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MOTIVATORS AND BARRIERS TO REGULAR EXERCISE AMONG OLDER PEOPLE LIVING IN OLD AGE HOMES IN EKURHULENI SOUTHERN SUBDISTRICT.

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree

Of

Master of Family Medicine

Johannesburg, July 2014

DECLARATION

I, Abiodun Adeniyi Aro, hereby declare that this research report is my own work.

It is being submitted for the degree of Master of Family Medicine Degree at the University of the Witwatersrand, Johannesburg. It has not been submitted before for another degree or examination at this or any other university.

…ARO A.A……..

Signature

18th July 2014.

DEDICATION

To God almighty for HIS protection and guidance throughout my years of study.

To my wife and daughter who have been very supportive and understanding since the beginning of my enrolment in the family medicine programme.

To all my teachers and fellow registrars for their support throughout my years of study.

To all the elderly people that resides in old age homes, especially those that agreed to participate in this research.

ABSTRACT

BACKGROUND

Physical activity has been consistently shown to play an important role in healthy ageing. While motivators and barriers to regular physical activities among old people residing in old age homes have been studied in other parts of the world, the researcher found no studies on this subject in South Africa. Therefore, the aim of this research was to identify the motivators and barriers to regular exercise in elderly people residing in old age homes in Ekurhuleni Southern sub-district of Gauteng province.

METHODS

This was a descriptive cross sectional study conducted among elderly residents in old age homes in Ekurhuleni Southern Sub-district. A structured questionnaire was administered in the common languages: English, Afrikaans and Zulu. The data was collected by the researcher (assisted by research assistants) from 139 residents in seven old age homes. A Pearson chi square test was used to examine the relationship between participants' characteristics with regular exercise.

RESULTS

This study showed that having knowledge of exercise benefits (P-value= 0.001) an opportunity to socialize (P-value= 0.001) was statistically associated with regular exercise. Similarly, younger age (P- value= 0.02), high educational attainment (P-value= 0.03), being of white race (P -value= 0.04) were the main motivators to regular exercise. In contrast, poor health (P-value=0.001) and lack of knowledge of exercise benefits (P-value=0.001) were the major barriers to regular exercise.

CONCLUSION

Increasing residents' knowledge of the benefits of regular exercise, opportunity for socialization and providing support to elderly people are crucial in increasing the uptake and maintenance of regular exercise among elderly people living in old age homes in Ekurhuleni Southern Sub-district.

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LIST OF DEFINITIONS IN APHABETICAL ORDER

TERMS USED IN RESEARCH REPORT

- **BARRIER**: A hindrance towards achieving a goal (i.e. not to exercise)
- **ELDERLY / OLDER PERSON**: A person aged 60 years and above.
- **HEALTH PROBLEM**: Presence of one or more health related conditions.
- **HIGH EDUCATION**: Tertiary school attendance
- **HIGH INTENSITY EXERCISE**: Include jumping, swimming, running and push ups.
- **IRREGULAR EXERCISE:** Non engagement in exercise or engagement less than 150 minutes per week.
- **LOW EDUCATION**: No formal education and primary school attendance
- **LOW INTENSITY EXERCISE**: Include walking, arm rowing, stretching.
- **MIDDLE EDUCATION:** High school attendance.
- **MOTIVATOR**: A driving factor towards achieving a goal (i.e. to exercise)
- **MODERATE INTENSITY EXERCISE**; Cycling, dancing
- **NO HEALTH PROBLEM**: Absence of any health related condition.
- **OTHER MEDICAL CONDITIONS**: these include autoimmune diseases, cancerous conditions, dermatological conditions and hematologic conditions.
- **REGULAR EXERCISE**: Engagement in exercise for at least 150 minutes per week (At least 30 minutes in a day, five times per week)

CHAPTER 1: INTRODUCTION

Physical inactivity has been identified by the World Health Organization (WHO) as the fourth leading risk factor for global mortality (6% of deaths globally) after hypertension (13% deaths globally), tobacco use (9% deaths globally) and high blood glucose (6% deaths globally) according to the 2010 report on global recommendation for physical activity[1].

Longevity and healthy aging does not happen by chance and many factors have been reported to be contributory[1]. Some of these include a balanced diet, moderate consumption of alcoholic beverages (i.e. 21 pints for men and 14 for women per week), avoidance of cigarette smoking and regular exercise[2].

The benefits of regular exercise have long been recognized and according to Joseph Addison in the eighteen century "without exercise the body cannot subsist in vigour, nor the soul act with cheerfulness"[3]. Some of these benefits include health promotion and maintenance, delay in the onset of and prevention disabilities and chronic diseases associated with old age[4].

Physical activity can be defined as any body movement by skeletal muscles which results in energy expenditure, while exercise on the other hand refers to a regularly structured program of physical activity in order to obtain an optimal level of fitness[5]. Examples of physical activities are walking, aerobics, bicycle riding, swimming, rowing, jumping and jogging to mention a few. These activities undertaken regularly, i.e. at least 5 times a week, between 30 to 45 minutes per session (or 150 minutes per week) have been recommended for maintenance of good health and optimal functioning[5].

However, regular physical activities have been shown to progressively decline with increase in age despite the several documented benefits in the elderly population[6]. Other factors that have been reported in the literature to influence physical activity in the elderly population include personal factors such as cultural background, level of educational attainment, and health status[7]. Furthermore, misconception by some elderly people that they cannot and should not exercise have also contributed to their reduced level of physical activities[8].

There is overwhelming evidence in the literature that insufficient physical activities could increase chance of developing chronic diseases, lead to loss of gait and balance and consequently loss of functional independence in the elderly[1, 3, 4, 6]. Conversely, regular exercise or physical activities initiated late in life has been reported to reduce morbidity and mortality associated with sedentary lifestyle[7].

However, despite the numerous benefits of regular exercise, persuading elderly people to engage in regular exercise has been recognized as a difficult task [8]. In an attempt to address this problem, the South African National department of Health in the guideline for promotion of active ageing in older adults at the primary care level in 2000, recommended that an older person with stable medical condition should engage in low intensity exercise for at least 30 minutes a day, at least three days a week[9]. This guideline further recommended that those too frail to stand could engage in arm rowing and other rhythmic upper body movements for the above recommended period of time.

Similarly, a more recent report by the WHO and Department of health of Ireland recommended moderate intensity activity at least 30 minutes a day, for at least five days a week or 150 minutes a week for elderly people in order to stay physically active[1,10].

According to Oxford English Dictionary: motivation is defined as a driving factor towards achieving a goal and barrier is defined as a hindrance towards achieving a goal[11]. Several motivational models have been developed in literature but according to the motivation equation adapted from Geelen and Soons [12], motivation is comprised of four subjective factors namely: perceived chance of success and perceived importance of the goal divided by perceived cost and inclination to remain sedentary[12]. According to this model, the perceived cost is a barrier which can prevent a beneficial objective from being achieved.

These factors are modifiable by educational intervention, associated medical condition, and support from health workers and relatives[12]. Thus, the uptake and maintenance of regular exercise is based on the balance of an individual's assessment of these four factors. According to this equation, if the perceived importance of the goal (e.g. improved health status) plays a more important role than the perceived cost (e.g. pain or shortness of breath) then, the inclination for an individual to remain sedentary becomes low and there is therefore a high chance of adopting a healthy lifestyle.

Similarly, according to Cox's Interaction Model of Client Health Behaviour, the predictors of regular exercise are determined by the interaction between personal characteristics of an individual, the interpersonal component and environmental factors[13]. The personal characteristics include: (a) background variables such as gender and ethnicity (b) cognitive appraisal such as self-efficacy, perceived barriers and perceived health status and (c) motivation to be healthy. The interpersonal factors include: (a) perceived influence from health workers, family and friends and finally the Environmental components such as influence of safety and aesthetics on physical activities.

This model proposed that each of these components could influence physical activity directly and indirectly through cognitive appraisal and motivation for health[13]. For instance, if the

environment is not favourable but there is a high motivation to be healthy and a high self-efficacy for physical activities, then there is a higher tendency to engage in physical activities regularly.

The interest of the researcher to identify the factors that influence regular exercise among older people residing in old age homes was aroused while providing medical services to residents in old age homes in Ekurhuleni Southern sub-district. The researcher observed that most of the elderly people in these homes were physically inactive. Furthermore, according to the researcher's knowledge there has been no documented work done on this topic in Ekurhuleni health district and probably in South Africa in general. Studies retrieved from the literature were from the United States of America (USA), Europe and other parts of the globe.

Moreover, because the population of older people is increasing in South Africa it becomes imperative to promote healthy habits among the elderly population, which includes regular exercise[14]. The researcher hopes that by identifying these factors, appropriate programmes of intervention could be developed in all old age homes in the district and in the country at large which could promote regular exercise and thereby improve the health status of the elderly population in old age homes in general.

1.1 AIM

To study motivators and barriers to regular exercise among elderly people that reside in old age homes in Ekurhuleni southern sub-district of Gauteng province.

1.2 OBJECTIVES

1. To determine the proportion of participants engaged in regular exercise.
2. To describe the type and duration of activities engaged in during exercise.
3. To describe the motivators and barriers to regular exercise among participants.
4. To describe the influence of socio-demographic and clinical factors on regular exercise.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This literature review looked at some of the identified motivators and barriers to regular exercise in the elderly population. Literature obtained from different reliable sources was utilized. These sources included electronic search engines like Sum search 2, National library of medicine (PubMed) and Science direct. Key words used to search for the relevant work done on this topic using the above search engines were: elderly, older adults, exercise, old age homes, physical activity, barriers and motivators.

The relevant articles were identified and the main findings summarized and subjected to critical appraisal as presented below**.** The literature reviewed was discussed under the following headings: the aging process, effects of regular exercise on health status, motivators and barriers to regular exercise.

2.2 AGING PROCESS

As a person ages, the organs of the body undergo degenerative processes for instance, the heart muscles atrophy, the valves calcify and the arterial walls becomes thickened (arteriosclerosis), all of which contribute to increased prevalence of heart diseases in the elderly population[15]. Furthermore, generalized atrophy of all muscles of the body, accompanied by replacement with fat deposits results in reduction of muscle tone and strength. These changes lead to postural imbalance which contribute to increased incidence of falls, fractures, head injuries and mortality in the elderly population.

Osteoporosis has been reported to be more prevalent in old age, especially in women as a result of oestrogen deficiency in addition to smoking and low weight[15]. Moreover, postural hypotension in the elderly population is more common which could be due to autonomic dysfunction associated with the aging process or side effects of medications such as angiotensin converting enzymes inhibitor (ACE- Inhibitors) and hydrochlorothiazide used for comorbid conditions like hypertension. Furthermore, tricyclic antidepressant such as amitriptyline could cause orthostatic hypotension through the anti-cholinergic and alpha-adrenergic blockade effects[15].

The vital capacity and lung compliance is reduced in the elderly person and thus they are likely to develop shortness of breath quicker than a young person. The function of the immune

system decreases with increase in age and thus the tendency to develop some infectious and malignant conditions[15].

