EFFECTS OF AEROBIC DANCE AND PEDOMETER-BASED WALK ON CARDIOVASCULAR PARAMETERS, BODY COMPOSITION AND FUNCTIONAL ABILITY OF BAPTIST ELDERLY WOMEN IN THE IBADAN METROPOLIS

BY

Atolani Shakirat DUYILEMI
B.Ed., M.Ed. (Ibadan)

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CERTIFICATION

I certify that this work was carried out by Mrs Atolani Shakirat DUYILEMI
in the Department of Human Kinetics, Faculty of Education,
University of Ibadan, Ibadan, Nigeria.

…….

Supervisor
I.O. Oladipo
B.Sc. (Ed.), (Benin) M.Ed., Ph.D. (Ibadan)
Professor, Exercise Physiology,
Department of Human Kinetics,
University of Ibadan,
Nigeria.

DEDICATION

I return all glory back to the almighty God, to Him alone be all the praise.

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ABSTRACT

Health-promoting activities are undertaken by some orthodox churches in the Ibadan metropolis, including the Baptist Church, which has a Department dedicated to the healthcare of its members, particularly the elderly. Research has shown that elderly people experience physiological decline in terms of cardiovascular parameters, body composition, and functional ability, making exercise crucial to mitigating the burden of age-related illness. Previous studies focused largely on conventional exercise, with little attention paid to Aerobic Dance (AD) and Pedometer-based Walk (PBW). This study, therefore, determined the effects of AD and PBW on the Cardiovascular Parameters –CP [Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Mean Arterial Blood Pressure (MABP), Body Composition –BC [Fat Mass (FM), Fat-Free Mass (FFM), Body Mass Index (BMI)] and Functional Ability –FA [Chair Sit-Reach (CSR), Arm Curl (AC) and Chair Sit and Stand (CSS)] of Baptist elderly women in the Ibadan metropolis. The moderating effect of of elderliness was also examined.

The study was anchored to the Programmed Theory of Ageing, while pretest-posttest control group quasi-experimental design with a 3x2 factorial matrix was adopted. The simple random sampling technique was used to select three out of the 25 associations in Ibadan Baptist Conference. Simple random sampling was adopted to select a church from each of the selected associations. Seventy elderly women of age 55 years and above were purposively selected from the sampled churches. Treatment lasted for 12 weeks. Data were analysed using multivariate analysis of covariance at 0.05 level of significance.

The participants' age was 61.33±5.88 years. Treatment had a significant main effect on cardiovascular parameters. On MABP ($F_{(2; 64)} = 5.36$, $\eta^2 = .16$), the participants exposed to PBW had the lowest mean score (88.268); on SBP ($F_{(2; 64)} = 7.22$, $\eta^2 = .20$), the participants exposed to PBW had the lowest mean score (122.41); and on DBP ($F_{(2; 64)} = 3.59$, $\eta^2 = .11$), the participants exposed to PBW had the lowest mean (71.54). The treatment was significant on two of the body composition parameters - FM ($F_{(2; 64)} = 19.77$, $\eta^2 = .41$). The participants exposed to AD had the lowest mean score (28.85) and BMI ($F_{(2; 64)} = 23.06$, $\eta^2 = .45$). The participants exposed to AD had the lowest mean score (26.71). The treatment was also significant on functional ability parameters. On CSR ($F_{(2; 64)} = 16.98$, $\eta^2 = .37$), the participants exposed to AD had the highest mean score (4.85); on CSS ($F_{(2; 64)} = 43.79$, $\eta^2 = .602$), the participants exposed to AD had the highest mean score (20.72); and on AC ($F_{(2; 64)} = 25.30$, $\eta^2 = .47$), the participants exposed to AD had the highest mean score (29.04). Stage of elderliness had a significant main effect only on AC ($F_{(1; 65)} = 3.97$, $\eta^2 = .06$). The two-way interaction effects of treatment and stage of elderliness were not significant.

Aerobic dance and pedometer-based walk improved the cardiovascular parameters, body composition, and functional ability among the Baptist elderly women in the Ibadan metropolis. Therefore, aerobic dance and pedometer-based walk should be adopted to mitigate the burden of age-related illness of Baptist elderly women.

Keywords: Aerobic dance, Pedometer-based walk, Baptist Elderly women, Functional ability.

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TABLE OF CONTENTS

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

LIST OF TABLES

LISTS OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Aging is the passage of time. It is a progressive loss of function, as well as a slow deterioration of physiological characteristics as people get older. This is the stage of life that follows adolescence and early adulthood; it is the last stage of life. It is impossible to say with certainty when old age begins because it varies. The United Nations has established the age of 60 as the beginning of old age. This was their first attempt at a thorough definition (United Nations, 2002). However, the World Health Organization (WHO) fixed the age of old age in Africa at 55 years, they reported that in the developing world, old age is typically defined not by years but by the advancement of other commitments, the loss of previous positions, and the loss of the ability to contribute enthusiastically to community (Kowal, Paul; Peachey& Karen, 2001).

Regular physical activity (PA) or exercise has many long-term health advantages. Physical activity have been linked to the prevention of diseases, falls, and poor health as people get older. It is also useful for avoiding and managing cardiovascular risk factors, as well as lowering heart-related mortality. As a result, the more physically active an elderly person is, the less likely they are to die young. Physical activity is essential for maintaining and improving life quality and quantity. It is also well-documented as a necessary component of healthy aging. There are no other age groups that can benefit more from exercise than the elderly. Inspite of the numerous health advantages of exercise, only a small percentage of the elderly meet the standard daily activity level of 30 to 60 minutes and many do not take part in any sort of activity at all. Sedentary behavior increases with age and is among the most significant predictor of functional decline in the elderly. Over three million people died in 2010 as a result of sedentary lifestyles worldwide (Bull & Bauman, 2011).

To reduce the threat of cardiovascular diseases, the American Heart Association commends doing at minimum thirty minutes of moderate (50–70 percent of maximum estimated heart rate) workout on several days (NCEP, 2002). Chronic aerobic exercise regimes clearly improve cardiovascular functioning, according to several human researches. This is true not only in healthy adults who do not have any health disparities (Clarkson, Montgomery & Mullen, 1999), but also for the elderly (Benjamin, Larson & Keyes, 2004) and people with cardiovascular risk factors (Hambrecht, Fiehn, and Weigl, 1998). A longer and more intense workout routine was required for healthy people to see significant improvements in cardiovascular parameters, but elderly and frail people can gain from shorter and less strenuous workouts.

The cardiovascular system, which transports blood throughout the human body, includes the coronary heart and blood veins, which deliver blood with oxygen to working muscles. Exercise improves resting heart rate, mean arterial pressure, resting systolic blood pressure, resting diastolic blood pressure, and pulse pressure significantly (Sunita, Jayant, Kamla, Rajnee, Sonika & Raghuveer, 2015).

Body Composition refers to the tissue components that constitute the body and is frequently used to relate to the relative percent of fats and fat-free tissue (Howley & Frank, 2007). The percentage of body fat is the proportion of total body mass that is made up of fats. Fat-free mass (FFM), fat body mass (FBM) or fat mass (FM), and the proportion of body fat are the most commonly examined components in the examination of body composition (percent BF). Fat-free mass is the mass of fat-free tissue, also referred to as lean body mass (Howley, and Franks, 2007). According to research (Ferraro, Muehlenkamp, Painter, Wasson, Hager & Hoverson, 2008), older men and women can have nearly one-third more fat than when they were younger. This fat tissue accumulates in the body's center, including around the internal organs.

One of the primary reasons for body fat growth is a lack of physical activity (Howley & Frank, 2007).The reduced walking pace and functional constraints of the elderly conditions the growth in body mass (Sternfeld, Ngo, Satariano & Tager, 2002). The rise in body fat during the aging process is caused by three factors: insufficient food, no or little exercise involuement, and a loss in fat-burning ability. As a result, the quantity of body fat

in physically active people is statistically smaller than inactive people (Wilmore & Costill, 1999).

In old age, physical functioning (capacity) is the sum of the effects of medical conditions, style of living, and maturity physiological differences as in sense of both environs and societal help structure (Reuben, 2003).Physical functioning changes are main predictor of old-age health and wellbeing; even minor declines in functioning abilities were linked to loss of independence, increased caregiver stress, and higher financial costs. Physical function loss occurs in four stages (Guralnik & Ferrucci, 2003).

The initiation of disease states is the initial stage, preceded next to functional appearance of disorder through various structures, that gives rise into functioning impairment like limited mobility, holding, or taking the steps, finally, the emergence of disorder, which is defined as incapacity to move, grasp, or climb stairs. Researchers have recently recognized the importance of diagnosing elderly people that had not reached Nagi's path to physical handicap nevertheless are showing mild adjustments in physical functionality; identifying these pre-clinical disabled older adults may help researchers identify interventions to revise Nagi's path to disability (Fried, 2003).

Women's aging differs depending on their biopsycho-social pattern. Women and men have dramatically different personal and social resources when they reach their later years. Such inequalities result from a lifetime's worth of experiences inside social institutions shaped by gender inequality (Beth, 1999). Women are more affected by aging than males, although they age at different rates. Besides multiple societal disadvantages, women have greater rates of chronic sickness and diseases in old age than males (Longue,1991).

Women over the age of 50 account for a sizable portion of the global populace, and their population is increasing. Women aged 60 and up would grow from approximately 336 million in 2000 to slightly more than 1 billion in 2050. Women exceed men in older population, and this disparity grows with age. In the world, there are approximately 123 women for each and every 100 men aged 60 and up (WHO, 2006).

Baptist women were used for this study because the church is orthodox, highly organized, with a well dedicated department dedicated to the health of their members, also with a

considerable large number of elderly women in attendance. The various groups in a Baptist church are as strong as the church itself. They practiced what they call “Baptist democracy.”

Aerobic exercise, like any other form of physical exercise, has prolonged advantages, such as reduced depression and anxiety, improved physiological and psychological health, increased work and leisure, and improved health (Weinberg & Gould, 2007). Aerobic dance, like other forms of aerobic exercise, has been shown to have cardiovascular and metabolic advantages such as improved maximal oxygen consumption (VO2max), increased aerobic endurance ability, and increased energy production via the mitochondrial respiratory system (MHR) when performed at a target heart rate of 60 to 70% of maximum heart rate (Banfi, Tirone, Durussel, Krisz, Moskowa, Molnar, Krause, & Cox, 2005).

Aerobic dance exercise has gained popularity as a fun way to stay in shape (Olvera, 2008). Aerobic dance might aid social contact. It is a low-impact activity. Aerobic dance can occur in many ways, in various settings, and requires little costly equipment; it has the potential to appeal to people of all ages (Lima & Vieira, 2007).Aerobic dance has been popular, mainly among women, since the twentieth century. This workout is distinguished because all participants move to similar beat and tempo, exercising various muscle groups simultaneously. Aerobic dance routines were originally designed as an aerobic activity to help people lose weight and enhance their physical fitness and performance (Kimura & Hozumi, 2012).

Dancing is a beneficial type of physical activity for older people, according to Judge (2003), because it improves balance and minimize the possibility of falling. It produces mild to relatively higher ground-reaction forces as well as joint torques (Lin, Su & Wu, 2005), that can lead to reasonably high pulse level (sixty-eight–ninety percent of age-anticipated maximal heart rate), volume of oxygen usages (forty–two to ninety percent of maximal oxygen uptake), and also evaluations of exercise intensity among both young and older (Guidetti, Emerenziani, Gallotta & Baldari, 2007).

Another option is walking, which is a safe and fairly strenuous form of exercise and physical activity. Increased daily steps from a brisk walk have been proven in studies to enhance serum lipid profiles, lower blood pressure, and increase fitness (Sugiura, 2002; Tully, 2005). Furukawa, (2003) and Iwane, (2000) proposed a 10,000-step-per-day aim to improve health outcomes, particularly in adults and the elderly. A pedometer is a movement sensor that can precisely monitor an individual's movement, allowing for the calculation of total steps taken in various contexts such as working, housekeeping, leisure time, and recreation. (Tudor & Bassett, 2004).

A Magnetic Pendulum is used in pedometers to track how many steps an individual takes when walking or running. They design the pendulum so that it swings past a magnetic field with each step, electronically recording the step. Most pedometers only work when they are attached to a belt or waistband. The pedometer only needs to record the steps taken, and it subsequently turns this data into many bits of helpful information (depending on its features and functions). Because it's nearly impossible to keep track of how many steps a person takes on a typical day in the mind, a pedometer becomes a viable alternative. Iwane (2000) and Tudor-Locker (2002) investigated the effects of wearing a pedometer on different ages, body composition, and cardiovascular measures. According to Swartz (2003), a pedometer is a motivational technique for increasing physical activity in older persons, resulting in weight loss. People who measure their daily steps become more active and are less likely to acquire certain health problems, according to an online study (PLOS medicine, 2019).

1.2 Statement of the Problem

As a pastor's wife, the researcher often receives prayer requests from the elderly women in the church and these requests revolve around their health. However, as a professional the researcher knows that the issues they are facing are age-related issues. Therefore, these women need professional interventions rather than just relying on prayer alone. This was what birth this study.

Aging is an essential and innate part of the human biology, it is programmed into the DNA. Physical activities have been recognised to mitigate against the effects of age related illnesss and diseases. The researcher considered two physical activities that would

be appealing, easy and fun to encourage these elderly women to participate in physical activies in order to help mitigate against the effects of these age related illnesses and diseases. These physical activities are: Aerobic dance and Pedometer-based walking.

Considering that several elderly people may have had good experiences with dancing while they were young, aerobic dance may be less challenging than other forms of exercise for them. Also, in comparison to traditional walking, pedometer-based walking is a more structured and quantitative form of physical activity. Walking must be quantifiable in order to be effective, which is achieved by using a pedometer. Aerobic dance and pedometer-based walk are both simple, easy and fun form of exercise which can attract and encourage the elderly to participate in physical activities.

Aerobic dance is becoming increasingly popular in this part of the world; research have been conducted in this area, although it has primarily focused on children and young people. Ezra (2007) evaluated the effects of aerobic dance on selected cardiovascular risk factors in overweight and obese Nigerian adults. To the best of the researcher's knowledge, there are little empirical findings on pedometer based-walk in this area of the world, although it has been thoroughly researched in other parts of the world. Oluwatoyosi, Adetipe, and Sunday, (2016) conducted research among health care specialists in Nigeria's tertiary hospitals. Therefore the researcher examines the impact of aerobic dance and pedometer based-walk on the fitness status of Baptist elderly women in the Ibadan, Nigeria.

The study examined the effects of aerobic dance and pedometer-based walk on the cardiovascular parameters, body composition, and functional ability of Baptist elderly women, all of which are important health indicators for promoting health and wellness in the elderly, as well as recommending the use of a pedometer to help the elderly in Ibadan metropolis increase their daily step count.

1.3 General Objective of the Study

The study's main goal was to explore the effects of aerobic dance and pedometer-based walk on cardiovascular parameters, body composition and functional ability of Baptist elderly women in the Ibadan metropolis.

1.4 Specific Objectives of the Study

The specific objectives for this study were;

1. 1. To determine the main effects of treatment (aerobic dance and pedometer-based walk) on cardiovascular parameters (blood pressure, mean arterial blood pressure, rate pressure product) of Baptist elderly women in the Ibadan metropolis.
2. To investigate the main effects of treatment (aerobic dance and pedometer-based walk) on body composition (Body Mass Index, fat-free mass, fat mass, waist hip ratio) of Baptist elderly women in the Ibadan metropolis.
3. To examine the main effects of treatment (aerobic dance and pedometer-based walk) on functional ability (30 second chair stand test, Chair sit and reach test, arm curl test of Baptist elderly women in the Ibadan metropolis.
4. To ascertain the main effects of age (early/late elderlinesss) on cardiovascular parameters (blood pressure, mean arterial blood pressure, rate pressure product) of Baptist elderly women in the Ibadan metropolis.
5. To examine the main effects of age (early/late elderliness) on body composition (Body Mass Index, fat-free mass, fat mass, waist hip ratio) of Baptist elderly women in the Ibadan metropolis.
6. To assess the main effects of age (early/late elderliness) on functional ability (30 seconds chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis.

1.5 Research Questions

Answers were sought to the following questions;

1. Does pedometer based walk improve the functional ability of Baptist elderly women?
2. Does aerobic dance improve functional ability of Baptist elderly women?

1.6 Hypotheses

The following hypotheses were tested in this study:

1. There will be no significant main effects of treatment (aerobic dance and pedometer-based walk) on cardiovascular parameters (blood pressure, mean arterial blood pressure, rate pressure product) of Baptist elderly women in the Ibadan metropolis.
2. There will be no significant main effects of treatment (aerobic dance and pedometer-based walk) on body composition (Body Mass Index, fat-free mass, fat mass, waist hip ratio) of the Baptist elderly women in the Ibadan metropolis.
3. There will be no significant main effects of treatment (aerobic dance and pedometer-based walk) on functional ability (30 seconds chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis.
4. There will be no significant main effects of age (early elderlinesss and late elderliness) on cardiovascular parameters (blood pressure, mean arterial blood pressure, rate pressure product) of Baptist the elderly women in Ibadan metropolis.
5. There will be no significant main effects of age (early elderliness and late elderliness) on body composition (Body Mass Index, fat-free mass, fat mass, waist hip ratio) of Baptist elderly women in the Ibadan metropolis.
6. There will be no significant main effects of age (early elderliness and late elderliness) on functional ability (30 seconds chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis.
7. There will be no significant two-way interaction effects of treatment (aerobic dance and pedometer-based walk) and age (early elderliness and late elderliness) on cardiovascular parameters (blood pressure, mean arterial blood pressure, rate pressure product) of Baptist elderly women in the Ibadan metropolis.
8. There will be no significant two-way interaction effects of treatment (aerobic dance and pedometer-based walk) and age (early elderliness and late elderliness) on body composition (Body Mass Index, fat-free mass, fat mass, waist hip ratio) of Baptist elderly women in the Ibadan metropolis.

9. There will be no significant two-way interaction effects of treatment (aerobic dance and pedometer-based walk) and age (early elderliness and late elderliness) on functional ability (30 seconds chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis.

1.7 Delimitation of the Study

This study was delimited to the following:

1. Pretest- posttest control group quasi-experimental design.
2. All Baptist women in the Ibadan conference.
1. 3. Seventy elderly women in Ibadan metropolis.
2. 4. Two experimental groups and one control group.
3. 5. Twelve-weeks of training.
4. 6. Independent variables of aerobic dance and pedometer based walk and dependent variables of cardiovascular parameter (Blood pressure, mean arterial blood pressure, rate pressure product), body composition (Body mass index, fat-free mass, fat mass, waist hip ratio) and functional ability (30 seconds chair stand test, chair sit and reach test, arm curl test).
5. Five (5) research assistants.
6. Research Instruments:

a. Weighing scale

b. Non-elastic measuring tape

c. Standiometer

d. Pedometer

e. DVD sound system player

f. Aerobic dance (gospel) music sound track.

g. Skinfold caliper

h. Digital heart rate and blood pressure monitor.

i. Stop watch

j. dumbbell

9. Statistical analysis:

i. Descriptive statistics of frequency, percentage, range, mean, standard deviation.
ii. Inferential Statistics of Multivariate Analysis of covariance (MANCOVA).
iii. Alpha level was set at $p<0.05$.

1.8 Limitations

Some participants in the pedometer-based walk group had battery problem with the pedometer, which the researcher had to collect to replace and return on the next training day, but they were still able to participate in the training despite not being able to receive feedback on how many steps they took. Also, some participants in the pedometer based walk group forgot to wear their pedometers even after being reminded. They took part in the walking activities, but they could not receive feedback on their step count. Some participants traveled during the training session. The researcher did not make use of data of participants that were not completed, also, the researcher had no control over what the participants did outside of the training days.

1.9 Significance of the Study

The results showed that aerobic dance exercise and pedometer-based walk had a substantial impact on various cardiovascular parameters, body composition, and functional ability of the elderly women. As a result, exercise programmers and caregivers like the exercise physiologist, physical therapists, geriatrics and wards may find the findings useful in prescribing exercises for the elderly. The study found that aerobic dance and pedometer based walk can be a suitable alternative to traditional exercise for the elderly. This study's findings also showed that pedometer-based walking exercise can be used as a self-goal, self-monitor, and feedback tool for physical activity.

1.10 Operational Definition of Terms

Pedometer: Device that tracks the number of steps a person takes throughout the course of a day.

Early elderliness: Female individuals of age 55 to 65years.

Late elderliness: Female individuals of age 66years and above.

Body composition: Relative proportions of percent body fat, fat mass as related to body mass index.

Aerobic dance: A form of physical exercise, which combines rhythmic music with aerobic exercise of low to moderate intensity for the goal of improving fitness and wellness using Nigeria local music.

Cardiovascular parameters: These are circulatory variables, which include blood pressure, mean arterial blood pressure involved in the movement of blood and nutrient to the working muscles.

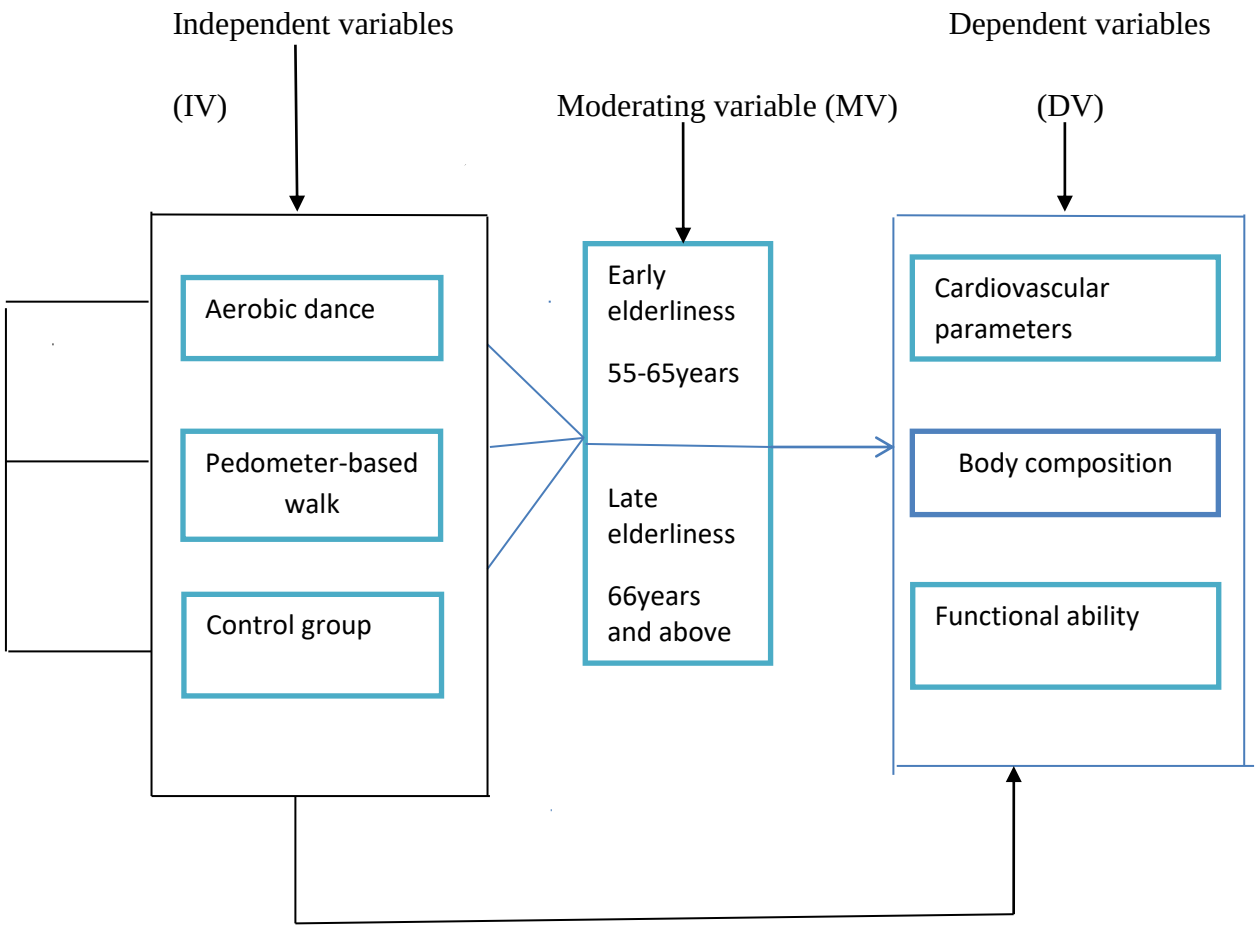
Functional ability: The physical ability to carry out normal activities of life especially with the use of arms and legs.

CHAPTER TWO

LITERATURE REVIEW

This chapter looked at relevants related literature to the study. It covers the conceptual framework of the study, the theoretical model, relevants materials on concept of cardiovascular parameters, body composition, functional ability, aerobic dance, and pedometer-based walk. This chapter also covers some previous related empirical findings on this study and the apprisal of literature.

2.1 Conceptual Framework



Source: Researcher, (2018)

The conceptual framework was developed by the researcher and it shows what the study was based on and the process by which the research done was conceptualized. It was conceptualized in this study that aerobic dance and pedometer based walk brought about a significant improvement on the cardiovascular parameters, body composition and functional ability of Baptist elderly women in Ibadan metropolis. The independent variables that were manipulated in this study were aerobic dance and pedometer based walk for the experimental group and exercise education for the control group. While the moderating variable for the study was age which was divided into early elderliness stage and late elderliness stage. The result of the effects of the independent and moderating variable were measured on the dependent variables of the participant cardiovascular parameters, body composition and functional ability.

2.2 Theoretical Model

Programmed Theory of Aging

There are many theories of aging in which programmed theory of aging is one. Programmed theory of aging state that aging is an essential and innate part of the human biology and that It is programmed into our bodily system. Humans have an innate predisposition to age and die (Goldsmith, 2014). Aging is programmed into the DNA, otherwise, human will live forever. The three major systems that are connected with aging are the endocrine system, immune system and the genes. These systems change over time and these changes causes the symptoms and signs of aging.

Programmed longevity theory is the idea that aging is caused by certain genes switching on and off over time.

Endocrine theory: is the idea that regular changes in hormones control aging

Immunological theory: states that immune system is programmed to decline over time, leaving people more susceptible to diseases.

Every human will age as aging is programmed into the DNA, and with aging comes a loss in biological aspects. Exercise has been shown to help prevent early deterioration and promote healthy, beautiful aging.

2.3 An Overview of the Circulatory system

The body's organs and tissues all require oxygen. The continual flow of oxygen-carrying blood meets this requirement. The cardiovascular system is responsible for maintaining a consistent blood flow, ensuring that every cell in the body has access to oxygen . The cells would not be able to function effectively without a well functioning cardiovascular system. The cardiovascular system is made up of several components that regulate blood flow.

These are:

Blood

Heart

Vessels of blood

The cardiovascular system's primary purpose is to move blood throughout the body. The heart's principal objective is to carry blood into the blood vessels. Blood vessels transport blood to all parts of the body before returning it to the heart and beginning the process all over again. Oxygen is transported to the rest of the body through the blood from the lung. It's also in charge of transporting waste materials like carbon dioxide, which the body's other systems eventually eliminate.(Saunders, 1995)

2.3.1a Blood

Blood is a fluid that transports vital chemicals, such as nutrients and oxygen, to the body's various organs and cells. Blood also transports waste from cells to processing areas. The blood volume of an adult is approximately 5 liters.

The vast majority of blood is made up of solid blood cells floating in liquid plasma.The remaining 90% of plasma is made up of dissolved substances (such as clotting proteins, carbohydrates, hormones, and minerals).

2.3.1b Function of Blood

Blood is an essential liquid in our bodies that serves a variety of purposes.

1. Make sure cells and tissues have enough oxygen (carried by RBCs).

2. . It allows cells to access vital nutrients such as amino acids, fatty acids, and glucose.
3. Waste, including carbon dioxide, is ejected.
4. Disease prevention and detection of alien objects by WBCs.
5. Blood coagulation and prevention against blood hemorrhage (platelets and clotting proteins).
6. The messenger system carries hormones toward other systems, enabling them to interrelate (Example, insulin is produce by the digestive system and moved through the blood, permitting cells to absorb sugars from food we consume).
7. It aids in the regulation and maintenance of body temperature.

2.3.1c Heart

The heart is a muscular organ that pumps blood throughout the body and is the size of a closed fist. It's slightly to the left of the center of the chest. Blood is pumped throughout the body while the heart beats. It delivers deoxygenated blood to the lungs, where oxygen is loaded and carbon dioxide, a metabolic waste product, is expelled. The heart, blood, and blood vessels comprise the circulatory system. The average person has about 5 liters of blood in their body, which is constantly circulating.

2.3.1d Valves and Chambers

A valve separates the four chambers of the human heart. The four chambers of the heart are the right atrium, right ventricle, left atrium, and left ventricle. It's important to keep in mind that the left side and right sides are inverted. consider your body's left and right sides as they appear to you.These chambers relax and contract while the heart pumps blood. Blood cannot flow backwards through the valves that separate the four chambers, so only one direction of flow is allowed.

2.3.1e Blood Circulation

The heart is composed of huge muscles that contract and relax, and blood flows from one chamber to the next via valves that separate the chambers when these muscles contract. The right atrium and right ventricle (the two right chambers) supply blood to the lungs. This bloodmoves oxygen into the body and removes carbon dioxide as it passes through the lungs (exits the body during exhalation). The newly oxygenated blood returns to the

heart's left side (left atrium and left ventricle) and is pushed into the aorta. The aorta divides into the rest of the body's blood vessels to distribute oxygenated blood.

When the cells require oxygen, they replace it with carbon dioxide. Blood vessels collect and transport blood to the heart's right side. The process is then duplicated, with the right side of the heart sending blood without oxygen to the lungs to be oxygenated(Lovering, 2021)

2.3.1f Respiratory Rate

A heartbeat is produced by small electrical impulses that bring about the heart muscles to reduce on a constant basis.To control the contraction and relaxation of the various compartments, the heart has a network of nerve fibers that act like electrical wires. The heart produces a wave-like push activity that precisely delivers blood to the entire body by maintaining all of these muscles contracting and relaxing in an orderly manner. The heart's regular injection movement is referred to as its' rhythm.'The heart pumps blood at various speeds all through the day, which is usual.

Palpitations are harmless fluctuations in heart rhythm that anyone can experience from time to time.An arrhythmia, on the other hand, is a persistently abnormal cardiac beat. The cardiac muscle could beat too quickly, too slowly, or in an irregular pattern. Discrepancies in the transmitter of electrical impulses that cause the heart muscles to contract induce changes in cardiac rhythm.Although arrhythmias do not always indicate a heart problem, some types of arrhythmias are of interest. Some arrhythmias are associated with syncope (fainting). Arrhythmias must be diagnosed by a doctor, who will most likely use an electrocardiogram (ECG) or some other form of heart observing system to do so.

