could result in AAT being effective since the activity was meaningful to her, while for Participant 1 it was conversation around the animal rather than a great affinity for the dog (Velde 2005). The individual attention from the researcher during the intervention period also played a role in her case as this provided the participant with meaningful activity to engage in.

5.3.1.2 Participants experiencing overall decrease in QoL in the intervention phase

Of the two participants who were found to have lower scores for QoL during the intervention phase of the study, one (Participant 2) had moderate cognitive dysfunction while the other (Participant 3) had severe cognitive dysfunction as indicated on results of their MMSE and GDS scores. Both of these participants had a decrease in QoL scores during the AAT intervention indicating, as suggested by Yakimicki *et al.* (2019) that AAT is not always effective in addressing affect and behaviour and improving QoL in people with dementia.

5.3.1.2.1 Participant 2

Participant 2 had a lower QoL score at the baseline compared with the other participants and the results for the other phases was impacted by the very large variation in her baseline scores. While her scores had a non-significant decrease in the intervention phase related to negative affect and disruptive behaviour.

Her QoL for some subtests did show improvement in care relationships, allowing the nurses to help her, and less conflict with the nurses once she had provided care to the dog (Konstantinos *et al.*, 2019).

Positive affect improved with her mood being influenced in a positive way during the intervention as she was excited when the therapy dog and researcher arrived for each session and would often help during intervention sessions. She enjoyed taking him for walks, grooming him and playing with him. When Participant 2 had improved mood after intervention and staff often reported that was then often observed trying to help staff members or other residents throughout the day which was scored as an increase in occupation (Friedmann *et al.*, 2015; Konstantinos *et al.*, 2019).

However, her increase in negative affect with more depressive symptoms including being sad and crying increased to a greater extent between sessions affecting her overall QoL. Participant 2 showed a decrease in social relationships due to her negative affect and increased restless behaviour overall.

This participant had the highest cognitive function and as suggested by Konstantinos *et al.*, (2019) the memories stimulated by the AAT may have made her more acutely aware of her situation in residential care. In terms of behaviour, she already expressed

being bored and packed her bags to go home, a behaviour that increased during the intervention phase Participant 2. She no longer felt at home with a need to leave the ward (Gammonley and Yates, 1991). The AAT sessions and her affinity for the dog may have increased memories of previous residences and pets perhaps making her more aware of her lack of freedom (Klapwijk *et al.*, 2016).

When AAT was withdrawn the greatest improvement as for Participant 1 who also had moderate dysfunction occurred in self-image although she did not continue to help others and her occupation decreased (Konstantinos *et al.*, 2019). However, during the withdrawal phase there was further deterioration in negative affect and disruptive behaviour with a decrease in positive affect which was supported as occurring in most studies by Aarskog, Hunskår and Bruvik, (2019) after withdrawal of AAT.

She did however revert being more comfortable in the ward and there was an improvement in social isolation in being accepted by others and not rejecting others in the environment (Gammonley and Yates, 1991). These changes at withdrawal are not supported by literature which shows a decrease in most components of QoL at this stage in the intervention. For participant 2, the withdrawal stage resulted in some baseline behaviour returning once the intervention was complete indicating overall the intervention sessions may not have been effective for her. However, her positive affect when the dog was present indicates she may benefit from a pet being constantly available for care in the facility.

5.3.1.2.2 Participant 3

Participant 3, despite being the most severely affected participant in terms of dependence and mobility, was reported to have a higher QoL and he presented with a positive affect and more social abilities at baseline than Participant 2 and 4. During the period of AAT intervention Participant 3 had a significant decrease in QoL and deterioration for all subtests on the QUALIDEM except for a very small increase in negative affect, self-image and feeling at home indicating he was more comfortable in the ward and less likely to feel locked up (Gammonley and Yates, 1991).

Care relationships were affected by the marked decrease in positive affect of Participant 3 who also had an increase in restless behaviour. This score overshadowed any improvement in other areas as this behaviour, where he no longer smiled and was cheerful and appeared contented, resulted in reduced social

relationships and more isolation. Thus, AAT appeared to have a negative effect on this participant's behaviour during the intervention phase as reported for two other studies by Yakimicki *et al.* (2019). The passive interaction with the dog confirming his inability to do any activities may have had an impact as he had little control in the sessions. Other studies have not reported on this aspect.

He also stopped assisting with care activities which was confirmed by his 100-point decrease in occupation indicating he needed maximum assistance with all activities (Gélinas, Gauthier and McIntyre, 1999).

Although the deterioration reported may have been congruent with his severe dementia, during intervention of withdrawal Participant 3 had a significant improvement in QoL. This did not reach baseline levels but he was reported to be feeling even more at home contrary to the suggestion by Gammonley and Yates (1991) that the presence of animals is needed to achieve this. Staff reported that participant 3 was less resistant to support and accepted their help which to them, indicated that participant 3 felt more comfortable and at ease with staff and the staff felt like they were better able to care for the participant. Feedback was that participant 3 responded positively when approached by indicated being more cheerful, being in a good mood and smiling (Dichter *et al.*, 2016).

It is not clear if the AAT intervention did cause more restless behaviour and less positive mood in this participant. This participant had the greatest decrease in QoL out of all the participants which improved significantly in terms of care relationships, affect and social relations and isolation at withdrawal. No other study supports these findings. This change may have been associated with his severe dysfunction and the effects of the therapy not occurring in the 10 weeks of intervention or the lack of suitability of AAT for this participant.

5.3.1.2.3 Summary

Significant negative change was found for Participant 3 in the intervention phase which may be attributed to his severe dysfunction and the possibility that AAT had a negative effect for him during this phase. While Participant 2 also had a deterioration in QoL and deterioration in the intervention phase for behaviour, self-image and social relationships, improvements in positive affect and engagement in occupation impacted her care relationships positively. These results indicate a limited effect of AAT for some

patients, either in the form it was offered in the study or when patients cannot activity control their participation (Baek, Lee and Sohng, 2020).

The significant improvement in the withdrawal phase for Participant 3 appear to be affect and social relationships while for Participant 2 they were related to self-image, social isolation and comfort on the ward. The AAT may have made these participants more aware of their loss of independence and situation in terms of restrictions in an assisted care facility as suggested by Ettema *et al.* (2007). This may also have been impacted by Participant 3's inability to interact with the dog without assistance. As indicated by Firmin *et al.* (2016) differences in the severity of dementia was not related to an increase or decrease in QoL during AAT intervention.

5.3.2 The effect of AAT on participation in activities of daily living

The visual analysis of the results of the DAD in Figure 4.6 indicate that all the participants had a decrease in participation in ADL over the 30-week study. Since the DAD measures executive functions such as initiates and plans/organises this assessment did include cognitive aspects. The results appear to indicate that there are no clear certainty of the benefits of cognitive functioning or ADL from AAT (Lai *et al.*, 2019). Baek, Lee and Sohng (2020) and Friedmann *et al.*, 2015 found significant increase in ADL performance in their studies on AAT intervention in dementia.

No other studies report detailed information on which aspects of ADL changed after AAT, although most studies report on the Barthel Index so from the literature it was expected performance rather than initiation and planning would be impacted as reported by Baek, Lee and Sohng (2020) and Friedmann *et al.*, (2015).

Thus, for this discussion the differences in initiation and planning/organisation will be considered as well as performance to describe the effects of AAT for each participant separately in ADL in long-term care. For two of the four participants (1 and 4) a significant decrease was found for these variables during the intervention period while for the other two participants (2 and 3) a small non-significant decrease in ADL was found. It is clear that the severity of the dementia did reflect the DAD scores supported by Wang *et al.* (2019) who referred to the correlation between MMSE scores and IADL trajectories. They found an indication that the rapid decline in one outcome measure tended to lead to a rapid decline in another outcome measure with a correlation between cognition and daily functioning. They differ somewhat from Nordgren,

Engström and Engstro (2012) reported an increase in one patient on MMSE scores after AAT but a decrease in ADL scores.