It is therefore not surprising that chronic conditions such as, diabetes mellitus, hypertension, chronic obstructive pulmonary disease, pneumonia, malignant conditions and coronary heart disease are common in the elderly. These changes associated with the aging process contribute to an increased likelihood of reduced physical activity in the elderly population[14, 15].

2.3 EFFECTS OF REGULAR EXERCISE ON HEALTH STATUS

Physical inactivity has been reported by the WHO as the principal cause of approximately 21-25% of the breast and colon cancer burden, 27% of diabetes mellitus and 30% of the ischaemic heart disease burden[1]. Conversely, regular exercise plays a significant role in slowing down degenerative processes associated with aging as reported in the study by Blair and colleagues[16]. In addition, regular exercise has been reported to decrease cardiovascular risk factors such as hypertension, arteriosclerosis, elevated low density lipoprotein (LDL), elevated triglycerides, and to increase high density lipoprotein (HDL) levels. Furthermore, insulin sensitivity, fibrinolysis, arterial stiffness and compliance is improved with regular exercise. Gait and balance is also enhanced by regular participation in physical activity and thus reduce the incidence of falls in the elderly[15]. Regular exercise has also been shown to reduce the risk of developing chronic diseases by 50% and premature death by 20-30% in old age[17].

In the same vein, the study by Joubert and colleagues in South Africa estimated that lack of physical activity caused 17,037 or 3.3% of all deaths in 2000 [18]. The authors concluded that there is a clear need to assess why South Africans are inactive, and also to ensure that sedentary life style be addressed as a national health Priority in order to reduce the associated disease burden[17]. WHO has also suggested a need to develop programmes in order to increase exercise participation among the elderly[19]. Similarly, Yolanda et al reported that regular exercise can reduce functional dependence, slow the progression of dementia and maximize independence in elderly people living in residential homes[20].

2.4 EXERCISE BARRIERS

2.4.1 POOR HEALTH

According to the Cox physical activity model, cognitive appraisal is the interpretation of factors related to an individual's state of health and behaviours, which includes perceived self-efficacy

for physical activities and perceived health status[13]. Poor health has been shown to reduce willingness to engage in regular physical activities in the elderly population[15].

In a qualitative study in Sweden by Leavy and Aberg, poor health was reported as one of the barriers to exercise among adults not involved in regular exercise in inactive adults [21]. Some of the cited problems were; Joint pains, lung or heart problems and tiredness reported by participants as barriers to exercise. Interestingly, in the same study, poor health was perceived as a motivator to regular exercise among elderly people exercising regularly. This latter group of elders perceived regular exercise as a health promotion strategy in controlling their chronic medical conditions.

The difference observed between these two groups could be due to a pre-informed perception of the effect of exercise on poor health. Thus, participants' engagement in regular exercise despite poor health could have been due to having knowledge of the benefits of exercise on poor health. However, in the above study there was information bias in the measurement of data, because physical activities in the participants were not objectively measured, which could reduce the validity of their findings.

The above study revealed that elderly people could perceive poor health as a motivator as well as a barrier to regular exercise[21]. This observation could be explained by the motivation equation by Geelen and Soons explained above, where if perceived importance of the goal is held as a high priority, poor health could become the motivator rather than the barrier to regular physical activities. Conversely, if the perceived importance of the goal is not held as a high priority, poor health could then be perceived as a significant barrier to regular exercise [22].

Similarly, according to Cox's physical activity model, the interaction of interpersonal factors such as encouragement from clinicians, high self-efficacy and internal motivation to engage in regular exercise could lead to an increase in physical activities despite poor health status[13].

2.4.2 FALLS AND FEAR OF FALLS

Falls are one of the leading causes of injury related visits to the emergency department and have been identified as a marker of deteriorating health status and declining function in the elderly population[23]. As a result, falls or fear of falls has been recognized as one of the barriers to regular exercise in the elderly population because it contributes to over 80% of hospital admissions [23]. Furthermore, falls in the elderly could have serious consequences such as: skull fractures, intracranial haemorrhage and death [21].

Similarly, fracture of the neck of femur in the elderly could lead to prolonged immobility which could set up a chain of catastrophic events such as development of deep vein thrombosis, pulmonary embolism and eventually death. According to Salva and colleagues in a study in Spain, 25.1% of men and 37% of women living in the community had fallen once a year; and 3.8% of the men and 10.9% of the women in their series had fallen two or more times [24]. History of previous falls could result in loss of confidence and subsequently further reduction in physical activities in the elderly population as shown by Chen in his paper [25].

2.4.3 LACK OF ENCOURAGEMENT

Inadequate encouragement by relatives, friends and health professionals seemed to reduce the necessary confidence in elderly people in the initiation and maintenance of physical activities [26]. This was reported by Horne and colleagues in a study conducted among South Asian women. We do know that health professionals occupy a very important position in modifying health behaviour of their patients, therefore WHO guidelines recommend that primary health care professionals encourage inactive adults to engage in moderate intensity exercise for at least 150 minutes or vigorous intensity exercise for at least 75 minutes a week[1].

It has also been reported in the literature that lack of encouragement by relatives and peers could be contributory to physical inactivity in the elderly population [27]. In the paper by Guerin and colleagues, lack of encouragement by family members was shown as a barrier to regular exercise. Therefore, Horne and colleagues suggested in their study that health professionals, peers, volunteers and relatives should increase their support to old age home residents in an effort to increase their level of physical activities [26].

2.4.4 LACK OF INTEREST

Moreover, some elderly people have been shown to be under the impression that they have been very active in their youthful years and would rather be engaged in other activities such as watching television, solving puzzle and generally taking things easy [28]. This was revealed in the work done by Moschny et al where lack of interest in exercise was reported by participants as one of the barriers to regular exercise [28]. This could have been due to health related problems such as pain, shortness of breath and fatigue associated with physical activities.

According to the adapted motivation equation by Geelen and Soons stated above, the perceived cost of physical activities such as pain or shortness of breath could have played a

more important role in the above group of elders and thus a high tendency to remain sedentary[12]. Moreover, lack of knowledge of exercise benefits was reported as a barrier to physical activities in the study by Schutzer and colleagues, which could be contributory to lack of interest in exercise [22]. The authors suggested that this could be because the present group of elders lived through a period of time when emphasis was placed more on cure rather than prevention of diseases.

In the study by Chen in China, poor health status was also identified as one of the causes of lack of interest in physical activities among elderly people residing in old age homes[25]. The participants reported the concern that exercise could exacerbate their already deteriorating health status and therefore avoid any physical activity likely to cause pain or shortness of breath. Rescnick and Adamo therefore suggested in their paper the importance of focusing on the interventions likely to decrease negative outcome expectations associated with physical activities in elderly people with chronic medical conditions[29].

2.4.5 LACK OF EXERCISE FACILITIES AND TRAINER

Previous studies have identified lack of exercise facilities and trainer as one of the barriers to regular exercise[25, 30]. In addition, lack of convenient space has been shown reduce willingness to engage in regular exercise[23]. For instance, environments with lack of recreational centres, sidewalks and parks make it more difficult for people to engage in exercise. Similarly, lack of supervision by an exercise trainer was reported in a systematic review by Baert and colleagues as a barrier to regular exercise in the elderly population[30]. Thus, making exercise opportunities accessible to elderly people by providing exercise facilities and trainer could increase their likelihood of engagement in regular exercise.

2.5 EXERCISE MOTIVATORS

2.5.1 KNOWLEDGE OF EXERCISE BENEFITS

The knowledge of exercise benefits could enhance the perceived importance of regular physical activities according to the motivation equation by Geleen and Soons[12]. An educational intervention to increase the knowledge of exercise benefits such as weight loss, increased functional independence and control of chronic conditions has been shown to enhance regular physical activities in elderly people [22, 31].

Furthermore, besides having knowledge of the physical benefits of regular exercise, having knowledge of the psychological benefits such as enjoyment or pleasure derived from physical activity was reported as a motivator in the study by Karen and Schutzer [22]. In addition, regular exercise is effective in the prevention and treatment of depressive disorders in the elderly [32]. This is because exercise modulates and exerts anti-inflammatory effects on the brain, thereby improving symptoms of depression [32].

In a study that examined the use of exercise compared to antidepressant medication (sertraline hydrochloride) as a treatment for major depressive disorder (MDD) in older adults. It was shown that regular exercise is a viable and cheaper option to medication in the treatment of depression in older adults. Thus, the knowledge of exercise as a preventative measure or therapeutic option to antidepressants in the treatment of mild to moderate depression could increase regular exercise in the elderly [32].

However, Cress and colleagues reported in their paper that having knowledge of exercise benefits alone is not enough to lead to a change in health behaviour[33].This finding was supported by Schuzter in her paper where feelings of enjoyment in engaging in physical activities played a more significant role in exercise maintenance than having knowledge of exercise benefits[22].

2.5.2 LANGUAGE BACKGROUND

Interestingly, ethnic background has been shown to be a motivator and a barrier to regular exercise in the elderly [34]. A study done on older adults' perception on regular exercise in Seattle in the USA revealed that different ethnic backgrounds differ in their motivators and barriers to exercise.[34] For instance, in the American-Indian and Alaska native, past history of oppression resulted in poverty and low self-esteem, which was associated with lower motivation for self-care including regular exercise. On the other hand, it was reported in this study that older people were more motivated to be involved in exercise when people of the same ethnic background were seen utilizing exercise facilities than when people of other different ethnic backgrounds were seen.

This above finding could be explained by the adapted model of physical activities by Cox, where ethnic background could interact positively with motivation to achieve and maintain a stable health status[13]. Furthermore, environmental factors such as availability of exercise facilities and trainers and encouragement by physicians and family members could interact with ethnic background to either increase or reduce involvement in regular exercise.

2.5.3 ENCOURAGEMENT BY HEALTH WORKERS AND RELATIVES

Interpersonal factors such as encouragement by clinicians has been cited more as a motivator to regular exercise in the elderly population than in the young adults, hence an elderly person being encouraged to exercise could be more willing to engage in regular exercise compared to an elderly person with lack of encouragement [13,27]. This is because a clinician occupied an important position in the modification of patients' health behaviour[27]. Similarly, WHO in their report on exercise advised health workers to utilize this unique position by advising patient to engage in regular exercise during consultation [10].

Encouragement by family and friends to engage in regular exercise is also a motivator to engage in regular exercise[34]. Thus, engaging the support of health professionals, friends and relatives has been recognized as an important strategy to increase participation in exercise in the elderly[27].

2.5.4 AVAILABILITY OF EXERCISE TRAINER AND FACILITY

A formal exercise programme held at least five times a week, and directed by a qualified physical trainer had been shown to be a motivating factor for regular exercise in elderly people[30, 31]. In the study by Costello et al in Washington D.C, availability of physical trainers was reported as a motivator to regular exercise[31]. This was because they were reported to have encouraged, supervised and provided education to participants on exercise equipment and appropriate exercises to engage in according to the health status and functional capacity of participants. Moreover, a formal exercise program has been reported to create an opportunity for socialization in elderly people living in old age homes[22].