Atrial fibrillation (AF), which is marked by a fast, erratic heartbeat, is the usual prevalent arrhythmia. Atrial fibrillation is caused by abnormal electric signals in the topmost room of the heart (left and right atrium) (Healthline.com). These erratic electric signals prompt the topmost room of the heart to contract extremely quickly and erratically in contrast to the bottom room (left and right ventricles).As a result, the heart's pumping action is disorganized, and the heart does not effectively transport blood. Atrial fibrillation reduces the efficiency with which the heart transport blood and increases the risk of blood

clots forming in the heart and arteries. These adverse impact can increase a person chance of getting heart failure, cardiac events, or shortage flow of blood to the brain.(Gorman, 2022)

2.3.1g The Cardiac Cycle

The Cardiac Cycle is a sequence of heart-related incidents. Whenever the heart beats, it undergoes a series of events known as the cardiac cycle. This cycle is broken down into two parts:

Systole (contraction)

Diastole (relaxation)

2.3.1h Systole

There is a period of contraction of the heart's ventricles between the first and second heart sounds of the cardiac cycle. During systole, blood is drained from the aorta and pulmonary trunk. A brief period of contraction precedes ventricular systole, which is followed by the ejection phase, in which 80 to 100cc of blood is pumped out of each ventricle. When arterial blood pressure reaches its greatest point, which in humans is usually 90 to 120 mm of mecury, this is known as systole. The commencement of ventricular systole is signaled by the QRS complex deflections on an ECG. Atrial systole occurs near the end of ventricular diastole, completing the filling of the ventricles.Atrial systole is linked to atrial depolarization, or the P wave deflection, on an ECG. In protozoans, “systole” can also refer to the contraction stage of the contractile vacuole.

2.3.1i. Diastole

The heart muscle relaxes before the chambers are filled with blood during this phase of the cardiac cycle. Diastole is followed by a phase of heart muscle contraction, or systole, in the cardiac cycle. At first, both the atria and the ventricles are in diastole, with a quick ventricle filling phase followed by a brief atrial systole. At the same time, arterial blood pressure drops to its lowest level, which is usually around 80mm of mecury in humans. Ventricular diastole resumes after blood has been released into the aorta and pulmonary artery. In protozoa, diastole refers to the relaxation of contractile vacuoles.

2.3.1j Blood vessels

Blood vessels are a component of the cardiovascular system that deliver blood to all regions of the body. These blood veins transport oxygen and nutrition to all of our organs and tissues, allowing our bodies to function properly.

The three types of blood vessels are as follows:

Arteries — Arteries are vessels that carry oxygen-rich blood from the heart to the rest of the body.

Capillaries – small blood vessels that transport gases (oxygen and carbon dioxide), water, nutrients, and waste products into and out of the circulation.

Veins carry depleted oxygenated blood back to the heart.

2.3.1k Arteries

Arteries are blood vessels that carry oxygen and nutrients from the heart to the rest of the body. Because the walls of these veins are naturally flexible, they can expand and contract as blood flows through them. As they migrate away from the heart, these vessels become smaller and smaller until they are the thinnest vessels (capillaries). The coronary arteries, which supplies blood, are kept separate from the rest of the body. The rapid beating of the heart puts pressure on the artery walls, causing them to enlarge. The pulse (or heart rate) is defined as the rhythmic contraction and relaxation of blood container, that can be detected and measured as blood pressure (BP).Blood pressure, on the other hand, is created by the pressure of blood on the blood vessels.

2.3.1l Capillaries

As the arteries shrink, they eventually transform into capillaries, which are slim blood vessels. Such veins are small enough that the blood's carried products can swap with the tissues surrounding them. Among them are nutrients contained in food, o2, co2, and byproducts. When byproducts and co2 accumulate in the capillaries, they meet with one another to form bigger vessels that return blood to the heart — these bigger vessels are veins.

2.3.1m Veins

Capillaries collect blood, which is then returned to the heart via veins. Because these vessels are further away from the heart, their blood pressure is significantly lower than that of the arteries. All veins return low oxygen (low oxygen) blood to the heart, where the process will start again. (Lovering, 2021)

2.4 Concept of Body Composition

Body composition refers to the proportions of fat, bone, water, and muscle in humans. The percentage of total body weight that is fat (also known as percent body fat) is an essential health indicator since high levels of body fatness are connected with an increased risk of coronary heart disease, stroke, and diabetes. While children are not at risk for heart disease or stroke in general, those who are overweight or obese have higher blood pressure and cholesterol levels. Furthermore, despite the fact that type 2 diabetes is more commonly associated with adults, it is increasingly being diagnosed in youngsters. Obesity and heart disease risk factors are well established to endure a lifetime, so documenting body composition as part of an overall health-related fitness profile is critical. Body composition, like other aspects of health-related fitness, has an impact on health (even in children) and interferes with regular physical activity participation (Kravitz & Heyward, 2002).

2.4.1a Determination of body composition

2.4.1b Skin-folds

Because a significant amount of total body fat is stored immediately beneath the skin, skin-fold measurement is an excellent method for determining body composition .Equations that estimate percent body fat from basic skin-fold measurements could be built by analyzing body composition with underwater weighing in a significant group of individuals and getting skin-fold assessments from these same people.The use of skinfolds to calculate percent body fat has several drawbacks, including the fact that body fat distribution differs with years, sex, racial group, and physical activity. In order to make a reasonably accurate estimate of percent body fat using skinfolds, the equation must have been developed with a similar subject group. As a result, there is a plethora of

"population-specific" equations, many of which appear to be based on far too few subjects to be useful.

Jackson and Pollock, as well as Pollock and Ward, proposed generalized formula that have been proven across a wide range of age groups and populations, both athletic and non-athletic, in an attempt to address this problem.

These equations are:

Men: $D=1.1125025-0.0013125(x) + 0.0000055(x^2) – 0.000244(y)$

Women: $D=1.089733-0.0009245(x) + 0.0000025(x^2) – 0.0000979(y)$

Where x=sum of triceps, chest and subscapular skin-folds (in mm) for men, and the sum of triceps, suprailium and abdomen skinfolds for women, and y=age in years (Ratini, 2021).

2.4.1c PROCEDURES FOR MEASURING SKINFOLD THICKNESS

The diameter of double skinfolds and hypodermis at certain places on the body are referred to as "fat-fold" thicknesses.They can provide useful information on the location of subcutaneous body fat and provide a reasonably straightforward assessment of total fatness. Using a skin-fold caliper to assess body fat is tricky. Standardizing site selection and placement is particularly important because even little differences in location can result in major measurement variances. Furthermore, skin and adipose tissue compressibility varies depending on hydration, age, size, and individual.Extremely thin or extremely obese people face unique measurement issues. The more difficult it is to get a reliable measurement, the thicker the skin-fold.

a. Use Lange skin-fold calipers for all measurements.
b. Describe your procedure and show them the calipers you'll be using.
c. Give the participant a "pinch" on the hand. (For this, the space between your thumb and index finger is excellent).
d. Apply pressure to the caliper fore on the inner and outer of the hand, then let go.

e. Determine the five locations where assessments would be obtained (thigh, abdomen, triceps, subscapula, and suprailiac).
f. Take assessmenton the right side of your body.

Make a dot in every location with a biro or a marking pencil.

g. Pull the skin-fold away from the body by firmly holding it with the thumb and index finger of the left hand. The skin fold must be parallel on all end; the greater fat beneath the epidermis, the denser the fold. Pulling the skin-fold off from the body is generally easy in slim people when contrast to fat people. It is sometimes unsettling for the individual.
h. Hold the caliper perpendicular to the skin fold with the dial facing up in your right hand. The caliper heads on the skin fold are 13 to 12 inch (1 cm) off from the skin fingers.

This is required to keep finger strain from affecting the force of the caliper heads. Throughout every assessment, keep your fingers pressed together.It is critical not to insert the caliper too far into the skin fold. The thickness of the skin's true double fold should be measured with the caliper head.

i. After about 4 seconds, the caliper's lever is released, and the dial is read. Waiting more than 4 seconds results in smaller, incorrect readings. Metric measurements must be taken to the nearest tenth of a millimeter. The following readings must be completed in the same order as the previous ones. The second measurement must be taken at least 15 seconds after the first measurement and in the same location to allow the skin-fold to "level" to usual within measurements. If the results of repeated measurements are inconclusive, retake the reading until the results are consistent. If the Tricep or Subscapular measurements varies beyond 3 mm or the Suprailiac or Abdominal measurements differ more than 5 mm, take another measurement. When entering data, make sure to check off the outlier with your initials so that the three closest readings are visible.

If the person is overweight, pulling the skin-fold may be difficult. In this case, attempt the measurement and, if it fails, mark it as "uncertain" on the record book.

j. If the skin-fold surpasses sixty seven milimiter, note "surpass caliper" in the data form for that skin-fold. Women who are pregnant should not be measured.

1. Practice the measurements until you're completely confident in them. It takes a lot of practice to become an expert at measuring skin folds on a consistent basis.

(Ratini, 2021).

2.4.1d Triceps Skin-fold:

a. From behind the person, draw a vertical skin-fold roughly half an inch over the earlier dotted spot, with the pollex and forefinger pointing downward and centered on the dot (+). • create a sign perpendicular to the fold's distance with the calipers.
b. After about 4 seconds, let go of the caliper and read the dial while keeping the skin-fold in place with your fingers.
c. Make a millimeter-by-millimeter record of your measurement.

2.4.1e Subscapular Skin-fold:

Locate the designated area on the subscapular skin fold. Pull a skin-fold to the right side of the body at a 45o angle slanting downward, approximately 12 inch over and to the left of the former chosen area.

a. Center the mark with the caliper parallel to the size of the fold.
b. After about 4 seconds, release the caliper and read the dial while keeping the skin-fold in place with your fingertips.
c. Take a measurement to the closest millimeter and write it down.

2.4.1f Suprailiac

a. The participant must stand upright, with their leg next to each other as well as their hands rested. With the thumb and index finger pointed downward, pull a diagonal skin-fold approximately 12 inch above the previously designated spot.
b. set the calipers perpendicular to the fold's size, centered on the dot.
c. After about 4 seconds, release the caliper and read the dial while keeping the skin-fold in place with your fingertips.

2.4.1g Abdomen:

a. Pull a horizontal skin-fold 12 inches to the left of the previously designated spot, centered on the (+).
b. Center the mark with the calipers plumb to the fold's length.
c. Let go of the caliper and interpret the dial for about four seconds even as the fingers are still holding the skinfold.
d. Take measurements to the closet millimeter.

2.4.1h Thigh:

a. The participant should stand with his or her weight on the left foot also with his or her right foot ahead and slightly bowed.
b. Hold a skinfold on the mid-thigh about 12 inch above the previously designated spot.
c. Center the mark with the calipers perpendicular to the fold's length.
d. Align the calipers perpendicular to the fold's length and center the mark.
e. After 4 seconds, release the caliper and read the dial while keeping your fingertips on the skin.

Measure to the nearest millimeter and write it down.

Bioelectrical Impedance is another approach for determining body composition.

2.4.1i Bioelectrical Impedance

The basic premise of bioelectrical impedance analysis for determining body composition is as follows: Because the fat-free component contains more electrolytes, a tiny interchanging current flowing between two electrodes travels more quickly through hydrated fat-free bodily tissues and extracellular water than fat or bone tissue. The impedance (resistance) to electrical current passage is related to body water content, which is related to fat and fat-free mass quality. BIA administers a painless, targeted electrical current to the get. Impedance is calculated using the resistance to current flow. This can then be customized to include information like body mass index (bmi), sex, years, and, in some cases, racial group, body fat level, and girth assessment. Impedance measurements will be taken with a Tanita body composition scale.

Demand measurement using bioelectrical impedance analysis under standardized settings, including hydration, recent meal and beverage intake, skin temperature, and recent physical activity. The accuracy of BIA is influenced by hydration. When there is a large loss of bodily water as a result of fluid restriction, for example, impedance decreases. This would result in a decreased percentage of body fat. Hyperhydration, on the other hand, would have a negative effect. Impedance measurements are also influenced by skin temperature. A warm environment may lead to lower electrical impedance and, as a result, lower body fat percentage. When compared to underwater weighing, even in perfect conditions, BIA results can be questionable. In lean and athletic participants, BIA tends to overpredict body fat, while in obese patients, it tends to underestimate body fat.

2.4.1j Girth measuement

Skinfold measurements are a less convenient, more accurate, and preferred alternative to girth measurements. The Gulick tape measures the circumference of the upper arm, forearm, abdomen, hips, thigh, and calf. The formulas for estimating percent fat mass using girth assessment are appropriate for both youth and adult male and female, as long as their physical characteristics match those of the original validation group.Persons who seem to be extremely big or skinny, or who engage in extreme physical or resistance activities that improves girth but not affecting the subcutaneous body fat, should avoid using the calculations. The girth measurement can be used to predict body composition and investigate fat distribution trends.(Ratini, 2021)

2.4.1k Procedure for calculating goal body fat percentage (GBF%) and target weight (TW).

1. Body fat percentage (BF percent) multiplied by total body weight (TBW) equals fat weight (FW).
2. Deduct FW from the total weight of the body.
3. Fat-free mass makes up the remaining weight (FFM)
4. Determine the percentage of GBF.
5. Take the LBM and divide it by the number of people in your group (1-GBF percent)
6. The TBW at the predetermined GBF percent will be the answer.

7. Deduct TW from TBW to calculate the weight loss (WL) required in achieving the GBF percent.

Step 1: TBW x BF percent -FW

Step 2: TBW – FW=LBM

Step 3: TW = LBM/(11-GBF percent)

Step 4: TBW-TW=WL

(pedia.com).

2.4.1l Lab Activity:

With the assistance of a companion, rehearse with a skin-fold calipers.

On the right side of the body, assessments must be taken.

a. Hold the calipers 1 cm apart from the thumb and finger, perpendicular to the skin fold and halfway between the crest and base.
b. Keep the pinch while looking at the calipers.
c. Before reading the calipers, wait 1-2 seconds.
d. Take many measurements at each location.
e. Repeat the process if the measurement does not drop within 1-2 mm.
f. Switch between the various location.
g. Make a note of the reading on a repot book.
h. Determine the participants approximate body fat percentage utilizing the seven site equation and one of the three site formulae.

With the help of a colleague, evaluate body mass in kilogram, height in centimeters, and bioelectrical impedance with Tanita body composition scale or the portable BIA.

Take your partner's waist and hip circumference measurements. Determine the waist-to-hip ratio.

a. Waist: The slimmest part of the torso.

b. Hip: Above the gluteus fold, at the widest point of the hips or buttocks.

4. Using girth measurements, calculate body composition. For each site, duplicate measurements must be done, and the mean calculated.

a. Adjust the tension of the Gulick tape so that it is tight but still not squeezing the body.
b. Make sure the tape is also not indenting the body or isn't too loose, leaving space in the tape and the body.
c. Repeat the test if the readings are not within 1 cm of one another.
d. Take reading.
e. Percent Fat = Constant A + Constant B – Constant C – 10.2 for young men (18-26 years).

Upper arm, abdomen, and forearm are represented by the letters A, B, and C, respectively.

Percent Fat = Constant A + Constant B – Constant C – 15.0 for older men (27-50 years).

A stands for buttocks, B for abdomen, and C for forearm.

F. Percent Fat = Constant A + Constant B – Constant C – 19.6 for Young Women (18-26 years).

A stands for abdominal, B for thigh, and C for forearm.

Women in their fifties (27-50 years old):

Constant A + Constant B – Constant C – 19.6 = Percent Fat

A stands for abdominal, B for thigh, and C for calf.

2.4.1m WEIGHT MEASUREMENT PROCEDURE

a. Make sure the scale is on a firm, flat surface.
b. All coats, thick sweaters, shoes, keys, and heavy pocket items should be removed by the participant.
c. Have the person involved stand in the center of the platform of the scale, weighted equally on the two leg. measure the individual to the closet 0.1 kg in kilos (100 grams).

2.4.1n MEASUREMENT PROCEDURE FOR HEIGHT

a. An upright board with a standard rule attached and a parallel headboard that can be brought into contact with the highest point on the head are required to measure stature.

b. The participants' shoes should be removed.

c. Standing with hands at sides, legs straight, and shoulders relaxed, the participant's heels, buttocks, shoulder blades, and head should all be in contact with the vertical board.

   If a participant is unable to place all four body parts against the board, at least the buttocks and heels, or the buttocks and head, should be in touch with the board.

d. The participant's head should be held in such a way that their eyes are directly ahead of them and their chin is not elevated.

e. Have the subjects take a big breath and hold it just before taking the measurement.

   Remind them to breathe deeply and relax their shoulders.

f. Adjust the headboard to the height of your head. Check the hair to see if it has been crushed. If the participant's braids are thick, take an accurate measurement and record it into the record book.

g. Measure your height to the nearest 0.1 centimeter. When taking the measurement, ensure your eyes are even with the headboard. If necessary, use a foot stool to properly read the measurement.

2.4.1o CIRCUMFERENCE MEASUREMENT PROCEDURE

Circumferences are critical assessment that capture the human body's cross-sectional and circumferential dimensions. Circumferences can be utilise to estimate nutritional status and fat patterning levels alone, in conjunction with skinfold reading taken at the regular time, or in conjunction with other circumferences. Cross-sectional areas of adipose tissue or underlying "muscle plus bone" regions can be created by combining limb circumferences with skin-fold measurements of subcutaneous adipose tissue thicknesses at comparable levels(Kravitz & Heyward, 2002).

a. Measurements are taken from the right side of the body. • For an accurate measurement, the tape must be properly placed in each circumference.
b. Wrap the tape in a circle parallel to the long axis of the body for each perimeter. The plane of the tape is parallel to the ground for circumferences taken with the person standing upright (waist, hip).
c. The measurement's validity and reliability are influenced by the amount of force adhered to the tape by the person taking the measurement. Use Gulick II tape because it consistently provides the same amount of tension (4 ounces) every time, as previously stated. Wrap the tape around the body part snugly but not so tightly that the subcutaneous adipose tissue is crushed if you don't have a tape with a pressure system.When measuring the circumference of your arm, you may notice gaps between the tape and your skin. A notation on the data form should be made if the gap is considerable; however, in most cases, the gap is minor and insignificant. It is not advised to try to reduce the space by toughening the tape.

2.4.1p Arm circumference

The right arm of the subject should be stretched out to the side, palm facing inward. Wrap the measuring tape around your arm at the halfway point you determined earlier. Your right arm is griping the tape's zero edge. Turn your arms so that the zero edge of the tape is in your left arm and the other edge of the tape is in your right hand after wrapping the tape around the appendage. Pull the tape gently with your left hand until the desired tension is reached. With your right hand, secure the tape in place.

Make sure your measurements are accurate to the nearest 0.1 cm.

2.4.1q WAIST CIRCUMFERENCE

Waist Circumference: This assessment is taken without the individual cloth on; if otherwise, it must be taken while rising and resting on your left arm beneath the cloth.

It's possible that women are agreeing to tuck their shirts under their bra straps. In addition, the participant's underwear's waistline may need to be lowered.

a. The participant must stand tall, with his or her feet together and his or her abdomen relaxed.

b. Find the participant's narrowest area of the torso by standing behind them.
c. Have the participant raise their arms as you wrap the tape rule across the smallest point of the torso. Grab the head of the tape rule with your right arm and the others with your left.
d. When the tape has been wrapped across the individual chest, relieve their hands at their ends.
e. Make certain the tape is parallel to the ground, equally distributed across the body, and not touching any cloth.
f. After the tape is in place, turn the zero end to your left hand and the rest to your right.
g. With your left hand, pull the tape until the desired tension is reached. Use your right hand to hold the tape in place.
h. Take measurements to the nearest 0.1 cm.

2.4.1r Hip circumference

The individual must remain upright, hands at sides, and leg close to each other, wearing only nonrestrictive underwear or a light smock over underwear. Both feet's weight should be the same**.**

a. Kneel or squat on the subject's right side. Calculate your buttocks' maximum extension.
b. With your right hand grab the zero point of the tape, wrap it around the buttocks in a parallel plane at this stage.
c. When everything is in place, move the tape's zero end to the left hand and the rest to the right.
d. Once the tape is in place, turn the zero end to the left and the rest to the right.
e. Gently pull the tape with your left hand until it reaches the desired tension. Keep the tape in place with your right hand.
f. Measurements should be accurate to 0.1 cm.

2.4.1s THIGH CIRCUMFERENCE

a. Stand with your right leg ahead of your left, and your weight on your left leg. Assume the participant's position.

b. Squat or kneel to the participant's left. Wrap the tape across your mid-thigh at the marked (+) while holding the zero end in your right hand.

Ensure the tape is parallel toward the long axis of the thigh rather than the ground.

c. When the tape is in place, switch the zero end to your left hand and the remainder to your right.
d. Gently pull the tape with your left hand until it reaches the desired tension. Use your right hand to hold the tape in place.
e. Take measurements to the closet 0.1 cm.

2.4.1t Body Fat and Its Importance

1. Fat acts as an insulator, allowing the body to react to changes in temperature.
2. Fat works as a shock absorber, preventing injury to the body's organs and bones.
3. Fat aids in the efficient utilization of vitamins by the body.
4. Fat is energy that is stored and made available when your body requires it.
5. The appropriate amount of fat helps you look your best, which increases your sentiments of happiness.
6. Fat contributes to chemical reactions that regulate development, immunity, reproduction, and other elements of basic metabolism.

2.4.1u Body Fatness: Factors Affecting It

2.4.1v Heredity

Parents determine your physical type. Certain people are predisposed to being lean, muscular, or obese from birth. Regular exercisers have a higher percentage of lean body mass.

2.4.1w Metabolism

The amount of energy your body uses only to keep you alive is referred to as your basal metabolism. Calories are the unit used to measure this energy. The metabolism of some persons is faster than that of others.

2.4.1x Maturation

Hormone levels in the body begin to vary as you get older. Female hormones cause girls to gain more body fat than boys during adolescence. Teenage boys build their muscles faster than girls due to male hormones.

2.4.1y Obesity in Childhood

Children who are overweight grow extra fat cells, making it difficult to maintain a healthy weight later in life. Keeping body fat levels in the healthy range during childhood and adolescence will help to keep body fat levels in check throughout life.

2.4.1z Diet

Calories are a metric for how much energy is contained in a given amount of food. Men require more calories on a daily basis than women because they are larger and have more muscular mass.

2.4.2 Physical Exercising

Calories are used by your body to produce energy. The more rigorous your exercise, the more energy your body expends and the more calories you require. A sedentary person expends less energy per day than an active person and hence requires fewer calories.

2.4.2a How Much Body Fat Is Beneficial?

One-half of the body's fat is stored deep within the organs. Between your skin and muscles is where the residual fat is stored. A physically fit individual has the appropriate amount of body fat, not too much or too little. Ladies have a higher body fat percentage than males;Obese women have a body fat percentage of over 35%, whereas obese men have a body fat percentage of over 30%.

2.4.2b Fat vs. Bodyweight

The terms "underweight" and "overweight" don't convey enough information about a person's fitness or body composition. The terms "underweight" and "overweight" refer to your weight in relation to others. Muscle mass exceeds fat mass. Because you are more muscular and have less body fat than the other individual, you can weigh more than someone of the same body size. Because your bones are thinner, you can weigh less than someone of the same height.

2.4.2c Overweight and underweight

The terms "over fat" and "under fat" are helpful since they indicate how much fat makes up your overall body weight. Obesity is a phrase used to describe persons who are highly over fat. Being under fat means having too little body fat; being over fat implies having too much body fat.

2.4.2d Body fat is insufficient.

The bare minimum of body fat is referred to as necessary body fat, since if fat levels in the body fall below this level, health problems arise. Being underweight might cause several body organs to malfunction. In reality, extremely low body fat levels, particularly among teenagers, can cause major health concerns.

2.5 Functional ability

ADLs is a healthcare word in explaining people's regular self-care task. Sidney Katz and his workmate at the Benjamin Rose clinic in Cleveland, Ohio, first defined the idea of ADLs in the 1950s, and it has since been broadened and updated by a number of scholars (Browdie and Richard, 2013).The ability or inability to do ADLs is commonly used by medical practitioner to evaluate person's functional state, especially in the case of those recovering from an injury, people with disabilities, and the elderly (Encyclopedia of nursing and Allied Health, 2016). In younger kids, ADLs are frequently completed with the assistance of adults because they have not yet grown the expertise required to do so individually.

ADLs involve eating, showering, wearing clothes, personal appearance, working, housekeeping, washing after pooping, and relaxing (medicinenet.com). Several national surveys in the United States gather information on the population's ADL status. While basic definitions of ADLs have been proposed, the meaning of an ADL may differ from person to person. Adaptive tools and gadgets could be utilise to supplement and foster independence in doing ADLs.

ADLs (Activities of Daily Living) are self-care activities that are carried out on a daily basis (Williams, 2014).

a. Personal grooming • Showering and bathing (brushing, combing, and styling hair)

b. Toilet cleanliness • Wearing clothes (going to the rest room, washing up, and getting back up) • Functional movement, also recognized as "transferring," is described as the capacity to walk, get to and from bed, and get into and off the seat; the wider view is beneficial for individual with varying physical capabilities who can still get around.
c. Self-sufficiency is a word that means an individual's capacity to (Cooking, chewing and swallowing is not inclusive).

Basic ADLs include getting out of bed, going to the restroom, bathing, dressing, grooming, and eating. "The first function to go is hygiene, followed by toilet usage and mobility, and finally feeding," the ADLs are organized in a pyramid. The final area in which a person is autonomous is eating, which is 62.9 percent likely, and sleeping, which is only 3.5 percent likely. "It's a matter of hygiene."

DEATH: wearing clothes, eating, ambulating (walking), toileting, hygiene is an evocative that some people find useful, despite its rarity.Tasks that must be completed on a daily basis in order to survive.

Instrumental activities of daily living (IADLs) are optional yet allow a person to live freely in a community.

IADLs come in a variety of formats(Bookman, Harrington, Pass, and Reisner, 2007; Williams, Cynthia, 2011).

Cleaning and maintaining the home
Dealing with money
Going for walks in the area
Making meals
Purchasing food and other essentials
Taking medications as prescribed

There are different kinds of IADLs that can be used in conjunction with each other:

1. Taking care of pets

2. Caring for others (including the selection and supervision of caregivers) (Roley, Delany and Barrows, 2008).
3. Managing communication
4. Accounting and financial administration
5. Health administration and upkeep
6. Creating and sustaining a home
7. Preparation and cleanup of meals
8. Religious rituals

Physiotherapists use activities to help clients maintain and gain freedom in their daily activities. Exercise regimens for patients are tailored to their specific needs, such as agility, power, stability, and coordination. A slower walking speed is linked to an higher rate of slipping. moving rate increase with physical activities, permitting one to walk quite securely and quickly. If an individual which to gain the important of exercise, it is critical to stick to a plan. Individuals who are frail must exercise to maintain functional independence and avoid the need for outside assistance or placement in a long-term care center.

Nursing, like other professions like nursing assistants, necessitates the ability to assist with daily tasks. This can entail things like repositioning an activity-intolerant patient in bed or assisting with patient movement. Giving bed washes and assisting with urine and stool discharge are common examples of these.

2.5a Instruments for evaluation

There are a variety of evaluation tools available, including the

1. ADL scale of Katz

2. The ADL/IADL scale of the Older Americans Resources and Services (OARS).

3. The Bristol Activities of Daily Living Scale and the Lawton IADL Scale

2.6 Aerobic Dance as a Concept

2.6.1a The origins of aerobic dancing

“Aerobic dance is a pleasant way to lose weight. It incorporates music-assisted activities that incorporate fat-burning aerobic motions, muscle-building training, and stretching” (Aerobic Dance, 1997). It's often done at three intensity levels: low, medium, and high. Beginners should stick to low-impact activities.It is done at a reduced intensity level and at a low speed. average dancers can begin to reap the gain of dance aerobics. They develop a strong and efficient heart and lungs. Dancers who perform at a high level of intensity work hard, which improves the efficiency and strength of the heart and lungs.

Dr. Kenneth H. Cooper invented aerobics to assist patients avoid cardiovascular event. In 1969, Jackie Sorensen established aerobic dancing.It's a set of dancing procedure aimed at improving cardiovascular fitness. Aerobic dance has grown in popularity over time, with an estimated 6 million participants in 1978, 19 million in 1982, and 22 million in 1987. Aerobics, whether done in a group or on your own, is a terrific way to get some exercise.The cost is inexpensive, and you don't need much in the way of equipment to participate. In the 1980s, the aerobics world was dominated by women, with around 9 out of 10 participants being female.

In 1969, aerobic dance was pioneered by Jacki Sorenson(matiadoc.com). In a group setting, she combined hard dance moves and exercises with well-known music. Dancing (aerobic dance) quickly became one of America's most popular recreational pastimes. Aerobic dancing has evolved from female-only dance motions to freestyle workout that combine dance, sport, and fitness movements for all. Step aerobics was initially invented in 1990, and by 1996, step aerobics had outnumbered both high and low impact aerobics in terms of attendance. Aerobics has grown into a multibillion-dollar industry with approximately 25 million users.

Aerobic dance, along with other aerobic exercises, has been described as a comprehensive physical fitness program (alwag.org). It allows for both physical exercise and enjoyment because it allows people to dance freely in their own styles. Music-related emotions are also physically conveyed by laughing, jumping, yelling, jogging, kicking, stretching,

sliding, and swinging. It can be used as a basic fitness conditioner if the instructions are followed and 30-45 minutes per period is set aside at least twice a week.

Due to the fact that it required a lot of energy, aerobic dance has also been labeled as a high calorie burner (alwag.org). Sorenson claims that a modest 45-minute session burns roughly 300 calories, which she claims is equivalent to riding for 45 minutes at 7 miles per hour. She also claims that a vigorous 45-minute lesson can burn up to 500 calories, which is equivalent to swimming for one hour at 30 yards per minute. Simply said, aerobic dancing is continuous movement done at a prescribed speed that requires the body to use an increasing amount of oxygen for a sustained length of time.

2.6.1b Aerobic dance has numerous advantages for everyone.

Aerobic dance is a sort of physical activities that has a variety of health benefits. The first area of improvement is overall health. Physical, social, emotional, intellectual, vocational, and spiritual components are all involved. The development of cardiovascular endurance, muscular endurance, body composition, strength, and flexibility are all part of the physical dimension of wellbeing. It assists in gaining information about nutrition, diet, and self-care, as well as the proper use of the medical system, by examining the physical dimension.

The social aspect of wellbeing is another factor to consider. It declares your community's common good, your independence as well as interconnectedness with people and environment, and your desire for family harmony. The third step is to understand and accept your sensations and emotions. This dimension is also developed by analyzing your limitations, establishing autonomy, and being able to manage stress effectively. The fourth dimension is the intellectual one, which promotes creativity and mental activity.

A well-informed individual will make use of the resources at hand to broaden their knowledge and improve their skills. Fifth, occupational, this has been processed for employment that will provide you with personal fulfillment and life enrichment. Spiritual well-being is the final aspect of wellness. This entails the search for reason and significant in life. It entails an understanding of the breadth and depth of life as well as normal occurences. For a healthy life, all of these dimensions are essential. They are

interconnected. They all suffer because I suffer, which is why it is critical to pay attention to each area. Physical activity is beneficial for a number of reasons.

2.6.1c Other advantages of aerobic dance include:

It boosts overall fitness. It improves every aspect of health and fitness (muscular strength and endurance, flexibility, cardiovascular fitness and body composition).

Rhythmic motions improve coordination and balance, also group physical activities provides opportunities for social contact that other exercise do not. This appeal to a large number of people.