5.3.2.1 Participants experiencing significant decrease in activities of daily living during the intervention phase

Both Participant 1 and Participant 4 who had a significant improvement in QoL during the intervention phase were reported to have significantly lower scores for the DAD and engagement in ADL. According to Suzuki *et al.* (2008) this may occur, when the short-term intervention programme such as the 10-week AAT intervention used in the current study, may not reflect changes in daily life and a more long-term effects which may materialise later. This may reflect the non-significant increase for Participant 1 found during the withdrawal phase, but not the small non-significant decrease for Participant 4 in DAD scores which may reflect the more long-term effect of AAT on ADL.

5.3.2.1.1 Participant 1

Participant 1 showed a deterioration in all subtests of the DAD from the baseline to intervention phase. This indicated a small decrease in initiation of self-care using the toilet and eating at appropriate times, showing an interest in leisure activities and household chores that she used to perform. There was also a decline in planning and organising the activities she did do and a deterioration in effective performance.

The overall low score during the baseline phase could be indicative of the fact that the participant did not engage in many of the activities due to her living in an assisted care facility. During intervention staff reported that participant 1 required more assistance with ADL as they needed to support her with taking a shower, helping the participant to get dressed, and choosing appropriate clothing. This decline may have been due to a decline seen over time in dementia or due to change on the QUALIDEM in this phase where she felt more at home and willing to be helped with ADL. Participant 1 was reliant on staff to help her with toileting, although she was able to sit and stand from the toilet independently. She was independent with eating.

During the withdrawal phase there was a small non-significant increase for planning and effective performance in particular. This reflects her improved self-image but not the lack of participation in occupation on the QUALIDEM. The AAT intervention may

have had an impact on Participant 1, due to the fact that she was engaged in meal preparation and caring for the dog by grooming, to ADL activities for herself when intervention stopped at a later stage (Suzuki *et al.*, 2008). These tasks may have carried over into activities such as self-grooming tasks as the participant was reported to engage in combing her own hair and brushing her teeth.

5.3.2.1.2 Participant 4

Participant 4 had varied scores on this outcome measure during all phases. This may be due to the progression of the disease. Since Participant 4 had lower scores for the MMSE this was reflected in her lower scores for ADL and may account for the significant decline in scores in the current study (Wang *et al.*, 2019). Participant 4 showed a deterioration from baseline to intervention for all subtests namely initiation, planning and organising and effective performance. This indicated a decline in initiation which presents as deterioration in undertaking all ADL.

One the items on the QUALIDEM the participant was reported to have an improvement in was attempting to assist with self-care and chores in the ward as a result of decrease in depressive symptoms while intervention with AAT was administered. This did not translate into improved initiation, planning and organising and effective performance measured on the DAD (Gélinas, Gauthier and McIntyre, 1999). Her attempts still needed to be guided and supervised in order for them to be carried out successfully.

During the withdrawal phases there was a small further non-significant decrease in ADL although initiation showed a small increase. This may have been due to her involvement during intervention in familiar activities rather than an effect of the AAT which had little carryover in the participant with more severe dementia. Essentially staff reported she preferred to wander around the facility with little change in this behaviour. She continued to rely on staff to manage her daily routine and provide her with assistance with all tasks.

5.3.2.2 Participants experiencing a non-significant decrease in ADL during the intervention phase

5.3.2.2.1 Participant 2

Overall, the DAD scores for participant 2 showed a very small non-significant decline over the intervention period. Participant 2 was the only participant to demonstrate an

increase in initiation from baseline to intervention. This did reflect the change in occupational participation reported on the QUALIDEM after intervention sessions. The decrease in planning and organising during this phase however meant she did need supervision and assistance although her scores for the DAD reflected her moderate level of dementia. This may be due to the progression of the disease as seen in a decline in function related to a decline in cognition as discussed by Wang *et al.* (2019).

The slight increase in initiation may be due to the fact that she displayed more of a need to care for others after AAT intervention sessions which related to a higher positive affect. Participant 2 was engaged in grooming and meal preparation tasks during AAT and in her case preparing tea or coffee during this period following intervention sessions.

Participant 2 had a marked significant decrease in her DAD scores during withdrawal even though she had reported increased self-image on the QUALIDEM and felt more at home. This however did not carry over into action as with occupation on the QUALIDEM at this stage with a marked decrease in initiation and effective performance.

5.3.2.2.2 Participant 3

Participant 3 showed deterioration in initiation and effective performance during the intervention phase with a non-significant decrease in initiation and effective performance. His scores were already low due to his severe dementia but prior to his decrease in positive affect measured by the QUALIDEM during AAT intervention he responded nonverbally while being assisted with his ADL even though he was dependent in all ADL as well as instrumental ADL (Wang *et al.*, 2019). It was reported by staff during all phases that the participant needed maximum assistance for washing, dressing and grooming. He was incontinent throughout the research study and was wearing nappies.

Literature describes the characteristics of late-stage dementia as having impaired cognitive abilities, functional inabilities, memory impairment, inability to complete ADL independently and having compromised mobility (Kovach and Magliocco, 1998). This correlates with impaired mobility, loss of functional and cognitive abilities, loss of communication and dependence on staff of Participant 3. One of the items the participant scored positive on the DAD included taking his medication as prescribed.

The researcher is mindful that this item may have been misunderstood by staff as the participant not refusing or taking his medication without protest from the staff. This did bring into focus the use of proxy assessments and possible misinterpretation of performance in ADL by staff reporting on the assessments (Ettema *et al.*, 2007).

At withdrawal there was no change in the DAD scores of Participants 3 even though positive affect improved on the QUALIDEM.

5.3.2.2.3 Summary

The non-significant decline in participation in ADL found over the study intervention period should take into consideration the progression of the disease itself. Only Participant 2 with a higher MMSE score showed some improvement during the intervention phases. This indicates perhaps improvement in ADL participation can only be expected in people with moderate dementia such as the participants in the study by Baek, Lee and Sohng (2020) where with an average score above 65 participants only had moderate and not severe dependence. Improvement in ADL after AAT mentioned by Friedmann *et al.* (2015) was for participants with mild to moderate levels of dementia, some of whom were independent in ADL.

5.4 Limitations of the study

A limitation of the study includes the nature of the disease. Dementia is progressive and thus it is difficult to assess and measure outcomes. The findings were limited as they did not describe a subjective view of the effect of AAT on the QoL of people living with dementia. People living with dementia often cannot provide subjective information on their experiences (Nordgren and Engström, 2014a).

The outcome measures considered the observations of care givers and not the opinion of the participants and their experiences of the AAT sessions. Another limitation included that the data was collected by proxy from the care giving staff. The care givers gave their observation to the questions. This needs to be taken into account as the care givers have been reported to score lower levels of some components QoL in patients with dementia with more accurate assessment on the observable measures of ADL function. The bias in reporting QoL might be influenced by the burden on caregivers and their own QoL. However as in the current study research indicates that proxies are almost as good as patients in detecting changes in QOL domains over

time and are sufficiently reliable and valid in the assessment of an intervention. Agreement is better for concrete, observable aspects of life (Ettema *et al.*, 2007).

During the study, the researcher also became aware of limitations with regards to the outcome measures used. The DAD categories had many items which the participants no longer engaged with. Staff may have scored these items incorrectly as “No” versus “Not applicable” due to a lack of knowledge or guidance by the blind rater on how to score the outcome measure.

The sample size of this study was small due to the research design used and thus the results cannot be generalised. The research has only four participants involved in the study, which means the data collection was limited with limited results.

CHAPTER 6: CONCLUSION

6.1 Introduction

This chapter discussed the main findings, implications of the research and future recommendations. This study aimed to investigate the effects of AAT on the QoL of people living with dementia in assisted care facilities. The objectives included to investigate the effects that AAT would have on the QoL of a person living with dementia as well as the effects on participation in ADL. The main findings indicate that although a small sample was used there are important findings. The implications are discussed in this chapter. The findings can influence future research and recommendations are made.