2.5.5 OPPORTUNITY TO SOCIALIZE

Socialization during physical activities have been cited as a motivation for regular exercise in elderly people living in old age homes[22, 27, 28]. Example of such benefits include dancing, social talk or listening to music during exercise classes. These could reduce the perception of difficulty, discomfort and monotony associated with exercise. In a research paper by Guerin et al in Australia, socialization during exercise was cited as a strong motivator to regular

exercise in the elderly population [27]. Their finding aligned with that by Belza et al, where socialization was also reported as a motivator to regular exercise[34].

Furthermore, in a review by Karageorghis and Priest, music was reported to enhance exercise performance, but it was suggested that music selection should be congruent with participants' characteristics e.g. age and socio-cultural background[35]. Thus, the music selection process in a group with multiple cultures should be democratised in order to accommodate all the participants' choice of music in the music programme[35]. These findings showed that social benefits of exercise created an interest in the uptake and maintenance of physical activities.

2.5.6 MARITAL STATUS

Marital status has also been shown to positively and negatively influence regular physical activities in the elderly population[36].The assumption that married couples would encourage each other to be more physically active could be determined by the perceived importance of regular exercise by one of the couples, or by their clinician[25]. In the study by Ibrahim et al among Malaysian men, being married was demonstrated as a barrier to adequate physical activities[37]. However in another study by Horne et al, marital status was reported as a motivator to regular exercise by participants[36]. The difference observed could be due to difference in the study design used in the two studies, the former study being quantitative and latter qualitative and probably because only men were studied in the paper by Ibrahim et al [37].

2.5.7 HIGH EDUCATIONAL ATTAINMENT

There is overwhelming evidence that high educational attainment is a strong motivator to uptake of healthy lifestyle including regular exercise, and thus a university graduate is expected to have more knowledge of exercise benefits compared to an illiterate[10, 21,22,29,38]. The study by Park and Chang done among Korean men showed that education enhances regular physical activities. This finding could be partially explained by Geelen and Soons motivation equation highlighted earlier[12], where high education could enhance the perceived importance of regular exercise [38].

Similarly, in the study by Vlassof, educational intervention was reported to increase physical activities in the elderly people[39]. However, according to the study by Dishman, having knowledge of exercise benefits does not necessarily translate to behaviour change but rather behavioural modification strategies is more important in the uptake and maintenance of physical activities[40].

2.6 CONCLUSION

The interaction between personal, interpersonal and environmental factors determine an individual's involvement in regular exercise. This literature review has shown that personal factors such as having knowledge of exercise benefits and feeling of enjoyment is crucial for uptake and maintenance of physical activities. In addition, encouragement by relatives and physicians and availability of exercise facilities and trainers were also identified as motivators to regular exercise.

Lack of knowledge of exercise benefits, exercise trainers and facilities and interest was identified as a barrier to regular exercise. Finally, poor health status was identified as a motivator as well as a barrier to regular exercise depending on the outcome of interaction between factors highlighted above.

Although various studies internationally have identified the motivators and barriers to regular exercise in the elderly population living in residential homes, as far as the researcher could ascertain no similar studies have been done in Ekurhuleni health district and probably in South Africa to identify these factors.

The researcher hopes that the result of this study will be implemented by policy makers, management of various old age homes and health care workers to increase engagement in regular exercise by older people living in old age homes.

This is with the hope that it would lower the economic burden associated with the cost of medical care. In other words, it would make economic sense to increase exercise uptake and maintenance in the elderly population.

CHAPTER 3: METHODS

3.1 STUDY SETTING

Ekurhuleni metropolitan Municipality is one of the three municipalities in Gauteng province. It is divided into Eastern, Northern and Southern sub-districts. According to the 2011 census, it has a population of 3.2 million, of whom 78% were black Africans. However, this study was conducted in the Southern sub-district which consists of Alberton, Germiston, Boksburg, Vosloorus, Katlehong and Thokoza townships [41].

This southern part of Ekurhuleni mostly consist of low to middle income class population and one-third of this still resides in informal settlements. However, the majority of the households have access to water, adequate sanitation and electricity. The health problems prevalent include chronic diseases like, HIV, hypertension, diabetes mellitus, tuberculosis and cervical cancer [41]. There are no exercise exercises easily facilities accessible to elderly people in this sub-district.

3.2 STUDY DESIGN

This was a quantitative cross sectional analytical study. This was used to compare the relationship between regular exercise with socio-demographic and clinical factors in participants.

3.2.1 STUDY POPULATION AND SAMPLE SIZE

The study population was eight hundred and twenty three (823) people that resided in old age homes in Ekurhuleni Southern Sub-district at the time of the study. The sample size of two hundred and sixty three (263) was estimated based on a 5% sampling error, a 95% confidence level and a 50% response rate using Raosoft software [42].

At the inception, a simple random sampling was planned, however after applying the inclusion and exclusion criteria (refer below), of the eight hundred and twenty three (823) participants, six hundred and forty-six (646) did not meet the criteria and were thus excluded. Then of the remaining one hundred and seventy seven participants (177), thirty eight (38) refused to participate, and thus all the remaining one hundred and thirty nine (139) participants were included in the study.

FLOW CHART OF PARTICIPANTS

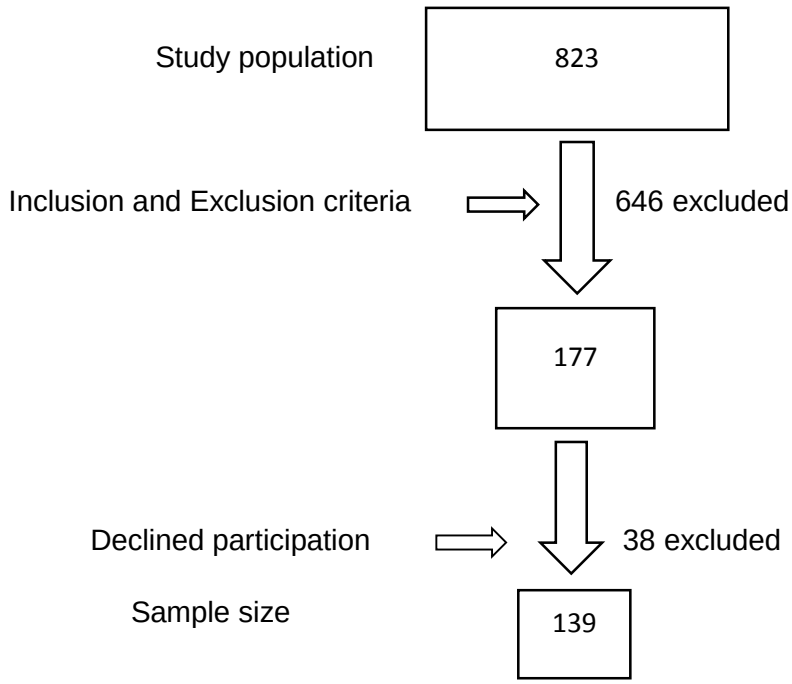

FIGURE 1

3.3 INCLUSION AND EXCLUSION CRITERIA

3.3.1 INCLUSION CRITERIA

Residents who were above or equal to 60 years, and willing to sign a consent form to participate in the study.

Residents who have stayed in the old age home, for at least 6 months before collection of data.

Residents with intact cognitive function.

3.3.2 EXCLUSION CRITERIA

Frail elderly residents and those with visual and hearing impairments

This was how participants were excluded:

- seventy-two were below sixty years of age
- two hundred and thirty six had cognitive impairment
- thirty had visual impairment
- twenty two had hearing impairment
- two hundred were too frail to be interviewed
- eighty six had lived in the old age homes for less than 6 months and
- thirty eight refused participation

3.4 DATA COLLECTION INSTRUMENT

A structured questionnaire which was developed based on conclusions/findings of previous studies appraised during the literature review was used to collect data from the participants. [1, 6, 10,21,24,28,29,30,35]. However, modifications of some questions were made after the pilot study was done on ten old age home residents in an old age home located in Ekurhuleni Eastern Sub-district after obtaining ethics approval. This was done to access the understanding of the modified questions by participants. The questionnaire was then administered by the researcher and the two research assistants.

Section A of the questionnaire collected data on Socio-demographic characteristics such as: age, gender and language background. Section B collected information on the body mass index (BMI) and clinical information of the participants which was retrieved from the medical records after the interview.

The third section recorded the types and duration of exercises engaged in while the last two sections recorded the motivators and barriers to regular exercise. The questionnaires were prepared in the English, Afrikaans and Zulu languages. The interview schedule in English was prepared by the researcher and translated into Zulu and Afrikaans languages by Zulu and Afrikaans health workers literate in both languages respectively. Accuracy of the translations were checked by going through each question, ensuring it was simple to understand then back translating the Afrikaans and Zulu versions into English.

The Afrikaans and Zulu translation to English version was then compared with the earlier English version. The back translation was found to agree with the original English version. To ensure uniformity and understanding of the questions, these questions were read to the participants, and they were also given the opportunity to go through the questions themselves before signing the consent form. The questionnaire is attached (see appendix 1).

3.5 DATA COLLECTION TECHNIQUE

Data collection was done at the old age homes. Prior to the visit an appointment was made with the facility managers by making a phone call to get permission to interview the residents. Each facility was visited at different times. There were three big old age homes (each accommodating more than one hundred residents) and four small old age homes included in the study. The small old age homes were visited once because the residents who were eligible and willing to participate were an average number of ten. The big old age homes were visited three times because the residents who were eligible and willing to participate were an average number of forty.

On arrival at these facilities, the researcher with the research assistants spoke to all the residents in groups to explain the purpose of the study. The eligible participants were each given an information leaflet to explain the purpose of the study by the researcher and research assistants where necessary and those willing to participate were given a consent form to sign.

After the consent form was signed, each participant was interviewed by the researcher and research assistants in their own rooms to ensure privacy. The researcher administered the structured questionnaire which was in the English language. Where the participant did not understand English, two trained research assistants administered a translated version of the questionnaire in Zulu and Afrikaans languages as appropriate under the supervision of the researcher.

The two research assistants are health workers who have been involved in other studies and have research experience and were re-orientated on the aim and objectives of this present study. They had two training sessions with the researcher on how to administer the questionnaire and collect data. There were two training sessions (each lasted about 30 minutes) with a week interval between each session.

During the interview, the participants Socio-demographic characteristics, exercise types and duration were recorded in the questionnaire. Thereafter, exercise motivators and barriers were recorded in the questionnaire. After each participant was interviewed, the researcher went to the nurse in charge of the old age homes to obtain the clinical information of the participants from the medical records and thus determine the health status of the participant (that is those with health problems versus those without health problems). The completed questionnaires were coded immediately to ensure confidentiality. The data collected was locked in a drawer accessible to the researcher and supervisor only. The same procedure was repeated in other facilities.

3.6 PILOT STUDY

There was a total of 65 residents accommodated, and after applying the inclusion and exclusion criteria only 36 were eligible to participate, out of which 10 were selected by simple random sampling by the use of a random number table. A structured questionnaire was used to interview each participant in their rooms to ensure privacy.