Aerobic dance has the following physical benefits:

It help lower the risk of cardiovascular disease, it also aid in improving the heart and lung health. Participating in aerobic dance Increases the aerobic fitness and Improved muscular tone and strength. Aerobic dance exercise also help lower blood pressure and cholesterol level, it is a good exercise for individuals who are obese and over weight to loss the excess fat on time and with so much fun. It is a reconmended physical activity for weight management. It has also be found to improved bone health, it aid in the prevention of osteoarthritis, osteomalacia, osteoporosis, rheumatoid arthritis and muscle weakness and pain. Aerobic dance help to increase flexibility since it entains a broad range of movements that demand flexibility.

2.6.1d Aerobic dance has psychological benefits such as:

1. Lowering depression.
2. Increasing self-esteem.
3. Reducing stress.
4. Improving general and psychological well-being.
5. It enhances one's overall quality of life.
6. Improved social skills.

2.6.1e Aerobic dance facilities

a. A ground that dissolves shock whereas still ensuring sufficient adhesion with adequate ventilation and a room temperature of 60-70°F.
b. Provide adequate room for everyone to walk around.

c. Acoustics that enable the instructor's sound to be noticed above the background soundtracks.
d. If there is a large crowd, the trainer should stand on an elevated platform so that everyone can see him.
e. Mirrors to allow participants to correct their errors.

2.6.1f Aerobic dancing equipment

a. A stero with a library of CDs and tapes.
b. Wireless microphone; mats, steps, benches, slides

Elastic bands, dumb bells, and ankle weights are all viable options.

c. Balls for stability.
d. Jump roping.
e. Clothing that is lightweight and breathable.
f. Shoes that are comfortable and well-maintained.
g. shielded sport stockings can help with shock absorption and provide extra support the leg.

2.6.1g Aerobic dances come in a variety of forms.

Participants always keep one foot on the ground, making this a low-impact activity. There is no jumping or banging, therefore joints are not harmed. This is a fantastic lesson for everyone, but especially for those who are overweight and can't hop around.

High-impact aerobics: this type of exercise includes some jumping movements and is best suited to intermediate to advanced exercisers.

Step aerobics are performed on a raised ledge and involve a wide range of movements that make use of the stepping-up motion. It can have a minimal or significant influence on the environment.

A usual aerobics exercise components/routine:

a. **Warm-up and pre-stretch** for 10 minutes: This is done to promote blood transportation to the muscles and the frequency at which oxygen is delivered to the

muscles in preparation for exercise. Warm-up exercises include a variety of rhythmic, full-range-of-motion movements that target all major muscle groups.

b. **Aerobic Exercise (20-30 minutes):** This is the most important time in class. Each class has a unique component. The intensity of this exercise ranges between fifty and eight five percentage of the target heart rate.
c. **Relax for 2 to 5 minutes:** The cool-down is intended to slowly reduce the heart rate and inhibit blood from joining in the lower extremities. Cool down with gentle rhythmic moans to revert blood to the heart.
d. **Final Stretch- 5–10 minutes of strength work:** This is commonly referred to as "abs." This workout strengthens the stomach and back core muscles. These muscles aid in the improvement of posture and the efficient performance of aerobic exercises.

2.7 Concept of pedometer

2.7.1a Application of a pedometer

Measuring physical activity has always been a difficult task for researchers and physician. Self-reported work out measurements have long been considered the gold standard for population monitoring and intervention evaluation (Salts and Saelens, 2000). Self-report assessments are prone to communal merit and recollection prejudice, but their most significant flaw is their inefficacy to precisely evaluate structureless and unplanned ambulant work out. Unstructured way of life associated activities are now frequently pushed to the general population, who are inspired to get 30 minutes of moderate-intensity physical exercise nearly every day of the week (Dunn, Andersen & Jakicic, 1998). As a result, accurately assessing these types of unstructured activities is critical. Because self-report methods fail to account for unstructured incidental activity, unbiased estimate of physical activity, such as the pedometer, have gained popularity. The pedometer is winning acceptance as a reliable estimate of ambulatory physical activity because it can supply a quick assessment of unplanned and unstructured physical activity (Tudor & Myers, 2011).

The advantages of using a pedometer to track your physical activity are numerous. They've reveal to be a reliable measure of physical activity (Welk, Differding, Thompson,

Blair, Dzuira, and Hart, 2000) and unlike self-report measures, can detect minor changes in an individual's incidental physical activity. Data from pedometers can also be accurately compared between studies (Schneider, Crouter & Bassett, 2004). Some academics and practitioners use pedometers to aid in habit change.A Pedometers can help people increase their physical activity levels by providing immediate feedback and serving as a constant reminder to get moving. The following health benefits of walking have been linked to pedometer use and overall well-being among people (Hultquist, Albright, &Thompson, 2005).

2.7.1b WALKING IS IMPORTANT

Walking, according to the American Council on Exercise, has the following health benefits:

Exercise causes blood vessels to dilate, lowering the pressure on blood vessel walls. Reduced pressure reduces the likelihood of a blood artery in the brain rupturing and causing a stroke. It also Lower cholesterol:Exercise lowers cholesterol levels, lowering risk of heart risk.

It increased heart rate while walking helps to lower heart rate when at rest. A healthy heart and cardiovascular system reduces the risk of coronary artery disease and heart attacks. Bone density is improved. The risk of osteoporosis and bone fractures decreases as bone density rises. Women with osteoporosis should engage in weight-bearing activity such as walking.

Walking boost anti-aging growth hormone production: The body stopped releasing hormones that assist maintain muscles strong as one became older. As a result, the only natural way to get the body to continue producing these hormones is through frequent exercise. Endorphins (en-dor-fins) are a type of neurotransmitter that enhances both mental and physical wellness. Endorphins are the body's natural stress relievers that help you relax. Walking for forty minutes three to four times a week can help with depression and anxiety. People typically notice that they feel better and sleep better as a result of endorphin release.

Walking also help in weight loss or weight maintenance: Research has shown that walking on a daily basis can help you lose weight and keep it off. A one-mile walk burns almost 100 calories for an average-weight person, and more for a bigger person, depending on the pace (up to 300 calories per hour). Nervous system and reflexes are strengthened: When you move your body, your brain sends “messages” to your muscles telling them how to move. Those messages must be sent often in order for the nervous system to continue to work and strengthen the reflexes.

Walking and stretching improve overall flexibility, making everyday activities like climbing stairs, crossing the street, and driving a car easier and safer. Flexibility will aid physical independence and may possibly extend the amount of time one may drive.

2.7.1c FIFTY-TWO WALKING FACTS

According to the American Council on Exercise, there are 52 fascinating facts about walking.

1. Walking is beneficial to your health: it can reduce your threat of coronary heart disease.
2. Dog caregivers must walk their dogs often than non-dog owners.
3. A fifteen minute walking could help overcome candy as well as fructose appetite.
4. A woman's shortest 5k (3.1 mile) speed is 21:58 (approximately 7 minutes per mile), and a man's fastest 5k (3.1 mile) time is 19:09 (approximately 6 minutes per mile)—both times are faster than most runners!
5. The first Wednesday of April is designated as National Walking Day.
6. Walking can boost creativity by up to 60%.
7. On average, people who track their steps take an extra 2,500 steps per
8. By walking 112 miles instead of driving, you can reduce greenhouse gas emissions by nearly 75%.
9. Walking lowers blood pressure and blood sugar levels.
10. One mile equals approximately 2,000 steps.
11. Taking a walk during your lunch break can help you be more productive at work.

12. Walkers have a 1 to 5% chance of experiencing an exercise-related injury, whereas runners have a 20 to 70% chance.
13. Sedentary behavior is defined as taking fewer than 5,000 steps per day.
14. The speed at which you walk can affect how long you live.
15. Servers (23,000 steps on a daily basis), nurses (16,000 steps per day), also salesperson are among the 15 jobs that get you moving (15,000).
16. In 1908, heel and toe racing got to Olympic inception.
17. Walking can help with your emotions and your mental health.
18. According to a Danish study, interval walkers loss 6 times extra body mass to steady-pace walkers.
19. The claim that walking or running a mile will burn 100 calories is false. Your speed and weight determine how many calories you burn. Running faster and harder will help you burn more calories.
20. Walking to the beat of "Shut Up and Dance" is about 3.5 miles per hour, and more than 5 miles per hour if "Shake It Off" is followed.
21. Walking for 21 minutes every day can reduce your risk of heart disease by 30%.
22. Concentrating on something in front of you can increase your speed by up to 23%.
23. Walking lowers the risk of breast and colon cancer by 23%.
24. Walking uphill activates three times as many muscle fibers as walking downhill. It can also increase calorie burn by up to 60%.
25. Stair climbing burns calories twice as fast as flat walking.
26. Australians take the most steps per day of any industrial country studied, with an estimate of 9,695 on a daily basis, whereas Americans take the fewest, with a mean of 5,117 steps on a daily basis.
27. Walking could aid the prevention of osteoporosis and osteoarthritis.
28. Being small does not imply being slow: during the 2008 Olympics, Olga Kaniskina of Russia won gold in the female's 20k race walk, defeating Norway's 5'8" Kjersti Plätzer.
29. The longest continuous walk took 2,425 days and covered 19,019 miles from South America's southernmost tip to Alaska's northernmost point.

30. To walk all over the universe, an individual would have to walk nonstop at a speed of 3 miles per hour for 347 days.
31. Good walking boots should endure for at least 500 miles.
32. Walking could promote a healthy body mass and reduce chances of becoming obese.
33. The majority of babies start walking between the ages of 12 and 13 months, while others can begin earlier as 9 or 10 months and as late as 15 or 16 months.
34. In the United States, walking is the most popular form of exercise.
35. One out of every seven children now walks to school. Almost two-thirds of all children walked to school in 1970.
36. The average adult walks three miles per hour.
37. Reducing CO2 emissions by just 10 miles per week results in a 500-pound reduction in CO2 emissions per year. Throughout his or her lifetime.
38. The average person walks 65,000 miles, which is equivalent to three round-the-world trips.
39. A person must walk the length of a football field to burn off more calories to compensate for a bar of chocolate.
40. Including 150 minutes of energetic walking in your weekly schedule could extend your life by three years.
41. Walking improves cerebral blood flow and lowers the risk of vascular disease, which may aid in the prevention of dementia later in life.
42. Walking necessitates the use of 200 muscles.
43. To burn away a mega sized meal, the individual must move about 13 miles, or a quarter marathon.
44. A standard world-class golf has approximately 12,000 steps.
45. A typical 18-hole golf course has approximately 12,000 steps.
46. Because the cumulative impact forces on the feet during a typical day of walking can reach several hundred tons, investing in high-quality footwear is a good idea.

"Walking is man's best medicine," Hippocrates once said.

47. It's a good idea to get a pedometer to track your daily steps or distance traveled. It can be extremely motivating to see one's progress over time.
48. To get an idea of your walking speed, divide the steps taking in one minute by thirty.
49. Playing song when walking improves mood, motivation, and performance, according to research.
50. The amount of time each foot makes contact with the ground varies greatly between walking and running. While walking, no less than one leg is always touching the floor, and this contact lasts longer than when running.
51. Walking is associated to better mental ability and creative skills since the time of Socrates.
52. Thomas Jefferson walked four miles every day and lived to the age of 83 at a time when the average life expectancy was 40 years.

2.7.1d Per-Day Step Count Recommendation

Evidence for step indexes predicated on pedometer-measured workout has emerged in recent years, either formally (via peer-reviewed publications) or informally (via social media) (i.e. through the lay literature). In the media and in practice, a value of 10,000 steps per day is widely accepted (Kosta, 2001). Dr. Yoshiro Hatano of Kyushu University of Health and Welfare spoke at the American College of Sports Medicine's annual meeting in 2001. He made it clear that the precise figure is based on the prominence of Japanese walking clubs and a 1960s pedometer producer slogan (Yamasa Corporation, Tokyo, Japan).The manpo-kei (literally "ten thousand steps meter") pedometer, according to Dr. Hatano, first appeared on the Japanese commercial market in 1965. Y. Hatano (1993).

The 10,000-step-per-day concept is still widely used in Japanese families now. This number of steps on a daily basis equates to a daily metabolic rate of 300 to 400 kcal (based on gait pace and body shape) (An energy expenditure of 150 kcal roughly equate thirty minutes of moderate physical activity). The distinction betwixt the two is explicate in bit on the verity that the previous is a day to day guideline that involve all activity, whereas the last mentioned is a suggestion to be agile "above and beyond" an unspecified

daily minimum level of activity (Welk, Differding & Thompson, 2000). A step count of 10,000 per day appears to be a practicable measure of day to day activity for presumably healthy people. Welk et al. (2000)found that 73 percent of participants who recorded at least 30 minutes of activity on any given day in the previous seven days also walked at least 10,000 steps on that same day. Participants in that study were young (on average 29 years old) and came from a physical activity center. According to (Wilde, Sidman, & Corbin, 2001), even with a recommended 30-minute walk, only 38–50% of women achieved 10,000 steps on any given day. Nonetheless, when a self-timed 30-minute walk was included in the therapies that showed improvements, women increased their average physical activity (majorly in body composition and/or blood pressure) from 7220–10030 steps per day. This demonstrates a strong resemblance between the 10,000-step-per-day and the 10,000-step-per-day.

Researchers (Tudor & Bassett, 2004) have also created physical thresholds for people based on their degree of activity.

Steps per day: 2,500(sedentary–basal activity).

Steps per day: 2,500–4,999 (limited activity).

Steps per day: 5,000–7,499 (low active).

Steps per day: 7,500–9,999 (somewhat active).

Steps per day: 10,000–12,499 (active).

12,500 steps per day (highly active).

2.8 The Aging Concept

Aging is the passage of time. It is a progressive loss of function, as well as a slow deterioration of physiological characteristics as people get older. This is the stage of life that follows adolescence and early adulthood; it is the last stage of life. It is impossible to say with certainty when old age begins because it varies.The United Nations has established the age of 60 as the beginning of old age. This was their first attempt at a thorough definition (United Nations, 2002). However, the World Health Organization fixed the age of old age in Africa at 55 years, they reported that in the developing world, old age is typically defined not by years but by the advancement of other commitments,

the loss of previous positions, and the loss of the ability to contribute enthusiastically to community (WHO). Most developed Western nations have a retirement age of 60 to 65.

However, the onset of old age is defined differently in different countries and communities, ranging from the middle forty's to seventy's. Gerontologists have identified the wide range of conditions that people face as they age.In developed countries, many individuals in their sixties as well as slightly earlier seventies are yet smart, energetic, as well as capable of caring for theirself. (Berk, 2010).They will, however, become increasingly frail after the age of 75, a situation marked with acute phycological and bodily depletion, a state characterized by severe mental and physical exhaustion. As a result, rather than grouping all people labeled as elderly together, certain gerontologists have acknowledged the distinctiveness of later life through categorizing it into sub-groups.

2.8.1a The effects of aging on the body's major systems

1. Cells have a reduced ability to divide.
2. Telomeres get shorter and shorter until they are so short that the cell dies.
3. The connective tissue that connects the cells stiffens.
4. Many organs' maximal functioning capacity decreases.
5. Waste products build up.

Blood vessels and the heart

Many of the body's arteries, particularly those that provide blood to the heart and brain, progressively acquire atherosclerosis, however the problem does not always become severe in some people. Also the ability of the heart muscle decreases as one age, aging also causes the aorta to thickens, stiffens, and becomes less flexible.

Signs of aging

It becomes more difficult for the body to regulate its temperature, and it takes longer for the heart rate to recover to normal after physical activity. The bones, muscles, and joints are are also affected by aging; the muscle tissue gets thinner and weaker, joints stiffen and become less flexible, bones become brittle and brittle and the cartilage and bone in the joint begin to deteriorate.

Digestive system

Food travels slower through the digestive system;

The stomach, liver, pancreas, and small intestine produce fewer digestive juices.

The senses of sight and hearing

Aging causes the retinas to become thinner and the irises stiffer, the lenses lose their clarity. For the sense of hearing aging affect the ear canal's walls, making it to thin out, the eardrums also get thicken due to aging

Nervous system and brain

During aging plaques and tangles, which are abnormal brain structures, can form in the brain, the number of nerve cell connections drops, also there is a drop in the amount of nerve cells in the brain and spinal cord.

2.8.1b The importance of the older generation in the society

Volunteering

According to research, older persons who volunteer live longer and have fewer disabilities than those who do not volunteer. The elderly serve in the community as unpaid volunteers, assisting in the completion of tasks.

Coaching of young people

They act as mentors to the younger members of society, correcting and training them on how to live and contribute to the society's progress.

Sharing historical information.

Seniors have a unique perspective on the past that younger generations lack. Sharing their tales with newer generations is a fantastic method for them to learn about history.

Teach expiring techniques.

Many older people can do things that younger people can't, such as canning, wood carving, and leatherworking. These aren't commonly taught talents, yet they're extremely valuable.

Preserving traditions and instilling cultural values:

Elders are the guardians of rich cultural heritage, they help pass down to the younger generations the beauty and richness of our great heritage.

2.9 Empirical Review

2.9.1a Benefits of Physical Activity for Seniors

Several studies have discovered that exercise, whether resistance training, balance training (Liu-Ambrose, Khan, Eng, Janssen, Lord & McKay, 2004) cause Changes in biological characteristic, muscle strength, endurance, aerobic power, balance, functional capacity in regular tasks, and a lower risk of falling. However, not all of these exercise modes will compel all of these adaptations, and not all older people will begin, let alone stick to, exercise regimens that include these types of exercise.

According to Fiatarone-Singh (2002), resistance training can increase the muscular mass, strength, power, and endurance of older people, though its impacts on aerobic endurance and balance is not yet established. In contrast, while aerobic exercise can improve aerobic power, reduce body fat percentage, and reduce the risk of cardiovascular disease in older people, it has less impact on balance, muscle strength, power, and endurance. It was also discovered that the exercise preferences of older people varied greatly (Mills, Stewart, Sepsis & King, 1997; Wilcox, King, Brassington, & Ahn, 1999). As a result, older people who like to walk may be uninterested in resistance or balance training programs. As a result, research into the advantage of different forms of physical activities for the elderly person is critical.

2.9.1b Effects of Aerobic Dance on Cardiovascular Parameters

Effects of aerobic dance on the cardiovascular parameters have been studied as a means of reducing hypertension and cardiovascular-related diseases. Collectively research has shown that aerobic dance has a positive effect on reducing the risk of cardiovascular diseases in all ages.

Ezra, (2007) tested the effects of Aerobic Dance on Selected Cardiovascular Disease Risk Factors of Overweight/Obese Nigerian Adults, he discovered significant sex-specific

reductions in RHR (F = 11.41 0.05), and significant sex-specific improvement in VO2 max (F = 509.30 0.05). He found no differences in resting systolic and diastolic blood pressures based on gender. The results of his study also show that 12 weeks of aerobic dancing had significant test by group interactional effects on RHR (F = 34.45 0.05), RSBP (F = 13.59 0.05), and VO2 max (F = 300.69 0.05). However, his results did not show a significant difference in the benefits of 12 weeks of aerobic dance on all identified CVD risk variables between the male and female adults studied.

Another study by Radmila, Ratomir, Durica, and Milena, (2006) discovered a statistically significant difference in the variables for cardiovascular fitness in their studied experimental group between the initial and final measurements, as well as between the experimental and control groups at the last measurement. Their study validated previous findings that aerobic dance training has a significant positive impact on changes in cardiovascular parameters in young adult women.

According to Jaywant, (2013);Effect of Aerobic Dance on the Body Fat Distribution and Cardiovascular Endurance in Middle Aged Women, found no significant difference in VO2max (p=0.00201) of the aerobic dancer, indicating that the effect of aerobics dance on cardiovascular endurance are not pronounced.

In 2015, Sunita, Jayant, Kamla, Rajnee, Sonika, and Raghuveer, discovered that the participants in the untrained group showed a highly significant (p0.0001) improvement in resting heart rate, mean arterial pressure (MAP), resting systolic blood pressure, resting diastolic blood pressure, pulse pressure, and post exercise fluctuation in MAP. Resting and post-exercise (cardiovascular parameters) values were significantly lower in trained groups than in untrained groups. They concluded that three months of regular aerobic exercise improves cardiovascular functions in medical students by decreasing sympathetic activity or increasing vagal tone.

Ahmad and Asyraf Rosli (2015) discovered a significant difference between pre and post-test for cardiovascular fitness when p = 0.02 <0.05 and weight loss when p = 0.00 < 0.05 in their investigation of the benefits of Aerobic Dance on Cardiovascular Level and Body Weight among Women. Based on their findings, they concluded that a six-week aerobic

dance program will improve cardiovascular fitness and weight, and that aerobic dance might be utilized as an option for people who want to live a healthy lifestyle in a joyful way.

Further findings from Jaime, Alexander, Katerine, Deiber, Monica, Mario and Daghovar, (2016) reported that dance and nutrition education had significant effects on mean arterial blood pressure, systolic blood pressure and diastolic blood pressure of hemodynamic and autonomic status in adults with metabolic syndrome. Furthermore, blood pressure that is, diastolic blood pressure and systolic blood pressure were significant in the effect of an aerobic dance and diet programme on cardiovascular fitness, body composition and weight loss in women (Jerrold, Jennifer, Lee, Kelly, Tien-Ning, Marshall, Gurinder, Shashi, Chinna, Dhanarai, Yami, Cristina, Katrina, Jason, Courtney, Ingrid, Michael, Pratima & Jackie, 2008).

2.9.1c Effects of Aerobic Dance on Body Composition

Previous research has tested the effects of aerobic dance on total body weight, percent body fat, BMI, and waist and hip circumference using different sample populations. The results of the research collectively support that aerobic dance as a method of physical activity has a positive effect on body composition variables, which plays a role in reducing obesity risk. One of the published studies on the effects of aerobic dance on body composition was conducted by Okuneye, Adeogun, and Idowu, (2010), they discovered a significant reduction in waist-hip ratios, improved trunk flexibility, leg power, and abdominal endurance/strength in their studied participants.

The effect of aerobic dancing training on body composition and respiratory endurance in obese males was also studied by Krishnamoorthi, Kodeeswaran, Kumaran, and Halik, (2021). Thirty subjects were chosen from MIET College Trichy, Tamilnadu, with ages ranging from 18 to 22 years. The subjects were separated into two groups of 15 each, one for the experimental group and one for the control group. They concluded that eight weeks of aerobic dance training considerably changed body composition in obese men.

Ezra, (2007) tested the effects of Aerobic Dance on Selected Cardiovascular Disease Risk Factors of Overweight/Obese Nigerian Adults, he discovered significant sex-specific

reductions in BMI (F = 29.81 0.05) and WHR (F = 51.68 0.05). His results also show that 12 weeks of aerobic dancing had significant test by group interactional effects on BMI (F = 54.86 0.05), WHR (F = 16.12 0.05).

Another study by Radmila, Ratomir, Durica, and Milena, (2006) discovered a statistically significant difference in the variables for cardiovascular fitness and body composition in their experimental group between the initial and final measurements, as well as between the experimental and control groups at the last measurement. Their study validated previous findings that aerobic dance training has a significant positive impact on the body composition in young adult women.

According to Jaywant, (2013);Effect of Aerobic Dance on the Body Fat Distribution and Cardiovascular Endurance in Middle Aged Women, aerobic dancers exhibited lower fat percentage (p=0.01462), indicating aerobics is highly effective in weight loss. Pantelic, Milanovic, Sporis, and Stojanovic-Tosic (2013) conducted a study to determine the effects of a twelve-week aerobic dance-training program on the body composition parameters of young women. They sampled 59 young women and divided them into two groups, experimental and control. The experimental group included 29 female subjects(age 23.1±1.9 years, body height 164.4±6.1 cm, body weight 62.1±5.6 kg, BMI 23.0±2.2 kg/m2), while the control group included 30 women (age 22.7±1.8 years, body height 165.3±6.2 cm, body weight 59.4±6.3 kg, BMI 21.7±1.7 kg/m2). Body composition measurements were taken, including the overall sum of upper and lower body skinfolds, the overall sum of upper and lower body skinfolds, the percentage of body fat, the percentage of muscle mass in the body, body height, and body weight. They found a statistically significant decrease (p 0.05) in all skinfold sums for the experimental group subjects at the final measurement compared to the initial measurement (ΣSFUPPER - 39.35 mm compared to 42.87 mm; Σ SFLOWER - 39.35mm compared to 49.88 mm; ΣTOTAL SF - 76.97 mm compared to 92.75 mm). In the case of BF%, a statistically significant (p 0.05) drop was observed at the last measurement in comparison to the initial one (20.37% to 22.66%). They conclude that aerobic dance reduces young women's subcutaneous fatty tissue and body composition.

2010, Octaviana, Hidayatullah, and Kristiyanto, investigated the effect of low-impact aerobic dance and zumba workouts on the proportion of body fat in obese women as measured by the Body Mass Index (BMI). Forty obese women (mean age 33.9±7.1 years) were randomly assigned to one of two experimental groups: low-impact aerobic dancing (n=20) or zumba (n=20). The subjects were also classified into mild and severe obesity categories depending on their BMI. The data analysis between the experimental groups revealed that there were significant differences between these exercises (r=0.005; p<0.05), obesity levels (r=0,000; p<0.05), and interactions between the exercises and obesity levels (r=0,000; p<0,05) from the pre-test to the post-test. Their findings shows that low-impact aerobic dance was more effective in reducing the percentage of body fat in obese women with severe obesity, whereas zumba was better in reducing the percentage of body fat in obese women with mild obesity; thus, the two exercises had an impact on reducing the percentage of body fat.

Ahmad and Asyraf Rosli (2015) discovered a significant difference between pre and post-test for cardiovascular fitness when p = 0.02 <0.05 and weight loss when p = 0.00 < 0.05 in their investigation of the importance of Aerobic Dance on Cardiovascular Level and Body Weight among Women. Based on their findings, they concluded that a six-week aerobic dance training improve body weight.

Research work by Evrim, Fatma, and Oktay, (2011) concluded that aerobic dance exercise at a moderate intensity and duration improves physical fitness and decreases body fat percentage of sedentary women. Also, Marjan, Abdossaleh and Sayeed, (2016), observed in their study that zumba dance had a significant effect on decreasing women body fat percentage and body mass index. The results of the finding by Goran and Poehlman, (1992), observed a gained 0.85(+)(-) 1.01kg of fat-free mass over 8weeks of training in their elderly subjects but they explained that the increase was in total body water not on the mass of mineral or protein in the body.

2.9.1d Effects of Aerobic Dance on Functional Ability

Douka, Zillidou, Lilou, and Manou (2019), found out in their study that dance promote the physical health and well-being of the elderly participants. Their physical fitness (chair

stand: T=-5.459, p 0.001; arm curl: T=-5.750, p 0.001; back scratch: T=-4.648, p 0.001; sit and reach: T=-4.759, p 0.001; 2 minute step: T=-5.567, P 0.001; foot up and go: T=-8.599, p 0.001) they were of the conclusion that dancing was a pleasurable approach for the elderly to be active while remaining functioning.

Chutimakul, Sukonthasab, and Kritpet conducted a study in 2018, after their 12 weeks of training on the effect of modified Khon dance performance on functional fitness in older Thai persons, they found significant differences in chair stand, 2-min step, chair sit and reach, and 8-ft up and go tests between the exercise and control groups. In 2010, Iva, Katerina, Hana, Petr, Bozena, Dana, Ladislav, and Ross after 12 weeks of training, discovered significant differences in chair stand, 2 min step, chair sit and reach, and 8ft up and go test between the their exercise and control groups.

Research by Styliani, Vasiliki, Olympia and Vasiliki,2019; Harran, Khawla and Wafa,2015, reported that aerobic exercise had significant effects on the functional ability of the elderly by improving chair sit and stand, chair sit and reach and arm curl.

2.9.1e Effects of Pedometer Based Walk on Cardiovascular Parameters

Elaine, Marie, and Janne's (2010) found a consistent associations between walking and Cardiovascular disease outcomes. Clinical biomarkers and measures improve within a short period of follow-up in intervention programes. Wanderley, Oliveira, Mota, and Carvalho (2008) discovered a mean reduction of 12mmHg ($p = 0.001$) in their studied participants systolic blood pressure; improvements of 5 repetitions ($p = 0.001$) in lower limb muscular endurance after the walking program. They concluded that a four-month walking program of increased duration and moderate effort can enhance the blood pressure and muscle endurance of older women.

Furthermore, in a randomized controlled trial, walking was found to induce gains in cardio-respiratory fitness in a larger clinical relevance. They also came up with these finding that engaging in either dancing or walking increase level of physical activity. Also, dancing and walking are both effective in improving cardiovascular and fall risk

associated factors in healthy older women. (Josianne, Juliano, Thiago, Rodrigo, Francesco, Gabriela, Joaovargas, Rafael, Rochelle, Ronei, Mauricio & Alvaro, 2018).

Augustine, Memoona, Hasnain and Sinacore, (2007) found walking to have a significant effect on systolic blood pressure and diastolic blood pressure of their study participants. Yoshikazui, Yoko, Sawako, Miwako and Toshikazu, (2008) also observed a significant effects of treatment on systolic blood pressure in a study carried out on the aged.

In 2010, Tudor- Locke came to a conclusion that increasing walking steps can improve body mass index and cardiovascular health outcomes of an individual. Corroborating this finding also was the study of Jong-Hwan, Masahi, Masaki, Noriaki, Harumi, Hyun, Katshuhiko and Yoshio, (2014); they concluded from their findings that 12weeks walking programme comprising low volume physical activity confers cardiovascular related health benefit on older adult. They detected a significant decrease in the systolic blood pressure of their participants at the 12 weeks in relation to the baseline value.

2.9.1f Effects of Pedometer-based Walk on Body Composition

Tudor-Locke, Ainsworth, Whitt, Thompson, Addy, and Jones, (2001) in their study of the relationship between pedometer-determined ambulatory activity and body composition characteristics came to the suggestion that walking more than 9000 steps per day is associated with better body composition, whereas walking less than 5000 steps per day is associated with sedentarism, which is associated with poor body composition. Those who walk 10,000 steps per day are more likely to be categorized as normal weight, but those who walk less than 5,000 steps per day are more likely to be classified as obese (Tudor-Locke, Ainsworth, Thompson & Matthews, 2002). Furthermore, a clear link between daily steps and body composition variables in the predicted direction has also been identified.

In 2008, Wanderley, Oliveira, Mota, and Carvalho, discovered a mean reduction of 12mmHg ($p = 0.001$) in their women's participant systolic blood pressure; improvements of 5 repetitions ($p = 0.001$) in lower limb muscular endurance; and no significant changes in body composition variables after the walking program. They came to conclusion that a

four-month walking program of increased duration and moderate effort can enhance the blood pressure and muscle endurance of older women.

Marques, Carvalho, Pizarro, Wanderlay, and Mota, (2011), examined the Influence of Physical Activity, Body Composition, and Lower Extremity Strength on Walking Ability. They examined the relationship among objective measures of body composition, lower extremity strength, physical activity, and walking performance. In their findings, the 30-second chair stand test (30sCST), appendicular lean mass index, body mass index, and age were all independent variables to walking ability, accounting for 44.3% of the variance. Slower walkers' walking performance was largely described by appendicular fat mass index, moderate to vigorous physical exercise, 30sCST, and aLMI ($r^2 = .49$, $p < .001$). aFMI and aLMI explained 31.4% (p.001) of the variance in faster walkers. These findings indicate that both fat and lean mass are related to walking performance in both higher- and lower-functioning older persons, whereas MPVA and muscle strength are solely related to walking ability in lower-functioning older adults.