6.2 Main findings

Although a small sample size was used in the current study the findings can be considered as clinically important. The study indicated the effect of AAT on the participants differed in terms of components or aspects which constitute their quality of life and the need to consider the duration and intensity of AAT intervention depending on each participant's response. The study provided detailed information about changes in QoL and ADL in patients with moderate and severe dementia that indicated both improvement and deterioration that has not been reported in other studies. The need to consider the differences in the components of QoL was clear as participants had various levels of mood, behaviour, self-image and social relationships and function as well as engagement in occupation. Animal assisted therapy also resulted in changes in these aspects differently in each participant and even though the outcome measures did not detect small changes, it does not mean that the intervention was not meaningful to the participant. Observations from the researcher and staff indicated that there was a positive effect from AAT on the participants. All participants had improvement for social isolation, if not during the intervention phase, then in the withdrawal phase and with the exception of Participant 2 for social relationships confirming the evidence presented in literature (Yakimicki *et al.*, 2019). This included being more accepting of the presence of others and being accepted by others as well as physical contact, eye contact, or talking to others or the dog. The

results for ADL reflect those reported as AAT having an effect for people with mild to moderate dementia and having little to no effect for those with moderate to severe dementia with scores less than 20 on the MMSE (Baek, Lee and Sohng, 2020; Friedmann *et al.*, 2015; Motomura *et al.*, 2004).

For 2 participants (1 and 4) the AAT improved their QoL and increased their self-image, they displayed more positive behaviour or less negative during intervention and showed improved social engagement. The results indicate that only participant 1 who had moderate dementia had some retention in terms of this improvement at withdrawal. The QoL scores for Participant 4 decreased during withdrawal but both participants retained improvement by a decrease in social isolation. The participants appeared to be more accepting of care with the improvements in QoL during the intervention phase which then led to them being more dependent and indicating a significant decrease in the DAD outcomes. While this finding was reported for Participants 1 and 4 for the other Participants 2 and 3 when the QoL scores decreased the DAD scores had a non-significant decrease during the intervention phase.

Participant 2 and 3 had a decrease in QoL during the intervention even though both participants responded to AAT as observed by the researcher and staff. Participant 2 displayed more negative behaviour during the intervention phase except during and immediately after the actual AAT sessions and participant 3 had a marked decrease in positive affect. Both participants seemed to be more aware of their loss of independence, their limitations and the restrictions imposed by residential care. These feelings appear to have resolved somewhat with the withdrawal of AAT and an improvement on QoL during this phase and they settled back into more positive behaviour and higher QoL. Both participants had non-significant negative change in the DAD scores during the intervention phase. This deteriorated significantly for Participant 2 during withdrawal as her QoL increased and she accepted being cared for. Participant 3 did not show change as he remained dependent on assistance with scores that were low overall.

In the current study the QoL scores showed little association with the level of dementia of ADL participation, since Participant 3 who had severe dementia and was totally dependent had a high QoL scores relative to other participants. However, some components such as self-image did appear to improve after AAT was withdrawn only

in participants with moderate dementia who possibly had better memory of the intervention.

The DAD scores for ADL participation did reflect the level of dementia since this is one of the characteristics of this assessment.

6.3 Implication of findings and recommendations to changes of practice

Animal assisted therapy may have a positive impact to people living with moderate to severe dementia in assisted care facilities and can be used to improve affect, behaviour and social functioning in assisted care facilities by bringing in a therapy dog on a regular basis and allowing residents who are interested to engage with the therapy dog.

Therapy as suggested must be used with those who have no contraindications in terms of associating with animals. There is a need to monitor the response of individuals and adjust the programme in terms of duration and intensity depending on their response. Some high functioning people may respond better to a resident pet than intermittent therapy sessions with an animal.

The intervention appears to have little impact of ADL participation with these people living with moderate to severe dementia in assisted care facilities due to the level of their dependence in these activities.

6.4 Recommendations for further research

Recommendations for further research include alternative study designs and increasing the population sample size to include more participants where all components of QoL are considered. A case study design may provide opportunity to gain more individualised data and results over a longer period of time with a small sample size. It is also recommended to perform the study in other private and public retirement facilities with assisted living and frail care units. This will increase the population sample size and include various socio-economic groups. It is suggested however that both positive and negative effects are clearly reported.

The researcher also recommends using a study design with a mixed method to include qualitative data. As discussed by Algar, Woods and Windle (2016) measuring QoL is a difficult multi-factorial concept which is difficult to measure. It is suggested that qualitative interviews and observational measures used together complement each other (Algar, Woods and Windle, 2016). This may include interviews with the participant, care givers, and close family to determine QoL for people living with dementia and receiving AAT. It is also recommended to include other ratings into the study such as sleeping behaviour, nutritional status etc, to include concrete measurable elements. It may also be interesting to explore other visuals and alternative methodologies such as photo voice and drawings in clients with mild to moderate dementia. This may be useful for those clients who are non verbal or have difficulties with language.

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Appendix A: QUALIDEM

QUALIDEM

Name: _____ Date: _____

The questionnaire contains 40 items. Fill in the questionnaire together with a colleague, based on your observations during the passed week. Answer each question and indicate the number that most closely represents your observations. An answer is never wrong, it indicates what resembles reality most closely from your perspective. Do not overthink the question, the first answer that comes to mind is usually the best. If you and your colleague disagree on an item, try to find a consensus.

Never = Never
 Seldom = Maximum once a week
 Sometimes = A few times a week
 Often = Almost daily

		NEVER	SELDOM	SOMETIMES	OFTEN	
1	Is cheerful	0	1	2	3	B
2	Makes restless movements	3	2	1	0	D
3	Has contact with other residents	0	1	2	3	F
5	Rejects help from nursing assistants	3	2	1	0	A
5	Has a contented appearance	0	1	2	3	B
6	Makes an anxious impression	3	2	1	0	C
8	Is angry	3	2	1	0	A
8	Is capable of enjoying things in daily life	0	1	2	3	B
9	Does not want to eat	3	2	1	0	J
10	Is in a good mood	0	1	2	3	B
11	Is sad	3	2	1	0	C
12	Responds positively when approached	0	1	2	3	F
13	Indicates that s/he is bored	3	2	1	0	H
17	Has conflicts with nursing assistants	3	2	1	0	A
15	Enjoys meals	0	1	2	3	J
16	Is rejected by other residents	3	2	1	0	G
17	Accuses others	3	2	1	0	A
18	Takes care of other residents	0	1	2	3	F
19	Is restless	3	2	1	0	D
20	Rejects contact with others openly	3	2	1	0	G
21	Smiles	0	1	2	3	B
22	Has tense body language	3	2	1	0	D
23	Cries	3	2	1	0	C
24	Appreciates help that he or she receives	0	1	2	3	A

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		NEVER	SELDOM	SOMETIMES	OFTEN	
25	Cuts oneself off from environment	3	2	1	0	F
26	Finds things to do without help from others	0	1	2	3	I
27	Indicates s/he would like more help	3	2	1	0	E
28	Indicates feeling locked up	3	2	1	0	H
29	Is on friendly terms with one or more residents	0	1	2	3	F
30	Likes to lie down (in bed)	3	2	1	0	J
31	Accepts help	0	1	2	3	A
32	Calls out	3	2	1	0	G
33	Criticizes the daily routine	3	2	1	0	A
34	Feels at ease in company of others	0	1	2	3	F
35	Indicates not being able to do anything	3	2	1	0	E
36	Feels at home on the ward	0	1	2	3	H
37	Indicates feeling worthless	3	2	1	0	E
38	Enjoys helping with chores on the ward	0	1	2	3	I
39	Wants to get off the ward	3	2	1	0	H
40	Mood can be influenced in a positive sense	0	1	2	3	B

Scoring: the capital letter behind each item indicates the specific subscale. Total the scores for each subscale.

Subscale (# of items)	Range	Score
A: Care relationship (7)	0 – 21	A
B: Positive affect (6)	0 – 18	B
C: Negative affect (3)	0 – 9	C
D: Restless tense behaviour (3)	0 – 9	D
E: Positive self image (3)	0 – 9	E
F: Social relationships (6)	0 – 18	F
G: Social isolation (3)	0 – 9	G
H: Feeling at home (4)	0 – 12	H
I: Occupation (2)	0 – 6	I
J: other questions for further research		J

Reference

Ettema, T.P., Dröes, R.M., de Lange, J., Mellenbergh, G.J., & Ribbe, M.W. (2007). QUALIDEM: development and evaluation of a dementia specific quality of life instrument--validation. *Int J Geriatr Psychiatry*. May; 22(5):424–30.