The aim of the pilot study was to ensure the appropriateness and understanding of the questions and also to detect any potential problems with the questionnaire. After the pilot study, the answers were grouped into themes for ease of data analysis (see appendix 1). Some of the options were modified for example, incorporation of music into exercise programmes as a motivator to regular exercise was found to be confusing and was modified to dancing with exercise. In addition, to the option: lack of support and interest as a barrier to regular was replaced with no interest and encouragement for easy understanding by the participants.

3.7 VALIDITY AND RELIABILITY OF STUDY

Validity is the extent that the research findings accurately represent the true situation and can thus be defended when challenged [43].

The following actions were taken to ensure validity in this study:

CONSTRUCT VALIDITY

This refers to the validity of a test or a measurement tool that is established by demonstrating its ability to identify or measure the variables, this judgment is based on the accumulation of correlations from previous studies using the instrument being evaluated[43]. In this study, the researcher used the literature review as the basis of developing the questionnaire and aligned the motivators and barriers to regular exercise in elderly people living in old age homes to those reported in the literature review.

EXTERNAL VALIDITY

This is concerned with the extent to which the research findings could be applied to the real world, beyond the controlled setting of the research[43]. In this study, the sample was not representative of all the old age homes in Ekurhuleni health district and therefore cannot be generalized to the entire district or Gauteng province.

CONTENT VALIDITY

This checks the content of the questionnaire and also if it covers the full domain of the content[43]. In this study, the questionnaire addressed the aim and the objectives and was compiled based on the previous research findings discussed in the literature review above.

FACE VALIDITY

This is the least scientific method of validity. It looked at how valid the questionnaire appears on the surface and makes a subjective judgment based on it. In this study, the researcher had an interview with nurses and volunteers in one of the old age homes at Ekurhuleni Southern Sub-district and obtained feedback from statisticians at Witwatersrand University on whether the questionnaire appeared to have answered the subject based on the title. They commented that it answered what it set out to access.

RELIABILITY

This is when something will perform in the future as it has in the past. A measure is considered reliable if a person had similar scores when given the same test twice[43]. A pilot study was done in one of the old age homes at Ekurhuleni Eastern Sub-district from which the final questionnaire used in this project was drawn. Doing another pilot study on this final questionnaire could have evaluated the reliability of the final questionnaire by giving it to participants two weeks later (test-retest reliability). By comparing results obtained from an initial test and repeat test, it would be assumed that if the questionnaire was reliable, similar results would be obtained from the two tests. This was not done because it was not part of the ethics approval granted.

3.8 DATA ANALYSIS

Data from the questionnaire was captured using a MS Excel spread sheet and was cleaned. The data was then imported into Stata software and analysed using STATA 10 statistical software (version 10.1, copyright 1984-2009 Statacorp, Texas, USA) with the help of two statisticians. Descriptive statistics was performed where categorical data were presented as frequencies and proportions. The normality of data was checked and the means and standard deviations were calculated for the continuous variables. The continuous variables were then grouped into categorical variables.

A chi square test was used to test associations between participants' characteristics and regular exercise. Univariate analysis was used to determine statistically significant motivators among those exercising regularly and barriers among those not exercising regularly. Statistical significance was ascertained at the 5% level i.e. $p<0.05$.

3.9 ETHICAL CONSIDERATIONS

Permission to conduct the study was obtained from the managers of each old age home in writing and from the Research Ethics committee of Ekurhuleni health district to conduct the study. Ethical clearance for the study was also obtained from the Human Research Ethics Committee of University of the Witwatersrand. The ethical clearance certificate number was M120120.

The questionnaires had no names on them, so it remained anonymous except to the researcher and research assistants. The raw data was confidential and only available to the researcher, the supervisor and the statisticians. Consent was obtained from each participant. They were informed that they had the right to refuse to participate in the study and were free to withdraw at any time from the study. Thereafter, consent was obtained from willing participants and those who agreed signed the consent form. The rights of those that refused to sign the form was respected.

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CHAPTER FOUR: RESULTS

This chapter presents the results of the study conducted among old age home residents of Ekurhuleni Southern Sub-district on the motivators and barriers to regular exercise. The first section of this result reported the baseline characteristics and clinical information of participants and the types and duration of exercises engaged in. The second section reported participants' characteristics in relation to exercise involvement while the third section reported participants' characteristics in relation to regular exercise. The final section reported motivators and barriers to regular exercise among participants.

SECTION A

4.1: BASELINE CHARACTERISTICS OF PARTICIPANTS

The total number of participants targeted to participate in the research was 263, however only 139 were included in the study as explained under sampling methods. A total number of 177 residents were given the questionnaire and 139 participants responded. The response rate was 79%.

Females constituted the majority of the participants (72%). The mean age was 70.4 years with standard deviation of 8. The vast majority of the participants (86%) were not in any formal relationship. Forty four percent were Afrikaans speaking while fifty eighty percent attended only high school (Table 1).

Table 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Variables	**Number of participants (N=139)**	**Percent (%)**	**SD/Mean**
Gender			
Male	39	28.1	
Female	100	71.9	

Variables	Number of participants (N=139)	Percent (%)	SD/Mean
Age			
60-69	41	29.5	8.0/70.4
70-79	51	36.7	
>or=80	47	33.8	
Marital status			
Single	23	16.5	
Divorced	18	12.9	
Widowed	78	56.1	
Married	13	9.4	
Separated	7	5.1	
Language background			
Afrikaans	61	43.9	
English	54	38.8	
Others	24	17.3	
Educational attainment			
Did not attend school	11	7.9	
Had primary school education	16	11.5	
Had high school education	81	58.3	
Had tertiary education	31	22.3	

4.2: HEALTH STATUS OF PARTICIPANTS

The majority of the research participants have a lower healthy status (86%) compared to those who were considered healthy (14%). More than half (60%) had abnormal BMI (i.e. overweight and obese).The mean BMI of the participants was 26.6kg/m^2 with standard deviation of 4.7. (Table 2).

TABLE 2: CLINICAL INFORMATION OF PARTICIPANTS

variable	Number	Percent (%)	SD/Mean
Health status			
No Health problem	20	14.4	
Has health problems	119	85.6	
Body mass index (kg/m2)			
Normal weight	55	39.6	4.7/26.6
overweight	48	34.5	
Obese	36	25.9	

4. 3: TYPES AND PROPORTION OF EXERCISES ENGAGED IN

Walking with other types of low intensity exercise was most common among participants' with a percentage of 89.2. Moderate intensity exercise constituted 14.3 percent, while 4.3 percent were involved in high intensity exercises. Those not involved in any form of exercise were only 7 percent of the sample size. (N not equal to 139 because of overlap in the types of exercises done among participants.)

TABLE 3: TYPES OF EXERCISES ENGAGED IN AND PROPORTIONS

Types of exercises done	Frequency N=139	Percent (%)
Low intensity	124	89.2
Moderate intensity	20	14.3
High intensity	6	4.3
No exercise done	10	7.2

4.4: DURATION OF EXERCISE DONE PER WEEK

Fifty percent (70) of the participants exercised more than 150 minutes per week.

TABLE 4: DURATION OF EXERCISES ENGAGED IN A WEEK

Duration of exercise	Frequency (N=139)	Percent (%)
>150 minutes/week	70	50.4
<150 minutes/week	56	40.3.
Don't know	3	2.1
No exercise done	10	7.2

SECTION B

4.5: EXERCISE ENGAGEMENT BY SOCIO-DEMOGRAPHIC CHARACTERISTICS

Females were more involved in exercises (71%) compared to males (29%). The mean age of participants involved in exercise was 75.5 years with standard deviation of 9. Fifty eight percent of participants attended only high school while forty-six percent were Afrikaans speaking. The majority of the participants not in any formal relationship (85%) were involved in exercise.

TABLE 5: EXERCISE ENGAGEMENT BY SOCIO-DEMOGRAPHIC CHARACTERISTICS

Variable	Exercise engagement		
	Frequency (N=129)	Percent (%)	SD/Mean
Gender			
Male	37	28.6	
Female	92	71.4	
Age (years)			
60-69	39	30.2	9.0/75.5
70-79	47	36.5	
Above 80 years	43	33.3	
Educational attainment			
Did not attend school	8	6.2	
Had primary school education	15	11.6	
Attended high school education	75	58.1	
Had tertiary education	31	24.1	
Language background			
Afrikaans	59	45.7	
English	48	37.2	
Other	22	17.1	
Marital status			
Single	21	16.3	
Divorced	15	11.6	
Widowed	74	57.3	
Married	12	9.4	
Separated	7	5.4	

4.6: EXERCISE ENGAGEMENT BY HEALTH STATUS

The majority of the participants (85%) with less healthy status were involved in exercise while more than half (63%) of those with abnormal BMI (i.e. overweight and obese) were involved in physical activities. The mean BMI of participants that engaged in exercise was 26.82kg/m2 with standard deviation 4.6. (Table 6).

TABLE 6: PARTICIPANTS' HEALTH STATUS IN RELATION TO EXERCISE ENGAGEMENT

Variable	Frequency (N=129)	Percent (%)	SD/Mean
Health status			
No Health problem	20	15.5	
Health problems	109	84.5	
Body mass index (kg/m2)			
Normal weight	48	37.2	4.6/26.82
overweight	46	35.7	
Obese	35	27.1	

SECTION C

4.7: PARTICIPANTS INVOLVED IN REGULAR EXERCISE

Fifty percent of participants were engaged in regular exercise, see figure 3 below.

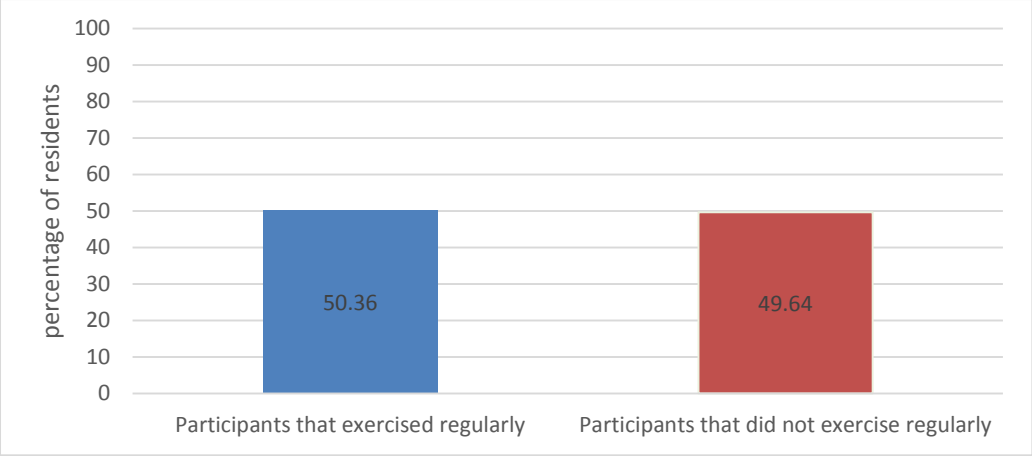

FIGURE 1

4.8; INFLUENCE OF SOCIO-DEMOGRAPHIC CHARACTERISTICS AND HEALTH STATUS ON REGULAR EXERCISE.