Meeks, (2016), in his work the Effects of Pedometer-metered Walking on Body Composition, Waist-to-Hip ratio, Blood Pressure, Blood Glucose, and Diet Choices in College-Aged Participants-a Pilot Study, found a significant decreases in waist (77.1cm ± 2.23cm to 74.5cm ± 2.03cm, p=0.002) and hip (99.8 ± 1.74cm to 99.0 ± 1.78, p=0.03) measurements. The results for blood pressure, FBG, those who received motivational statements, and body composition were not significant, however a decrease in fat free mass neared significance (p=0.06). Waist and hip measurements reduced considerably at the end of the research, implying that pedometer-monitored walking may result in physical abdominal changes.

Also in the work of Yasemin, Secil and Zekeriya, (2014), pedometer based walks resulted in significant decrease in weight and body mass index of obese women. Likewise, Tudor, (2010) maintained that step count (pedometer based walk) improved body mass index and cardiovascular outcomes.

2.9.1g Effects of Pedometer-based Walk on Functional Ability

In 2011, Marques, Carvalho, Pizarro, Wanderlay, and Mota, examined the Influence of Physical Activity, Body Composition, and Lower Extremity Strength on Walking Ability. they examined the relationship among objective measures of body composition, lower extremity strength, physical activity, and walking performance and determined whether the interaction differed according to walking ability. According to their findings, the 30-second chair stand test (30sCST), appendicular lean mass index, body mass index, and age were all independent variables to walking ability, accounting for 44.3% of the variance. Slower walkers' walking performance was largely described by appendicular fat mass index, moderate to vigorous physical exercise, 30sCST, and aLMI ($r^2 = .49$, $p < .001$). aFMI and aLMI explained 31.4% (p.001) of the variance in faster walkers. These findings indicate that both fat and lean mass are related to walking performance in both higher- and lower-functioning older persons, whereas MPVA and muscle strength are solely related to walking ability in lower-functioning older adults.

In the work of Angela, Mike, Michael, Wai, Lancaster and Cindy, (2004), pedometer based walk increase the lower body strength of the elderly through chair sit and reach and chair sit and stand test. Also, an increase was observed in the upper body strength, which was brought about by body arm curl.

2.10 Appraisal of Related Literature

The literature review has attempted to offer a comprehensive look at the conceptual and theoretical framework, the study was guided by programmed theories of aging. Also, literature reviewed the concept of ageing, concept of aerobic dance, concept of pedometer based walk, concept of cardiovascular system, body composition and functional ability.Furthermore, empirical review of literature was done on effects of aerobic dance on the cardiovascular parameters of the elderly, effects of aerobic dance exercise on body composition of the elderly, effects of aerobic dance exercise on the functional ability of the elderly. Also the literature reviewed the effects of pedometer based walk on the cardiovascular parameters of the elderly, effects of pedometer based walk on the body composition of the elderly, and effects of pedometer based walk on the functional ability of the elderly.

CHAPTER THREE

METHODOLOGY

The method and procedures used for this study was discussed under the follow sub heading;

3.1 Research Design

The research design for this study was pretest-posttest control group quasi- experimental research design using 3x2 factorial matrix. Two experimental groups (aerobic dance and pedometer based walk), and one control group. Age categories (early elderliness and late elderliness) were the moderating variables and the dependent variables were cardiovascular parameters, body composition and functional ability. Base line measurements were recorded and subsequent measurement were taken at the 4^{th}, $8^{th}$and 12^{th}week of the exercise intervention.

3.2 Outline of the Design

The notation of the design is presented as follows;

Experimental group 1 R O_1 T_1 O_4 O_7 O_{10}

Experimental group 2 R O_2 T_2 O_5 O_8 O_{11}

Control group R O_3 O_6 O_9 O_{12}

Where;

R - Randomization

O1 - experimental group 1 pre-test

O2 - experimental group 2 pre-test

O3 - control group pre-test

O4 - experimental group1 4^{th} week measurement

O5 - experimental group2 4^{th} week measurement

O6 - control group 4^{th} week measurement

O7 - Experimental group1 8^{th} week measurement

O8 - Experimental group2 8th week measurement

O9 - Control group 8th week measurement

O10 - Experimental group1 12th week measurement

O11 - Experimental group2 12th week measurement

O12 - Control group 12th week measurement

T1 - Treatment group1 (aerobic dance)

T2 - Treatment group 2 (pedometer based walk)

3.3 Table: 3.1: Factorial Matrix Table

Treatment	**Age**	
	Early Elderliness	**Late Elderliness**
Aerobic Dance		
Pedometer Walk		
Cotrol Group		

3 x 2 Factorial Matrix

3.4 Population

The population of the study was all elderly women in Ibadan metropolis.

3.5 Sample and Sampling Technique

The sample size for the study was seventy elderly women in Baptist churches in the Ibadan metropolis. Multistage sampling procedure and voluntary sampling technique were used for this study.

Stage one: Churches were purposively used because they are the avenue and gateway to get a collection of women of different backgrounds, tribes and culture.

Stage two: Simple random sampling technique was used to choose Baptist churches among other orthodox churches because Baptist churches are among the oldest, best organized churches with a considerably large number of elderly women and a department dedicated to the health care of its members.

Stage three: Simple random sample technique was used to select three out of twenty-five Baptist Associations in Ibadan conference these were, OnaIye Association, Orisun Ayo Association and Emmanuel Association.

Stage four: Simple random sample technique was also used to select a church each from the three associations selected in stage three. From OnaIye Association, Oke Ado Baptist church was randomly selected, from Orisun Ayo Association, Molete Baptist church was randomly selected and from Emmanuel Association, Victory land Baptist church was randomly selected.

Stage five: Simple random sampling technique was used to assign each of the three churches into groups. Oke Ado Baptist church was assigned the aerobic dance group while Molete Baptist church was assigned the pedometer based walk group and Victory land Baptist church was the comparison group.

Stage six: Voluntary sampling technique was finally used to get the seventy women who also met the inclusion criteria for the study.

3.6 Table: 3.2: List of Baptist Church Associations in Ibadan Conference

Ibadan Conference	
List of Association in Ibadan Conference	
1	AMAZING GRACE
2	CHRIST LOVE
3	CHOSEN GENERATION
4	OPE-OLUWA
5	IGANGAN
6	BOLUWADURO
7	ERUWA WEST
8	ERUWA EAST
9	EMMANUEL*
10	HEPHZIBAH
11	IBADAN CENTRAL
12	CORNERSTONE
13	LIVING STONE
14	FOUNTAIN OF MERCY
15	CHAMPION
16	. OVERCOMER
17	. IBADAN EAST
18	IBADAN NORTH
19	GOSHEN
20	IGBOORA
21	GILGAI
22	ISOKAN
23	ONA IYE*
24	ORISUN AYO*
25	SOLID ROCK

***- Associations selected for the study.**

3.7 Table: 3.3: List of the Three Selected Associations and Churches under them

ONA IYE ASSOCIATION	ORISUN AYO ASSOCIATION	EMMANUEL ASSOCIATION
1).GOOD NEWS BAPTIST CHURCH	1).BEULAH BAPTIST CHURCH	1).BETHEL BAPTIST CHURCH
2).GOOD WAY BAPTIST CHURCH	2).CHRIST BAPIST CHURCH	2).BODIJA ESTATE BAPTIST CHURCH
3).MT. ZION BAPTIST CHURCH	3).EBENEZER BAPTIST CHURCH, ASAAJU	3).EBENEZER BAPTIST CHURCH
4).N.R.A BAPTIST CHURCH	4).FBC IDI AYUNRE BAPTIST CHURCH	4).FAITH FOUNDATION BAPTIST CHURCH
5).OKE ADO BAPTIST CHURCH*	5).HALLELUYAH BAPTIST CHURCH	5).GATEWAY BAPTIST CHURCH
6).OLUYOLE BAPTIST CHURCH	6).MOLETE BAPTIST CHURCH*	6).HALLELUYAH BAPTIST CHURCH
7).OLUYOLE METROPOLITANT BAPTIST CHURCH	7).ODO ONA ELEWE BAPTIST CHURCH	7). MOUNT CALVARY BAPTIST CHURCH
8).PEOPLES BAPTIST CHURCH	8).ONA ARA BAPTIST CHURCH	8). NEW CONVENANT BAPTIST CHURCH
9).PRAISE BAPTIST CHURCH	9).PHILADEPHIA BAPTIST CHURCH	9).VICTORY LAND BAPTIST CHURCH(MOKOLA)*
10). ROCK OF AGES	10).RING ROAD BAPTIST CHURCH	
11).SHALLOM BAPTIST CHURCH	11).VICTORY LAND BAPTIST CHURCH	
	12).YEJIDE BAPTIST CHURCH	

Source: WMU 100 convention 2018 treasurer's report

***Churches Selected for the Study**

3.8 Table 3:4: Number of Participants in Each Group

n=70

		Early Elderliness	Late Elderliness	Total
Church 1	Aerobic Dance	11	9	20
Church 2	Pedometer Walk	29	1	30
Church 3	Control	15	5	20
Total		55	15	70

3.9 Inclusion Criterion

1. Participants that volunteer to take part in the study.
2. The participants were elderly women of 55years of age and above.
3. Elderly women who completed the exercise readiness questionnaire, medical history questionnaire and lifestyle questionnaire.
4. No history or symptoms of cardiovascular diseases like atherosclerosis, thrombosis, stroke, renal disease and any other cardiovascular diseases.
5. No major musculoskeletal problem like bone fractures, morbid osteoarthritis, spondylitis and any other musculoskeletal diseases that can predispose the participant to danger.

3.10 Exclusion Criterion

Participants were excluded if they had any of the following:

1. women below the age of 55years.
2. Elderly women who were physically challenged (handicap, blind, physical signs of weakness).
3. Elderly women with resting heart rate 100beats/minute and above.
4. Systolic blood pressure of 170mmHg or above, diastolic pressure of 100mmHg or above.
5. Elderly women with a history or findings of chronic musculoskeletal problem (bone fractures, morbid osteoarthritis, spondylitis, rheumatoid).
6. Elderly women with a history or findings of chronic cardiopulmonary disease (atherosclerosis, thrombosis, stroke, renal disease).

3.11 Research Instruments

The following research instruments were used in this study:

1. Weighing scale:The overall body weight in kilograms was calculated using an Irish-made Hanson model compact weighing scale. The graduation range is 0-180kg. The weight was rounded to the nearest 0.1 kilogram.
2. Stadiometer: The participant's height was measured to the closest millimeters using a standard stadiometer.
3. Sphygmomanometer: To measure blood pressure, a free style accession aneroid sphygmomanometer made in England was utilised.
4. Measuring tape: The waist-hip ratio was measured in millimeters using a non-elastic tape measure made in China (Model Butterfly) calibrated in centimeters from 0 centimeter to 150 centimeters.
5. Skinfold caliper: A skinfold caliper made by evaluation instruments in the United States was used to measure the thickness of participants' skin folds in millimeters ranging from 0 to 79 millimeters.
6. Musical sound box: During the aerobic dancing workout session, a compact disc player made by L G Corporation in Japan was used to play music.
7. Pedometer: The Digi-walker SW-701 from yamax, Japan, was used to count steps.
8. Stopwatch: To time the rhythmic actions, a sport timer alarm stopwatch made in the United Kingdom was employed.
9. Dumbbell: 3kilogram weight dumbbell made by Zhongda fitness sports industry China was used to test upper body strength.

3.12 Validity of the Instruments

When an instrument measures what it was intended to measure, it is said to be valid. The study's instruments were all standardized, with manufacturer's ranges of validity linked to each. All of the studied instruments were scientifically shown to be standardized and reliable. However, the researcher double-checked the calibration with the help of her supervisor before using it to make sure it was in good working order.

3.13 Reliability of Instruments

The weighing scale has a reliability of 0.96 as reported by Safrit and Woods (1995), the pedometer has a reliability coefficient of 0.80 as reported by Jour, Lisa, Susan, Nigel, Terry and Deborah (2007), the stadiometer 0.99 as reported by Willet, (1990) and the sphygmonanometer 0.97 as reported by Bourbonnais, (1998).

3.14 Test Location: The various church premises of each group were used for the training programme.

3.15 Informed Consent: All participants were well informed about the test before commencement. They were also given an informed consent form, which they filled, signed and returned to the researcher.

3.16 Procedures for Training Programme: The following procedures were followed for the training programme.

1. First experimental group was the aerobic dance group, the group was trained on low-impact gospel aerobic dance 136-148 cadence beat, to mid tempo music at target heart rate of 50% to 75% (high tempo) age predicted MaxHR.

i. The second experimental group performed pedometer based walking. Step counts were loaded gradually each week from 6000steps still they met the recommended daily step counts of 8500steps.

ii. The third group was the control group they were placed in exercise education.

2. The training programme lasted for twelve weeks. There were three sessions per week.
3. The training days were Tuesday, Thursday and Saturday for the aerobic dance group, Monday, Wednesday and Friday for the pedometer based walking group and Sunday's for the control group. Calls and messages were sent every morning to remind the pedometer group participants to wear and record their daily step count, and at each meeting, the researcher collected and recorded daily step counts.

4. Every training session for the experimental groups was made up of three segments. These were general calisthenics, conditioning bout and cool down.
5. The training and measurements took place at the church premises of each group.
6. The researcher was assisted by five trained research assistants who helped in administration, measurement, and recording of data.

3.17 Pilot Study

This was conducted among ten elderly women that were not part of the research study. They were taken from Assemblies of God Church. This was necessary to familiarize the researcher with the instruments used in the study and to detect any unforeseen problem that may stem up during the study. Five volunteed participants were in the aerobic dance group and five in the pedometer-based group. The pedometer-based walk group were made to wear and record their steps count daily for two weeks, measurement were taken at the pre and post. The other five volunteered were exposed to low and moderate christain music and measurement were taken at the pre and post.

3.18 Trial Testing of Instrument

All the instruments used in this study were standardized and reliable with manufacturer's ranges of validity linked to each. Also, the researcher double-checked the calibration and pre-tested all the instrument with the assistance of her supervisor before using it to make sure it was in proper order.

3.19 Procedure for Data Collection

The training location for the experimental group1 (aerobic dance) was the hall of Oke-Ado Baptist church. While, for the experimental group 2 (pedometer based walking) was the car park of Molete Baptist church and for the control group was the children church of Victory land Baptist church. The participants were made to sign an informed consent and filled the physical activity readiness questionnaires before the commencement of the program.

The following Data were Recorded:

1. **Age**: The age at the time of the most recent birthday was recorded.

2. **Weight**: Using an Omron digital weighing scale, the participants' weight was measured in kilograms while wearing only sportswear and no shoes, with their arms relaxed at their sides.

3. **Height**: The participants' heights were measured barefooted against the stadiometer while standing erect and facing straight ahead. Each participant's head lay on the instrument's horizontal ruler. After that, their height was measured to the nearest centimeter.

4. **Body mass index**: This was used to determine the degree of obesity/overweight. Weight (kg)/height2 (meters) was obtained by dividing the participant's weight (in kilograms) by the square of her height (in meters).

5. **Cardiovascular measurements:** Mean arterial pressure is the product of rate pressure and mean arterial pressure.

Blood pressure levels: Before the workout, this was measured using an Omron BP and heart rate monitor in the same method as the BP measurement.

The following formula was used to determine the rate pressure product:

Heart rate (HR) x systolic blood pressure is the rate pressure product (SBP).

Similarly, the following equation was used to calculate mean arterial blood pressure:

DP +1/3 is the average arterial blood pressure (SP - DP).

6. **Body composition**: Skinfold measurements on the right side of the body were collected on dry skin.

a. A pen was used to mark the mid-point of each skinfold.

b. The skinfold was held with the thumb and index finger about one centimeter away from the mid-point.

c. To maintain grip, the calipers were placed midway between the base and tip of the skinfold, with the dial facing upwards. This allowed the calipers to be fully released, putting the skinfold under full stress.

d. Shortly after the skinfold caliper was released, the dial was read to the nearest 0.5mm.

e. At each site, a minimum of two measurements were made, with the average calculated and recorded.

f. The % body fat was calculated by plotting age in years and the sum of the three skinfolds on the nomogram, and the results of each of the three skinfold measurements were added.

g. The two plots were joined together using a ruler and a sharp pencil. The sketched line went over the % body fat scale. According to the gender, the percent of body fat result was read to the nearest 0.5 percent. Hockey (1993) protocol was followed.

Purpose; the goal is to calculate the participant's % body fat.

Objective; Provide a field method for determining anthropometric features with accuracy.

Equipment: skinfold caliper

Instruction; the researcher used the following protocols for each site: triceps skinfold, suprailiac skinfold, and abdominal skinfold.

Triceps: The triceps muscle was folded vertically at the upper arm's back midline.

The researcher pricked a spot 1cm (0.4 in.) above the midpoint between the shoulder (acromion process of the scapula) and the tip of the elbow on the posterior part of the triceps (inferior section of the olecranon process of the ulna). The jaws of the calipers were placed 1cm below and perpendicular to the vertical fold.

Suprailiac: 2–3cm forward, a diagonal fold was taken just above the hip bone.

Suprailiac skinfold: The researcher grabbed the skinfold slightly above the iliac crest, along the natural cleavage of the skinfold, at the level of the anterior axillary line (running

diagonally down the crest toward the umbilicus). The calipers' jaws were placed 1cm (0.4 in.) apart from the diagonal fold and perpendicular to it.

Thigh skinfold: The skinfold was held vertically by the researcher in the anterior midline of the thigh, halfway between the proximal border of the patella (upper knee) and the inguinal crease (hip).

Scoring: The skinfold measurement was converted to percent body fat using Hockey's (1993) formulae for measuring women's percent body fat below;

1.0994921-(0.0009929x the sum of the triceps, thigh and suprailiac measurements) + (0.0000023 x the square of the sum of the triceps, thigh and suprailiac) - (0.0001392 x age) = body density

Conversion of body density to percent of body fat was done by using

%BF[(4.95/body density)-4.5]x 100

Lean body mass: (0.29569x W) + (0.41813xH) -43.2933

Where w is weight in kilograms (kg) and H is height in centimeters (cm).

Reliability = 0.825

7. **Functional Ability Test**

i) Chair sit and reach test

Purpose

This is essential for good posture, regular gait patterns, and other mobility tasks such as getting in and out of a bathtub or car.

Description

The distance (inches) (+ or -) between extended fingers and the tip of a toe measured from a seated position on a chair with one leg extended and hands reaching toward the toes.

Risk zone

Early Elderliness

Less than (−) 0.5 inch

Late Elderliness

Less than (−) 1.0 inch

Interpretation

Participants with a score of minus (-) 0.5 inches or less in the early elderly stage and minus (-) 1.0 inches or less in the late elderly stage have very poor lower body flexibility.

(Topend Sports, 2008)

ii). Arm Curl Test

Purpose

To determine upper body strength, which is required for home tasks and other activities that require lifting and carrying items such as groceries, baggage, and grandchildren.

Description

The number of bicep curls that can be performed in 30 seconds while seated on an armless chair with a hand weight of (3kg). The elbow must be fully straightened when the arm has been bent completely.

Risk zone

Early Elderliness

Less than 12 curl using correct form.

Late Elderliness

Less than 10 curl using the proper form.

Scoring: the number of bicep curls done in 30 seconds while holding a 3kg hand weight was counted and recorded.

Interpretation

Anyone participants in the early elderly stages who cannot do 13 bicep curls in 30 seconds and anyone in the late elderly stages who cannot do 12 bicep curls in 30 seconds has weak upper body strength.

(Topend Sport, 2008)

iii). **Chair Stand Test for 30seconds**

Purpose

To evaluate lower body strength, which is required for a variety of activities such as ascending stairs, walking, and getting out of a chair, tub, or car. Reduces the possibility of falling.

Description

The participant sits in a chair without an arm rest and completes the number of full stands in 30seconds with arms folded across chest. The subject rises from a seated posture, then falls entirely back down, and repeats this process for 30 seconds.

Risk zone

Early Elderliness

Less than 12 unassisted stand.

Late Elderliness

Less than 10 unassisted stand.

Scoring: The number of full stands done in 30 seconds with arms folded across the chest was counted and recorded as part of the scoring.

Interpretation

Anyone in the early elderly stage who cannot do 12 unassisted stands in 30 seconds and anyone in the late elderly stage who cannot do 10 unassisted stands in 30 seconds has insufficient lower body strength (Topend Sport, 2008).

Pedometer Use Procedure

This group was based in Molete Baptist church.

Data Collection

A pedometer was used to measure hip movement because when a person walks, his or her hips are propelled forward in a back and forth motion. The pedometer records every movement made by the participants through their hips as a step.

Procedure: The pedometer was to be clipped on the writing side of the waistband or belt in an upright posture directly above the knee. The pedometer was worn all day and only taken off for bathing, swimming, or going to bed. At bedtime, when the pedometer was removed, the day steps were recorded. The pedometer's step count was recorded on a sheet handed to the participants. The pedometers are available thrice a week to the researcher (during the training sessions)

Measurement Output

The steps data was collected using the pedometer exclusively in terms of steps walked over a period.

Recommended Daily Step/ Interpretation

For age 50-70years, 6000-8500step count, was recommended by Tudor-Locke, (2004).The daily step counts was increased gradually in order not to overload the participants from 6000step counts the first week till they reach the recommended steps counts goal.

Type and Model

Digi-walker SW-701, yamax, Japan, was used for the step counts.

Control Group

The children's church of victory land Baptist church, Mokola, Ibadan was used for the control group.

3.20 Table 3:5: Schedule for the Training of Control Group

Topic	Activities	Training objective	Duration
Week 1-2 Pre test Physical activities	Explained the meaning of physical activity	Examined the meaning of exercise and physical activity	30minutes
Week 3-4 Physical fitness	Discussed physical fitness	Reviewed health related components	30minutes
Week 5-6 Geriatric condition	Discussed the changes that takes place during aging	Examine some common geriatrics condition	30minutes
Week 7-8 Physical fitness and aging process	Discussed physical fitness and aging	To relate physical fitness to aging	30minutes
Week 9-10 Benefits of physical activity	Benefits of exercise on health	To identify benefits of exercise	30minutes
Week 11-12 Revision	Revision	Revised all the topic taught	30minutes

3.21 Procedure for Data Analysis

The data for this study was analyzed using descriptive statistics of range, mean and standard deviation, while inferential statistic of repeated analysis of (MANCOVA) was used to test the hypotheses at 0.05 level of significance

3.22 Ethical Consideration

This work was submitted to ethical consideration and subsequent approval from the social science and humanities research ethics committee (SSHREC) of the University of Ibadan. Both electronic and hard copies of the research proposal showing the participants' dossier and introductory letter from University of Ibadan, head of department, Human Kinetics and Health Education, was submitted to the chairman of SSHREC for approval.

Only participants who filled the informed consent form were used in the study. Confidentiality of the participants was assured without referring to their names and other personal data. They were not exposed to any form of risks, there were enough breaks, water and light refreshment was readily available for the participants and those participants who could no longer continue with the programme at any point in time were allowed to drop out.

CHAPTER FOUR

RESULTS AND DISCUSSION

The research was undertaken to investigate the effect of aerobic dance and pedometer based walk exercise on the cardiovascular parameters, body composition and functional ability of elderly women in the Ibadan metropolis. Data were collected using pretest-posttest control group experimental research design and were subjected to analyses with the results presented below;

Seventy participants were recruited for the study and attrition was taken care of. Thirty volunteered participants from the pedometer group started and finished the training programme. There were twenty volunteered participants for the aerobic dance group but seventeen finished the training while three of the participants dropped out of the training. Two of the participants relocated out of reach and one was not consistent with training. For the control group, twenty volunteered participants started and finished the training. Pedometer based walking group had more participants that started and completed the programme than the other two groups, this might be because of the device used (pedometer). The instrument interest and sustained their participation throughout the twelve weeks.

Presentation of Results

4.1 DEMOGRAPHIC VARIABLES

Table 4.1: Frequency Distribution of Participant's

Participant's by group	**Frequency**	**Percentage**
Aerobic dance	17	25.3
Pedometer based walking	30	44.8
Control	20	29.9
Total	67	100.0
Participant's year	**Frequency**	**Percentage**
55-65yrs	54	80.6
66-76yrs	13	19.4
Total	67	100.0
Participant's height characteristics	**Frequency**	**Percentage**
1.4-1.6m	47	70.15
1.7-1.9m	20	29.85
Total	67	100.0
Participant's weight characteristics	**Frequency**	**Percentage**
40-54	4	5.97
55-69	25	37.31
70-84	23	34.33
85-99	9	13.43
100-114	6	8.96
Total	67	100
Participant's 'BMI' characteristics	**Frequency**	**Percentage**
18.5-24.9	22	32.84
25-29.9	24	35.82
30 and above	21	31.34
Total	67	100

Table 4.1 shows the group distribution of the participants. Aerobic dance group has seventeen participants, pedometer-based walk group has thirty participants and the control group has 20 participants. The implication of this is that aerobic dance group had attrition, while the participants in the pedometer-based walk group had more participants who started and finished the training programme due to the motivating effects of the machine(pedometer) they used. This is an indicator that pedometer-based walk, is an interesting and desirable form of exercise machine by the elderly.

The table also shows the characteristic of participants, stage of elderliness. The table shows that 54(80.6%) of the participants were in the early elderliness stage and 13 (19.4%) within the late elderliness stage. The implication of this is that, there were more participants in the early elderliness stage to the late elderliness stage, suggesting that more women did not cross over to that next stage of life.

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The table also express the height spread of participants. The height of many falls between 1.4-1.6 (70.15%). This shows that majority of the participants were in the height bracket of 1.4-1.6m.

The table reveals also the weight spread of participants which had the weight of many between 55-69kg (37.31%), followed by 70-84kg (34.33%). According to the table of ideal weight according to height and weight, majority of the participants (77.6%) are of large frame body size, (13.4%) of medium frame size and (9%) of small frame body size.

It also reveals the BMI spread of participants. Many of the participants fall within 25-29.9kg/m2 (35.82%) followed 18.5-24.9kg/m2 (32.84%) and 30 and above (31.34%) respectively. The implication of this is that majority of the participants at the entry level were overweight, following closely is participants in normal weight and obese.

4.2 Research Question 1:

Does aerobic dance exercise improve the functional ability of Baptist elderly women?

Table 4.2: Functional Ability Table (Aerobic Dance Group)

Activities	Age category (yrs)	No of Participants in each Category	Valid percent	Norm	Base line Rating	12th week Rating	Base line mean	12th week mean	Percent increase
Chair sit and reach	Early elderliness 55-65	10	58.8	2	1	9	0.74	1.86	60.2%
	Late elderliness 66-74	7	41.2	1	1	4			
30secs chair stand	Early elderliness 55-65	10	58.8	15	2	10	12.76	19.59	34.9%
	Late elderliness 66-74	7	41.2	14	1	6			
Arm curl	Early 55-65	10	58.8	16	9	10	21.35	28.76	25.8%
	Late 66-74	7	41.2	15	5	6			

The table shows that for chair sit and reach at the entry level 1(10%) of ten (10) participants in the early elderliness met the standard norm and at the post measurement, 9(90%) out of ten (10) met the standard norm, this indicating that, at the entry level, nine out of the ten participants were below average rating for the chair sit and reach, meaning that they had below average lower body flexibility, but at the 12th week measurement, majority of the participants had improved on their lower body flexibility. 1(14.3%) out of the seven (7) participants in the late elderliness for chair sit and reach test, met the norm standard at the entry level and 4(57.1%) out of seven (7) at the post measurement.

The table also reveals that 2(20%) of ten (10) participants in the early elderliness at the entry level for 30secs chair stand test met the norm standard but at the end of the training (post measurement) 10(100%) of ten (10) met the norm standard. 1(14.3%) of seven (7) participants in the late elderliness group met the norm standard at the entry level but at the end of the 12weeks 6(86%) of the seven (7) participants met the norm standard. This result shows that at the entry level for both the early and late elderliness for 30secs chair stand test, majority of the participants were below average but at the post measurement, for early elderliness, all the participants met the average rating and six (6) out of seven (7) of the late elderliness met the average rating, indicating an improvement in the participants lower body strength.

For arm curl at the baseline 9(90%) out of the ten (10) participants in the early elderliness met the norm standard and it increased to 10(100%) of ten (10) at the 12th week. 5(71.4%) of seven (7) participants of the late elderliness met the standard norm at the entry level and at the end of the 12th week, 6(86%) out of seven (7) participants. This implies that at the entry level, majority of the participants in the early and late elderliness group were average, which means, they possess upper body strength. Furthermore, when compared, the 12th week mean functional ability of the three activities were greater to the baseline mean values, for chair sit and reach there was a (60.2%) increase, (34.9%) for 30secs chair stand and (25.8%) for arm curl, showing that aerobic dance exercise improve the functional ability of the participants.

Research Question 2:

Does pedometer based walk exercise improve the functional ability of Baptist elderly women?

Table 4.3: Functional Ability Table (Pedometer-Based Walk Group)

Activities	Age category (yrs)	No of Participants in each Category	Valid percent	Norm	Base line Rating	12th week Rating	Base line mean	12th week mean	Percentage increase
Chair sit and reach	Early elderliness 55-65	29	96.67	2	2	12	0.84	1.56	46.2%
	Late elderliness 66-74	1	3.33	1	0	0			
30secs chair stand	Early elderliness 55-65	29	96.67	15	11	24	13.3	16.9	21.3%
	Late elderliness 66-74	1	3.33	14	0	1			
Arm curl	Early 55-65	29	96.67	16	26	29	23	28.2	18.4%
	Late 66-74	1	3.33	15	1	1			

Table 4.3 shows that at the entry level, 2(6.9%) out of the 29 in the early elderliness met the norm standard, the participants, performed below average, indicating poor lower body flexibility, however, at the end of the 12th week, 12(41.4%) out of the 29 participants met the average rating. For the late elderliness, none met the norm standard at the entry and post measurement.

The table also shows that 11(51.7%) out of 29 in the early elderliness at the entry level met the norm standard but at the end of the training 24(83%) out of 29 met the norm standard for 30secs chair stand test. This implies that at the entry level the participants performed below average, which reveals poor lower body strength but at the end of the post measurement eighty three (83%) percent of them performed at average rating. zero (0%) of 1 in the late elderliness group met the norm standard at the entry level but at the end of the 12weeks 1(100%) of 1 met the standard.

For arm curl at the baseline 26(89.7%) out of the 29 participants in the early elderliness met the norm standard and it increased to 29(100%) of 29 at the 12th week. 1(100%) of 1 of the late elderliness met the standard norm at the entry level and at the end of the 12th week. For the arm curl test which is a test of the upper body strength, majority of the participants in the early and late elderliness performed averagely at the entry level and at the post measurement, all the participants met the norm standard. Further, when compared, the 12th week mean functional ability of the three activities were greater to their baseline mean values, for chair sit and reach there was (46.2%) increase, 30secs chair stand test (21.3%) and for arm curl (18.4%) showing that pedometer based walk improve the functional ability of the participants.