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Appendix B: Disability Assessment for Dementia

DISABILITY ASSESSMENT FOR DEMENTIA (DAD)

Name:			File No:
Date:	MMS:	GDS:	DAD:
Respondent:		Relationship:	
Specify all motor and sensory disorders:			
Rater:			Time:

During the past two weeks, did (name) _____, without help or reminder,

HYGIENE

SCORING: YES=1 NO=0 N/A=Not Applicable

	Initiation	Planning & Organization	Effective Performance
Undertake to wash himself/herself or to take a bath or a shower			
Undertake to brush his/her teeth or care for his/her dentures			
Decide to care for his/her hair (wash and comb)			
Prepare the water, towels, and soap for washing, taking a bath or a shower			
Wash and dry completely all parts of his/her body safely			
Brush his/her teeth or care for his/her dentures appropriately			
Care for his/her hair (wash and comb)			

DRESSING

Undertake to dress himself/herself			
Choose appropriate clothing (with regard to the occasion, neatness, the weather and color combination)			
Dress himself/herself in the appropriate order (undergarments, pants/dress, shoes)			
Dress himself/herself completely			
Undress himself/herself completely			

CONTINENCE

Decide to use the toilet at appropriate times			
Use the toilet without "accidents"			

EATING

Decide that he/she needs to eat			
Choose appropriate utensils and seasonings when eating			
Eat his/her meals at a normal pace and with appropriate manners			

MEAL PREPARATION

Undertake to prepare a light meal or snack for himself/herself			
Adequately plan a light meal or snack (ingredients, cookware)			
Prepare or cook a light meal or a snack safely			

TELEPHONING

Attempt to telephone someone at a suitable time			
Find and dial a telephone number correctly			
Carry out an appropriate telephone conversation			
Write and convey a telephone message adequately			

DISABILITY ASSESSMENT FOR DEMENTIA (DAD)

During the past two weeks, did (name) _____, without help or reminder,

GOING ON AN OUTING

SCORING: YES=1 NO=0 N/A=Not Applicable

	Initiation	Planning & Organization	Effective Performance
Undertake to go out (walk, visit, shop) at an appropriate time			
Adequately organize an outing with respect to transportation, keys, destination, weather, necessary money, shopping list			
Go out and reach a familiar destination without getting lost			
Safely take the adequate mode of transportation (car, bus, taxi)			
Return from the store with the appropriate items			

FINANCE AND CORRESPONDENCE

Show an interest in his/her personal affairs such as his/her finances and written correspondence			
Organize his/her finance to pay his/her bills (cheques, bankbook, bills)			
Adequately organize his/her correspondence with respect to stationery, address, stamps			
Handle adequately his/her money (make change)			

MEDICATIONS

Decide to take his/her medications at the correct time			
Take his/her medications as prescribed (according to the right dosage)			

LEISURE AND HOUSEWORK

Show an interest in leisure activity(ies)			
Take an interest in household chores that he/she used to perform in the past			
Plan and organize adequately household chores that he/she used to perform in the past			
Complete household chores adequately as he/she used to perform in the past			
Stay safely at home by himself/herself when needed			

Comments:

SUB TOTAL / #applicable items	/	/	/
DAD TOTAL / #applicable items	/		
DAD TOTAL in %			

Appendix C The Mini Mental State Examination (MMSE)

Mini-Mental State Examination (MMSE)

Patient's Name: _____ Date: _____

Instructions: Score one point for each correct response within each question or activity.

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day? Month?"
5		"Where are we now? State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then the instructor asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible.
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, ...) Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.) 
30		TOTAL

Appendix D Global Deterioration Scale (GDS)



Global Deterioration Scale

Home	Alzheimer's Disease	Other Dementias
Global Deterioration Scale	Brief Cognitive Rating Scale	Functional Assessment Staging

The Global Deterioration Scale (GDS), developed by Dr. , provides caregivers an overview of the stages of cognitive function for those suffering from a primary degenerative dementia such as Alzheimer's disease. It is broken down into 7 different stages. Stages 1-3 are the pre-dementia stages. Stages 4-7 are the dementia stages. Beginning in stage 5, an individual can no longer survive without assistance. Within the GDS, each stage is numbered (1-7), given a short title (i.e., Forgetfulness, Early Confusional, etc. followed by a brief listing of the characteristics for that stage. Caregivers can get a rough idea of where an individual is at in the disease process by observing that individual's behavioral characteristics and comparing them to the GDS. For more specific assessments, use the accompanying Brief Cognitive Rating Scale (BCRS) and the Functional Assessment Staging (FAST) measures.

The Global Deterioration Scale for Assessment of Primary Degenerative Dementia

Level	Clinical Characteristics
1 No cognitive decline	No subjective complaints of memory deficit. No memory deficit evident on clinical interview.
2 Very mild cognitive decline (Age Associated Memory Impairment)	Subjective complaints of memory deficit, most frequently in following areas: (a) forgetting where one has placed familiar objects; (b) forgetting names one formerly knew well. No objective evidence of memory deficit on clinical interview. No objective deficits in employment or social situations. Appropriate concern with respect to symptomatology.
3 Mild cognitive decline (Mild Cognitive Impairment)	Earliest clear-cut deficits. Manifestations in more than one of the following areas: (a) patient may have gotten lost when traveling to an unfamiliar location; (b) co-workers become aware of patient's relatively poor performance; (c) word and name finding deficit becomes evident to intimates; (d) patient may read a passage or a book and retain relatively little material; (e) patient may demonstrate decreased facility in remembering names upon introduction to new people; (f) patient may have lost or misplaced an object of value; (g) concentration deficit may be evident on clinical testing. Objective evidence of memory deficit obtained only with an intensive interview. Decreased performance in demanding employment and social settings. Denial begins to become manifest in patient. Mild to moderate anxiety accompanies symptoms.
4 Moderate cognitive decline (Mild Dementia)	Clear-cut deficit on careful clinical interview. Deficit manifest in following areas: (a) decreased knowledge of current and recent events; (b) may exhibit some deficit in memory of one's personal history; (c) concentration deficit elicited on serial subtractions; (d) decreased ability to travel, handle finances, etc. Frequently no deficit in following areas: (a) orientation to time and place; (b) recognition of familiar persons and faces; (c) ability to travel to familiar locations. Inability to perform complex tasks. Denial is dominant defense mechanism. Flattening of affect and withdrawal from challenging situations frequently occur.
5 Moderately severe cognitive decline (Moderate Dementia)	Patient can no longer survive without some assistance. Patient is unable during interview to recall a major relevant aspect of their current lives, e.g., an address or telephone number of many years, the names of close family members (such as grandchildren), the name of the high school or college from which they graduated. Frequently some disorientation to time (date, day of week, season,

	etc.) or to place. An educated person may have difficulty counting back from 40 by 4s or from 20 by 2s. Persons at this stage retain knowledge of many major facts regarding themselves and others. They invariably know their own names and generally know their spouses' and children's names. They require no assistance with toileting and eating, but may have some difficulty choosing the proper clothing to wear.
6 Severe cognitive decline (Moderately Severe Dementia)	May occasionally forget the name of the spouse upon whom they are entirely dependent for survival. Will be largely unaware of all recent events and experiences in their lives. Retain some knowledge of their past lives but this is very sketchy. Generally unaware of their surroundings, the year, the season, etc. May have difficulty counting from 10, both backward and, sometimes, forward. Will require some assistance with activities of daily living, e.g., may become incontinent, will require travel assistance but occasionally will be able to travel to familiar locations. Diurnal rhythm frequently disturbed. Almost always recall their own name. Frequently continue to be able to distinguish familiar from unfamiliar persons in their environment. Personality and emotional changes occur. These are quite variable and include: (a) delusional behavior, e.g., patients may accuse their spouse of being an impostor, may talk to imaginary figures in the environment, or to their own reflection in the mirror; (b) obsessive symptoms, e.g., person may continually repeat simple cleaning activities; (c) anxiety symptoms, agitation, and even previously nonexistent violent behavior may occur; (d) cognitive abulia, i.e., loss of willpower because an individual cannot carry a thought long enough to determine a purposeful course of action.
7 Very severe cognitive decline (Severe Dementia)	All verbal abilities are lost over the course of this stage. Frequently there is no speech at all -only unintelligible utterances and rare emergence of seemingly forgotten words and phrases. Incontinent of urine, requires assistance toileting and feeding. Basic psychomotor skills, e.g., ability to walk, are lost with the progression of this stage. The brain appears to no longer be able to tell the body what to do. Generalized rigidity and developmental neurologic reflexes are frequently present.