Seventy-three percent (51) of participants involved in regular exercise were females, though not statistically associated with regular exercise (P-value=0.9) and x^2 of 0.02. Furthermore, younger age (60-69 years) was statistically associated with regular exercise (P- value=0.02), and x^2 of 7.5 but the mean age of those involved in regular exercise was 74.4 years. Overweight and obese participants were more engaged in regular exercise though not statistically significant (P -value=0.08) and the mean BMI was 27.4 kg/m2.

Considering marital status, the widowed were the most active though this was not statistically significant (P-value=0.2) and chi-square 6.6. However, when marital status was regrouped into dichotomous categories, that is those in formal relationships and those not in formal relationships, there was statistical significant relationship between marital status and regular exercise (P -value= 0.01).

In addition, increasing education (P -value=0.03) with x^2 of 10.5 and being of Caucasian origin (P-value=0.04) with x^2 of 6.6 was statistically associated with regular exercise. Finally, those with health problems were more involved in regular exercise, though this was not statistically significant (P- value 0.4) with x^2 of 0.5.

TABLE 7: TEST OF ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC CHARACTERISTICS WITH REGULAR EXERCISE

Variable	Regularly exercised		P value	X^2
	frequency	Percent (%)		
Gender			0.9	0.02
Male	19	27.2		
Female	51	72.8		
Age			0.02	7.5
60-69	27	38.6		
70-79	19	27.1		
>or=80	24	34.3		
Marital status				
Single	10	14.3	0.2	6.6
Married	3	4.3		

Separated	2	2.8		
Divorced	9	12.9		
widowed	46	65.7		
Educational attainment			0.03	10.5
Did not attend school	1	1.4		
Had primary school education	9	12.9		
Had high school education	44	62.9		
Has tertiary education	16	22.8		
Language background				
Afrikaans	33	47.1	0.04	6.6
English	30	42.9		
Other	7	10		

TABLE 8: RELATIONSHIP BETWEEN HEALTH STATUS AND REGULAR EXERCISE

Variable	Regularly exercised			
	Frequency	Percent (%)	P- value	X^2
BMI				
18-24.9kg/m2	27	38.6	0.08	4.8
25-29.9kg/m2	24	34.3		
>or=30kg/m2	19	27.1		
Health status				
No Health problem	10	14.3	0.4	0.5
Health problems	60	85.7		

4.9 RELATIONSHIP BETWEEN CHRONIC MEDICAL CONDITIONS AND REGULAR EXERCISE

Forty-one percent (57) of the participants had cardiovascular (CV) related conditions (i.e. hypertension, diabetes mellitus, dyslipidaemia etc.) and forty six percent (32) of these were involved in regular exercise. Presence of chronic medical conditions was not statistically associated with regular exercise (P value=0.5) with x^2 of 6.4 (See table 9).

TABLE 9: RELATIONSHIP BETWEEN CHRONIC MEDICAL CONDITIONS WITH REGULAR EXERCISE

Health status	Frequency N=139	Percent (%)	Regularly exercised n=70	Percentage that exercised regularly	P-value	X^2
No Health problem	20	17.8	10	14	0.5	6.4
Have health problems						
Cardiovascular conditions alone	57	41	32	45.7		
Cardiovascular/ neurological conditions	2	1.4	1	1.4		
Cardiovascular/ musculoskeletal conditions	19	13.7	8	11.4		
Cardiovascular/ other medical conditions	10	7.1	5	7.1		
Neurological conditions alone	4	2.8	4	5.8		
Musculoskeletal conditions alone	16	11.5	6	8.5		
Other medical conditions	8	5.7	4	5.8		
Total	119	85.6	60	85.7		

SECTION D

4.10 MOTIVATORS TO REGULAR EXERCISE

Most of the participants reported more than one motivator to regular exercise (therefore n was not equal to 70). Motivators in the questionnaire were grouped into themes e.g. involvement in regular exercise to lose weight and to improve health status was categorized under knowledge of exercise benefits (see appendix 1: questionnaire). Participants who indicated

knowledge of exercise benefits were in the majority (98%). In addition, all the motivators were statistically associated with regular exercise. (See table 9).

TABLE 10 MOTIVATORS TO REGULAR EXERCISE

Motivators	Exercised regularly			
	Frequency (n not =70)	Percent (%)	P-value	X^2
Knowledge of exercise benefits	69	98.5	<0.001	17.9
Opportunity to socialize	45	64.2	<0.001	55.5
Encouragement by health workers and relatives	37	52.8	<0.001	44.4
Availability of trainer and exercise facilities	25	35.7	<0.001	17.2

4.11 BARRIERS TO REGULAR EXERCISE

Most of the participants reported more than one impediment that prevented them from involvement in regular exercise (therefore n was not equal to 69). Barrier options in the questionnaire were grouped into themes e.g. shortness of breath, joint pain and fatigued were categorized under poor health (see appendix 1).There was a statistically significant association between regular exercise and barriers. Majority of participants not engaged in regular exercise reported poor health status as the most common barrier to regular exercise.

TABLE 11 BARRIERS TO REGULAR EXERCISE

Barriers	Did not exercise regularly			
	Frequency (n not equal to 69)	Percent (%)	p-value	X^2
Poor health	57	82.6	<0.001	94.1
Lack of knowledge of exercise benefits	50	72.4	<0.001	67.1
Lack of encouragement	38	55.1	<0.001	55.0
Lack of interest	27	39.1	<0.001	33.9
Lack of exercise facilities	24	34.7	29.4	< 0.001

4.12 SUMMARY OF MAIN FINDINGS

Majority of the participants were the widowed, the Afrikaans, people with health problems and those with high school education. Furthermore, younger age (P-value=0.02), increasing educational attainment (P value=0.03) and language background (P-value=0.04) was statistically associated with regular exercise. Walking was the most common form of physical activity and half of the participants were engaged in regular exercise.

The knowledge of exercise benefits, opportunity to socialize, encouragement by health workers and relatives and availability of exercise trainer and facilities were statistically associated with regular exercise. Conversely, health problems, lack of knowledge of exercise benefits, lack of encouragement by health workers and relatives, lack of interest and lack of exercise trainer and facilities was statistically associated with irregular exercise

CHAPTER 5: DISCUSSION

This study identified the motivators and barriers to regular exercise in elderly residents in old age homes at Ekurhuleni Southern Sub-district. The discussion is divided into the following headings: participants' characteristics, the proportion of participants engaged in regular exercise and the types of exercises engaged in. Thereafter, the relationship between regular exercise and participants' characteristics and finally motivators and barriers to regular exercise are discussed.

5.1 BASELINE CHARACTERISTICS OF THE PARTICIPANTS

One hundred and thirty-nine participants were involved in this study, which is similar to the study by Resnick and Adamo[29] where one hundred and sixty three participants were involved. In addition, a greater proportion of participants in our study had cognitive impairment and were frail compared to the latter study which contributed to the smaller sample size in this present study.

Furthermore, our study had more female participants compared to male, which was similar to the study by Giuli et al conducted in Italy where female participants were also in the majority (56.5%) [44]. Similarly, in the study by Horne and colleagues, female participants were reported to be in the majority[24]. This could probably be because women live longer than men as shown in the paper by Eskes et al where they explained that lower cardiovascular risks and genetic make-up in females could be contributory factors[45].

The average age of participants was 70.4 years (SD of 8.0) which was similar to that obtained by Lee and Laffrey where the mean age of participants was 69 years[46]. The widowed constituted 56% of the participants in this study, which was similar to that reported by Resnick and Adamo, where 53% fifty-three percent of the participants were widowed[29]. This similarity could be because both studies were conducted among old age home residents, who are more likely to be widowed and lack support and adequate care at home. Conversely, in the study conducted by Giuli et al, married couples constituted a larger proportion of participants, probably because this latter study was conducted among community dwelling elderly people[44].

Elderly whites (Afrikaans and English background) constituted 83% of the participants in this current study which was similar to the work done by Resnick and Adamo where 99% of the participants were whites [29]. The researcher thought this could be because it is less culturally acceptable for elderly non-whites to be cared for in old age homes and vice versa. In addition,

the legacy of the apartheid Government created socio-economic disparity between whites and non-whites which could have contributed to the higher proportion of elderly non-whites being less likely to afford the costs of old age homes in their post-retirement period.

Furthermore, most of the participants in this present study were well educated (81%), which was similar to the study by Lee and Laffrey where 87% were reported to be well educated[46]. This could be due to a high proportion of Caucasian in both studies who are more likely to be educated.

Moreover, 86% of the participants in this study had health-related problems, which was similar to the study finding by Giuli et al where 78% had health-related problems[44]. This similarity between both studies could be explained by increased prevalence of degenerative diseases and cardiovascular morbidity with increase in age[7]. The researcher also reasoned that because this study was conducted among old age home residents, it is likely that the presence of chronic diseases (which require holistic and dedicated care) compelled residents to be brought in from their homes to old age homes, hence, the high prevalence of chronic diseases in this present study.

The mean BMI of the participants in this present study was 26.6kg/m2 (SD of 4.7). This result could be compared to the result obtained by Gobbi et al, [6] where the mean BMI was 26.2kg/m2.

5.2 PARTICIPANTS ENGAGED IN EXERCISE AND TYPES OF EXERCISES ENGAGED IN

Participants were involved in various types of exercise as shown in table 3 above. However, walking was reported by 81% of participants as the mode of exercise in this current study which aligned with the study done by Belza and colleagues where 76% engaged in walking[34]. This could be because walking is cheap, it promotes independence, is the major mode of movement and also a means of socialization[34].

Our study further revealed that 93% of the participants were involved in physical activities and those not involved in any physical activities reported poor health mainly due to paraplegia, osteoarthritis and urinary incontinence as barriers[20]. The mean age of participants involved in exercise was 75.5 (SD of 9) years which was higher than the mean age of 70.4 years (SD of 8.0) for all the participants in this present study. The researcher could not find an explanation for this finding.

The present study revealed that 50% of participants were engaged in regular exercise as shown in figure 3 above. This was similar to the finding by Gobbi et al where 49.7% reported

engagement in regular exercise [6]. This similarity between both studies could be due to increased prevalence of degenerative diseases and cardiovascular morbidity with increase in age[14, 15]. The researcher also thought that lack of knowledge of exercise benefits, and insufficient encouragement by health workers could be contributory[38].

5.3 RELATIONSHIP BETWEEN PARTICIPANTS' CHARACTERISTICS AND REGULAR EXERCISE

In this present study, there was no association between gender and regular exercise (P-value=0.9 and x^2 0.02) although females were seen to be more physically active which aligned with the study conducted by Gobbi et al [6].This could be due to a higher proportion of females in both studies.

However, an association was shown between regular exercise and younger age in our study (P- value=0.02 x^2 7.5). The most physically active participants were in the age range 60-69 years, which aligned with the work done by Gobbi et al [6] where participants in the younger age group were more active than older participants. Koeneman et al also showed an association between younger age and regular exercise[47].

Our research thus further supports previous literature that elderly people in the younger age group are more likely to be physically active than older adults[12, 46,48]. This could be due to increased prevalence of degenerative diseases and cardiovascular morbidity with increase in age[7,14]. In this current research, no association was shown between BMI and regular exercise (P- value=0.08) and the mean BMI was 27.4 kg/m2.