4.3 Hypotheses:

Hypothesis one: There will be no significant main effect of Treatment on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis

Ho1a:No significant main effects of Treatment on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of the Baptist elderly women in the Ibadan metropolis (Base line and 4^{th} Week data)

Table 4.4: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta^2
Corrected Model	Mean arterial blood 4th Week	2212.947	9	245.883	57.101	.000	.900
	Rate pressure product 4th Week	103080102.0	9	11453344.663	115.219	.000	.948
	Systolic blood pressure 4th Week	2879.643	9	319.960	81.844	.000	.928
	Diastolic blood pressure 4th Week	2993.471	9	332.608	42.011	.000	.869
Treatment	Mean arterial blood 4th Week	23.200	2	11.600	2.694	.076	.086
	Rate pressure product 4th Week	480146.774	2	240073.387	2.415	.098	.078
	Systolic blood pressure 4th Week	18.983	2	9.492	2.428	.097	.079
	Diastolic blood pressure 4th Week	34.761	2	17.381	2.195	.121	.072
Age	Mean arterial blood 4th Week	3.965	1	3.965	.921	.341	.016
	Rate pressure product 4th Week	1106.103	1	1106.103	.011	.916	.000
	Systolic blood pressure 4th Week	7.605E-02	1	7.605E-03	.002	.965	.000
	Diastolic blood pressure 4th Week	1.271	1	1.271	.161	.690	.003
Treatment x Age	Mean arterial blood 4th Week	.812	2	.406	.094	.910	.003
	Rate pressure product 4th Week	91588.444	2	45794.222	.461	.633	.016
	Systolic blood pressure 4th Week	3.972	2	1.986	.508	.604	.018
	Diastolic blood pressure 4th Week	1.366	2	.683	.086	.917	.003
Error	Mean arterial blood 4th Week	245.449	57	4.306			
	Rate pressure product 4th Week	5666093.880	57	99405.156			
	Systolic blood pressure 4th Week	222.835	57	3.909			
	Diastolic blood pressure 4th Week	451.275	57	7.917			
Total	Mean arterial blood 4th Week	2458.396	66				
	Rate pressure product 4th Week	108746195.9	66				
	Systolic blood pressure 4th Week	3102.478	66				
	Diastolic blood pressure 4th Week	3444.746	66				

Table 4.4 revealed that:

i. There was no significant main effect of Treatment on Mean arterial blood pressure ($F_{(2;64)}$= 2.694; p>0.05 partial η^2=0.086), Null hypotheses was accepted;

ii. There was no significant efffect of Treatment on Rate pressure product ($F_{(2;64)}$=2.415; p>0.05partial η^2=0.078), Null hypotheses was accepted;

iii. There was no significant main effect of Treatment on Systolic blood pressure ($F_{(2;64)}$=2.428; p>0.05 partial η^2=0.079), Null hypotheses was accepted and

iv. There was no significant efffect of Treatment on Diastolic blood pressure $F_{(2;64)}$=2.195; p>0.05 partial η^2=0.072), Null hypotheses was accepted.

Table 4.5: Expected Mean Scores on Treatment effect on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of elderly Baptist women in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Mean arterial blood 4th Week	Pedometer based walk	90.874	1.109	88.654	93.094
	Aerobic dance	91.755	.660	90.433	93.077
	Control	93.168	.583	92.001	94.334
Rate pressure product 4th Week	Pedometer based walk	19916.230	168.442	19578.930	20253.529
	Aerobic dance	19943.925	100.317	19743.044	20144.805
	Control	20178.968	88.537	20001.677	20356.260
Systolic blood pressure 4th Week	Pedometer based walk	125.454	1.056	123.339	127.569
	Aerobic dance	125.629	.629	124.370	126.889
	Control	127.107	.555	125.995	128.219
Diastolic blood pressure 4th Week	Pedometer based walk	73.693	1.503	70.683	76.703
	Aerobic dance	74.432	.895	72.639	76.224
	Control	76.284	.790	74.702	77.867

Table 4.5 reveals the respective mean scores of Treatment on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of elderly Baptist women in the Ibadan metropolis (Base line and 4th Week data). It was observed from the estimated mean values for each variable in the above table that pedometer based walk had the lowest mean scores and this implies that pedometer based walk had a greater effect than aerobic dance exercise on the cardiovascular parameters of the elderly women at the 4th week.

Ho1b: There will be no significant main effects of Treatment on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Table 4.6: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Eta^2
Corrected Model	Mean arterial blood 8th Week	2093.626	9	232.625	42.125	.000	.869
	Rate pressure product 8th Week	98032553.071	9	10892505.897	66.863	.000	.913
	Systolic blood pressure 8th Week	2884.814	9	320.535	58.516	.000	.902
	Diastolic blood pressure 8th Week	2884.305	9	320.478	30.262	.000	.827
Treatment	Mean arterial blood 8th Week	24.185	2	12.092	2.190	.121	.071
	Rate pressure product 8th Week	1229012.902	2	614506.451	3.772	.029	.117
	Systolic blood pressure 8th Week	41.292	2	20.646	3.769	.029	.117
	Diastolic blood pressure 8th Week	29.733	2	14.867	1.404	.254	.047
Age	Mean arterial blood 8th Week	6.822	1	6.822	1.235	.271	.021
	Rate pressure product 8th Week	62633.014	1	62633.014	.384	.538	.007
	Systolic blood pressure 8th Week	.118	1	.118	.022	.884	.000
	Diastolic blood pressure 8th Week	1.099	1	1.099	.104	.748	.002
Treatment x Age	Mean arterial blood 8th Week	.799	2	.399	.072	.930	.003
	Rate pressure product 8th Week	122824.889	2	61412.445	.377	.688	.013
	Systolic blood pressure 8th Week	9.201	2	4.601	.840	.437	.029
	Diastolic blood pressure 8th Week	4.894	2	2.447	.231	.794	.008
Error	Mean arterial blood 8th Week	314.765	57	5.522			
	Rate pressure product 8th Week	9285687.377	57	162906.796			
	Systolic blood pressure 8th Week	312.231	57	5.478			
	Diastolic blood pressure 8th Week	603.635	57	10.590			
Total	Mean arterial blood 8th Week	2408.392	66				
	Rate pressure product 8th Week	107318240.4	66				
	Systolic blood pressure 8th Week	3197.045	66				
	Diastolic blood pressure 8th Week	3487.940	66				

Table 4.6 revealed that:

i. There was no significant main effect of Treatment on Mean arterial blood pressure ($F_{(2;64)}$= 2.190; p>0.05 partial η^2=0.071), Null hypotheses was accepted;

ii. There was a significant effect of Treatment on Rate pressure product ($F_{(2;64)}$=3.772; p<0.05 partial η^2=0.117), Null hypotheses was rejected;

iii. There was a significant effect of Treatment on Systolic blood pressure ($F_{(2;64)}$=3.769; p<0.05 partial η^2=0.117), Null hypotheses was rejected and

iv. There was no significant effect of Treatment on Diastolic blood pressure ($F_{(2;64)}$=1.404; p>0.05 partial η^2=0.047), Null hypotheses was accepted.

Table 4.7: Expected Mean Scores on Treatment effect on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Mean arterial blood 8th Week	Pedometer-based walk Aerobic dance Control	90.353 91.091 92.594	1.255 .748 .660	87.839 89.593 91.272	92.867 92.588 93.915
Rate pressure product 8th Week	Pedometer-based walk Aerobic dance Control	19844.457 19768.652 20168.612	215.633 128.421 113.341	19412.659 19511.492 19941.650	20276.255 20025.812 20395.575
Systolic blood pressure 8th Week	Pedometer-based walk Aerobic dance Control	124.911 124.709 126.988	1.250 .745 .657	122.407 123.217 125.672	127.415 126.200 128.304
Diastolic blood pressure 8th Week	Pedometer-based walk Aerobic dance Control	73.167 73.745 75.493	1.739 1.035 .914	69.685 71.672 73.663	76.648 75.818 77.323

Table 4.7 reveals the respective mean scores of Treatment on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of elderly women in Ibadan metropolis (Base line and 8th Week data). The estimated marginal mean value from this table shows that pedometer based walk had the lowest mean score $\bar{x}$=90.353 for mean arterial blood pressure and $\bar{x}$=73.167 for diastolic blood pressure compared to aerobic dance and the control group. This indicates that pedometer-based walk was more potent than aerobic dance and control on these variables. More so the table shows that aerobic dance exercise had the lowest mean score $\bar{x}$=19768.652 for rate pressure product and systolic blood pressure $\bar{x}$=124.709, indicating that it had the greatest effects of treatment on these variables.

Table:4.8 Post Hoc Tests

Dependent Variable: 8TH WEEK (RATE PRESSURE PRODUCT)
Scheffe

(I) Treatment Group	(J) Treatment Group	Mean Difference (I-J)	Std. Error	Sig.
PEDOMETER-BASED WALK	AEROBIC DANCE	1267.25098	357.76615	.003
	CONTROL	191.03333	340.20821	.854
AEROBIC DANCE	PEDOMETER-BASED WALK	-1267.25098	357.76615	.003
	CONTROL	-1076.21765	388.77364	.027
CONTROL	PEDOMETER-BASED WALK	-191.03333	340.20821	.854
	AEROBIC DANCE	1076.21765	388.77364	.027

The direction of the significant was between pedometer-based walk and aerobic dance and between aerobic dance and control.

Ho1c: there will be no significant main effect of Treatment on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Table 4.9: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta^2
Corrected Model	Mean arterial blood 12th Week	2179.140	9	242.127	35.087	.000	.847
	Rate pressure product 12th Week	99685906.683	9	11076211.85	78.619	.000	.925
	Systolic blood pressure 12th Week	3031.980	9	4	76.466	.000	.924
	Diastolic blood pressure 12th Week	2568.196	9	336.887	20.106	.000	.760
				285.355			
Treatment	Mean arterial blood 12th Week	73.989	2	36.994	5.361	.007	.158
	Rate pressure product 12th Week	1682241.369	2	841120.684	5.970	.004	.173
	Systolic blood pressure 12th Week	63.622	2	31.811	7.220	.002	.202
	Diastolic blood pressure 12th Week	101.811	2	50.905	3.587	.034	.112
Age	Mean arterial blood 12th Week	.245	1	.245	.035	.851	.001
	Rate pressure product 12th Week	68386.159	1	68386.159	.485	.489	.008
	Systolic blood pressure 12th Week	11.204	1	11.204	2.543	.116	.043
	Diastolic blood pressure 12th Week	1.870	1	1.870	.132	.718	.002
Treatment x Age	Mean arterial blood 12th Week	10.134	2	5.067	.734	.484	.025
	Rate pressure product 12th Week	680.813	2	340.406	.002	.998	.000
	Systolic blood pressure 12th Week	2.505	2	1.252	.284	.754	.010
	Diastolic blood pressure 12th Week	23.561	2	11.781	.830	.441	.028
Error	Mean arterial blood 12th Week	393.341	57	6.901			
	Rate pressure product 12th Week	8030436.391	57	140884.849			
	Systolic blood pressure 12th Week	251.125	57	4.406			
	Diastolic blood pressure 12th Week	808.968	57	14.192			
Total	Mean arterial blood 12th Week	2572.481	66				
	Rate pressure product 12th Week	107716343.1	66				
	Systolic blood pressure 12th Week	3283.104	66				
	Diastolic blood pressure 12th Week	3377.164	66				

Table 4.9 revealed that:

i. There was a significant main effect of Treatment on Mean arterial blood pressure ($F_{(2;64)}$= 5.361; $p<0.05$ partial η^2=0.158), Null hypotheses was rejected;

ii. There was significant impact of Treatment on Rate pressure product ($F_{(2;64)}$=5.970; $p<0.05$ partial η^2=0.173), Null hypotheses was rejected;

iii. There was a significant impact of Treatment on Systolic blood pressure ($F_{(2;64)}$=7.220; $p<0.05$ partial η^2=0.202), Null hypotheses was rejected;

iv. There was a significant impact of Treatment on Diastolic blood pressure ($F_{(2;64)}$=3.587; $p<0.05$ partial η^2=0.112), Null hypotheses was rejected.

Table 4.10: Expected Mean Scores on Treatment effect on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Mean arterial blood 12th Week	Pedometer-based walk	88.268	1.403	85.458	91.078
	Aerobic dance	89.761	.836	88.087	91.435
	Control	92.314	.738	90.837	93.792
Rate pressure product 12th Week	Pedometer-based walk	19460.155	200.529	19058.602	19861.709
	Aerobic dance	19619.145	119.426	19379.998	19858.292
	Control	20027.888	105.403	19816.823	20238.953
Systolic blood pressure 12th Week	Pedometer-based walk	122.407	1.121	120.162	124.653
	Aerobic dance	123.636	.668	122.299	124.974
	Control	126.062	.589	124.882	127.243
Diastolic blood pressure 12th Week	Pedometer-based walk	71.535	2.013	67.505	75.566
	Aerobic dance	71.711	1.199	69.310	74.111
	Control	75.188	1.058	73.069	77.306

Table 4.10 reveals the respective mean scores of Treatment on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data). It was observed that the estimated mean value $\bar{x}$=88.268 of mean arterial blood pressure, rate pressure product $\bar{x}$=19460.155, systolic blood pressure $\bar{x}$=122.407 and diastolic blood pressure $\bar{x}$=71.535 of participants who took part in pedometer-based walk was lower than their counter-parts in the aerobic dance exercise and control group. This indicates that pedometer-based walk was more effective in obtaining needed result on the cardiovascular parameters of the elderly than aerobic dance exercise and control.

Table: 4.11 post Hoc tests: 12TH WEEK (RATE PRESSURE PRODUCT)

Scheffe

(I) Treatment Group	(J) Treatment Group	Mean Difference (I-J)	Std. Error	Sig.
PEDOMETER-BASED WALK	AEROBIC DANCE	1215.05490	360.76470	.005
	CONTROL	133.86667	343.05960	.927
AEROBIC DANCE	PEDOMETER-BASED WALK	-1215.05490	360.76470	.005
	CONTROL	-1081.18824	392.03208	.028
CONTROL	PEDOMETER-BASED WALK	-133.86667	343.05960	.927
	AEROBIC DANCE	1081.18824	392.03208	.028

The direction of significant was between pedometer-based walk and aerobic dance and aerobic dance and control.

Hypothesis two: There will be no significant main effects of Treatment on Body composition (Fat-mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis

Ho2a: No significant main effects of Treatment on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of baptist elderly women in the Ibadan metropolis (Base line and 4^{th} Week data)

Table 4.12: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta^2
Corrected Model	Fat mass4th Week	1774.310	9	197.146	704.315	.000	.991
	Fat free mass 4th Week	35212.544	9	3912.505	171.939	.000	.964
	Body mass index 4th Week	2174.159	9	241.573	2432.338	.000	.997
	Waist hip ratio 4th Week	.866	9	9.623E-02	2785.779	.000	.998
Treatment	Fat mass4th Week	5.105	2	2.552	9.118	.000	.242
	Fat free mass 4th Week	65.001	2	32.501	1.428	.248	.048
	Body mass index 4th Week	3.298	2	1.649	16.605	.000	.368
	Waist hip ratio 4th Week	8.679E-05	2	4.339E-05	1.256	.292	.042
Age	Fat mass4th Week	.657	1	.657	2.345	.131	.040
	Fat free mass 4th Week	11.304	1	11.304	.497	.484	.009
	Body mass index 4th Week	.265	1	.265	2.672	.108	.045
	Waist hip ratio 4th Week	4.541E-06	1	4.541E-06	.131	.718	.002
Treatment x Age	Fat mass4th Week	.550	2	.275	.982	.381	.033
	Fat free mass 4th Week	80.686	2	40.343	1.773	.179	.059
	Body mass index 4th Week	2.722E-02	2	1.361E-02	.137	.872	.005
	Waist hip ratio 4th Week	5.778E-05	2	2.889E-05	.836	.439	.029
Error	Fat mass4th Week	15.955	57	.280			
	Fat free mass 4th Week	1297.047	57	22.755			
	Body mass index 4th Week	5.661	57	9.932E-02			
	Waist hip ratio 4th Week	1.969E-03	57	3.454E-05			
Total	Fat mass4th Week	1790.265	66				
	Fat free mass 4th Week	36509.591	66				
	Body mass index 4th Week	2179.821	66				
	Waist hip ratio 4th Week	.868	66				

Table 4.12

i. There was significant effect of Treatment on fat mass ($F_{(2;64)}$=9.118; p<0.05 partial η^2=0.242), Null hypotheses was rejected;

ii. There was no significant effect of Treatment on fat free mass $F_{(2;64)}$=1.428; p>0.05 partial η^2=0.048), Null hypotheses was accepted;

iii. There was significant effect of Treatment on body mass index ($F_{(2;64)}$=16.605; p<0.05 partial η^2=0.368), Null hypotheses was rejected;

iv. There was no significant effect of Treatment on waist hip ratio ($F_{(2;64)}$=1.256; p>0.05 partial η^2=0.042), Null hypotheses was accepted.

Table 4.13: Expected Mean Scores on Treatment effect on Bodycomposition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Fat mass4th Week	Pedometer-based walk	30.244	.275	29.694	30.794
	Aerobic dance	29.681	.132	29.417	29.946
	Control	30.482	.143	30.197	30.768
Fat free mass 4th Week	Pedometer-based walk	109.410	2.476	104.452	114.367
	Aerobic dance	110.014	1.191	107.629	112.399
	Control	107.145	1.286	104.570	109.721
Body mass index 4th Week	Pedometer-based walk	27.756	.164	27.429	28.084
	Aerobic dance	27.348	.079	27.190	27.506
	Control	27.996	.085	27.826	28.167
Waist hip ratio 4th Week	Pedometerbased walk	.804	.003	.798	.810
	Aerobic dance	.800	.001	.797	.803
	Control	.802	.002	.799	.806

Table 4.13 indicate respective mean scores of Treatment effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of baptist elderlywomen in Ibadan the metropolis (Base line and 4th Week data).The estimated marginal mean value for fat mass $\bar{x}$=29.681, fat free mass $\bar{x}$=110.014, body mass index$\bar{x}$=27.348 and waist hip ratio $\bar{x}$=.800 shows that aerobic dance exercise had better effects of treatment on all the body composition variables studied than pedometer-based walk and the control.

Ho2b: There was no significant main effect of Treatment on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Table 4.14: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta^2
Corrected Model	Fat mass 8th Week	1766.971	9	196.330	423.043	.000	.985
	Fat free mass 8th Week	35634.498	9	3959.389	165.672	.000	.963
	Body mass index 8th Week	2142.933	9	238.104	1241.680	.000	.995
	Waist hip ratio 8th Week	.879	9	9.763E-02	1154.619	.000	.995
Treatment	Fat mass 8th Week	16.265	2	8.133	17.524	.000	.381
	Fat free mass 8th Week	53.939	2	26.969	1.128	.331	.038
	Body mass index 8th Week	9.023	2	4.511	23.526	.000	.452
	Waist hip ratio 8th Week	9.661E-05	2	4.831E-05	.571	.568	.020
Age	Fat mass 8th Week	.482	1	.482	1.038	.313	.018
	Fat free mass 8th Week	16.393	1	16.393	.686	.411	.012
	Body mass index 8th Week	.450	1	.450	2.345	.131	.040
	Waist hip ratio 8th Week	4.801E-06	1	4.801E-06	.057	.813	.001
Treatment x Age	Fat mass 8th Week	.909	2	.454	.979	.382	.033
	Fat free mass 8th Week	93.108	2	46.554	1.948	.152	.064
	Body mass index 8th Week	.201	2	.100	.523	.596	.018
	Waist hip ratio 8th Week	1.090E-04	2	5.451E-05	.645	.529	.022
Error	Fat mass 8th Week	26.453	57	.464			
	Fat free mass 8th Week	1362.241	57	23.899			
	Body mass index 8th Week	10.930	57	.192			
	Waist hip ratio 8th Week	4.820E-03	57	8.456E-05			
Total	Fat mass 8th Week	1793.424	66				
	Fat free mass 8th Week	36996.739	66				
	Body mass index 8th Week	2153.864	66				
	Waist hip ratio 8th Week	.883	66				

Table 4.14

i. Significant main effect of Treatment was found on fat mass ($F_{(2;64)}$=17.524; p<0.05 partial η^2=0.381), Null hypotheses was rejected;
ii. There was no significant effect of Treatment on fat free mass ($F_{(2;64)}$=1.128; p>0.05 partial η^2=0.038), Null hypotheses was accepted;
iii. There was significant effect of Treatment on body mass index ($F_{(2;64)}$=23.526; p<0.05 partial η^2=0.452), Null hypotheses was rejected;
iv. There was no significant effect of Treatment on waist hip ratio ($F_{(2;64)}$=.571; p>0.05 partial η^2=0.020), Null hypotheses was accepted.

Table 4.15: Expected Mean Scores on Treatment effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 8h Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Fat mass 8th Week	Pedometer-based walk	29.884	.354	29.176	30.592
	Aerobic dance	29.044	.170	28.703	29.384
	Control	30.488	.184	30.120	30.856
Fat free mass 8th Week	Pedometer-based walk	108.858	2.537	103.777	113.938
	Aerobic dance	109.540	1.221	107.095	111.984
	Control	106.916	1.318	104.276	109.555
Body mass index 8th Week	Pedometer-based walk	27.619	.227	27.164	28.075
	Aerobic dance	26.901	.109	26.682	27.120
	Control	27.969	.118	27.733	28.206
Waist hip ratio 8th Week	Pedometer-based walk	.802	.005	.792	.811
	Aerobic dance	.797	.002	.793	.802
	Control	.801	.002	.796	.806

Table 4.15 reveals the respective mean scores of Treatment effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data) The estimated marginal mean value of fat mass $\bar{x}$=29.044, fat free mass $\bar{x}$=109.540, body mass $\bar{x}$=26.901 and waist hip ratio $\bar{x}$=.797 shows that aerobic dance had better effects of treatment on all the body composition variables studied than pedometer-based walk and the control.

Ho2c: No significant effect of Treatment on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Table 4.16: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta^2
Corrected Model	Fat mass 12th Week	1774.035	9	197.115	341.555	.000	.982
	Fat free mass 12th Week	35167.705	9	3907.523	151.636	.000	.960
	Body mass index 12th Week	2152.734	9	239.193	932.262	.000	.993
	Waist hip ratio 12th Week	.875	9	9.719E-02	917.192	.000	.993
Treatment	Fat mass 12th Week	22.818	2	11.409	19.770	.000	.410
	Fat free mass 12th Week	29.877	2	14.939	.580	.563	.020
	Body mass index 12th Week	11.833	2	5.916	23.060	.000	.447
	Waist hip ratio 12th Week	7.402E-05	2	3.701E-05	.349	.707	.012
Age	Fat mass 12th Week	.297	1	.297	.515	.476	.009
	Fat free mass 12th Week	8.784	1	8.784	.341	.562	.006
	Body mass index 12th Week	.248	1	.248	.968	.329	.017
	Waist hip ratio 12th Week	3.458E-06	1	3.458E-06	.033	.857	.001
Treatment x Age	Fat mass 12th Week	.871	2	.435	.754	.475	.026
	Fat free mass 12th Week	74.804	2	37.402	1.451	.243	.048
	Body mass index 12th Week	.493	2	.247	.961	.389	.033
	Waist hip ratio 12th Week	1.228E-04	2	6.142E-05	.580	.563	.020
Error	Fat mass 12th Week	32.895	57	.577			
	Fat free mass 12th Week	1468.842	57	25.769			
	Body mass index 12th Week	14.625	57	.257			
	Waist hip ratio 12th Week	6.040E-03	57	1.060E-04			
Total	Fat mass 12th Week	1806.931	66				
	Fat free mass 12th Week	36636.547	66				
	Body mass index 12th Week	2167.359	66				
	Waist hip ratio 12th Week	.881	66				

Table 4.16 showed:

i. There was a Significant main effect of Treatment on fat mass ($F_{(2;64)}$=19.770; p<0.05 partial η^2=0.410), Null hypotheses was rejected;

ii. There was no significant main effect of Treatment on fat free mass ($F_{(2;64)}$=0.580; p>0.05 partial η^2=0.020), Null hypotheses was accepted;

iii. There was a significant main effect of Treatment on body mass index ($F_{(2;64)}$=23.060; p<0.05 partial η^2=0.447), Null hypotheses was rejected;

iv. There was no significant main effect of Treatment on waist hip ratio ($F_{(2;64)}$=0.349; p>0.05 partial η^2=0.012), Null hypotheses was accepted.

Table 4.17: Expected Mean Scores on Treatment effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Fat mass 12th Week	Pedometer-based walk	29.748	.394	28.958	30.537
	Aerobic dance	28.848	.190	28.468	29.228
	Control	30.563	.205	30.153	30.973
Fat free mass 12th Week	Pedometer-based walk	109.375	2.635	104.099	114.650
	Aerobic dance	108.943	1.268	106.405	111.482
	Control	107.142	1.369	104.401	109.882
Body mass index 12th Week	Pedometer-based walk	27.607	.263	27.081	28.134
	Aerobic dance	26.710	.126	26.457	26.963
	Control	27.925	.137	27.652	28.198
Waist hip ratio 12th Week	Pedometer-based walk	.800	.005	.790	.811
	Aerobic dance	.799	.003	.794	.804
	Control	.802	.003	.796	.807

Table 4.17 reveals the respective mean scores of Treatment effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data) The table shows that aerobic dance exercise had the greatest impact of treatment on the participants fat mass $\bar{x}$=28.848, body mass index $\bar{x}$=26.710 and waist hip ratio $\bar{x}$=.799 however pedometer-based walk elicited greater effects than aerobic dance exercise on fat free mass $\bar{x}$=109.375.

Hypothesis three: There will be no significant effect of Treatment on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis.

Ho3a: No significant main effect of Treatment on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Table 4.18: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta^2
Corrected Model	Chair sit and reach test 4th week	152.112	8	19.014	35.154	.000	.829
	30 sec chair stand test 4th week	445.314	8	55.664	101.270	.000	.933
	Arm curl test 4th week	3063.018	8	382.877	346.028	.000	.979
Treatment	Chair sit and reach test 4th week	11.671	2	5.836	10.790	.000	.271
	30 sec chair stand test 4th week	23.768	2	11.884	21.620	.000	.427
	Arm curl test 4th week	40.823	2	20.411	18.447	.000	.389
Age	Chair sit and reach test 4th week	2.512	1	2.512	4.644	.035	.074
	30 sec chair stand test 4th week	.856	1	.856	1.557	.217	.026
	Arm curl test 4th week	4.599	1	4.599	4.157	.046	.067
Treatment x Age	Chair sit and reach test 4th week	.149	2	7.442E-02	.138	.872	.005
	30 sec chair stand test 4th week	1.740	2	.870	1.583	.214	.052
	Arm curl test 4th week	.600	2	.300	.271	.764	.009
Error	Chair sit and reach test 4th week	31.371	58	.541			
	30 sec chair stand test 4th week	31.880	58	.550			
	Arm curl test 4th week	64.177	58	1.106			
Total	Chair sit and reach test 4th week	183.483	66				
	30 sec chair stand test 4th week	477.194	66				
	Arm curl test 4th week	3127.194	66				

Table 4.18 shows:

i. Significant main effect of Treatment was found on chair sit and reach test ($F_{(2;64)}$= 10.790; $p<0.05$ partial η^2=.271), Null hypotheses was rejected;

ii. Significant main effect of Treatment was found on 30 seconds chair stand test ($F_{(2;64)}$=21.620; $p<0.05$ partial η^2=0.427), Null hypotheses was rejected.

iii. Significant effect of Treatment was found on arm curl test ($F_{(2;64)}$=18.447; $p<0.05$ partial η^2=0.389), Null hypotheses was rejected.

Table 4.19: Expected Mean Scores on Treatment effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Chair sit and reach test 4th week	Pedometer-based walk	1.944	.387	1.169	2.718
	Aerobic dance	3.174	.183	2.808	3.540
	Control	2.003	.211	1.581	2.424
30 sec chair stand test 4th week	Pedometer-based walk	13.721	.390	12.940	14.502
	Aerobic dance	15.323	.184	14.954	15.692
	Control	13.600	.212	13.175	14.025
Arm curl test 4th week	Pedometer-based walk	21.385	.554	20.277	22.493
	Aerobic dance	23.377	.261	22.854	23.900
	Control	21.089	.301	20.485	21.692

Table 4.19 revealed the respective mean scores of Treatment effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data) The result of the marginal mean of chair sit and reach $\bar{x}$=3.174, 30sec chair stand test $\bar{x}$=15.323 and arm curl $\bar{x}$=23.377 of participants in the aerobic dance exercise shows a better performance than the participants in the pedometer-based walk group and control.

Table: 4.20 Post Hoc tests: 4th week (30 SECS CHAIR STAND TEST)

Dependent variables	(I) Treatment Group	(J) Treatment Group	Mean Difference (I-J)	Std. Error	Sig.
4th week(30 secs chair stand test)	PEDOMETER-BASED WALK	AEROBIC DANCE	-1.01961	.77800	.429
		CONTROL	1.43333	.73982	.161
	AEROBIC DANCE	PEDOMETER-BASED WALK	1.01961	.77800	.429
		CONTROL	2.45294	.84543	0.19
	CONTROL	PEDOMETER-BASED WALK	-1.43333	.73982	.161
		AEROBIC DANCE	-2.45294	.84543	.019
4th week(Arm curl test)	PEDOMETER-BASED WALK	AEROBIC DANCE	-.09608	1.81643	.999
		CONTROL	7.68333	1.72729	.000
	AEROBIC DANCE	PEDOMETER-BASED WALK	.09608	1.81643	.999
		CONTROL	7.77941	1.97386	.001
	CONTROL	PEDOMETER-BASED WALK	-7.68333	1.72729	.000
		AEROBIC DANCE	-7.77941	1.97386	.001

The direction of significant was between pedometer based walking and control and aerobic dance and control.

Ho3b: No significant main effect of Treatment on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data).

Table 4.21: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta^2
Corrected Model	Chair sit and reach test 8th week	202.078	8	25.260	24.457	.000	.771
	30 sec chair stand test 8th week	612.613	8	76.577	51.943	.000	.878
	Arm curl test 8th week	3595.311	8	449.414	138.187	.000	.950
Treatment	Chair sit and reach test 8th week	23.982	2	11.991	11.610	.000	.286
	30 sec chair stand test 8th week	129.621	2	64.811	43.962	.000	.603
	Arm curl test 8th week	149.176	2	74.588	22.934	.000	.442
Age	Chair sit and reach test 8th week	3.901	1	3.901	3.777	.057	.061
	30 sec chair stand test 8th week	.661	1	.661	.448	.506	.008
	Arm curl test 8th week	11.751	1	11.751	3.613	.062	.059
Treatment x Age	Chair sit and reach test 8th week	.863	2	.431	.418	.661	.014
	30 sec chair stand test 8th week	4.017	2	2.008	1.362	.264	.045
	Arm curl test 8th week	1.416	2	.708	.218	.805	.007
Error	Chair sit and reach test 8th week	59.905	58	1.033			
	30 sec chair stand test 8th week	85.506	58	1.474			
	Arm curl test 8th week	188.629	58	3.252			
Total	Chair sit and reach test 8th week	261.983	66				
	30 sec chair stand test 8th week	698.119	66				
	Arm curl test 8th week	3783.940	66				

Table 4.21 revealed:

i. Significant main effect of Treatment was found on chair sit and reach test ($F_{(2;64)}$= 11.610; $p<0.05$ partial $\eta^2=0.286$), Null hypotheses was rejected.

ii. Significant effect of Treatment was found on 30 seconds chair stand test ($F_{(2;64)}$=43.962; $p<0.05$ partial $\eta^2=0.603$), Null hypotheses was rejected.

i. Significant effect of Treatment was found on arm curl test ($F_{(2;64)}$=22.934; $p<0.05$ partial $\eta^2=0.442$), Null hypotheses was rejected.