Barry Reisberg, MD. All Rights reserved. Reproduced with permission.

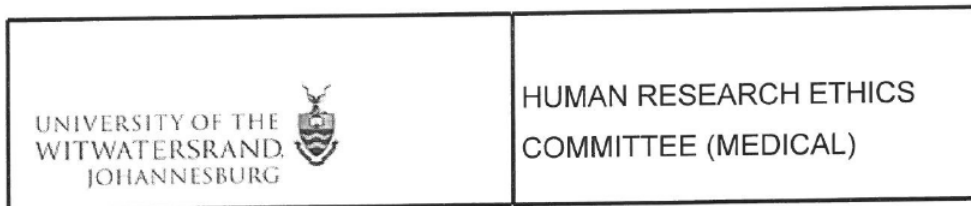
[Home](#) | [Alzheimer's Disease](#) | [Resources & Services](#) | [About GRI](#) | [Info Request](#)

Appendix E Animal Assisted Therapy Intervention Programme

The intervention sessions consisted of the following activities:

- Grooming sessions with the dog. This included combing the dog with a brush when the participant expressed an interest in this.
- Walking the dog with and without a lead.
- Meal preparation for the dog and feeding the dog. The participants were able to prepare a meal for the dog or give the dog treats throughout the session. The participants were encouraged to provide the dog with water as well.
- Playing with the dog, this included activities such as playing fetch with the dog or providing the dog with toys he likes to play with (balls/rope etc).
- Spending time petting the dog or other interactions with the dog.
- Giving the dog commands, such as sit, wait or fetch.

Appendix F Ethical Clearance certificate



Office of the Deputy Vice-Chancellor (Research & Post Graduate Affairs)

TO: Ms N van der Merwe
School of Therapeutic Sciences
Department of Occupational Therapy
Medical School
University

E-mail: nanettevdm@gmail.com

CC: Supervisor: Ms K van Stormbroek <Kirsty.Vanstormbroek@wits.ac.za>
and <HREC-Medical.ResearchOffice@wits.ac.za>

FROM: Iain Burns
Human Research Ethics Committee (Medical)
Tel: 011 717 1252

E-mail: Iain.Burns@wits.ac.za

DATE: 03/04/2018

REF: R14/49

PROTOCOL NO: **M170909** *(This is your ethics application study reference number. Please quote this reference number in all correspondence relating to this study)*

PROJECT TITLE: *The impact of animal assisted therapy on quality of life and participation in activities of daily living in persons with dementia in Pretoria*

Please find attached the Clearance Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to the Government funding of the University.



MSWorks2000/Iain0007/Clearscan.wps



R14/49 Ms N van der Merwe

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M170909

NAME: Ms N van der Merwe
(Principal Investigator)
DEPARTMENT: School of Therapeutic Sciences
Department of Occupational Therapy
Medical School
University

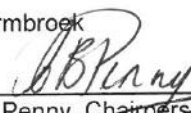
PROJECT TITLE: The impact of animal assisted therapy on quality of life and participation in activities of daily living in persons with dementia in Pretoria

DATE CONSIDERED: 29/09/2017

DECISION: Approved unconditionally

CONDITIONS:

SUPERVISOR: Ms K van Stormbroek

APPROVED BY: 
Professor CB Penny, Chairperson, HREC (Medical)

DATE OF APPROVAL: 03/04/2018

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on 3rd floor, Phillip V Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report.** The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in **September** and will therefore be due in the month of **September** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix G Permission from Residential Facility



Title: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study

Doctor Mario Greyling, Director, Retire@Midstream

I am an Occupational therapist currently completing my Masters in Occupational Therapy at the University of the Witwatersrand. I work at Care@Midstream, a sub-acute facility, and have come in contact with residents/patients with various diagnoses and illnesses, including dementia. I have also been exposed to Animal Assisted Intervention. This has become a great interest to me as I have observed positive reactions from staff, co-workers and patients/residents whenever the therapy dog, Cooper, visits the facility. I often work with the elderly population and those who have been diagnosed with dementia. This exposure has lead me to question if animal assisted therapy (AAT) improves the quality of life of people with dementia. The aim of my study is therefore to determine what the effect of AAT has on the quality of life of people with dementia. I used this background to start a research project as part of the completion of my Master's degree and would like to request your permission to complete my project at Retire@Midstream.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee prior to initiating the research project (Protocol no: M170909).

I am inviting residents with dementia to take part in the study. They will be involved in a programme were their normal function will be assessed in terms of their quality of life and participation in their everyday care activities over 10 weeks. These assessments will be completed by a nurse or social worker who will obtain collateral information from their caregivers.

The initial phase of the research project consists of four weeks during which data will be collected by the nurse or social worker. During this phase, there will be no therapy and the questionnaires will be completed by the nurse or social worker. There will be five opportunities for data collection.

The next phase will consist of the intervention, AAT. The AAT intervention will be introduced during this period and will consist of one-on-one therapy sessions with a trained dog. These sessions are goal directed and outcomes are measurable. These sessions will consist of

grooming activities, walking the dog or preparing meals for the dog. The research project will consist of participation in weekly AAT sessions. I will conduct each session involving AAT. Cooper, a trained therapy dog will be used during the sessions as a modality for intervention. Cooper's handler will also be present during each therapy sessions.

Participants would be required to attend weekly 30-minute occupational therapy sessions for 10 weeks while they receive AAT. Every two weeks data will be collected, 10 weeks before and after the AAT therapy with, the last five assessments being the withdrawal phase. During this phase, the intervention will be withdrawn and no therapy will be given. The study will take approximately eight months in total to complete.

Participation in the research project is voluntary. Participants are free to withdraw from the research process at any point before the completion of the process. No personal details will be associated with the data and participants will be allocated a number which will not be able to be associated with their name.

Benefits for the participants include exposure to a 10-week intervention period with the researcher, an occupational therapist, and a trained therapy dog. Literature has described some of the benefits as including improved social interaction, decreased behavioural problems such as anxiety and decreased feelings of loneliness. Counselling will be arranged by the researcher should a participant require assistance following a negative experience during the intervention period.

Confidentiality will be maintained by assigning numbers to each participant.

Results of the study will be available on request of the participant and his/her proxy. This information will only be available once the research project has been completed.

Thank you for your time and participation in this research project.

Please feel free to contact me with any questions regarding the research by email: nanettevdm@gmail.com or telephone: 083 973 3642 or the research supervisor, Kirsty van Stormbroek via email: kirsty.vanstormbroek@wits.ac.za or telephone: 011 717 3701.

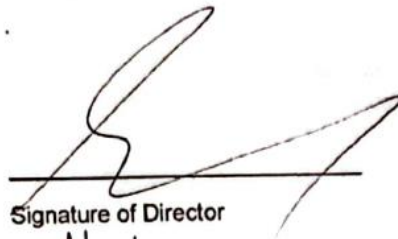
This study has been approved by the University of the Witwatersrand Human Research Ethics Committee (Protocol no: M170909). For any concerns regarding the rights of a participant, or other ethical considerations, please contact the chairperson of the Human Research Ethics Committee. Chairperson, Prof P Cleaton-Jones (email: peter.cleaton-jones@wits.ac.za). Human Research Ethics Committee administrative offices contact details: Ms. Z Ndlovu/Mr. Rhulani Mkansi/Mr. Lebo Moeng, Tel: 011 717 2700/2656/1234/1252, or email: zanele.ndlovu@wits.ac.za; rhulani.mkansi@wits.ac.za; lebo.moeng@wits.ac.za.