Similarly, a prospective cohort study by Landi et al and systematic review by Koeneman et al, showed no association between regular exercises with BMI[46, 47]. Though the association between BMI and regular exercise did not achieve statistical significance in this present study, it is of clinical significance because it showed that a higher proportion of overweight and obese participants were more engaged in regular exercise as shown in table 8. The finding could be explained by the adapted Cox model of physical activity[13]. For instance, if self-efficacy and internal motivation for regular exercise is low in participants with normal weight, then there is a higher tendency to remain sedentary.

The researcher therefore inferred from this finding that other benefits of regular exercise (apart from weight loss) such as health maintenance and promotion should be emphasized by clinicians to elderly people with normal weight in order to increase their participation in

exercise. This could be achieved through educational intervention and behavioural therapies[11, 20,38].

In addition, our study revealed no association between marital status and regular exercise (P-value=0.2 and x^2 6.6). However, it is worthy of note that when marital status was regrouped into dichotomous groups, (that is those in a formal relationship and those not in formal relationships) being out of a formal relationship was found to be associated with regular exercise (P -value=0.01 and x^2 9.4). This latter finding was in contrast to the study by Resnick and Adamo where being married was seen to be associated with regular exercise[29]. The difference observed between both studies could probably be explained by the low representation of married participants in our study (4%) compared to the latter study where married participants constituted 36% of the total. As a result, married participants in this present study were less likely to engage in regular exercise.

White participants in this present study were more engaged in regular exercise than non-whites (P- value=0.04 and x^2 6.6), which was consistent with the study by Belza et al [33] where ethnic background was reported as a motivator to regular exercise. This could be because white participants constituted the majority in this study and were therefore more likely to feel comfortable around each other. Similarly, in the work done by Belza et al, the American Indian/Alaska native showed a strong desire to be with people of similar identity and ethnic background[34].

It is also important to note that only one of the old age homes in our study accommodated only blacks, and the majority of these residents had low educational levels and were not engaged in regular exercise. The researcher therefore inferred that a similar cultural or ethnic background might not solely explain the association observed between ethnic background and regular exercise in our study, but probably having knowledge of exercise benefits, which is higher in people with high education levels[37].

High education was associated with an increased likelihood of reporting regular exercise in this present study (P- value=0.03 and x^2 10.5) which was also supported in the study by Park and Chang in South Korea[38]. This similarity between our study and the latter study could be explained by the adapted motivation equation proposed by Geelens and Soons where the perceived importance of regular exercise could be enhanced by higher education[12].

Thus, highly educated people are more likely to perceive exercise to be beneficial and in turn more likely to engage in regular exercise[38].

Furthermore, our study showed that health status was not associated with regular exercise. Likewise, the systematic review by Koeneman et al, found no association between health

status and regular physical activities[47]. Table 8 showed that elderly people with health related problems were more likely to report engagement in regular exercise, probably because they constituted the majority of the participants.

Moreover, 63% of participants in our study had only cardiovascular related conditions of whom 66% reported engagement in regular exercise as shown in table 9. Likewise, in the study by Lee and Laffrey, 51% of the participants had cardiovascular related conditions of whom the majority were reported to engage in regular physical activities[46]. Our study and the latter study showed that despite poor health statuses, participants reported engagement in regular exercise probably because they had an understanding of the role of exercise in management of chronic conditions.

The researcher therefore reasoned that chronic medical conditions was probably perceived by participants engaged in regular exercise in both studies as the rationale to stay physically active and was the deterrent to those not involved in regular exercise.

5.4 MOTIVATORS TO REGULAR EXERCISE

5.4.1KNOWLEDGE OF EXERCISE BENEFITS

In this present study, knowledge of exercise benefits was seen to be the most common motivator to engage in regular exercise which aligned with findings by Belza and colleagues[34]. Similarly, lack of knowledge of exercise benefits was seen to be the second most common barrier to regular exercise (after poor health) in our study. A further analysis of our study showed that participants with high education were more motivated by having knowledge of exercise benefits and vice versa. This was also shown by Park and Chang in their study, [38] and corroborated by Geelen and Soons adapted motivation equation explained earlier[12].

In a focused review by Phillips and colleagues, clinicians were urged to educate elderly people on the benefits of exercise and also to correct misconceptions that ill health necessitates reduction in physical activities [49]. However, according to Dishman, having knowledge of exercise benefits does not translate into exercise adherence as highlighted earlier, but rather socialization and feelings of enjoyment associated with regular exercise seem to play a more important role in long-term adherence to exercise[40]. In addition, Cox's physical activities model showed that interaction between personal, environmental and interpersonal factors determine engagement in physical activities and not only having knowledge of exercise benefits[13]. The researcher therefore inferred that in addition to

educating elderly people on the benefits of regular exercise, creating an enabling environment for socialization while exercising could lead to long-term adherence to exercise[34,35].

5.4.2 OPPORTUNITY TO SOCIALIZE

People are more likely to engage in and adhere to regular physical activities if there is a social component to exercise.[35] Opportunity to socialize was reported by 64% of the participants as a motivator to regular exercise in our study as shown in table 10. In this current study, elderly people engaged in regular exercise mostly by walking to visit friends and occasionally relatives living within the facility. Furthermore, some participants (mainly whites) reported dancing as the motivator to regular exercise in their rooms. A similar report to our finding was obtained by Belza and colleagues where the Spanish speaking Latinos emphasized the opportunity to socialize as the motivator to engage in physical activities[35].

According to Horne et al, making physical activity fun and not necessarily a competitive event was shown as a motivator to regular exercise in the elderly[35]. Similarly, Karageorghis and Priest showed that dancing while exercising could be a strong motivator to regular exercise[36]. Thus, incorporating suitable music according to age and ethnic background could increase interest in engaging in regular exercise in the elderly population[28, 33, 36]. This is because music has been shown to enhance exercise experience by reducing negative perceptions associated with exercise such as such as monotony, fatigue, pain and shortness of breath[28].

5.4.3 ENCOURAGEMENT BY HEALTH WORKERS AND RELATIVES

Furthermore, this present research showed that 53% of the participants were motivated to exercise regularly by encouragement from health care workers and relatives. The positive influence of health workers on uptake of regular exercise was shown in the study by Horne and colleagues in Glasgow[26]. The latter study shows the need for health workers to promote exercise as a primary and not only secondary preventive measure and also to maximize support from friends and relatives in order to increase exercise uptake and adherence by elderly people during consultations[36].

Moreover, our study showed that the widowed, who are more likely to be lonely, constituted the majority of residents in old age homes as shown in table 1, and therefore might need more encouragement to engage in regular physical activities. According to Resnick and Adamo in

their study, elderly people without spouses may need more encouragement than those with spouses and therefore should get more attention in self-efficacy based interventions[29].

A further analysis of our study showed there was no association observed between participants' health status and encouragement by health workers and relatives to engage in regular exercise. The reason could be that clinicians that attend to the medical needs of residents in various old age homes were more focused on the pharmacologic management of chronic medical conditions than the non-pharmacological aspect like regular exercise[36].

This present study has further shown the need for health workers and relatives to increase their support to old age home residents especially the widowed, those with low education and poor health statuses[12, 28, 34, 49].

5.4.4. EXERCISE TRAINERS AND FACILITIES

Provision of exercise facilities and trainers was found to be the least reported motivating factor to regular exercise in this present study. This was probably because few old age homes were reported to provide exercise facilities and trainers to assist residents with exercises. This could be due to the financial requirement involved in employing and setting up exercise facilities in old age homes.

According to the study by Costello and colleagues, exercise programs and trainers was shown to be a motivator to regular exercise in the elderly[31]. Furthermore, the availability of exercise trainers was reported as a motivator to regular exercise from two perspectives: provision of encouragement and knowledge of exercise benefits to elderly people[31]. Exercise programs directed by exercise trainers could create a forum for socialization among old age home residents which could increase physical activity levels in the elderly[28, 33, 49].

Conversely, it is important to note that more than half of old age homes involved in this present study did not have exercise facilities or a trainer. The researcher observed that this barrier was reported by 35% of participants in this present study. This finding was consistent with the systematic review by Baert and colleagues where lack of access to exercise facilities and trainers was clearly shown as a significant barrier to physical activities[30].

According to Costello and colleagues, a knowledgeable exercise trainer could also be a motivator to regular exercise and vice versa[31]. The researcher concluded from these studies that availability of exercise trainers and facilities in old age homes could be used to achieve at least three objectives: (1) Guidance on types and duration of physical activities by trainer

which will be commensurate with the level of functioning and health status of residents (2) Provide education to old age home residents on the health benefits of regular exercise and (3) Create a forum for socialization in elderly people living in old age homes[30,31].

5.5 BARRIERS TO REGULAR EXERCISE

5.5.1 POOR HEALTH

Poor health was found in this present study to be the most commonly reported barrier to regular exercise as shown in table 11. This aligned with the findings of previous studies that cited poor health as a barrier to regular exercise [20, 28, 49].According to Phillips and colleagues, ill health and pain associated with physical activities was a significant barrier to regular exercise in the elderly[49] .A further analysis of this present study showed that poor health status was not a deterrent to participants involved in regular exercise, but rather a motivator. This is because majority of participants with health problems were engaged in regular exercise as shown in table 8. The researcher thought this could be due to the influence of other factors such as having knowledge of exercise benefits, and support from relatives and health workers.

A similar finding was reported in the study by Belza and colleagues, where the Cantonese-speaking Chinese reported poor health as the motivator to regular exercise and even considered physical activities more important than taking medication. In this latter study, having the knowledge of exercise benefits was seen to play a major role in participants being physically active despite poor health status[34].

Furthermore, the researcher reasoned that this finding could be explained by the Geelen and Soons adapted motivation equation, where if the perceived importance of engaging in regular exercise as a health maintenance and promotion strategy play a more important role than perceived cost (e.g. pain or fear of falling) then there is an increased likelihood of exercise participation despite poor health status[12].

Moreover, according to Phillips and colleagues it is important to correct misconceptions in the elderly that ill health and disabilities are caused by physical activities and therefore the need to remain sedentary explained above[49]. However, the opposite is true because studies have shown that physical inactivity is a precursor to all major modifiable risk factors such as hypertension, obesity and diabetes mellitus type 2 etc[14, 15].

Treatment of comorbid conditions such as osteoarthritis, pain and impaired vision has been suggested as a motivator to regular exercise[49]. The authors inferred that it is not enough to correct misconceptions of regular exercise on poor health status, provide educational intervention and encourage elderly people to engage in regular exercise without asking about and addressing the symptoms that limit physical activities in the elderly[48].

This shows the importance of taking into consideration associated health problems and level of functioning of each individual in planning an exercise program[49]. Moreover, it is crucial to address treatable symptoms associated with physical activity such as joint pain and falls in order to increase exercise uptake and adherence in elderly people[20,21 ,22].

5.5.2 LACK OF KNOWLEDGE OF EXERCISE BENEFITS

Our study showed that 72% of participants that did not exercise regularly reported lack of knowledge of exercise benefits as a barrier to regular exercise. Conversely, our earlier finding showed that the overwhelming majority (98%) of participants that exercise regularly reported having knowledge of exercise benefits as a motivator to regular exercise. This has shown that having knowledge of exercise benefits has the tendency of increasing physical activities in the elderly and vice versa. A similar finding was reported by Baert and colleagues and Vlassof in their studies[30, 39].