Table 4.22: Expected Mean Scores on Treatment effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Chair sit and reach test 8th week	Pedometer-based walk	2.443	.535	1.372	3.513
	Aerobic dance	4.155	.253	3.650	4.661
	Control	2.458	.291	1.875	3.041
30 sec chair stand test 8th week	Pedometer-based walk	15.433	.639	14.154	16.712
	Aerobic dance	17.832	.302	17.228	18.436
	Control	13.544	.348	12.847	14.240
Arm curl test 8th week	Pedometer-based walk	23.349	.949	21.449	25.248
	Aerobic dance	26.271	.448	25.374	27.168
	Control	21.714	.517	20.680	22.749

Table 4.22 revealed the respective mean scores of Treatment effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderlywomen in the Ibadan metropolis (Base line and 8th Week data). The result of the marginal mean for chair sit and reach $\bar{x}$=4.155, 30 sec chair stand $\bar{x}$=17.832 and arm curl $\bar{x}$=26.271 indicates, that aerobic dance exercise had a better effects on the participants functional ability than pedometer based walk and the comparison group.

Ho3c: No significant main effects of Treatment on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Table 4.23: MANCOVA revealing the main and interaction significant effects of Treatment, Age on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in Ibadan metropolis (Base line and 12th Week data)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta^2
Corrected Model	Chair sit and reach test 12th week	205.109	8	25.639	25.847	.000	.781
	30 sec chair stand test 12th week	913.243	8	114.155	32.689	.000	.818
	Arm curl test 12th week	3928.681	8	491.085	75.854	.000	.913
Treatment	Chair sit and reach test 12th week	33.695	2	16.847	16.984	.000	.369
	30 sec chair stand test 12th week	305.822	2	152.911	43.786	.000	.602
	Arm curl test 12th week	327.620	2	163.810	25.302	.000	.466
Age	Chair sit and reach test 12th week	.871	1	.871	.878	.353	.015
	30 sec chair stand test 12th week	2.018	1	2.018	.578	.450	.010
	Arm curl test 12th week	25.683	1	25.683	3.967	.051	.064
Treatment x Age	Chair sit and reach test 12th week	2.700	2	1.350	1.361	.264	.045
	30 sec chair stand test 12th week	27.395	2	13.698	3.922	.025	.119
	Arm curl test 12th week	3.869	2	1.935	.299	.743	.010
Error:	Chair sit and reach test 12th week	57.533	58	.992			
	30 sec chair stand test 12th week	202.548	58	3.492			
	Arm curl test 12th week	375.498	58	6.474			
Total	Chair sit and reach test 12th week	262.642	66				
	30 sec chair stand test 12th week	1115.791	66				
	Arm curl test 12th week	4304.179	66				

Table 4.23 Shows:

i. Significant main effect of Treatment was on chair sit and reach test ($F_{(2;64)}$= 16.984;$p<0.05$ partial η^2=0.369), Null hypotheses was rejected;

ii. Significant main effect of Treatment was found on 30 seconds chair stand test ($F_{(2;64)}$=43.786; $p<0.05$ partial η^2=0.602), Null hypotheses was rejected and

iii. Significant effect of Treatment was found on arm curl test ($F_{(2;64)}$=25.302; $p<0.05$partial η^2=0.466), Null hypotheses was rejected.

Figure 4.1: Graph showing the effect of treatment 30 sec chair stand

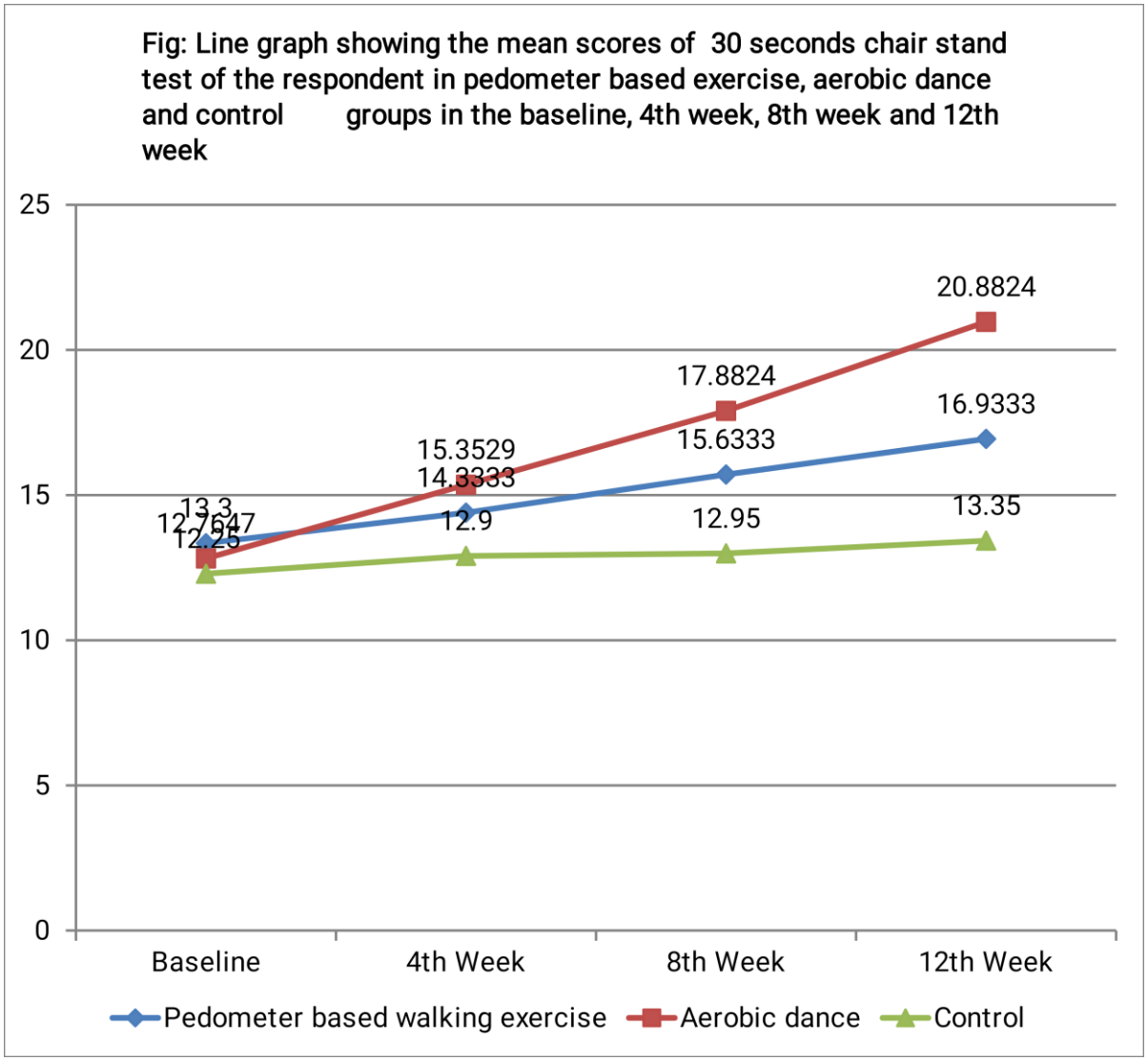

Table 4.24: Expected Mean Scores on Treatment effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Dependent Variable	Treatment Groups	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Chair sit and reach test 12th week	Pedometer-based walk	4.008	.524	2.959	5.057
	Aerobic dance	4.848	.247	4.353	5.344
	Control	2.638	.285	2.067	3.210
30 sec chair stand test 12th week	Pedometer-based walk	16.701	.983	14.732	18.669
	Aerobic dance	20.717	.464	19.788	21.647
	Control	14.170	.535	13.098	15.242
Arm curl test 12th week	Pedometer-based walk	24.504	1.339	21.823	27.184
	Aerobic dance	29.039	.632	27.774	30.305
	Control	22.319	.729	20.859	23.778

Table 4.24 revealed the respective mean scores of Treatment effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of t Baptist elderly in the Ibadan metropolis (Base line and 12^{th} Week data). The result of the marginal mean for chair sit and reach $\bar{x}$=4.848, 30 sec chair stand $\bar{x}$=20.717 and arm curl $\bar{x}$=29.039 shows that aerobic dance exercise had best effect on participants functional ability than pedometer based walk and the control.

Table 4.25:Post Hoc Tests: 12th week

Dependent variables	(I) Treatment Group	(J) Treatment Group	Mean Difference (I-J)	Std. Error	Sig.
12th WEEK (CHAIR SIT AND REACH TEST)	PEDOMETER-BASED WALK	AEROBIC DANCE	-79549	.56317	.374
		CONTROL	1.30333	.53553	.059
	AEROBIC DANCE	PEDOMETER-BASED WALK	.79549	.56317	.374
		CONTROL	2.09882	.61198	.005
	CONTROL	PEDOMETER-BASED WALK	-1.30333	.53553	.059
		AEROBIC DANCE	-2..09882	61198	.005
12th WEEK(30 SEC CHAIR STAND TEST)	PEDOMETER-BASED WALK	AEROBIC DANCE	-.3.94902	.92498	.000
		CONTROL	3.5833	.87959	.001
	AEROBIC DANCE	PEDOMETER-BASED WALK	3.94902	.92498	.000
		CONTROL	-7.53235	1.00515	.000
	CONTROL	PEDOMETER-BASED WALK	-3.58333	.87959	.001
		AEROBIC DANCE	-7.53235	1.00515	.000
12TH WEEK (ARM CURL TEST)	PEDOMETER-BASED WALK	AEROBIC DANCE	-2.06078	1.94534	.573
		CONTROL	10.03333	1.84986	.000
	AEROBIC DANCE	PEDOMETER-BASED WALK	2.06078	1.94534	.573
		CONTROL	12.09412	2.11394	.000
	CONTROL	PEDOMETER-BASED WALK	-10.03333	1.84986	.000
		AEROBIC DANCE	-12.09412	2.11394	.000

The direction of significant was between aerobic dance and control, pedometer-based walk and aerobic dance, pedometer-based walk and control, aerobic dance and control and pedometer-based walk and control.

Hypothesis four: There will be no significant main effects of Age (early elderliness and late elderliness) on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Ho4a: No significant effect of Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Table 4.4 revealed that:

i. There was no significant effect of Age on Mean arterial blood pressure ($F_{(1;65)}$= 0.921; p>0.05 partial η^2=0.016), Null hypotheses was accepted;
ii. No significant efffect of Age on Rate pressure product ($F_{(1;65)}$=0.011; p>0.05 partial η^2=0.001), Null hypotheses was accepted;
iii. There was no significant effect of Age on Systolic blood pressure ($F_{(1;65)}$=.002; p>0.05 partial η^2=0.001), Null hypotheses was accepted;
iv. No significant effect of Age on Diastolic blood pressure ($F_{(1;65)}$=.161; p>0.05 partial η^2=0.003), Null hypotheses was accepted.

Table 4.26: Expected Mean Scores on Age effect on Cardio-vascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Mean arterial blood 4th Week	Early elderliness Late elderliness	91.373 92.492	.332 1.045	90.709 90.399	92.038 94.584
Rate pressure product 4th Week	Early elderliness Late elderliness	20003.703 20022.379	50.414 158.740	19902.751 19704.508	20104.655 20340.250
Systolic blood pressure 4th Week	Early elderliness Late elderliness	126.039 126.088	.316 .995	125.406 124.095	126.672 128.081
Diastolic blood pressure 4th Week	Early elderliness Late elderliness	74.487 75.120	.450 1.417	73.586 72.283	75.387 77.956

Table 4.26 shows the respective mean scores of Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in Ibadan metropolis (Base line and 4th Week data). Early elderliness stage for mean arterial blood pressure $\bar{x}$=91.373, rate pressure product $\bar{x}$=20003.703, systolic blood pressure $\bar{x}$=126.039 and diastolic blood pressure $\bar{x}$=74.487 had the lowest mean value, which implies that participants in this stage did better than their counterpart in the late elderliness.

Ho4b: No significant effect of Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly in the Ibadan metropolis (Base line and 8th Week data)

Table 4.6 shows that:

i. There was no significant main effect of Age on Mean arterial blood pressure ($F_{(1;65)}$= 1.235; p>0.05 partial η^2=0.021), Null hypotheses was accepted;
ii. No significant main effect of Age on Rate pressure product ($F_{(1;65)}$=0.384;p>0.05partial η^2=0.007), Null hypotheses was accepted;
iii. There was no significant effects of Age on Systolic blood pressure ($F_{(1;65)}$= 0.022; p>0.05 partial η^2=0.001), Null hypotheses was accepted and
iv. No significant effects of Age on Diastolic blood pressure ($F_{(1;65)}$=0.104; p>0.05 parrtial η^2=0.002), Null hypotheses was accepted.

Table 4.27: Expected Mean Scores on Age effect on Cardio-vascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in Ibadan metropolis (Base line and 8th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Mean arterial blood 8th Week	Early elderliness Late elderliness	90.613 92.079	.376 1.183	89.860 89.710	91.365 94.448
Rate pressure product 8th Week	Early elderliness Late elderliness	19856.971 19997.510	64.538 203.213	19727.736 19590.584	19986.207 20404.436
Systolic blood pressure 8th Week	Early elderliness Late elderliness	125.439 125.633	.374 1.178	124.690 123.273	126.189 127.992
Diastolic blood pressure 8th Week	Early elderliness Late elderliness	73.840 74.429	.520 1.638	72.798 71.148	74.882 77.710

Table 4.27 shows the respective mean scores of Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data). Early elderliness stage for mean arterial blood pressure $\bar{x}$=90.613, rate pressure product $\bar{x}$=19856.971,systolic blood pressure $\bar{x}$=125.439 and diastolic blood pressure $\bar{x}$=73.840 had the lowest mean value, which implies that participants in this stage did better than their counterpart in the late elderliness.

Ho4c: No significant effects of Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Table 4.9 shows that:

i. There was no significant main effect of Age on Mean arterial blood pressure ($F_{(1;65)}$= 0.035; p>0.05 partial η^2=0.001), Null hypotheses was accepted;
ii. No significant main effect of Age on Rate pressure product ($F_{(1;65)}$=0.485; p>0.05 partial η^2=0.008), Null hypotheses was accepted;
iii. There was no significant effect of Age on Systolic blood pressure ($F_{(1;65)}$= 2.543; p>0.05 partial η^2=0.043), Null hypotheses was accepted;
iv. There was no significant main effects of Age on Diastolic blood pressure ($F_{(1;65)}$= 0.132; p>0.05 partial η^2=0.002), Null hypotheses was accepted.

Table 4.28: Expected Mean Scores on Age effect on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Mean arterial blood 12th Week	Early elderliness Late elderliness	89.976 90.253	.420 1.323	89.134 87.605	90.817 92.902
Rate pressure product 12th Week	Early elderliness Late elderliness	19775.822 19628.971	60.018 188.979	19655.639 19250.547	19896.005 20007.394
Systolic blood pressure 12th Week	Early elderliness Late elderliness	124.975 123.096	.336 1.057	124.303 120.979	125.647 125.212
Diastolic blood pressure 12th Week	Early elderliness Late elderliness	73.195 72.427	.602 1.897	71.989 68.629	74.401 76.225

Table 4.28 shows the respective mean scores of Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in Ibadan metropolis (Base line and 12th Week data). This table shows that participants at the late elderliness stage had a lower mean value; rate pressure product $\bar{x}$=19628.971, systolic blood pressure $\bar{x}$=123.096 and diastolic blood pressure $\bar{x}$=72.427indicating a better performance than early elderly but for the Mean arterial blood pressure early elderly had the lowest mean value $\bar{x}$=89.976 which implies a better performance than late elderliness.

Hypothesis five: There will be no significant effects of Age (early elderliness and late elderliness) on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Ho5a: No significant main effect of Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of the Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data).

Table 4.12 showed that:

i. No significant effects of Age on fat mass ($F_{(1;65)}$= 2.345; p>0.05 partial η^2=0.040), Null hypotheses was accepted;
ii. No significant main effect of Age on fat free mass ($F_{(1;65)}$=0.497;p>0.05 partial η^2=0.009), Null hypotheses was accepted;
iii. No significant main effect of Age on body mass index ($F_{(1;65)}$=2.672; p>0.05 partial η^2=0.045), Null hypotheses was accepted;
iv. No significant effects of Age on waist hip ratio ($F_{(1;65)}$=0.131; p>0.05 partial η^2=0.002), Null hypotheses was accepted.

Table 4.29: Expected Mean Scores on Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Fat mass4th Week	Early elderliness	29.967	.080	29.806	30.128
	Late elderliness	30.305	.206	29.893	30.717
Fat free mass 4th Week	Early elderliness	109.557	.725	108.105	111.008
	Late elderliness	108.156	1.855	104.442	111.870
Body mass index 4th Week	Early elderliness	27.593	.048	27.497	27.689
	Late elderliness	27.808	.123	27.562	28.053
Waist hip ratio 4th Week	Early elderliness	.802	.001	.801	.804
	Late elderliness	.802	.002	.797	.806

Table 4.29 shows the respective mean scores of Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly in the Ibadan metropolis (Base line and 4th Week data). The above table shows that participants at the early elderliness stage did better than their counterparts at the late elderliness except for waist to hip ratio were there was an equal effect of treatment.

Ho5b: No significant effects of Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data).

Table 4.14 revealed that:

i. There was no significant effects of Age on fat mass ($F_{(1;65)}$= 1.038; p>0.05 partial η^2=0.018), Null hypotheses was accepted;
ii. No significant effects of Age on fat free mass ($F_{(1;65)}$= 0.686; p>0.05 partial η^2=0.012), Null hypotheses was accepted;
iii. No significant main effect of Age on body mass index ($F_{(1;65)}$=2.345; p>0.05 partial η^2=0.040), Null hypotheses was accepted;
iv. No significant main effect of Age on waist hip ratio ($F_{(1;65)}$=0.057; p>0.05 partial η^2=0.001), Null hypotheses was accepted.

Table 4.30: Expected Mean Scores on Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Fat mass 8th Week	Early elderliness	29.661	.104	29.453	29.868
	Late elderliness	29.950	.265	29.419	30.480
Fat free mass 8th Week	Early elderliness	109.281	.743	107.793	110.768
	Late elderliness	107.594	1.901	103.788	111.400
Body mass index 8th Week	Early elderliness	27.357	.067	27.224	27.490
	Late elderliness	27.636	.170	27.295	27.977
Waist hip ratio 8th Week	Early elderliness	.800	.001	.798	.803
	Late elderliness	.799	.004	.792	.807

Table 4.30 shows the respective mean scores of Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data) The above table shows that participants at the early elderliness stage did better in fat mass $\bar{x}$=29.661, fat free mass $\bar{x}$=109.281 and body mass index $\bar{x}$=27.357 than their counterparts at the late elderliness stage except for waist to hip ratio $\bar{x}$=.799 were late elderliness did better.

Ho5c: No significant effects of Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly in the Ibadan metropolis (Base line and 12h Week data)

Table 4.16 revealed that:

i. No significant effects of Age on fat mass ($F_{(1;65)}$= 0.515; p>0.05 partial η^2=0.009), Null hypotheses was accepted;
ii. No significant effects of Age on fat free mass ($F_{(1;65)}$= 0.341; p>0.05 partial η^2=0.006), Null hypotheses was accepted;
iii. No significant effect of Age on body mass index ($F_{(1;65)}$=0.968; p>0.05 partial η^2=.0017), Null hypotheses was accepted;
iv. No significant effect of Age on waist hip ratio ($F_{(1;65)}$=0.033; p>0.05 partial η^2=0.001), Null hypotheses was accepted.

Table 4.31: Expected Mean Scores on Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Fat mass 12th Week	Early elderliness	29.606	.115	29.375	29.837
	Late elderliness	29.833	.295	29.242	30.425
Fat free mass 12th Week	Early elderliness	109.104	.771	107.559	110.648
	Late elderliness	107.869	1.974	103.917	111.821
Body mass index 12th Week	Early elderliness	27.310	.077	27.156	27.464
	Late elderliness	27.518	.197	27.124	27.912
Waist hip ratio 12th Week	Early elderliness	.801	.002	.798	.804
	Late elderliness	.800	.004	.792	.808

Table 4.31 shows the respective mean scores of Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data) The above table shows that participants at the early elderliness stage did better in fat mass $\bar{x}$=29.606, fat free mass $\bar{x}$=109.104 and body mass index $\bar{x}$=27.310 than their counterparts at the late elderliness except for waist to hip ratio were there was an equal effect of treatment.

Hypothesis six: There will be no significant effects of age (early elderliness and late elderliness) on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of training of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data).

Ho6a: No significant main effect of Age on Functional ability (30 Second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in Ibadan metropolis (Base line and 4th Week data)

Table 4.18 shows:

i. There was a significant main effect of Age on chair sit and reach test ($F_{(1;65)}$= 4.644; $p<0.05$ partial η^2=0.074), Null hypotheses was rejected;
ii. No significant main effect of Age on 30 seconds chair stand test ($F_{(1;65)}$=1.557; $p>0.05$ partial η^2=0.026), Null hypotheses was accepted and
iii. There was a significant main effect of Age on arm curl test ($F_{(1;65)}$=4.157; $p<0.05$ partial η^2=0.067), Null hypotheses was rejected.

Table 4.32: Expected Mean Scores on Age effect on Functional ability (30 Second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Chair sit and reach test 4th week	Early elderliness	2.721	.111	2.498	2.944
	Late elderliness	2.026	.298	1.429	2.622
30 sec chair stand test 4th week	Early elderliness	14.418	.112	14.193	14.642
	Late elderliness	14.012	.300	13.410	14.613
Arm curl test 4th week	Early elderliness	22.421	.159	22.102	22.739
	Late elderliness	21.480	.426	20.627	22.333

Table 4.32 shows the respective mean scores of Age effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of elderly Baptist women in Ibadan metropolis (Base line and 4^{th} Week data) The mean scores from the above table shows that participants at the early elderliness stage did better than their counterparts at the late elderliness.

Ho6b: No significant effects of Age on Functional ability (30 Second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 8^{th} Week data)

Table 4.21 revealed:

ii. No significant effects of Age on chair sit and reach test ($F_{(1;65)}$= 3.777; p>0.05 partial η^2=0.061), Null hypotheses was accepted;
iii. No significant effeects of Age on 30 seconds chair stand test ($F_{(1;65)}$=0.448; p>0.05 partial η^2=0.008), Null hypotheses was accepted and
iv. No significant effect of Age on arm curl test ($F_{(1;65)}$= 3.613; p>0.05 partial η^2=0.062), Null hypotheses was accepted.

Table 4.33: Expected Mean Scores on Age effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Chair sit and reach test 8th week	Early elderliness	3.452	.154	3.144	3.760
	Late elderliness	2.585	.412	1.761	3.410
30 sec chair stand test 8th week	Early elderliness	15.781	.184	15.414	16.149
	Late elderliness	15.425	.492	14.440	16.410
Arm curl test 8th week	Early elderliness	24.530	.273	23.984	25.076
	Late elderliness	23.026	.731	21.563	24.489

Table 4.33 shows the respective mean scores of Age effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of elderly Baptist women in Ibadan metropolis (Base line and 8th Week data) The above table shows that participants at the early elderliness stage did better than their counterparts at the late elderliness.

Ho6c: No significant effects of Age on Functional ability (30 Second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis (Base line and 12th Week data)

Table 4.23 shows:

i. No significant effects of Age on chair sit and reach test ($F_{(1;65)}$= 0.878; p>0.05 partial η^2=0.015), Null hypotheses was accepted;
ii. No significant effects of Age on 30 seconds chair stand test ($F_{(1;65)}$=0.578; p>0.05 partial η^2=0.010), Null hypotheses was accepted and
iii. There was a significant main effect of Age on arm curl test ($F_{(1;65)}$= 3.967; p<0.05 partial η^2=0.064), Null hypotheses was rejected.

Table 4.34: Expected Mean Scores on Age effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Dependent Variable	Age	Mean	Std. Error	95% Confidence Interval	
				Low Bound	Upper Bound
Chair sit and reach test 12th week	Early elderliness	4.036	.151	3.735	4.338
	Late elderliness	3.627	.404	2.819	4.435
30 sec chair stand test 12th week	Early elderliness	17.508	.283	16.942	18.074
	Late elderliness	16.884	.757	15.369	18.400
Arm curl test 12th week	Early elderliness	26.399	.385	25.628	27.170
	Late elderliness	24.175	1.031	22.112	26.239

Table 4.34 shows the respective mean scores of Age effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis (Base line and 12th Week data)The above table shows that participants at the early elderliness stage did better than their counterparts at the late elderliness stage.

Hypothesis Seven: There will be no significant interaction effects of Treatment and age on Cardiovascularparameters (mean arterial blood pressure, rate pressure product and blood pressure) of training of Baptist elderly in the Ibadan metropolis (Base line and 4th Week data)

Ho7a: No significant interaction effects of Treatment and Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly in the Ibadan metropolis (Base line and 4th Week data).

Table 4.4 showed:

i. No significant interaction effect of Treatment and Age on Mean arterial blood pressure of the elderly ($F_{(2;64)}$= 0.094, p>0.05 partial η^2=0.003), Null hypotheses was accepted;

ii. No significant interaction effect of Treatment and Age on Rate pressure product of the elderly ($F_{(2;64)}$=0.461; p>0.05 partial η^2=0.016), Null hypotheses was accepted;

iii. No significant interaction effect of Treatment and Age on Systolic blood pressure of the elderly ($F_{(2;64)}$=0.508; p>0.05 partial η^2=0.018), Null hypotheses was accepted

iv. No significant interaction effect of Treatment and Age on Diastolic blood pressure of the elderly ($F_{(2;64)}$=0.086; p>0.05 partial η^2=0.003), Null hypotheses was accepted.

Table 4.35: Expecte Mean Scores on Treatment and Age effect on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Mean arterial blood 4th Week	Pedometer based walk	Early elderliness Late elderliness	90.226 91.523	.471 2.232	89.282 87.054	91.170 95.991
	Aerobic dance	Early elderliness Late elderliness	91.396 92.115	.666 1.122	90.063 89.869	92.729 94.361
	Control	Early elderliness Late elderliness	92.498 93.837	.558 1.074	91.382 91.686	93.615 95.988
Rate pressure product 4th Week	Pedometer based walk	Early elderliness Late elderliness	19828.222 20004.237	71.629 339.063	19684.787 19325.276	19971.657 20683.199
	Aerobic dance	Early elderliness Late elderliness	20011.310 19876.539	101.137 170.425	19808.787 19535.268	20213.834 20217.809
	Control	Early elderliness Late elderliness	20171.576 20186.361	84.720 163.238	20001.927 19859.482	20341.225 20513.240
Systolic blood pressure 4th Week	Pedometer based walk	Early elderliness Late elderliness	124.988 125.920	.449 2.126	124.088 121.662	125.887 130.178
	Aerobic dance	Early elderliness Late elderliness	126.105 125.153	.634 1.069	124.835 123.013	127.375 127.293
	Control	Early elderliness Late elderliness	127.024 127.190	.531 1.024	125.960 125.140	128.088 129.240
Diastolic blood pressure 4th Week	Pedometer based walk	Early elderliness Late elderliness	73.541 73.845	.639 3.026	72.261 67.786	74.821 79.904
	Aerobic dance	Early elderliness Late elderliness	74.230 74.633	.903 1.521	72.423 71.587	76.038 77.679
	Control	Early elderliness Late elderliness	75.688 76.881	.756 1.457	74.174 73.964	77.202 79.798

Table 4.35 reveals the respective mean scores of Treatment and Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in Ibadan metropolis (Base line and 4th Week data). The table shows that for mean arterial blood pressure, pedometer early elderliness had the greatest effects of treatment $\bar{x}$=90.226 to aerobic dance early elderliness group $\bar{x}$=91.396 and control $\bar{x}$=92.498. Pedometer based walk late elderlinesshad a better mean value $\bar{x}$=91.523 to aerobic dance late elderliness $\bar{x}$=92.115 and control group late elderliness $\bar{x}$=93.837. For Rate pressure product; pedometer based walk early elderliness did better $\bar{x}$=19828.222than aerobic dance early elderliness stage $\bar{x}$=20011.310 and control $\bar{x}$=20171.576, aerobic dance late elderliness had a better mean score value of $\bar{x}$=19876.539 to pedometer late elderliness $\bar{x}$=20004.237and control late elderliness group $\bar{x}$=20186.361. Systolic blood pressure; pedometer early elderliness had better performance $\bar{x}$=124.988 followed by aerobic dance early elderliness $\bar{x}$=126.105 and control early $\bar{x}$=127.024 and aerobic dance late elderliness $\bar{x}$=125.153 had better mean score to pedometer based walk late elderliness $\bar{x}$=125.920 and control group late elderliness $\bar{x}$=127.190.Diastolic blood pressure; pedometer based early elderliness $\bar{x}$=73.541 had better effects of treatment from the mean score value followed by aerobic dance early $\bar{x}$=74.230 and control group early $\bar{x}$=75.688, also pedometer based walk late had better mean score to aerobic dance late $\bar{x}$=74.633 and control group late elderliness stage $\bar{x}$=76.881.

Ho7b: There will be no significant interaction effects of Treatment and Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly in the Ibadan metropolis (Base line and 8^{th} Week data)

Table 4.6 showed:

i. No significant effects effect of Treatment and Age on Mean arterial blood pressure ($F_{(2;64)}$= 0.072; p>0.05 partial η^2=0.003), Null hypotheses was accepted;

ii. No significant interaction effect of Treatment and Age on Rate pressure product ($F_{(2;64)}$= 0.377; p>0.05 partial η^2=0.013), Null hypotheses was accepted;

iii. No significant interaction effect of Treatment and Age on Systolic blood pressure ($F_{(1;65)}$=0.840; p>0.05 partial η^2=0.029), Null hypotheses was accepted and

iv. No significant interaction effect of Treatment and Age on Diastolic blood pressure ($F_{(2;64)}$=0.231; p>0.05 partial η^2=0.008), Null hypotheses was accepted.