Kind regards

Nanette van der Merwe

INFORMED CONSENT

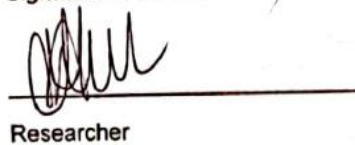
I, Marie Snyders, hereby give my informed consent for the research study entitled: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia In Pretoria – A Pilot Study, to take place at Retire@Midstream.



Signature of Director

1/6/2018

Date



Researcher

1/6/2018

Date

Appendix H Information sheet and signed informed consent form

UNIVERSITY OF THE
WITWATERSRAND
JOHANNESBURG



Department of Occupational Therapy
Wits Education Campus

School of Therapeutic Sciences, Faculty of Health Sciences, 7 York Road, Parktown, 2193, South Africa
Tel: +27 11 717 3701 | Fax: +27 717 3709 | Email: leilane.bogoshi@wits.ac.za | www.wits.ac.za

FAMILY MEMBER

Title: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study

Dear Mrs Winter's family

I am an Occupational therapist currently completing my Masters in Occupational Therapy at the University of the Witwatersrand. I work at Care@Midstream, a sub-acute facility, and have come in contact with residents/patients with various diagnoses and illnesses, including dementia. I have also been exposed to Animal Assisted Intervention. This has become a great interest to me as I have observed positive reactions from staff, co-workers and patients/residents whenever the therapy dog, Cooper, visits the facility. I often work with the elderly population and those who have been diagnosed with dementia. This exposure has lead me to question if animal assisted therapy (AAT) improves the quality of life of people with dementia. The aim of my study is therefore to determine what the effect of AAT has on the quality of life of people with dementia. I used this background to start a research project as part of the completion of my Master's degree and would like to request your participation.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee prior to initiating the research project (Protocol no: M170909).

I am inviting that your family member with dementia take part in the study. They will be involved in a programme where their normal function will be assessed in terms of their quality of life and participation in their everyday care activities over 10 weeks. These assessments will be completed by the matron or social worker who will obtain collateral information from their caregivers regarding their participation in daily activities. The social worker and matron have agreed to participate in the research project.

The initial phase of the research project consists of four weeks during which data will be collected by the matron or social worker. During this phase, there will be no therapy and the

questionnaires will be completed by the matron or social worker. There will be five opportunities for data collection.

The next phase will consist of the intervention, AAT. The AAT intervention will be introduced and will consist of one-on-one therapy sessions with a trained dog. These sessions are goal directed and outcomes are measurable. These sessions will consist of grooming activities, walking the dog or preparing meals for the dog. The research project will consist of participation in weekly AAT sessions. I will conduct each session involving AAT. Cooper, a trained therapy dog will be used during the sessions as a modality for intervention. Cooper is a kind and loving dog. He is friendly and enjoys socialising with humans and other animals. He is specially trained and has been visiting Care@Midstream on a regular basis where he interacts with patients. Cooper's handler will also be present during each therapy sessions.

Your family member would be required to attend weekly 30-minute occupational therapy sessions for 10 weeks while they receive AAT. Every two weeks data will be collected 10 weeks before and after the AAT therapy with the last five assessments being the withdrawal phase. During this phase, the intervention will be withdrawn and no therapy will be given. The study will take approximately eight months in total to complete.

Participation in the research project is voluntary. You are free to withdraw your family member from the research process at any point before the completion of the process. No personal details will be associated with the data and your family member will be allocated a number which will not be able to be associated with their name.

Should you choose to give permission for your family member to participate in the research project the benefits include exposure to a 10-week intervention period with the researcher, an occupational therapist, and a trained therapy dog. Literature has described some of the benefits as including improved social interaction, decreased behavioural problems such as anxiety and decreased feelings of loneliness. Counselling will be arranged by the researcher should a participant require assistance following a negative experience during the intervention period.

Confidentiality will be maintained by assigning numbers to each participant.

Results of the study will be available on request of the participant and his/her family member. This information will only be available once the research project has been completed.

Thank you for your time and participation in this research project.

Please feel free to contact me with any questions regarding the research by email: nanettevdm@gmail.com or telephone: 083 973 3642 or the research supervisor, Kirsty van Stormbroek via email: kirsty.vanstormbroek@wits.ac.za or telephone: 011 717 3701.

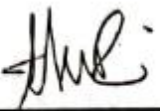
This study has been approved by the University of the Witwatersrand Human Research Ethics Committee (Protocol no: M170909). For any concerns regarding your rights as a participant, or other ethical considerations, please contact the chairperson of the Human Research Ethics Committee. Chairperson, Prof P Cleaton-Jones (email: peter.cleaton-jones@wits.ac.za). Human Research Ethics Committee administrative offices contact details: Ms. Z Ndlovu/Mr. Rhulani Mkansi/Mr. Lebo Moeng, Tel: 011 717 2700/2656/1234/1252, or email: zanele/ndlovu@wits.ac.za; rhulani.mkansi@wits.ac.za; lebo.moeng@wits.ac.za.

Kind regards

Nanette van der Merwe

INFORMED CONSENT PROXY FAMILY MEMBER

I, Leoni Winter, hereby give my informed consent for my family member to participate in the research study entitled: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study


Signature of family member

4/8/2018
Date


Researcher

04/8/2018
Date

FAMILY MEMBER

Title: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study

Dear Mrs Mudder's family

I am an Occupational therapist currently completing my Masters in Occupational Therapy at the University of the Witwatersrand. I work at Care@Midstream, a sub-acute facility, and have come in contact with residents/patients with various diagnoses and illnesses, including dementia. I have also been exposed to Animal Assisted Intervention. This has become a great interest to me as I have observed positive reactions from staff, co-workers and patients/residents whenever the therapy dog, Cooper, visits the facility. I often work with the elderly population and those who have been diagnosed with dementia. This exposure has lead me to question if animal assisted therapy (AAT) improves the quality of life of people with dementia. The aim of my study is therefore to determine what the effect of AAT has on the quality of life of people with dementia. I used this background to start a research project as part of the completion of my Master's degree and would like to request your participation.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee prior to initiating the research project (Protocol no: M170002).

I am inviting that your family member with dementia take part in the study. They will be involved in a programme where their normal function will be assessed in terms of their quality of life and participation in their everyday care activities over 10 weeks. These assessments will be completed by the matron or social worker who will obtain collateral information from their caregivers regarding their participation in daily activities. The social worker and matron have agreed to participate in the research project.

The initial phase of the research project consists of four weeks during which data will be collected by the matron or social worker. During this phase, there will be no therapy and the

questionnaires will be completed by the matron or social worker. There will be five opportunities for data collection.

The next phase will consist of the intervention, AAT. The AAT intervention will be introduced and will consist of one-on-one therapy sessions with a trained dog. These sessions are goal directed and outcomes are measurable. These sessions will consist of grooming activities, walking the dog or preparing meals for the dog. The research project will consist of participation in weekly AAT sessions. I will conduct each session involving AAT. Cooper, a trained therapy dog will be used during the sessions as a modality for intervention. Cooper is a kind and loving dog. He is friendly and enjoys socialising with humans and other animals. He is specially trained and has been visiting Care@Midstream on a regular basis where he interacts with patients. Cooper's handler will also be present during each therapy session.

Your family member would be required to attend weekly 20-minute occupational therapy sessions for 10 weeks while they receive AAT. Every two weeks data will be collected 10 weeks before and after the AAT therapy with the last five assessments being the withdrawal phase. During this phase, the intervention will be withdrawn and no therapy will be given. The study will take approximately eight months in total to complete.

Participation in the research project is voluntary. You are free to withdraw your family member from the research process at any point before the completion of the process. No personal details will be associated with the data and your family member will be allocated a number which will not be able to be associated with their name.

Should you choose to give permission for your family member to participate in the research project the benefits include exposure to a 10-week intervention period with the researcher, an occupational therapist, and a trained therapy dog. Literature has described some of the benefits as including improved social interaction, decreased behavioural problems such as anxiety and decreased feelings of loneliness. Counselling will be arranged by the researcher should a participant require assistance following a negative experience during the intervention period.

Confidentiality will be maintained by assigning numbers to each participant.

Results of the study will be available on request of the participant and his/her family member. This information will only be available once the research project has been completed.

Thank you for your time and participation in this research project.