In addition, further analysis of our study showed that a greater proportion of participants that reported lack of knowledge of exercise benefits as a barrier were those with low education levels. This finding has thus further corroborated previous studies on the role of educational intervention in increasing exercise participation in the elderly people[34, 49].

5.5.3 LACK OF ENCOURAGEMENT

Our study showed that 55% of participants reported lack of encouragement as a barrier to regular exercise. Similarly, 53% of those that exercised regularly reported encouragement by health workers and relatives as a motivator. This results showed that sufficient encouragement was not given to residents of old age homes to engage in regular exercise. This finding was also reported in the focused review by Horne and colleagues where they showed that health professionals did not give enough encouragement to elderly people to increase their physical activity levels[36].

Horne and colleagues pointed out in their study that encouragement of elders by peer mentors was a motivator to long term adherence to regular exercise[36]. However, another interesting finding in the latter study showed that encouragement of elders to engage in exercise during routine primary care consultations could serve to demotivate elderly people from physical activities.

5.5.4 LACK OF INTEREST

Lack of interest in physical activities was reported by 39% of participants in our study. This could be due to negative interaction between personal, interpersonal and environmental factors as explained by the Cox model of physical activities[13]. Thus, lack of interest of participants in physical activities could be due to personal factors such as low self-esteem as also shown in the study by Belza and colleagues[34]. In this latter study, a previous history of oppression in the American Indian/Alaska natives caused low self-esteem and thus lower motivation for self-care.

A further analysis of our study showed that a greater proportion of non-whites reported lack of interest in physical activities which could probably be explained by the past history of oppression experienced by the non-whites in the Apartheid period which could have contributed to low motivation for self-care. In addition, other personal factors such as lack of knowledge of exercise benefits, and pain or shortness of breath associated with exercise could cause lack of interest in exercise, especially in the elderly[20, 21,22,34,36].

Furthermore, lack of interpersonal factors such as encouragement by health workers and relatives and unfavourable environmental conditions could create lack of interest to initiate and maintain exercise in the elderly[30, 35, 36]. The researcher therefore inferred that these factors highlighted above interact to create or cause lack of interest in exercise among elderly people.

In summary, the researcher believes that elderly people's interest in physical activities can be enhanced by providing educational intervention, increasing encouragement by health workers, increasing opportunity for socialization and provision of fitness facilities and trainer is important to the initiation of and long-term adherence to regular exercise.

5.6 BIASES AND LIMITATION

The calculated sample size could not be attained due to the large number of residents with impaired cognitive function and fragile condition.

Recall bias such as reporting the frequency of exercise on the part of the participants could not be excluded and there was also a potential for researcher bias because the researcher was involved in most of the data collection.

Information bias resulting from Hawthorne's effect could not be excluded in this study because participants know that the researcher and research assistants are health professionals, therefore they might have provided responses they feel the interviewers wanted to hear.

Furthermore, duration, types and frequency of physical activities, motivators and barriers were self-reported by the participants and were not objectively assessed thereby increasing the information bias in this study.

The above limitation and biases can therefore limits the power of this study and therefore generalization. These can be minimized by including participants with impaired cognitive functions and frail condition. Information bias can be minimized by the researcher objectively assessing the frequency and the types of physical activities residents engage in.

5.7 IMPLICATION FOR FUTURE RESEARCH

This study has triggered a need for future research where participants with impaired cognitive function, frail condition, hearing and visual impairment could be included using a strong study design. This is because this group of elders has been shown to constitute almost half of residents in old age homes. Furthermore, a more detailed study could be conducted to explore the relationship between participants' characteristics with motivators and barriers to regular exercise.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

This study has helped to identify the motivators and barriers to regular exercise in elderly residents in old age homes in the Southern Sub-district of Ekurhuleni health district. Having knowledge of exercise benefits was the strongest motivator and poor health was the strongest barrier to regular exercise. Educational intervention and increasing opportunity to socialize among old age home residents could increase physical activities in elderly residents.

Finally, availability of exercise trainers and facilities in old age homes could be used to achieve at least three objectives among old age home residents.

6.2 RECOMMENDATIONS

Finally, the researcher hopes that by improving regular exercise, the quality of life of the older population will be improved. This in turn could reduce the high cost of providing healthcare services for Senior citizens which could help to reduce the financial burden placed on the health system of the state. In other words, it would make economic sense to promote regular exercise, especially among the older population.

The researcher therefore recommends the following:

To the researcher:

- Should publish the findings of this project in lay person's language in a community newspaper in order to encourage relatives and the community at large to be more involved in increasing exercise levels of the aged.

To health worker:

- Should provide educational intervention on the benefits of regular exercise to residents in old age homes especially those with low educational attainment and poor health status. This could be achieved through counselling in the physician's office, with written or verbal instruction, or through behavioural modification strategies.
- Should maximize support from friends and relatives of old age home residents in order to increase exercise uptake and adherence.
- Should be trained in the art of communication about the information to provide when encouraging elderly people to engage in regular exercise.

- Should explore personal, interpersonal and environmental factors of each individual and thereafter address any identified factor/s in order to increase regular exercise among old age home residents.

To management of old age homes:

- Should develop programs that would increase socialization among old age home residents while engaging in physical activities.
- Should encourage relatives to take residents for a walk or social gathering regularly.
- Should incorporate activities of daily living into exercise programs which could increase engagement in physical activities by old age home residents.
- Should increase the opportunity to socialize by organizing social events, such as dance competitions or sporting events on a regular basis.
- Should use music and dancing to develop exercise programs that would assist elderly residents that are usually bored of daily routine in old age homes to engage in regular physical activities. This could be achieved by developing exercise programs that would incorporate music and dancing suited to residents' characteristics into exercise programs.

To the Health districts and municipalities

- District occupational therapist and physiotherapist should assist to organize and supervise exercise programs in old age homes on a regular basis in order to increase exercise participation among the elderly people residing in old age homes.
- Occupational therapists and physiotherapists should take into consideration associated health problems and level of functioning of each individual in planning an exercise program.
- Should provide safe exercise facilities like walks and parks easily accessible to the older population.

To the national department of Health

- Availability of exercise facilities and trainers should be made a pre-requisite for accreditation of old age homes.
- Policy makers should consider the need for culturally appropriate facilities for old age home residents.

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APPENDIX 1: Patient information leaflet

Introduction

Good afternoon, my name is Aro Abiodun Adeniyi I am a postgraduate student of family medicine at the University of Witwatersrand. This questionnaire is part of a research that is required for my master's degree at the above named University. All the information provided in this questionnaire will be treated as confidential as no one will be able to identify you.

The purpose of this study is to identify the barriers and motivators to exercise in people above 60 years of age living in old age homes in Ekurhuleni Southern sub-district. I will be asking these questions in English language. This questionnaire consists of five sections A to E, which can be completed between fifteen to twenty minutes.

There will be no direct benefit to you by participating in this study and your personal information will be namelessly processed into the study report.

You are free not to participate in this study and you may at any stage, withdraw your consent to participate. You will not be discriminated against should you decide to withdraw your consent at any stage. However, if you choose to take part in the study a consent form will be given to you to sign.

The findings acquired from this study will be communicated to Ekurhuleni Department of health with the aim of reducing the morbidity and mortality associated with lack of regular exercise in people over 60 years residing in old age homes in the district.

APPENDIX 2: QUESTIONNAIRE

Participant's code.....

Name of old age home……

SECTION A

SOCIO-DEMOGRAPHIC CHARACTERISTICS

- Age.....
- **Sex** (1) Male ☐ (2) Female ☐

Marital status: 1. Single ☐ 2. Married ☐ 3. Separated ☐
4. Divorce ☐ 5. Widowed ☐

Ethnic background

1. Afrikaans ☐ 2. Zulu ☐ 3. Sotho ☐ 4. Indian ☐ 5. Xhosa ☐

6. Venda ☐ 7. Ndebele ☐ 8. Swati ☐ 9. Twana ☐ 10. Tsonga ☐
11. English ☐ 12. Dutch ☐ 13.Swazi ☐ 14. Shangani ☐ 15. Shona
16. Coloured ☐ 17.Others.....

Highest Educational attainment

1. Did not attend any school ☐ 2. Completed primary school ☐
3. Completed High school ☐ 4. Had a diploma ☐

5. Had university degree ☐ 6. Specify any other category.....

SECTION B

CLINICAL DATA

1. Weight……. 2. Height…… 3. Calculated Body mass index……..

Chronic medical condition …….

SECTION C

EXERCISE TYPES AND DURATION

Do you exercise?

1. YES ☐ 2. NO ☐

How many times do you exercise in a week?

1. One ☐ 2. Two ☐ 3. Three ☐ 4. Four ☐ 5. More than four ☐

6. Don't know ☐ 7. None ☐

What type of exercise/s do you engage in?

1. Walking ☐ 2. Running ☐ 3. Arm rowing ☐ 4. Dancing ☐ 5. Jumping ☐

6. Stretching ☐ 7. Cycling ☐ 8. Swimming ☐ 9. Push up ☐ 10. None ☐

11. Specify others……

How long do you exercise in a day?

1. 1-30 minutes ☐

2. 31-60 minutes ☐

3. > 1 hour ☐

4. Don't know ☐

5. None ☐

SECTION D

EXERCISE MOTIVATORS

If you exercise regularly (i.e. more than thirty minutes a day and at least five times a week) select the most appropriate option?

(A) KNOWLEDGE OF EXERCISE BENEFITS

1. Makes me to feel better ☐
2. Makes me feel healthy ☐
3. Makes me to lose weight. ☐
4. I know the benefits of regular exercise ☐
5. Makes me sleep better ☐
6. It improved my balance ☐
7. It prevent me from falling ☐

(B) ENCOURAGEMENT BY OTHERS

7. Encouragement from family members or friends ☐
8. Encouragement from health workers and volunteers ☐

(C) OPPORTUNITY TO SOCIALIZE

9. Exercising with others ☐
10. Dancing with exercise ☐
11. Chance to talk and laugh with other people ☐

(D) PROVISION FOR FACILITIES AND TRAINER

12. Availability of exercise facilities and trainer in the facility ☐
13. Part of routine of old age home ☐
14. Specify other reasons.....

SECTION E

EXERCISE BARRIERS

Select the most appropriate option if you do not exercise regularly or you do not exercise at all?

(A). **HEALTH PROBLEMS**

1. Shortness of breath ☐
2. Always feel sad ☐
3. Joint pain when exercising ☐
4. Easily gets tired ☐
5. Cannot walk properly ☐
6. Back pain ☐
7. Cough ☐
8. Problems with passing urine ☐
9. Problems with passing faeces ☐
10. Has fallen before ☐
11. Fear of falling ☐
12. Body pain when exercising ☐
13. Specify other reasons.....