Table 4.36: Expected Mean Scores on Treatment and Age effect on Cardio-vascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Mean arterial blood 8th Week	Pedometer based walk	Early elderliness Late elderliness	89.735 90.972	.534 2.527	88.666 85.911	90.804 96.032
	Aerobic dance	Early elderliness Late elderliness	90.453 91.729	.754 1.270	88.943 89.185	91.962 94.272
	Control	Early elderliness Late elderliness	91.650 93.538	.631 1.217	90.386 91.101	92.914 95.974
Rate pressure product 8th Week	Pedometer based walk	Early elderliness Late elderliness	19650.480 20038.435	91.697 434.056	19466.860 19169.254	19834.100 20907.616
	Aerobic dance	Early elderliness Late elderliness	19776.706 19760.598	129.472 218.172	19517.443 19323.716	20035.970 20197.479
	Control	Early elderliness Late elderliness	20143.728 20193.497	108.456 208.972	19926.550 19775.038	20360.906 20611.955
Systolic blood pressure 8th Week	Pedometer based walk	Early elderliness Late elderliness	123.992 125.830	.532 2.517	122.928 120.790	125.057 130.870
	Aerobic dance	Early elderliness Late elderliness	125.380 124.037	.751 1.265	123.877 121.504	126.884 126.570
	Control	Early elderliness Late elderliness	126.945 127.030	.629 1.212	125.686 124.604	128.205 129.457
Diastolic blood pressure 8th Week	Pedometer based walk	Early elderliness Late elderliness	73.573 72.760	.739 3.500	72.093 65.752	75.054 79.768
	Aerobic dance	Early elderliness Late elderliness	73.317 74.173	1.044 1.759	71.227 70.650	75.408 77.695
	Control	Early elderliness Late elderliness	74.631 76.355	.874 1.685	72.880 72.981	76.382 79.728

Table 4.36 shows the respective mean scores of Treatment and Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly in the Ibadan metropolis (Base line and 8th Week data) The marginal mean value for mean arterial blood pressure shows that pedometer based walk early elderliness group $\bar{x}$=89.735 had the lowest mean indicating that it had the greatest effects of treatment followed by aerobic dance early elderliness $\bar{x}$=90.453 andcontrol group early $\bar{x}$=91.650. Mean arterial blood pressure, late elderliness had a better mean score of $\bar{x}$=90.972, aerobic dance late elderliness $\bar{x}$=91.729 and control group late elderliness $\bar{x}$=93.538. Rate pressure product; pedometer based walk, early elderliness $\bar{x}$=19650.480 followed by aerobic dance early elderliness $\bar{x}$=19776.706 and control group early elderliness $\bar{x}$=20143.728. Aerobic dance late elderliness $\bar{x}$=19760.598 had better mean to pedometer based walk late elderliness $\bar{x}$=20038.435 and control group late $\bar{x}$=20193.497. Systolic blood pressure; pedometer based walk early elderliness $\bar{x}$=123.992 did better followed by aerobic dance early elderliness of $\bar{x}$=125.380 and control group early elderliness $\bar{x}$=126.945 and aerobic dance late elderliness group $\bar{x}$=124.037 had a better mean to pedometer based walk with mean value $\bar{x}$=125.830 and control group late elderliness $\bar{x}$=127.030. Diastolic blood pressure; aerobic dance early elderliness group $\bar{x}$=73.317 had better performance followed by pedometer based walk $\bar{x}$=73.573 and control group early elderliness $\bar{x}$=74.631 and pedometer based walk late elderliness $\bar{x}$=72.760 did better than aerobic dancelate elderliness $\bar{x}$=74.173 and control group late elderliness $\bar{x}$=76.355.

Ho7c: There will be no significant interaction effects of Treatment and Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly in the Ibadan metropolis (Base line and 12th Week data)

Table 4.9 showed:

i. No significant interaction effect of Treatment and Age on Mean arterial blood pressure ($F_{(2;64)}$= 0.734; p>0.05 partial η^2=0.025), Null hypotheses was accepted;

ii. No significant interaction effect of Treatment and Age on Rate pressure product ($F_{(2;64)}$= 0.002, p>0.05 partial η^2=0.001), Null hypotheses was accepted;

iii. No significant interaction effect of Treatment and Age on Systolic blood pressure ($F_{(2;64)}$=0.284, p>0.05 partial η^2=0.010), Null hypotheses was accepted;

iv. No significant interaction effect of Treatment and Age on Diastolic blood pressure ($F_{(2;64)}$=0.830; p>0.05 partial η^2=0.028), Null hypotheses was accepted.

Table 4.37: Expected Mean Scores on Treatment and Age effect on Cardio-vascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Mean arterial blood 12th Week	Pedometer based walk	Early elderliness Late elderliness	89.119 87.417	.597 2.825	87.924 81.760	90.314 93.074
	Aerobic dance	Early elderliness Late elderliness	89.454 90.068	.843 1.420	87.766 87.225	91.141 92.912
	Control	Early elderliness Late elderliness	91.354 93.275	.706 1.360	89.940 90.552	92.767 95.999
Rate pressure product 12th Week	Pedometer based walk	Early elderliness Late elderliness	19536.036 19384.274	85.274 403.653	19365.278 18575.974	19706.795 20192.575
	Aerobic dance	Early elderliness Late elderliness	19695.933 19542.357	120.403 202.890	19454.829 19136.076	19937.039 19948.638
	Control	Early elderliness Late elderliness	20095.496 19960.281	100.859 194.335	19893.530 19571.132	20297.463 20349.429
Systolic blood pressure 12th Week	Pedometer based walk	Early elderliness Late elderliness	123.308 121.506	.477 2.257	122.354 116.986	124.263 126.027
	Aerobic dance	Early elderliness Late elderliness	124.879 122.393	.673 1.135	123.531 120.121	126.228 124.665
	Control	Early elderliness Late elderliness	126.738 125.387	.564 1.087	125.608 123.211	127.867 127.563
Diastolic blood pressure 12th Week	Pedometer based walk	Early elderliness Late elderliness	73.251 69.820	.856 4.051	71.537 61.707	74.965 77.933
	Aerobic dance	Early Late	72.038 71.383	1.208 2.036	69.618 67.306	74.458 75.461
	Control	Early Late	74.297 76.079	1.012 1.951	72.270 72.173	76.324 79.984

Table 4.37 reveals the respective mean scores of Treatment and Age on Cardiovascular parameters (mean arterial blood pressure, rate pressure product and blood pressure) of Baptist elderly in the Ibadan metropolis (Base line and 12th Week data) The table shows that for mean arterial blood pressure, pedometer based walk early elderliness $\bar{x}$=89.119 elicited better effect of treatment on to it counter-part aerobic dance early elderliness $\bar{x}$=89.454 and control early elderliness $\bar{x}$=91.354 and pedometer based walk late elderliness had better mean $\bar{x}$=87.417 to aerobic dance group late elderliness with mean$\bar{x}$=90.068 and control group late elderliness group $\bar{x}$=93.275. Rate pressure product; pedometer based walk early elderliness $\bar{x}$=19536.036 had better effects followed by aerobic dance early elderliness $\bar{x}$=19695.933 and control early $\bar{x}$=20095.496 and pedometer based walk late elderliness with mean $\bar{x}$=19384.274 had better mean to aerobic dance late$\bar{x}$=19542.357and control group late elderliness $\bar{x}$=19960.281. Systolic blood pressure; pedometer based walk early elderliness group $\bar{x}$=123.308 did better from the mean score followed by aerobic dance early elderliness group $\bar{x}$=124.879 and control early elderliness $\bar{x}$=126.738 and pedometer based walk late had better mean $\bar{x}$=121.506 to aerobic dance late elderliness $\bar{x}$=122.393 and control late elderliness group $\bar{x}$=125.397. Diastolic blood pressure; pedometer based walk early elderliness group $\bar{x}$=73.251 did better, followed by aerobic dance early elderliness $\bar{x}$=72.038 and control early elderliness $\bar{x}$=74.297. Pedometer based walk late elderliness $\bar{x}$=69.820 had better mean to aerobic dance late elderliness $\bar{x}$=71.383 and control group late elderliness group $\bar{x}$=76.079.

Hypothesis eight: There will be no significant interaction effects of Treatment and age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of training of Baptist elderly women in the Ibadan metropolis.

Ho8a: There will be no significant interaction effect of Treatment and Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly in the Ibadan metropolis (Base line and 4th Week data)

Table 4.12 showed:

i. No significant interaction effect of Treatment and Age on fat mass ($F_{(2;64)}$= 0.982; p>0.05 partial η^2=0.033), Null hypotheses was accepted;
ii. No significant interaction effect of Treatment and Age on fat free mass ($F_{(2;64)}$=1.773; p>0.05 partial η^2=0.059), Null hypotheses was accepted;
iii. No significant interaction effect of Treatment and Age on body mass index ($F_{(2;64)}$=0.137; p>0.05 partial η^2=0.005), Null hypotheses was accepted;
iv. No significant interaction effect of Treatment and Age on waist hip ratio ($F_{(2;64)}$=0.836; p>0.05 partial η^2=0.029), Null hypotheses was accepted.

Table 4.38: Expected Mean Scores on Treatment and Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Fat mass 4th	Pedometer based walk	Early elderliness	30.080	.107	29.865	30.296
		Late elderliness	30.408	.540	29.328	31.489
	Aerobic dance	Early elderliness	29.373	.169	29.036	29.711
		Late elderliness	29.989	.207	29.575	30.403
	Control	Early elderliness	30.448	.151	30.144	30.751
		Late elderliness	30.517	.244	30.028	31.006
Fat free mass 4th	Pedometer based walk	Early elderliness	110.042	.969	108.102	111.982
		Late elderliness	108.778	4.865	99.036	118.519
	Aerobic dance	Early elderliness	112.403	1.521	109.359	115.448
		Late elderliness	107.625	1.864	103.892	111.358
	Control	Early elderliness	106.225	1.366	103.490	108.960
		Late elderliness	108.066	2.201	103.658	112.474
Body mass index 4th	Pedometer based walk	Early elderliness	27.638	.064	27.510	27.767
		Late elderliness	27.874	.321	27.231	28.518
	Aerobic dance	Early elderliness	27.276	.100	27.075	27.477
		Late elderliness	27.420	.123	27.174	27.667
	Control	Early elderliness	27.865	.090	27.684	28.046
		Late elderliness	28.128	.145	27.837	28.419
4th Waist hip ratio	Pedometer based walk	Early elderliness	.802	.001	.800	.805
		Late elderliness	.805	.006	.793	.817
	Aerobic dance	Early elderliness	.802	.002	.798	.806
		Late elderliness	.797	.002	.793	.802
	Control	Early	.803	.002	.799	.806
		Late	.802	.003	.797	.807

Table 4.38 reveals the respective mean scores of Treatment and Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)The marginal mean score from the above table shows that for fat mass $\bar{x}$=29.373, aerobic dance early elderliness had the greatest effects of treatment followed by pedometer based early $\bar{x}$=30.080 and control group early $\bar{x}$=30.448 and aerobic dance late elderliness $\bar{x}$=29.989 had better mean score to pedometer based walk late $\bar{x}$=30.408. Fat free mass; aerobic dance early elderliness $\bar{x}$=112.403, pedometer based walk early elderliness $\bar{x}$=110.042 and control group early $\bar{x}$=106.225. Pedometer based walk late elderliness had the highest mean score $\bar{x}$=108.778 followed by control group late elderliness $\bar{x}$=108.066 and aerobic dance late elderliness $\bar{x}$=107.625. Body mass index; aerobic dance early elderliness $\bar{x}$=27.276 had better mean to pedometer based walk early elderliness x=27.638 and control early elderliness $\bar{x}$=27.865. Aerobic dance late elderliness $\bar{x}$=27.420 had better mean followed by pedometer based walk late elderliness $\bar{x}$=27.874 and control group late elderliness $\bar{x}$=108.066. Waist to hip ratio; aerobic dance early elderliness and pedometer early elderliness had equal score of $\bar{x}$=.802, followed by control group early elderliness group $\bar{x}$=.803. Aerobic dance late elderliness group had better mean score to it counter-part late pedometer based walk group $\bar{x}$=.805 and control group late elderliness $\bar{x}$=.802.

Ho8b: There will be no significant interaction effect of Treatment and Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly in the Ibadan metropolis (Base line and 8th Week data)

Table 4.14 revealed that:

i. No significant interaction effect of Treatment and Age on fat mass ($F_{(2;64)}$= 0.979; p>0.05 partial η^2=0.033), Null hypotheses was accepted;
ii. No significant interaction effect of Treatment and Age on fat free mass ($F_{(2;64)}$=1.948; p>0.05 partial η^2=0.064), Null hypotheses was accepted;
iii. No significant interaction effect of Treatment and Age on body mass index ($F_{(2;64)}$=0.523; p>0.05 partial η^2=0.018), Null hypotheses was accepted;
iv. No significant interaction effect of Treatment and Age on waist hip ratio ($F_{(2;64)}$=0.645; p>0.0 5 partial η^2=0.022), Null hypotheses was accepted

Table 4.39: Expected Mean Scores on Treatment and Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Fat mass 8th	Pedometer based walk	Early elderliness Late elderliness	29.664 30.103	.138 .695	29.387 28.712	29.941 31.494
	Aerobic dance	Early elderliness Late elderliness	28.762 29.325	.217 .266	28.327 28.792	29.197 29.858
	Control	Early elderliness Late elderliness	30.555 30.421	.195 .314	30.165 29.792	30.946 31.050
Fat free mass 8th	Pedometer based walk	Early elderliness Late elderliness	109.639 108.076	.993 4.985	107.651 98.093	111.626 118.060
	Aerobic dance	Early elderliness Late elderliness	112.192 106.887	1.558 1.910	109.072 103.061	115.313 110.712
	Control	Early elderliness Late elderliness	106.012 107.819	1.400 2.256	103.209 103.302	108.815 112.337
Body mass index 8th	Pedometer based walk	Early elderliness Late elderliness	27.312 27.927	.089 .447	27.134 27.033	27.490 28.821
	Aerobic dance	Early elderliness Late elderliness	26.833 26.969	.140 .171	26.554 26.626	27.113 27.311
	Control	Early elderliness Late elderliness	27.926 28.013	.125 .202	27.674 27.608	28.177 28.418
8th Waist hip ratio	Pedometer based walk	Early elderliness Late elderliness	.799 .804	.002 .009	.796 .785	.803 .823
	Aerobic dance	Early elderliness Late	.801 .794	.003 .004	.795 .787	.806 .802
	Control	Early Late	.801 .800	.003 .004	.796 .792	.806 .809

Table 4.39 shows the respective mean scores of Treatment and Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly in the Ibadan metropolis (Base line and 8th Week data) It was observed from the marginal mean score for fat mass that aerobic dance early elderliness group had the lowest mean score $\bar{x}$=108.066, indicating a better performance to pedometer based walk early elderliness $\bar{x}$=29.664 and control early elderliness $\bar{x}$=30.555. Aerobic dance late elderliness $\bar{x}$=29.325, pedometer based walk late elderliness $\bar{x}$=30.103 and control group late elderliness $\bar{x}$=30.555. Fat free mass; aerobic dance early elderliness $\bar{x}$=112.192, pedometer based early elderliness $\bar{x}$=109.639 and control early elderliness $\bar{x}$=106.012. Pedometer based walk late elderliness group had better mean $\bar{x}$=108.076, control late elderliness$\bar{x}$=107.819and aerobic dance late elderliness $\bar{x}$=106.887. Body mass index; aerobic dance early elderliness $\bar{x}$=26.833 had greatest effects of treatment on body mass index followed by pedometer based walk early elderliness $\bar{x}$=27.312 and control group early elderliness $\bar{x}$=27.926.Aerobic dance late had better mean $\bar{x}$=26.969 to pedometer based walk late $\bar{x}$=27.927 and control late elderliness $\bar{x}$=28.013. Waist to hip ratio; pedometer based walk early elderliness had better mean $\bar{x}$=.799, and aerobic dance and control early had equal mean of $\bar{x}$=.801. Aerobic dance late elderliness had better mean $\bar{x}$=.794 follow by control group late elderliness $\bar{x}$=.800 and pedometer based late elderliness $\bar{x}$=.804.

Ho8c: There will be no significant interaction effect of Treatment and Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly in the Ibadan metropolis (Base line and 12th Week data).

Table 4.16 revealed that:

i. No significant interaction effect of Treatment and Age on fat mass ($F_{(2;64)}$= 0.754; p>0.05 partial η^2=0.026), Null hypotheses was accepted;
ii. No significant interaction effect of Treatment and Age on fat free mass ($F_{(2;64)}$=1.451; p>0.05 partial η^2=0.048), Null hypotheses was accepted;
iii. No significant interaction effect of Treatment and Age on body mass index ($F_{(2;64)}$=0.961; p>0.05 partial η^2=0.033), Null hypotheses was accepted and
iv. No significant interaction effect of Treatment and Age on waist hip ratio ($F2_{(2;64)}$=0.580; p>0.0 5 partial η^2=0.020), Null hypotheses was accepted.

Table 4.40: Expected Mean Scores on Treatment and Age effect on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Fat mass 12th	Pedometer based walk	Early elderliness Late elderliness	29.535 29.961	.154 .775	29.226 28.409	29.844 31.512
	Aerobic dance	Early elderliness Late elderliness	28.616 29.080	.242 .297	28.131 28.485	29.101 29.674
	Control	Early elderliness Late elderliness	30.668 30.459	.218 .351	30.232 29.757	31.103 31.161
Fat free mass 12th	Pedometer based walk	Early elderliness Late elderliness	109.562 109.187	1.031 5.177	107.498 98.821	111.626 119.553
	Aerobic dance	Early elderliness Late elderliness	111.345 106.542	1.618 1.984	108.104 102.569	114.585 110.514
	Control	Early elderliness Late elderliness	106.405 107.879	1.454 2.342	103.494 103.189	109.315 112.570
Body mass index 12th	Pedometer based walk	Early elderliness Late elderliness	27.239 27.975	.103 .517	27.033 26.941	27.445 29.010
	Aerobic dance	Early elderliness Late elderliness	26.729 26.692	.161 .198	26.405 26.295	27.052 27.088
	Control	Early elderliness Late elderliness	27.963 27.887	.145 .234	27.673 27.419	28.253 28.355
12th Waist hip ratio	Pedometer based walk	Early elderliness Late elderliness	.797 .804	.002 .010	.793 .783	.801 .825
	Aerobic dance	Early elderliness Late elderliness	.802 .796	.003 .004	.795 .788	.808 .804
	Control	Early Late	.804 .800	.003 .005	.798 .791	.809 .810

Table 4.40 revealed the respective mean scores of Treatment and Age on Body composition (fat mass, fat free mass, body mass index and waist hip ratio) of Baptist elderly in the Ibadan metropolis (Base line and 12th Week data) The table shows that for fat mass aerobic dance early elderliness $\bar{x}$=28.616 had the greater effects of treatment followed by pedometer based early elderliness $\bar{x}$=29.535 and control $\bar{x}$=30.555. Aerobic dance late elderliness had best mean score $\bar{x}$=29.080 followed by pedometer $\bar{x}$=29.961 and control group late elderliness $\bar{x}$=30.459. Fat free; aerobic dance early elderliness $\bar{x}$=111.345 had the greatest effect of treatment followed by pedometer based walking early elderliness $\bar{x}$=109.562 and control $\bar{x}$=106.405. Pedometer based late elderliness with mean score $\bar{x}$=109.187 did better followed by control group late elderliness $\bar{x}$=107.879 and aerobic dance late elderliness $\bar{x}$=106.542. Body mass index; aerobic dance early elderliness group had better mean $\bar{x}$=26.729 followed by pedometer early $\bar{x}$=27.239 and control $\bar{x}$=27.963. Aerobic dance late elderliness with mean $\bar{x}$=26.692 did better than control group late $\bar{x}$=27.887 and pedometer based late elderliness $\bar{x}$=27.975. Waist to hip ratio; pedometer based early had better mean of $\bar{x}$=.797 followed by aerobic dance early $\bar{x}$=.802 and control group $\bar{x}$=.804. Aerobic dance late had better mean score $\bar{x}$=.796 followed by control $\bar{x}$=.800 and pedometer late elderliness $\bar{x}$=.804.

Hypothesis nine: There will be no significant interaction effects of Treatment and age on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test)of Baptist elderly in the Ibadan metropolis

Ho9a: No significant interaction effect of Treatment and Age on Functional ability (30 Second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis (Base line and 4th Week data)

Table 4.18 revealed that:

i. No significant interaction effect of Treatment and Age on chair sit and reach test ($F_{(2;64)}$= 0.138; p>0.05 partiaal η^2=0.005), Null hypotheses was accepted;
ii. No significant interaction effect of Treatment and Age on 30 seconds chair stand test ($F_{(2;64)}$= 1.583; p>0.05 partial η^2=0.052), Null hypotheses was accepted and
iii. No significant interaction effect of Treatment and Age on body mass arm curl test ($F_{(2;64)}$=0.271; p>0.05 partial η^2=0.009), Null hypotheses was accepted.

Table 4.41: Expected Mean Scores on Treatment and Age effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 4th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Chair sit and reach test 4th week	Pedometer based walk	Early elderliness	2.384	.142	2.099	2.669
		Late elderliness	1.503	.758	-1.372E-02	3.020
	Aerobic dance	Early elderliness	3.528	.236	3.055	4.001
		Late elderliness	2.820	.283	2.253	3.387
	Control	Early elderliness	2.251	.200	1.850	2.652
		Late elderliness	1.754	.358	1.037	2.471
30 seconds chair stand test 4th week	Pedometer based walk	Early elderliness	13.840	.143	13.553	14.127
		Late elderliness	13.602	.764	12.072	15.131
	Aerobic dance	Early elderliness	15.801	.238	15.325	16.278
		Late elderliness	14.845	.285	14.273	15.416
	Control	Early elderliness	13.612	.202	13.208	14.016
		Late	13.588	.361	12.865	14.311
Arm curl test 4th week	Pedometer based walk	Early	22.108	.203	21.701	22.515
		Late	20.663	1.084	18.493	22.832
	Aerobic dance	Early	23.786	.338	23.110	24.462
		Late	22.968	.405	22.157	23.779
	Control	Early	21.368	.287	20.795	21.942
		Late	20.809	.513	19.783	21.835

Table 4.41 shows the respective mean scores of Treatment and Age on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis (Base line and 4th Week data) From the estimated marginal mean score for chair sit and reach test the participants in the aerobic dance early elderliness $\bar{x}$=3.528 had the highest means score indicating that it elicited the greatest effects on the participants followed by pedometer based early $\bar{x}$=2.384 and control $\bar{x}$=2.251. Aerobic dance late elderliness did better $\bar{x}$=2.820 than control group late elderliness $\bar{x}$=1.754 and pedometer based late elderliness $\bar{x}$=1.503. Chair sit and stand test; aerobic dance early elderliness $\bar{x}$=15.801 had the greatest mean score indicating it had the greatest effects of treatment followed bypedometer based walking early elderliness $\bar{x}$=13.840 and control group early elderliness $\bar{x}$=13.612. Aerobic dance late had better mean $\bar{x}$=14.845, pedometer late $\bar{x}$=13.602 and control late $\bar{x}$=12.588. Body arm curl; aerobic dance early elderliness $\bar{x}$=23.786 had the greatest effects of treatment followed by pedometer based walk early elderliness $\bar{x}$=22.108 and control group early elderliness $\bar{x}$=21.368. Aerobic dance late did better with a mean score $\bar{x}$=22.968 and pedometer based walk late elderliness$\bar{x}$=20.663 and control $\bar{x}$=20.809**.**

Ho9b: No significant interaction effect of Treatment and Age on Functional ability (30 Second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis (Base line and 8th Week data).

Table 4.21 revealed that:

i. No significant interaction effect of Treatment and Age on chair sit and reach test ($F_{(2;64)}$= 0.418; p>0.05 partial η^2=0.014), Null hypotheses was accepted;

ii. No significant interaction effect of Treatment and Age on 30 seconds chair stand test ($F_{(2;64)}$= 1.362; p>0.05 partial η^2=0.045), Null hypotheses was accepted and

iii. No significant interaction effect of Treatment and Age on arm curl test ($F_{(2;64)}$= 0.218; p>0.05 partial η^2=0.007), Null hypotheses was accepted.

Table 4.42: Expected Mean Scores on Treatment and Age effect on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 8th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Chair sit and reach test 8th week	Pedometer based walk	Early elderliness	3.113	.197	2.720	3.507
		Late elderliness	1.772	1.047	-.324	3.868
	Aerobic dance	Early elderliness	4.590	.326	3.937	5.244
		Late elderliness	3.720	.391	2.937	4.503
	Control	Early elderliness	2.652	.277	2.098	3.206
		Late elderliness	2.264	.495	1.272	3.255
30 seconds chair stand test 8th week	Pedometer based walk	Early elderliness	15.125	.235	14.655	15.595
		Late elderliness	15.741	1.251	13.237	18.246
	Aerobic dance	Early elderliness	18.522	.390	17.741	19.302
		Late elderliness	17.142	.468	16.206	18.078
	Control	Early elderliness	13.697	.331	13.035	14.359
		Late elderliness	13.391	.592	12.206	14.575
Arm curl test 8th week	Pedometer based walk	Early elderliness	24.069	.349	23.371	24.767
		Late elderliness	22.629	1.858	18.909	26.349
	Aerobic dance	Early	27.252	.579	26.093	28.411
		Late	25.289	.694	23.899	26.679
	Control	Early	22.269	.491	21.286	23.252
		Late	21.159	.879	19.400	22.918

Table 4.42 reveals the respective mean scores of Treatment and Age on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis (Base line and 8th Week data) The table shows that for chair sit and reach aerobic dance early elderliness $\bar{x}$=4.590 had the greatest effects of treatment followed by pedometer based walk early elderliness $\bar{x}$=3.113 and control group early elderliness $\bar{x}$=2.652.Aerobic dance late had better effect of treatment $\bar{x}$=3.720, control late $\bar{x}$=2.264 and pedometer based late elderliness $\bar{x}$=1.772. Chair sit and stand; aerobic dance group early elderliness $\bar{x}$=18.522 had the greatest effects of treatment followed by pedometer based early elderliness $\bar{x}$=15.125 and control $\bar{x}$=13.697. Aerobic dance late had better mean score $\bar{x}$=17.142, pedometer late $\bar{x}$=15.741 and control late $\bar{x}$=13.391. Arm curl; aerobic dance early $\bar{x}$=27.252 had the highest mean score indicating that it elicited a greater effect on the participants arm curl than the others, pedometer early $\bar{x}$=24.069, control early $\bar{x}$=22.269. Aerobic dance late elderliness $\bar{x}$=25.289, pedometer late elderliness $\bar{x}$=22.629 and control group late elderliness $\bar{x}$=21.159.

Ho9c: No significant interaction effect of Treatment and Age on Functional ability (30 Second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis (Base line and 12th Week data)

Table 4.23 revealed that:

i. No significant interaction effect of Treatment and Age on chair sit and reach test ($F_{(2;64)}$= 1.361; p>0.05 partial η^2=0.045), Null hypotheses was accepted;
ii. A significant interaction effect of Treatment was found and Age on 30 seconds chair stand test ($F_{(2;64)}$= 3.922; p<0.05 partial η^2=0.119), Null hypotheses was rejected and
iii. No significant interaction effect of Treatment and Age on arm curl test ($F_{(2;64)}$= 0.299; p>0.05 paartial η^2=0.010), Null hypotheses was accepted.

Table 4.43: Expected Mean Scores on Treatment and Age effect on Functional ability (30 Second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly women in the Ibadan metropolis (Base line and 12th Week data)

Dependent Variable	Treatment	Age	Mean	Std. Error	95% Confidence Interval	
					Low Bound	Upper Bound
Chair sit and reach test 12th week	Pedometer based walk	Early elderliness Late elderliness	3.775 4.242	.193 1.026	3.389 2.187	4.160 6.296
	Aerobic dance	Early elderliness Late elderliness	5.473 4.223	.320 .383	4.833 3.456	6.114 4.991
	Control	Early elderliness Late elderliness	2.861 2.415	.271 .485	2.318 1.444	3.404 3.387
30 seconds chair stand test 12th week	Pedometer based walk	Early elderliness Late elderliness	16.400 17.002	.361 1.926	15.676 13.147	17.123 20.857
	Aerobic dance	Early elderliness Late elderliness	22.225 19.210	.600 .720	21.024 17.770	23.426 20.650
	Control	Early elderliness Late elderliness	13.899 14.441	.509 .911	12.880 12.619	14.918 16.264
Arm curl test 12th week	Pedometer based walk	Early elderly Late elderly	25.962 23.046	.492 2.622	24.977 17.798	26.946 28.295
	Aerobic dance	Early elderly Late elderly	30.289 27.789	.817 .980	28.654 25.828	31.925 29.750
	Control	Early elderly Late elderly	22.946 21.961	.693 1.240	21.559 19.209	24.334 24.173

Table 4.43 reveals the respective mean scores of Treatment and Age on Functional ability (30 second chair stand test, chair sit and reach test, arm curl test) of Baptist elderly in the Ibadan metropolis (Base line and 12th Week data) The marginal mean scores for chair sit and reach shows that aerobic dance early elderliness$\bar{x}$=5.473 had the highest mean score indicating that it had the greatest effect of treatment followed by pedometer based walk early elderliness$\bar{x}$=3.775 and control group early elderliness group $\bar{x}$=2.861. Pedometer based late had better mean $\bar{x}$=4.242, aerobic dance late $\bar{x}$=4.223 and control late$\bar{x}$=2.415. Chair sit and stand; aerobic dance early elderliness$\bar{x}$=22.225 had the greatest effects of treatment followed by pedometer based early elderliness$\bar{x}$=16.400 and control group early elderliness$\bar{x}$=13.899. Aerobic dance late had better mean $\bar{x}$=19.210, pedometer based late $\bar{x}$=17.002 and control late $\bar{x}$=14.441. Arm curl; aerobic dance early elderliness$\bar{x}$=30.289 group had the greatest effect followed by pedometer based early elderliness$\bar{x}$=25.962 and control group early elderliness$\bar{x}$=22.946. Aerobic dance late had mean $\bar{x}$=27.789, pedometer late $\bar{x}$=23.046 and control group late elderliness$\bar{x}$=21.961.

4.4 Discussion of Findings

The purpose of this study was to examine the effects of aerobic dance and pedometer based walk on the cardiovascular parameters, body composition, and functional ability of Baptist elderly women in the Ibadan metropolis.

The early elderly participants who took part in the study were more than the late elderly participants. Majority of the participants' height ranges between 1.4 and 1.6 meters with a weight range value of 55 kilograms to 69 kilograms. Also, more of the participants were overweight (22 to29.9kg/m2) at the entry level.

Findings from this work show that aerobic dance exercise had an effect on the functional ability of the participants. The post-mean (12thweek) values of the three variables studied under functional ability increased significantly from their entry level. There was 60% significant rise in Chair sit and reach test of the participants which measured the lower back and hamstring muscles. There was 35% improvement in the 30 seconds chair sit and stand test which measured leg strength, core and back muscle and 26% in the arm curl test

which measured the muscles of the upper and lower arms. This corroborates the findings of Iva, Kterina, Petr, Bozena, Dana, Ladislav and Andel (2010) who found chair stand test and chair sit and reach to be significant in their work. This implies that aerobic dance helped to improve the independent day-to-day living of the participants in this study, which is a crucial factor in determining the individual's quality of life.

Also, pedometer based walk had significant effects on the functional ability of the studied participants, there was a 46% increase in the chair sit and reach test which is a measure of lower back and hamstring muscles of the participants, 21% for 30seconds chair sit and stand which measured leg strength, core and back muscle and 18% in the arm curl test which measured the muscles of the upper and lower arm. The implication of this is that pedometer based walk helped to improve lower back and hamstring muscles, leg strength, core and back muscle, muscles of the upper and lower arm of the participants.

Effects of Aerobic Dance and Pedometer-Based Walk on Cardiovascular Parameters of Baptist Elderly Women

It was revealed from the analyses of the study that aerobic dance and pedometer based walk had no significant effects on the cardiovascular parameters; diastolic blood pressure, systolic blood pressure, mean arterial blood pressure and rate pressure product of the participants at the 4th week of training. The treatment was not significant at the 4th week of training and this might be because the training intensity at the 4th week was low. For any training to have a significant effects, three things should be considered which are; intensity, duration, and frequency. The intensity of the training was low at the beginning of the training programme and it was increased gradually from the first week through the 12 weeks of training. However, it was deduced from the results that pedometer based walk group had the lowest mean score, showing that it had better effects than aerobic dance group at this stage. This implies that pedometer based walking, although at the 4th week, had no significant effects but still had a far-reaching effects on systolic blood pressure, diastolic blood pressure, mean arterial blood pressure and rate pressure product of the participants.