Please feel free to contact me with any questions regarding the research by email: narettindm@gmail.com or telephone: 083 973 3642 or the research supervisor, Kirsty van Stumberg via email: kirsty.vanstumberg@wits.ac.za or telephone: 011 717 3701.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee (Protocol no: M170905). For any concerns regarding your rights as a participant, or other ethical considerations, please contact the chairperson of the Human Research Ethics Committee, Chairperson, Prof P. Cleaton-Jones (email: peter.cleaton-jones@wits.ac.za), Human Research Ethics Committee administrative offices contact details: Ms. Z Ndlovu/Mr. Rhulani Mkhamsi/Mr. Lebo Moeng, Tel: 011 717 27002650/1234/1252, or email: zandile.ndlovu@wits.ac.za; rhulani.mkhamsi@wits.ac.za; lebo.moeng@wits.ac.za.

Kind regards

Nanette van der Merwe

INFORMED CONSENT PROXY FAMILY MEMBER

Peterson Mulder hereby give my informed consent for my family member to participate in the research study entitled: The Effect of Animal Assisted Therapy on Quality of Life and Participation In Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study



Signature of family member

CWF Mulder

23-7-2018

Date

23-7-2018

Date



FAMILY MEMBER

Title: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study

Dear Mr van der Berg's family

I am an Occupational therapist currently completing my Masters in Occupational Therapy at the University of the Witwatersrand. I work at Care@Midstream, a sub-acute facility, and have come in contact with residents/patients with various diagnoses and illnesses, including dementia. I have also been exposed to Animal Assisted Intervention. This has become a great interest to me as I have observed positive reactions from staff, co-workers and patients/residents whenever the therapy dog, Cooper, visits the facility. I often work with the elderly population and those who have been diagnosed with dementia. This exposure has lead me to question if animal assisted therapy (AAT) improves the quality of life of people with dementia. The aim of my study is therefore to determine what the effect of AAT has on the quality of life of people with dementia. I used this background to start a research project as part of the completion of my Master's degree and would like to request your participation.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee prior to initiating the research project (Protocol no: M170909).

I am inviting that your family member with dementia take part in the study. They will be involved in a programme where their normal function will be assessed in terms of their quality of life and participation in their everyday care activities over 10 weeks. These assessments will be completed by the matron or social worker who will obtain collateral information from their caregivers regarding their participation in daily activities. The social worker and matron have agreed to participate in the research project.

The initial phase of the research project consists of four weeks during which data will be collected by the matron or social worker. During this phase, there will be no therapy and the

questionnaires will be completed by the matron or social worker. There will be five opportunities for data collection.

The next phase will consist of the intervention, AAT. The AAT intervention will be introduced and will consist of one-on-one therapy sessions with a trained dog. These sessions are goal directed and outcomes are measurable. These sessions will consist of grooming activities, walking the dog or preparing meals for the dog. The research project will consist of participation in weekly AAT sessions. I will conduct each session involving AAT. Cooper, a trained therapy dog will be used during the sessions as a modality for intervention. Cooper is a kind and loving dog. He is friendly and enjoys socialising with humans and other animals. He is specially trained and has been visiting Care@Midstream on a regular basis where he interacts with patients. Cooper's handler will also be present during each therapy sessions.

Your family member would be required to attend weekly 30-minute occupational therapy sessions for 10 weeks while they receive AAT. Every two weeks data will be collected 10 weeks before and after the AAT therapy with the last five assessments being the withdrawal phase. During this phase, the intervention will be withdrawn and no therapy will be given. The study will take approximately eight months in total to complete.

Participation in the research project is voluntary. You are free to withdraw your family member from the research process at any point before the completion of the process. No personal details will be associated with the data and your family member will be allocated a number which will not be able to be associated with their name.

Should you choose to give permission for your family member to participate in the research project the benefits include exposure to a 10-week intervention period with the researcher, an occupational therapist, and a trained therapy dog. Literature has described some of the benefits as including improved social interaction, decreased behavioural problems such as anxiety and decreased feelings of loneliness. Counselling will be arranged by the researcher should a participant require assistance following a negative experience during the intervention period.

Confidentiality will be maintained by assigning numbers to each participant.

Results of the study will be available on request of the participant and his/her family member. This information will only be available once the research project has been completed.

Thank you for your time and participation in this research project.

Please feel free to contact me with any questions regarding the research by email: nanettevdm@gmail.com or telephone: 083 973 3642 or the research supervisor, Kirsty van Stormbroek via email: kirsty.vanstormbroek@wits.ac.za or telephone: 011 717 3701.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee (Protocol no: M170909). For any concerns regarding your rights as a participant, or other ethical considerations, please contact the chairperson of the Human Research Ethics Committee. Chairperson, Prof P Cleaton-Jones (email: peter.cleaton-jones@wits.ac.za). Human Research Ethics Committee administrative offices contact details: Ms. Z Ndlovu/Mr. Rhulani Mkansi/Mr. Lebo Moeng, Tel: 011 717 2700/2656/1234/1252, or email: zanele/ndlovu@wits.ac.za; rhulani.mkansi@wits.ac.za; lebo.moeng@wits.ac.za.

Kind regards

Nanette van der Merwe

INFORMED CONSENT PROXY FAMILY MEMBER

I, Hettie van der Berg, hereby give my informed consent for my family member to participate in the research study entitled: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study

Hettie van der Berg
Signature of family member

04-08-2018
Date

[Signature]
Researcher

04-08-2018
Date



FAMILY MEMBER

Title: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study

Dear Mrs Coetzee's family

I am an Occupational therapist currently completing my Masters in Occupational Therapy at the University of the Witwatersrand. I work at Care@Midstream, a sub-acute facility, and have come in contact with residents/patients with various diagnoses and illnesses, including dementia. I have also been exposed to Animal Assisted Intervention. This has become a great interest to me as I have observed positive reactions from staff, co-workers and patients/residents whenever the therapy dog, Cooper, visits the facility. I often work with the elderly population and those who have been diagnosed with dementia. This exposure has lead me to question if animal assisted therapy (AAT) improves the quality of life of people with dementia. The aim of my study is therefore to determine what the effect of AAT has on the quality of life of people with dementia. I used this background to start a research project as part of the completion of my Master's degree and would like to request your participation.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee prior to initiating the research project (Protocol no: M170909).

I am inviting that your family member with dementia take part in the study. They will be involved in a programme were their normal function will be assessed in terms of their quality of life and participation in their everyday care activities over 10 weeks. These assessments will be completed by the matron or social worker who will obtain collateral information from their caregivers regarding their participation in daily activities. The social worker and matron have agreed to participate in the research project.

The initial phase of the research project consists of four weeks during which data will be collected by the matron or social worker. During this phase, there will be no therapy and the

questionnaires will be completed by the matron or social worker. There will be five opportunities for data collection.

The next phase will consist of the intervention, AAT. The AAT intervention will be introduced and will consist of one-on-one therapy sessions with a trained dog. These sessions are goal directed and outcomes are measurable. These sessions will consist of grooming activities, walking the dog or preparing meals for the dog. The research project will consist of participation in weekly AAT sessions. I will conduct each session involving AAT. Cooper, a trained therapy dog will be used during the sessions as a modality for intervention. Cooper is a kind and loving dog. He is friendly and enjoys socialising with humans and other animals. He is specially trained and has been visiting Care@Midstream on a regular basis where he interacts with patients. Cooper's handler will also be present during each therapy sessions.

Your family member would be required to attend weekly 30-minute occupational therapy sessions for 10 weeks while they receive AAT. Every two weeks data will be collected 10 weeks before and after the AAT therapy with the last five assessments being the withdrawal phase. During this phase, the intervention will be withdrawn and no therapy will be given. The study will take approximately eight months in total to complete.

Participation in the research project is voluntary. You are free to withdraw your family member from the research process at any point before the completion of the process. No personal details will be associated with the data and your family member will be allocated a number which will not be able to be associated with their name.

Should you choose to give permission for your family member to participate in the research project the benefits include exposure to a 10-week intervention period with the researcher, an occupational therapist, and a trained therapy dog. Literature has described some of the benefits as including improved social interaction, decreased behavioural problems such as anxiety and decreased feelings of loneliness. Counselling will be arranged by the researcher should a participant require assistance following a negative experience during the intervention period.