(B). **NO ENCOURAGEMENT**

14. NO encouragement from family/friends ☐
15. No encouragement from health workers ☐
16. No encouragement from old age home ☐

☐

(C) **LACK OF EXERCISE FACILITIES AND TRAINER**

(D) **NO INTEREST** i.e. you prefer to do other things, like watch television etc. ☐

(E). **LACK OF KNOWLEDGE OF EXERCISE BENEFITS** ☐

(F) Specify other reasons.....

APPENDIX 3: LIST OF OLD AGE HOMES IN EHURHULENI SOUTHERN SUB-DISTRICT

NAMES OF OLD AGE HOMES	NUMBER OF RESIDENTS
ALBERTON	102
COSMOS	223
COLONEL ROWLAND	18
SOLHEIM	139
VOSLOORUS	52
ELLANDSVALLEI	39
KOWA-PIENNAR	57
PRIMA-VILLA	47
Marian house home	21
Huis Dine Both man	125
TOTAL	823

APPENDIX4: CERTIFICATE OF APPROVAL FROM EKURHULENI RESEARCH AND ETHICS COMMITTEE

Ekurhuleni

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

RESEARCH ETHICS CLEARANCE CERTIFICATE

Research Project Title: **REGULAR PHYSICAL ACTIVITIES : MOTIVATIORS AND BARRIERS IN ELDERLY PEOPLE RESIDING IN OLD AGE HOMES IN EKRUHULENI SOUTHERN SUB- DISTRICT.**

Research Project Number: 11-07-2013-01

Name of Researcher(s): Dr Aro Abiodun Adenniyi

Division/Institution/Company: Wits University

DECISION TAKEN BY THE EKURHULENI HEALTH DISTRICT ETHICS PANEL (EHDEP)

- *THIS DOCUMENT CERTIFIES THAT THE ABOVE RESEARCH PROJECT HAS BEEN FULLY APPROVED BY THE EHDEP. THE RESEARCHER(S) MAY THEREFORE COMMENCE WITH THE INTENDED RESEARCH PROJECT.*
- *NOTE THAT THE RESEARCHER WILL BE EXPECTED TO PRESENT THE RESEARCH FINDINGS OF THE PROPOSED RESEARCH PROJECT AT THE ANNUAL EKURHULENI RESEARCH CONFERENCE HELD IN JULY/AUGUST.*
- *THE ETHICS PANEL WISHES THE RESEARCHER(S) THE BEST OF SUCCESS.*

DR. J. SEPUYA

DEPUTY CHAIRPERSON: EKURHULENI METROPOLITAN MUNICIPALITY
Dated: 04/09/2013

DR. R. Kellerman

CHAIRPERSON: GAUTENG DEPARTMENT OF HEALTH (EKURHULENI REGION)
Dated: 04/09/2013

APPENDIX 5: CERTIFICATE OF APPROVAL FROM HUMAN RESEARCH ETHICS COMMITTEE UNIVERSITY OF WITWATERSRAND JOHANNESBURG

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr Aro Abioudun Adeniyi

CLEARANCE CERTIFICATE	**M120120**
PROJECT	Motivators and Barriers to Regular Exercise among Older People Presiding in Old Age Homes in Ekurhuleni Southern Sub-District
INVESTIGATORS	Dr Aro Abioudun Adeniyi.
DEPARTMENT	Department of Family Medicine
DATE CONSIDERED	27/01/2012
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 13/02/2012 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Dr Samuel Agbo

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

APPENDIX 6: LETTERS OF PERMISSION FROM OLD AGE HOMES

INFORMED CONSENT TO CONDUCT A RESEARCH ON THE IDENTIFICATION OF BARRIERS AND MOTIVATORS TO REGULAR EXERCISE IN ELDERLY PATIENTS IN SOLHEIM OLD AGE HOME.

I have been informed by the researcher of the purpose and nature of this research. I am also aware that there are no direct benefits to the research participants or this old age home for taking part in this study.

In view of the requirements and purpose of this research, I agree that the researcher can conduct this research in the above named old age home and can use the information collected during this study.

I have had sufficient opportunity to ask questions about this research and understood that consent had been given by the research and ethics committee of Ekurhuleni Health district to conduct this study in all the old age homes in the Southern sub-district.

Signature of facility Manager.....

Date and Time 31/08/2011 – 09H15

.....

INTERVIEWER:

I, herewith confirm that the management of the above named old age home has been informed of the nature and purpose of this study and has agreed to participate.

Printed Name and Signature with date and Time

..... 31/08/2011 .....

Contact details of researcher: C- 0820735109,e-mailabiodunaro10@gmail.com

INFORMED CONSENT TO CONDUCT A RESEARCH ON THE IDENTIFICATION OF BARRIERS AND MOTIVATORS TO REGULAR EXERCISE IN ELDERLY PATIENTS IN KOWA PIENAAR OLD AGE HOME.

I have been informed by the researcher of the purpose and nature of this research.Iam also aware that there are no direct benefits to the research participants of this old age home for taking part in this study.

In view of the requirement and purpose of this research, I agree that the researcher can conduct this research in the above named old age home and can use the information collected during this study.

I have had sufficient opportunity to ask question about his research and understood that consent had been given by the research and ethics committee of Ekhuruleni health district to conduct this study in all old age homes in the southern sub-district.

Signature of facility Manager..... D.P. Lee

Date and Time

5 August 2011 10:00 am

INTERVIEWER:

I, herewith confirm that the management of the above named old age home has been informed of the nature and purpose of this study and has agreed to participate.

Printed Name and Signature with date and Time

[illegible] 5/8/2011 10:[illegible] am

Contact details of researcher: C- 0820735109,e-mailabiodunaro10@gmail.com

INFORMED CONSENT TO CONDUCT A RESEARCH ON THE IDENTIFICATION OF BARRIERS AND MOTIVATORS TO REGULAR EXERCISE IN ELDERLY PATIENTS IN HUIS DIEN BOTHMA OLD AGE HOME.

I have been informed by the researcher of the purpose and nature of this research.Iam also aware that there are no direct benefits to the research participants of this old age home for taking part in this study.

In view of the requirement and purpose of this research, I agree that the researcher can conduct this research in the above named old age home and can use the information collected during this study.

I have had sufficient opportunity to ask question about his research and understood that consent had been given by the research and ethics committee of Ekhuruleni health district to conduct this study in all old age homes in the southern sub-district.

SANF Huis Dien Bothma
50 Harrier Str
Jamison Park
Boksburg

Signature of facility Manager.....

Date and Time

5 August 2011 10:45

INTERVIEWER:

I, herewith confirm that the management of the above named old age home has been informed of the nature and purpose of this study and has agreed to participate.

Printed Name and Signature with date and Time

H.M. Meerens : SANF Huis Dien Bothma

5/8/2011 10:45

Contact details of researcher: C- 0820735109,e-mailabiodunaro10@gmail.com

INFORMED CONSENT TO CONDUCT A RESEARCH ON THE IDENTIFICATION OF BARRIERS AND MOTIVATORS TO REGULAR EXERCISE IN ELDERLY PATIENTS IN COSMOS OLD AGE HOME.

I have been informed by the researcher of the purpose and nature of this research. I am also aware that there are no direct benefits to the research participants or this old age home for taking part in this study.

In view of the requirements and purpose of this research, I agree that the researcher can conduct this research in the above named old age home and can use the information collected during this study.

I have had sufficient opportunity to ask questions about this research and understood that consent had been given by the research and ethics committee of Ekurhuleni Health district to conduct this study in all the old age homes in the Southern sub district.

Signature of facility Manager pp Social Worker

Date and Time

5/8/11 11h00 social@bsfa.co.za

011 915 5416

INTERVIEWER:

I, herewith confirm that the management of the above named old age home has been informed of the nature and purpose of this study and has agreed to participate.

Printed Name and Signature with date and Time

Karen Meyer 5/8/11 11h00 ARTARO A-A

011 915 5416 11:00am

Contact details of researcher: C- 0820735109,e-mailabioduaro10@gmail.com

INFORMED CONSENT TO CONDUCT A RESEARCH ON THE IDENTIFICATION OF BARRIERS AND MOTIVATORS TO REGULAR EXERCISE IN ELDERLY PATIENTS IN ELANDVALLEI OLD AGE HOME.

I have been informed by the researcher of the purpose and nature of this research.Iam also aware that there are no direct benefits to the research participants of this old age home for taking part in this study.

In view of the requirement and purpose of this research, I agree that the researcher can conduct this research in the above named old age home and can use the information collected during this study.

I have had sufficient opportunity to ask question about his research and understood that consent had been given by the research and ethics committee of Ekhuruleni health district to conduct this study in all old age homes in the southern sub-district.

Signature of facility Manager.....

Date and Time

5/6/2011 10:00 a.m

INTERVIEWER:

I, herewith confirm that the management of the above named old age home has been informed of the nature and purpose of this study and has agreed to participate.

Printed Name and Signature with date and Time

DR ARO A.T. 5/6/2011 10:00 a.m

Contact details of researcher: C- 0820735109,c-mailabiodunaro10@gmail.com

INFORMED CONSENT TO CONDUCT A RESEARCH ON THE IDENTIFICATION OF BARRIERS AND MOTIVATORS TO REGULAR EXERCISE IN ELDERLY PATIENTS IN KINROSS HEIDELBERG OLD AGE HOME.

I have been informed by the researcher of the purpose and nature of this research.Iam also aware that there are no direct benefits to the research participants of this old age home for taking part in this study.

In view of the requirement and purpose of this research, I agree that the researcher can conduct this research in the above named old age home and can use the information collected during this study.

I have had sufficient opportunity to ask question about his research and understood that consent had been given by the research and ethics committee of Ekhuruleni health district to conduct this study in all old age homes in the southern sub-district.

Signature of facility Manager.....C M Siebert.

Date and Time

5-8-11 10 H45

INTERVIEWER:

I, herewith confirm that the management of the above named old age home has been informed of the nature and purpose of this study and has agreed to participate.

Printed Name and Signature with date and Time [illegible]

C M Siebert SAVF Kinross Herberg CM Siebert 5/8/2011

5-8-11

Contact details of researcher: C- 0820735109,e-mailabiodunaro10@gmail.com

INFORMED CONSENT TO CONDUCT A RESEARCH ON THE IDENTIFICATION OF BARRIERS AND MOTIVATORS TO REGULAR EXERCISE IN ELDERLY PATIENTS IN VOSLORUS OLD AGE HOME.

I have been informed by the researcher of the purpose and nature of this research.Iam also aware that there are no direct benefits to the research participants of this old age home for taking part in this study.

In view of the requirement and purpose of this research, I agree that the researcher can conduct this research in the above named old age home and can use the information collected during this study.

I have had sufficient opportunity to ask question about his research and understood that consent had been given by the research and ethics committee of Ekhuruleni health district to conduct this study in all old age homes in the southern sub-district.

Signature of facility manager .....

Date and Time

25/08/2011 011 706-3603 11:00a.m.

INTERVIEWER:

I herewith confirm that the management of the above named old age home has been informed of the nature and purpose of this study and has agreed to participate.

Printed Name and Signature with Date and Time

DR AKO A.A 25/8/11 [signature] 11:00a.m.

Contact details of researcher: C-0820735109,e-mail abiodunaro10@gmail.com