Confidentiality will be maintained by assigning numbers to each participant.

Results of the study will be available on request of the participant and his/her family member. This information will only be available once the research project has been completed.

Thank you for your time and participation in this research project.

Please feel free to contact me with any questions regarding the research by email: nanettevdm@gmail.com or telephone: 083 973 3642 or the research supervisor, Kirsty van Stormbroek via email: kirsty.vanstormbroek@wits.ac.za or telephone: 011 717 3701.



This study has been approved by the University of the Witwatersrand Human Research Ethics Committee (Protocol no: M170909). For any concerns regarding your rights as a participant, or other ethical considerations, please contact the chairperson of the Human Research Ethics Committee. Chairperson, Prof P Cleaton-Jones (email: peter.cleaton-jones@wits.ac.za). Human Research Ethics Committee administrative offices contact details: Ms. Z Ndlovu/Mr. Rhulani Mkansi/Mr. Lebo Moeng, Tel: 011 717 2700/2656/1234/1252, or email: zanele.ndlovu@wits.ac.za; rhulani.mkansi@wits.ac.za; lebo.moeng@wits.ac.za.

Kind regards

Nanette van der Merwe



INFORMED CONSENT PROXY FAMILY MEMBER

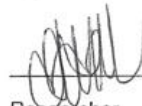
I, MAGNUS CORTEE, hereby give my informed consent for my family member _____
to participate in the research study entitled: The Effect of Animal Assisted Therapy on
Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in
Pretoria – A Pilot Study



Signature of family member

14 August 2018

Date



Researcher

14/08/2018

Date



Title: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study

Dear Monique Marais

I am an Occupational therapist currently completing my Masters in Occupational Therapy at the University of the Witwatersrand. I work at Care@Midstream, a sub-acute facility, and have come in contact with residents/patients with various diagnoses and illnesses, including dementia. I have also been exposed to Animal Assisted Intervention. This has become a great interest to me as I have observed positive reactions from staff, co-workers and patients/residents whenever the therapy dog, Cooper, visits the facility. I often work with the elderly population and those who have been diagnosed with dementia. This exposure has lead me to question if animal assisted therapy (AAT) improves the quality of life of people with dementia. The aim of my study is therefore to determine what the effect of AAT has on the quality of life of people with dementia. I used this background to start a research project as part of the completion of my Master's degree and would like to request your participation.

This study will be approved by the University of the Witwatersrand Human Research Ethics Committee prior to initiating the research project.

I am inviting you to assist in the study. You will be required to collect information from the participants' family or caregivers. The participants will be involved in a programme were their normal function will be assessed in terms of their quality of life and participation in their everyday care activities over 10 weeks.

The initial phase of the research project consists of four weeks during which appointments will be made to collect data through an interview with the caregiver. Contact will be made telephonically.

During this phase, there will be no therapy and the questionnaires will be completed with the participant's caregiver. There will be five opportunities for data collection.

The next phase will consist of the intervention, AAT. The AAT intervention will be introduced and will consist of one-on-one therapy sessions with a trained dog. These sessions are goal directed and outcomes are measurable. These sessions will consist of grooming activities, walking the dog or preparing meals for the dog. The research project will consist of participation in weekly AAT sessions. I will conduct each session involving AAT. Cooper, a trained therapy dog will be used during the sessions as a modality for intervention. Cooper is a kind and loving dog. He is friendly and enjoys socialising with humans and other animals. He is specially trained and has been visiting Care@Midstream on a regular basis where he interacts with patients. Cooper's handler will also be present during each therapy session.

The participants would be required to attend weekly 30-minute occupational therapy sessions for 10 weeks while they receive AAT. Every two weeks data will be collected 10 weeks before and after the AAT therapy with the last five assessments being the withdrawal phase. During this phase, the intervention will be withdrawn and no therapy will be given. The study will take approximately eight months in total to complete.

Participation in the research project is voluntary. Participants are free to withdraw from the research process at any point before the completion of the process. No personal details will be associated with the data and the participant will be allocated a number which will not be able to be associated with their name. You will be asked to assign the numbers and match the data collected with the number for each participant.

Results of the study will be available on request of the participant and his/her family member. This information will only be available once the research project has been completed.

Thank you for your time and participation in this research project.

Please feel free to contact me with any questions regarding the research by email: nanettevdm@gmail.com or telephone: 083 973 3642 or the research supervisor, Kirsty van Stormbroek via email: kirsty.vanstormbroek@wits.ac.za or telephone: 011 717 3701.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee (reference number – pending approval). For any concerns regarding your rights as a participant, or other ethical considerations, please contact the chairperson of the Human Research Ethics Committee. Chairperson, Prof P Cleaton-Jones (email: peter.cleaton-jones@wits.ac.za). Human Research Ethics Committee administrative offices contact details: Ms.

Z Ndlovu/Mr. Rhulani Mkansi/Mr. Lebo Moeng, Tel: 011 717 2700/2656/1234/1252, or email:
zanele/ndlovu@wits.ac.za; rhulani.mkansi@wits.ac.za; lebo.moeng@wits.ac.za.

Kind regards

Nanette van der Merwe

INFORMED CONSENT

I, Monique Narais, hereby give my informed consent to participate in the research study entitled: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study



Signature

28-03-2018

Date



Researcher

28-03-2018

Date



Title: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria – A Pilot Study

Sr Irene, the Matron, Retire@Midstream

I am an Occupational therapist currently completing my Masters in Occupational Therapy at the University of the Witwatersrand. I work at Care@Midstream, a sub-acute facility, and have come in contact with residents/patients with various diagnoses and illnesses, including dementia. I have also been exposed to Animal Assisted Intervention. This has become a great interest to me as I have observed positive reactions from staff, co-workers and patients/residents whenever the therapy dog, Cooper, visits the facility. I often work with the elderly population and those who have been diagnosed with dementia. This exposure has lead me to question if animal assisted therapy (AAT) improves the quality of life of people with dementia. The aim of my study is therefore to determine what the effect of AAT has on the quality of life of people with dementia. I used this background to start a research project as part of the completion of my Master's degree and would like to request your permission and participation to complete my project at Retire@Midstream.

This study has been approved by the University of the Witwatersrand Human Research Ethics Committee prior to initiating the research project (Protocol no: M170909).

I am inviting residents with dementia to take part in the study. They will be involved in a programme where their normal function will be assessed in terms of their quality of life and participation in their everyday care activities over 10 weeks. These assessments will be completed by the matron or social worker who will obtain collateral information from their caregivers and/or family members. Data collection will take approximately 30 minutes every two weeks.

The initial phase of the research project consists of four weeks. During this phase, there will be no therapy and the questionnaires will be completed with the participant's caregiver/family member. There will be five opportunities for data collection.

The next phase will consist of the intervention, AAT. The AAT intervention will be introduced after this period and will consist of one-on-one therapy sessions with a trained dog. These sessions are goal directed and outcomes are measurable. These sessions will consist of grooming activities, walking the dog or preparing meals for the dog. The research project will

2700/2656/1234/1252, or email: zaneleindlovu@wits.ac.za, thulani.mkansi@wits.ac.za,
lebo.moeng@wits.ac.za.

Kind regards

Nanette van der Merwe

INFORMED CONSENT

I, Irene Venter, hereby give my informed consent for participation and for the research study entitled: The Effect of Animal Assisted Therapy on Quality of Life and Participation in Activities of Daily Living of Persons with Dementia in Pretoria - A Pilot Study, to take place at Retire@Midstream.

[Signature]
Signature of Matron

17/7/2018
Date

[Signature]
Researcher

17/7/2018
Date

Appendix I Turn it in Report

Research report

ORIGINALITY REPORT

10%

SIMILARITY INDEX

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"Arts & Dementia", Walter de Gruyter GmbH, 2021

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Eadric Bressel, Talin J. Louder, James P. Hoover, Luke C. Roberts, Dennis G. Dolny. "Acute and chronic effects of aquatic treadmill training on land treadmill running kinematics: A cross-over and single-subject design approach", Journal of Sports Sciences, 2016

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