At the 8th week of training, rate pressure product and systolic blood pressure were significant. There was 2% decrease in the systolic blood pressure of the participants at this stage, showing a gradual improvement from the 4th through to the 8th week of training. This is in line with the findings of Kelley and Kelley (2000). They found 2-4% reduction in the systolic blood pressure of their participants in the 6-30 weeks of training. Meanwhile, there was no substantial impact of treatment on mean arterial blood pressure and diastolic blood pressure, but there was a gradual improvement from the 4th week to the 8th week of training as observed from their mean score values. No matter how little the improvement found in these variables, it has a valuable effect in reducing the risk of cardiovascular diseases.

However, at the 12th week of training, all the cardiovascular variables were significant; Diastolic blood pressure, Systolic blood pressure, Mean arterial blood pressure and rate pressure product. This result shows a 3% decrease in the variables from the baseline measurement to 12th week, showing a gradual improvement from the baseline to the 8th week and up to the 12th week. The finding in this study supported the observations reported by Augustine, Memoona,Hasnain and Sinacore, (2007) walking had a positive effect on systolic blood pressure and diastolic blood pressure of their study participants. Further support was made by Yoshikazui, Yoko, Sawako, Miwako and Toshikazu, (2008) they observed significant effects of treatment on systolic blood pressure in a study carried out among the aged. Also, Tudor- Locke (2010) concluded in his work that increasing walking steps can improve body mass index and cardiovascular health outcomes of an individual. Corroborating this finding also was the study of Jong, Masahi, Masaki, Noriaki, Harumi, Hyun, Katshuhiko and Yoshio, (2014); they concluded from their findings that 12weeks walking programme comprising low volume physical activity confers cardiovascular related health benefit on older adult. They detected a significant decrease in the systolic blood pressure of their participants at the 12 weeks in relation to the baseline value.

Further findings from Jaime, Alexander, Katerine, Deiber, Monica, Mario and Daghovar, (2016), reported that dance and nutrition education had significant effects on mean arterial blood pressure, systolic blood pressure and diastolic blood pressure of hemodynamic and

autonomic status in adults with metabolic syndrome. Furthermore, blood pressure that is, diastolic blood pressure and systolic blood pressure were significant in the effect of an aerobic dance and diet programme on cardiovascular fitness, body composition and weight loss in women (Jerrold, Jennifer, Lee, Kelly, Tien-Ning, Marshall, Gurinder, Shashi, Chinna, Dhanarai, Yami, Cristina, Katrina, Jason, Courtney, Ingrid, Michael, Pratima & Jackie, 2008).

This study shows a substantial impact of treatment on the cardiovascular variables of the participants. This implies that the treatment improved by lowering the amount of pressure on the arteries during contraction of the heart muscle, which is the systolic blood pressure. It also lowers the blood pressure when the heartbeat. The treatment also had a significant impact on the mean arterial blood pressure, which is the impact of the cardiac output and the amount of resistance provided by the blood vessels. Treatment also had effects on the rate pressure product which is the measurement of the amount of stress placed on the cardiac muscle based on the number of times it must beat per minute and the arterial blood pressure it must pump against. It shows the heart's energy demand, which is an excellent indicator of the heart's energy use.

It was deduced from the mean values of the analyses that pedometer based walk not aerobic dance had the greatest effects on the participants mean arterial blood pressure, rate pressure product, diastolic blood pressure and systolic blood pressure. Research by Harvard medical school and American College of Cardiology found from their multiple studies that walking reduces risk of a cardiovascular event by 31%. They also found out that women who walked at minimum twice a week for at least 40 minutes had up to 25% lower risk of heart failure than the inactive ones. Also, the motivating effect that comes with the use of pedometer encouraged the participants in the group to walk even on days that were not training days, increasing their physical activities level.

Also, it was observed from the study that the effects of treatment gradually increased compared to the baseline. For mean arterial blood pressure, there was 1% decrease from the baseline to the 4th week and 1.1% through the 4th week until the 8th week and 1.1% for the 8th to the 12th week.For rate pressure product, there was 1.3% decrease from

baseline to 4th week, 1.4% from 4th week to 8th week and 0.2% from 8th week to 12th week. Systolic blood pressure had 2% decrease from baseline to 4th week, 1% decrease from 4th week to 8th week and 1% from 8th week to 12th week. This result shows that treatment had a gradual increase or improvement from baseline to 8th week of training, but from the 8th to the 12th week the effects plateau. In summary, aerobic dance and pedometer-based walk have significant main effect on the cardiovascular parameters of the elderly women studied and these findings were supported by other researches cited.

Effects of Aerobic Dance and Pedometer-Based Walk on Body Composition of Baptist Elderly Women

This study also discovered there was a notable main outcome of intervention on the participants' fat mass and body mass index throughout the 12-week training program.The participants experienced a gradual decrease in their fat mass and body mass index throughout the 12weeks. This result tallies with the findings of Evrim, Fatma, and Oktay, (2011) that aerobic dance exercise at a moderate intensity and duration improves physical fitness and decreases body fat percentage of sedentary women. Further support was the work of Fatma, (2011) who found significant differences in middle-aged sedentary obese women weight, body mass index and fat percentage. Consequently, Marjan, Abdossaleh and Sayeed, (2016), observed in their study that zumba dance, aerobic dance, had a significant effect on decreasing women body fat percentage and body mass index.

Also in the work of Yasemin, Secil and Zekeriya, (2014), pedometer based walks resulted in significant decrease in weight and body mass index of obese women. Likewise, Tudor, (2010), maintained that step count (pedometer based walk) improved body mass index and cardiovascular outcomes. This study found 3% decrease in the fat mass and body mass index of the participants throughout the 12weeks of training. For body fat mass, the women experienced 1% decrease from the baseline up till 4th week, 2% through the 4th week up to the 8th week and 0.3% for the 8th week to the 12th week. Body mass index, there was 1% decrease from the baseline to the 4th week, 1.4% from the 4th to the 8th week and 0.4% from the 8th to the 12th week. It was also observed that the effects of

treatment increase gradually from the baseline to the 4th and 8th weeks but the effects decreases from the 8th week to the 12th week.

Studies (Ferraro, Muehlenkamp, Painter, Wasson, Hager, & Hoverson, 2008) revealed that older people may have nearly one-third extra fat compared to when they were younger. This increase in body fat during aging is caused by reduced physical activity, an increase in inadequate diet, and a decrease in the ability of the body to burn fat. Physically active elderly has statistically significant smaller amount of body fat to their counter-part who are inactive. The result that physical activity like pedometer based walking and aerobic dance had significant effects in reducing the body fat and body mass index of the elderly women, which invariably helps in decreasing the risk of obesity, type 2 diabetes, heart and blood vessel diseases. Furthermore, from the result it was noted that aerobic dance exercise had the lowest mean score value, showing that it had a better effect than pedometer based walk on the participants' fat mass and body mass index. This could be traceable to a higher intensity level of aerobic dance exercise with a corresponding higher level of calories burnt. Although the intensity level of the pedometer based walk increased as the training days progressed.

This study found no significant main effect of treatment on waist to hip ratio and fat-free mass of the participants throughout the 12 weeks of training. This result supports the findings of Goran and Poehlman, (1992), they observed a gained 0.85(+)(-) 1.01kg of fat-free mass over 8weeks of training in their elderly subjects but they explained that the increase was in total body water not on the mass of mineral or protein in the body. Also, in some selected intervention studies, it was concluded that aerobic exercise reduces fat mass by 0.4-3.2kg in women from 55years and over but there were no effects on fat-free mass (Toth, Beckett & Poehlman, 1999).

Although treatments were not significant, from the analyses, there was a little effect of treatment on FFM and W/H; it was deduced from the mean score of the participants that there was a minor improvement from the 4th to the 12th week of training. Waist to hip ratio determines how much of fat is stored in the waist, hips and buttocks. It tells if an individual is overweight and prone to health risk. The mean score value from this work

revealed that aerobic dance had a better effect than pedometer based walk on the participants' FFM and W/H. In summary aerobic dance and pedometer-based walk had a significant main effect on the body composition of the baptist elderly women studied which can be generalise to the general population.

Effects of Aerobic Dance and Pedometer-based Walk on Functional Ability of Baptist Elderly Women

The study also discovered that treatment was effective on all of the functional abilities investigated in this work.Chair sit and reach which measures lower back and hamstring muscles, 30secs chair sit and stand test measured leg strength, core and back muscle and body arm curl which measured muscles of the upper and lower arm of the participants in this study gradually increased from the baseline though the 4th week to the 12th week of training. This study is in line with an earlier study of Iva, Katerina, Hana, Petr, Bozena, Dana, Ladislav and Ross, (2010), where traditional dance significantly improved chair sit and stand and chair sit and reach test of institutionalized older adult. Further support was the work of Styliani, Vasiliki, Olympia and Vasiliki,2019; Harran, Khawla and Wafa,2015, they reported that aerobic exercise had significant effects on the functional ability of the elderly by improving chair sit and stand, chair sit and reach and arm curl.

Also supporting these findings is the work of Angela, Mike, Michael, Wai, Lancaster and Cindy, (2004) where pedometer based walk increase the lower body strength of the elderly through chair sit and reach and chair sit and stand test. Also, an increase was observed in the upper body strength, which was brought about by body arm curl. Furthermore, in a randomized controlled trial, walking was found to induce gains in cardio-respiratory fitness in a larger clinical relevance while dancing to lower body muscle power. They also came up with these finding that engaging in either dancing or walking increase level of physical activity. Also, dancing and walking are both effective in improving cardiovascular and fall risk associated factors in healthy older women. (Josianne, Juliano, Thiago, Rodrigo, Francesco, Gabriela, Joaovargas, Rafael, Rochelle, Ronei, Mauricio & Alvaro, 2018)

Aerobic dance and pedometer based walk from this work improved the functional ability of the elderly women and this lead to a more or better independent life for the elderly women. The treatment helped in improving the lower body strength of the participants. Their legs are strengthened which will be used in stairs climbing and walking, this will also help to reduce risk of fall. The intervention further helped to increase lower body strength, it helps increase lower back and hamstring flexibility, which will help in lower back pain. Upper body strength was also increased, which will be needed for day-to-day activities, aid in lifting objects, carrying of grandchildren, and many other things that help in daily living activity. Further, the analyses show that aerobic dance had the greatest effect on the functional ability of the participants than on a pedometer- based walk.

This study shows, 26% increase from the baseline measurement to the 4th week, 25% from 4th week to the 8th and 17% from the 8th to the 12th week of training for the participants' chair sit and reach test. There was a 52% increase from the baseline to the 12th week of training. Chair sit and stand the test of the participants increased from the baseline to the 4th week by 8%, from 4th to 8th week by 10% and 12% from 8th to 12week of training. There was a 27% increase from baseline to the 12th week of training. For the body arm curl of the participants, there was a 7% increase from the baseline reaching the 4th week, 9% through the 4th up to the 8th week and 7% from the 8th till the 12th week of training. There was 21% increase from the base-line to the 12th week of training. It was observed in this study that treatment was significant throughout the 12 weeks training but its effect gradually decrease for chair sit and reach and arm curl test but there was a progressive increase in the effect of treatment on chair sit and stand test.

Effects of Age on Cardiovascular Parameters of Baptist Elderly Women

Finding from this work reviews that there was no notable major effects of age(early elderliness and late elderliness) on mean arterial blood pressure, rate pressure product, systolic blood pressure and diastolic blood pressure throughout the 12 weeks of training. This might be because at this stage, there were no major differences in the stages of the elderly studied. Women in this stage of early elderlinesss in this study were from 55years old and they were already experiencing some things in similar with the women in the late

elderliness stage, such as menopause, physiological and functional decline, hence, there was no significant difference within these elderliness stages studied. Future studies could look into other age bracket not included in this study. However, it was discovered from the mean scores value that early elderliness did better than their late elderliness counter-part, this study supported the findings of Jayaram, and Srikanth, (2013), they assess the effect of age, gender and body mass index on different cardiovascular parameters on male and female individuals between the ages of 20-50 years. The participants were segregated into three groups based on age and their results shows a significant increase in BMI, SBP, DBP and CO as the age advances in both the male and female participants, indicating that the participants in the younger group did better than the older group.

Effect of Age on Body Composition of Baptist Elderly Women

The result from the analyses of this work show no significant main effects of age(early elderliness and late elderliness) on body composition (BMI, FFM, FM, W/H) of the participants. However, it can be deduced from the mean score value of the participants that the early elderliness did better than the participants in the late elderliness group for all the variables except for waist to hip ratio, where participants in the late elderliness outperformed the early elderliness. This corroborate the findings of Lopes, Costa, Soares, Kaiser, Rosa, Santos, Silva, Dias, Lopes, Zanatta1, Barros, Silva, and Ammar, (2021), in their research work relation between Age and Body Composition of Institutionalizined Fragiles Elderly Women, in which they concluded that with age advancement there is a reduction in body composition parameters of the elderly. They also found a more significant result from the youngest group (elderly women) to the older elderly group in their study. Also,Woolf, Reese, Mason, Beaird, Tudor-locke and Vaughan (2008), examined RMR across the life cycle of women, RMR adjusted for FFM was significantly higher in young (20-30years) and middle aged (40-50years) women compared with the older women.

Effect of Age on Functional Ability of Baptist Elderly Women

The findings of this work on significant main effects of age on functional ability (Chair sit and reach, Arm curl, Chair sit and stand body composition) of elderly women in Ibadan

metropolis were not significant. However, it was observed from the mean score that participants in the early elderliness stage did better than the late elderliness group. Also, a progressive improvement was observed in the mean score value of the participants from the baseline to the 12th week of training. More research work is needed in this area because there are dearth of information available.

Interaction Effect of Treatment and Age on Cardiovascular Parameters of Baptist Elderly Women

The interaction effect of treatment and age (early elderliness and late elderliness) on cardiovascular parameters (HR, MABP, RPP) of the women was not significant. However, it could be observed from the mean score a progressive increase from the baseline to the 12th week of training.

Interaction Effect of Treatment and Age On Body Composition of Baptist Elderly Women

The interaction effect of treatment and age (early elderliness and late elderliness) on body composition (Body Mass Index, fat-free mass, fat mass, waist-hip ratio) of the participants was not significant. However, it could be observed from the mean score a progressive increase from the baseline to the 12th week of training.

Interaction Effect of Treatment and Age on Functional Ability of Baptist Elderly Women

The interaction effect of treatment and age (early elderliness and late elderliness) on functional ability (Chair sit and reach, Arm curl) of the participants was not significant but it was significant on chair sit and stand at the twelveth week of training. Although the result was not significant, the mean score values of the variables studied shows progressive increase from the baseline to the 12th week of training.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary, conclusion, and recommendations for the study.

5.1 Summary

The study examined the effects of aerobic dance and pedometer based walk on cardiovascular parameters, body composition and functional ability of the elderly in Ibadan metropolis. Ageing comes with physiological and functional decline and women experiences this decline faster than their male counter-parts and this is because of their physiological makeup. The importance of exercise to improve the physiological and functional ability of the elderly cannot be over-emphasized, especially because of the need for the elderly to perform their day-to-day activities with little or no support. Also, they need to maintain a healthy body composition and cardiovascular functioning.

Although much is known of the importance of exercise but research has shown that most people do not get involved enough in it, especially the elderly. The study hypothesized that participation in aerobic dance and pedometer based walk have a significant effects on the participant cardiovascular parameters, body composition and functional ability. Two research questions were answered and nine hypotheses were formulated and tested at 0.5 level of significance.

Relevant literature were reviewed under the variables of the study. The independent variables of aerobic dance and pedometer based walk exercise were the treatments manipulated on the dependent variables of cardiovascular parameters, body composition, and functional ability. There was a moderating variable of stage of elderliness (early and late) used in this study. The theoretical framework for the study was programmed theory of aging. There were three participating groups for the study, two experimental and a

control group. Pretest-posttest control group experimental research design involving time series was used, adopting the 3x2 factorial matrix. Data for the work were analyzed using descriptive statistics of range, mean and standard deviation, while inferential statistic of repeated analysis of Mancova were used to test the hypotheses.

Results from this work revealed that aerobic dance and pedometer based walk had significant effects on the cardiovascular parameters, body composition and functional ability of the elderly women. Also, the result shows that treatment and age were not significant. The interaction effects of treatment and age were not also significant.

5.2 Conclusion

From the study, the following conclusions were drawn;

1. Aerobic dance exercise had a significant effect on mean arterial blood pressure, systolic blood pressure and diastolic blood pressure of the elderly Baptist women in the Ibadan metropolis.
2. Pedometer based walk had a significant effect on mean arterial blood pressure, systolic blood pressure and diastolic blood pressure of the elderly Baptist women in the Ibadan metropolis. systolic blood pressure was significant from the 8th week.
3. Pedometer based walk exercise had greater effect than aerobic dance on the cardiovascular parameters of the participants studied.
4. Twelve weeks of aerobic dance had better effect on fat mass and body mass index of the Baptist elderly women in the Ibadan metropolis.
5. The effects of treatment on the body composition of the participants show from their mean score value that aerobic dance exercise had better effect than pedometer based walk
6. Twelve weeks of aerobic dance had a significant effect on the elderly women in Ibadan metropolis lower back and hamstring muscles through the use of the chair sit and reach test. Leg strength, core and back muscle through chair sit and stand test. Muscles of the upper and lower arm using arm curl test.

7. Twelve weeks of pedometer based walk had a significant effect on lower back and hamstring muscles through the use of the chair sit and reach test. Leg strength, core and back muscle through chair sit and stand test. Muscles of the upper and lower arm using arm curl test of the elderly women in the Ibadan metropolis.
8. It was observed from the mean score value of the analyses that aerobic dance had the highest mean score value and therefore had a better effect on the participants lower back and hamstring muscles, Leg strength, core and back muscle, muscles of the upper and lower arm.
9. Age of elderly was seen not to have a significant effect on treatment but from the observation made from the mean score, early elderly had the greatest impact of treatment.
10. The interaction effect of treatment and age was found not to be significant.
11. Pedometer based walk had significant effects on the functional ability of the participants.
12. Aerobic dance had significant effects on the functional ability of the participants.

5.3 Recommendations

Based on the findings of this study, the following recommendations were made:

1. Pedometer based walk exercise should be adapted into the daily routine of the elderly, especially for its significant effects on the cardiovascular parameters, body composition and functional ability of the elderly.
2. Elderly women should be encouraged to participate in aerobic dance as daily or routine exercise because of its benefit to physiological and daily living activity of the elderly.
3. The combination of pedometer based walk and aerobic dance exercise can serve as adjunct to the conventional form of exercise for an elderly who wants to maintain physiological and functional ability since they are easy and fun motivated physical activities.
4. Pedometer based walk should be recommended for elderly who need a self-monitor and feedback physical activity. Since pedometer is simple to use and self-monitor device which gives feedback on one's daily step count.

5.4 Contributions to knowledge

This research findings have added to the existing body of knowledge in the following areas:

1. Both pedometer based walk and aerobic dance exercise improved the cardiovascular parameters, body composition and functional ability of the elderly.
2. This work has established that pedometer based walk had a better effect on cardiovascular parameters of the elderly than aerobic dance exercise
3. This study also confirmed that aerobic dance exercise is more efficacious on body composition and functional ability than pedometer based walk
4. This study established that both treatments are better with elderly that are within the age bracket of 55-65years.

5.5 Suggestions for Further Study

1. Further study should be carried out using both male and female so that effect can be compared on gender.
2. Further study can look into combining pedometer based walk exercise group with aerobic dance exercise group to determine their combined effects.
3. Other variables can also be considered in future study.
4. This study can also be carried out on other population.
5. Further study can look into the effects of aerobic dance and pedometer based walk on waist–hip ratio and fat-free mass in other to prove or contradict the findings of this work

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Appendix I

Training Programme

Week 1 and 2

Group 1 (Aerobic Dance)

The Aerobic Dance Used the Following Activities as Rhythm

Week 1 and 2 Physical Activities

Activities	Time
Warm up: jogging on the spot,side kick, arm circle,shoulderpress,walking	10minutes
Hip rolls,AB squeezing march,basal match, right leg side kick	30minutes
Cool down: match in place,toe tapping, walk and kick,arm lift	10minutes

Total time: 40minutes

Target heart rate: 50-55% of age predicted MaxHR

Week 3-4

Week 3 and 4 Physical Activities

Activities	Time
Warm up: toe tapping,walking,jog in place,shoulder press,shoulder stretch	10 minutes
Shake roll,step touch,alternative side crunches,hip roll,basal match	40 minutes
Cool down: matching,trunk bender,arm lift, shoulder press,walk and kick	5 minutes

Total time: 45 minutes

Target heart rate: 50-55% of age predicted MaxHR

Week 5-6

Week 5 and 6 Physical Activities

Activities	Time
Warm up: hip roll,arm curl,shoulder press, side kicks	10 minutes
Pump squats, side knee crunch,	40 minutes
Cool down: matching,trunk bender,arm lift,shoulder press,walk and kick	5 minutes

Total time: 45 minutes

Target heart rate: 55-60% of age predicted MaxHR

Week 7-8

Week 7 and 8 Physical Activities

Activities	Time
Warm up: toe tapping,arm rotation,neck rotation,hip roll,leg lift,walking	10 minutes
Step curls,knee up,pump squats,body roll	40 minutes
Cool down: matching, trunk bender,arm lift, walk and kick	10 minutes

Total time: 50minutes

Target heart rate: 60-65% of age predicted MaxHR

Week 9-10

Week 9 and 10 Physical Activities

Activities	Time
Warm up: jogging on the spot, arm circle, hip roll, arm curl, shoulder press	10 minutes
Hip roll, AB squeezing, side knee crunch,	40 minutes
Cool down: toe tapping, walk and kick, arm lift, match in place	10 minutes

Total time: 60minutes

Target heart rate: 65-70% of age predicted MaxHR

Week 11-12

Week 11 and 12 Physical Activities

Activities	Time
Warm up: toe tapping, walking, jog in place, hip roll, arm curl, shoulder press, side kicks	10 minutes
Side knee crunch, knee crunch	40 minutes
Cool down: matching, trunk bender, arm lift, shoulder press, walk and kick, breathing	10 minutes

Total time: 60minutes

Target heart rate: 70-75% of age predicted MaxHR

(Measurement took place at 4weeks interval.)

(Training took place 3(three) times a week, Tuesday, Thursday and Saturday)

Group 2 (Pedometer-Based Walking Group)

Daily Count Record

Phone no ----------

Age----------

No of Steps Taken…….

Record Sheet

Week 1	Monday	Wednesday	Friday
Step count			

Targeted step count: 6000

Warm up: 10minutes

Walking activities: (Included 15minutes brisk walk) 30minutes

Cool down: 10minutes

Total time: 50minutes

Record Sheet

Week2	Monday	Wednesday	Friday
Step count			

Targeted step counts: 6000

Warm up: 10minutes

Walking activities: (included 15minutes brisk walk) 30minutes

Cool time: 10minutes

Total time: 50minutes

Record Sheet

Week 3	Monday	Wednesday	Friday
Step count			

Targeted Step Count: 6500

Warm up: 10minutes

Walking activities:(included 20minutes brisk walk) 30minutes

Cool time: 10minutes

Total time: 50minutes

Record Sheet

Week 4	Monday	Wednesday	Friday
Step count			

Targeted step counts: 6500

Warm up: 10minutes

Walking activities: (included 20minutes brisk walk) 30minutes

Cool time: 10minutes

Total time: 50minutes

Record Sheet

Week 5	Monday	Wednesday	Friday
Step count			

Targeted step count: 7000

Warm up: 10minutes

Walking activities: (included 25minutes brisk walk) 40minutes

Cool time: 10minutes

Total time: 60minutes

Record Sheet

Week 6	Monday	Wednesday	Friday
Step count			

Targeted step counts: 7000

Warm up: 10minutes

Walking activities: (included 25minutes brisk walk) 40minutes

Cool time: 10minutes

Total time: 60minutes

Record sheet

Week 7	Monday	Wednesday	Friday
Step count			

Targeted step counts:7500

Warm up: 10minutes

Walking activities: (included 25minutes brisk walk) 40minutes

Cool time: 10minutes

Total time: 60minutes

Record Sheet

Week 8	Monday	Wednesday	Friday
Step count			

Targeted step counts: 7500

Warm up: 10minutes

Walking activities: (included 25minutes brisk walk) 40minutes

Cool down: 10minutes

Total time:60minutes

Record Sheet

Week 9	Monday	Wednesday	Friday
Step count			

Targeted step counts: 8000

Warm up:10minutes

Walking activities: (included 25minutes brisk walk) 40minutes

Cool down: 10minutes

Total time: 60minutes

Record Sheet

Week 10	Monday	Wednesday	Friday
Step count			

Targeted step counts: 8000

Warm up: 10minutes

Walking activities: (included 25minutes brisk walk) 40minutes

Cool time: 10minutes

Total time: 60minutes

Record Sheet

Week 11	Monday	Wednesday	Friday
Step count			

Targeted step count: 8500

Warm up: 10minutes

Walking activities: (included 30minutes brisk walk) 40minutes

Cool time: 10minutes

Total time: 60minutes

Record Sheet

Week 12	Monday	Wednesday	Friday
Step count			

Targeted step count: 8500

Warm up: 10minutes

Walking activities: (included 30minutes brisk walk) 40minutes

Cool time: 10minutes

Total time: 60minutes

Sms (messages were sent by 6.00am every morning to remind the participants to wear their pedometer and at night by 9.00pm to record their steps).

The training days were Monday's, Wednesday's and Friday's.

Group 3

Control Group

Victory Baptist Church, Mokola, Ibadan Was Used For The Control Group.

Control Group Activities.

Topic	Activities	Training objective	Duration
Week 1-2 Pre test Physical activities	Explained the meaning of physical activity	Examined the meaning of exercise and physical activity	30minutes
Week 3-4 Physical fitness	Discussed physical fitness	Reviewed health related components	30minutes
Week 5-6 Geriatric condition	Discussed the changes that takes place during aging	Examine some common geriatrics condition	30minutes
Week 7-8 Physical fitness and aging process	Discussed physical fitness and aging	To relate physical fitness to aging	30minutes
Week 9-10 Benefits of physical activity	Benefits of exercise on health	To identify benefits of exercise	30minutes
Week 11-12 Revision	Revision	Revised all the topic taught	30minutes

Appendix II

Table: Body Fat Percentage Chart Table

	Underfat	*Ideal*	*Overfat*	*Obese*
Women				
Age 20-39	< 21%	21-33%	34-39%	> 39%
Age 40-59	< 23%	23-34%	35-40%	> 40
Age 60-79	< 24%	24-35%	36-42%	> 42%
Men				
Age 20-39	< 8%	8-19%	20-25%	> 25%
Age 40-59	11%	11-21%	22-28%	> 28%
Age 60-79	< 13%	13-24%	25-30%	> 30%

Source: American Journal of Clinical Nutrition

Appendix III

Recommended Daily Step Count

Adult (50-70years) 6,000-8500 steps per day
Adult with Chronic disease 3,000-5,500

Source: Tudor-Locke (2004)

Appendix IV

Informed Consent Form

My name is Duyilemi Atolani, a doctoral student of University of Ibadan, department of Human Kinetics.

The goal of my study is to find out the effects of aerobic dance and pedometer based walking on the cardiovascular parameters, body composition and functional ability of elderly women in Ibadan metropolis.

A physical activity readiness questionnaire shall be issue to you to show your level of medical history and readiness to participate in the exercise programme which will be strictly monitored.

Kindly note that all that will be collected for this process shall be treated with utmost confidentiality and however will be subjected to statistical analysis for the purpose of the study alone.

I want you to respond to the part below. Thanks, for your cooperation

Yours DuyilemiAtolani

CONSENT

Now that the reason of the research is clear to me, I confirm that my participation is voluntary. I am not forced in any way to cooperate. I have been informed of the procedures and duties as a participant. I wish to give my cooperation

Name and signature of participant……..

Date…….

Appendix V

PHYSICAL ACTIVITY READI ESS QUESTIONNAIRE (PAR-Q)

QUESTIONS		Yes	No
1	Has your doctor ever said you hsve a heart condition and you should only perform physical activity reconmmended by a doctor?		
2	Do you feel pain in your chest when you perform physical activity?		
3	In the past month, have you had chest pain when you were not performing physical activity?		
4	Do you lose your balance because of dizziness or do you ever lose consciousness?		
5	Do you have a bone or joint problem that could be made worse by a change in your physical activity?		
6	Is your doctor currently prescribing any medication for your blood pressure or for a heart condition?		
7	Do you know of any other reason why you should not engage in physical activity?		

Recreational Questions

	Questions	Yes	No
1	Do you partake in any recreational activities (hockey, soccer, tennis)?		
2	Do you have any hobbies (gardening, reading etc)?		

Medical Questions

	Questions	Yes	No
1	Have you ever had pain or injuries (ankle, knee, hip, back, shoulder, etc)?		
2	Have you ever had any surgeries?		
3	Have you ever		

Appendix VI

Chair Sit and Reach Test

Age	Below	Average	Above average
55-59	<-0.5	-0.5-5.5	>5.5
60-64	< -0.5	-0.5-5.0	>5.0
65-69	< -0.5	-0.5-4.5	>4.5
70-74	<-1.0	-1.0-4.0	>4.0
75-79	< 1.5	-1.5-3.5	>3.5
80-84	<-2.0	-2.0-3.0	>3.0
85-89	<-2.5	-2.5-2.5	>2.5
90-94	<-4.5	-4.5-1.0	>1.0

Appendix VII

Chair Sit and Stand Test

Age	Below	Average	Above average
55-59	<13	13-18	>18
60-64	< 12	12-17	>17
65-69	< 11	11-16	>16
70-74	<10	10-15	>15
75-79	< 10	10-15	>15
80-84	<9	9-14	>14
85-89	<8	8-13	>13
90-94	<4	4-11	>11

Appendix VIII

Arm Curl Test Chart

Age	Below	Average	Above average
55-59	<14	14-20	>20
60-64	< 13	13-19	>19
65-69	< 12	12-18	>18
70-74	<12	12-17	>17
75-79	< 11	11-17	>17
80-84	<10	10-16	>16
85-89	<10	10-15	>15
90-94	<8	8-13	>13

(Modified Topend Sports, 2006)

The full fitness test as an index of fitness in the elderly, medical rehabilitation

Appendix IX

Height and Weight Chart

Height	Small Frame (pounds)	Medium Frame (pounds)	Large Frame (pounds)
4’10”	102-111	109-121	118-131
4’11”	103-113	111-123	120-134
5’0”	104-115	113-126	122-137
5’1”	106-118	115-129	125-140
5’2”	108-121	118-132	128-143
5’3”	111-124	121-135	131-147
5’4”	114-127	124-138	134-151
5’5”	117-130	127-141	137-1555
5’6”	120-133	130-144	140-159
5’7”	123-136	133-147	143-163
5’8”	126-139	136-150	146-167
5’9”	129-142	139-153	149-170
5’10”	132-145	142-156	152-173
5’11”	135-148	145-159	155-176
6’0”	138-151	148-162	158-179

www.diseasecheck.com

Appendix X

Waist to Hip Ratio

	Male	**Female**
Extreme	>1.00	>0.90
High	0.95-1.00	0.85-0.90
Average	0.90-0.95	0.80-0.85
Good	0.85-0.90	0.75-0.80
Excellent	<0.85	<0.75

Topendsports.com

Appendix XI

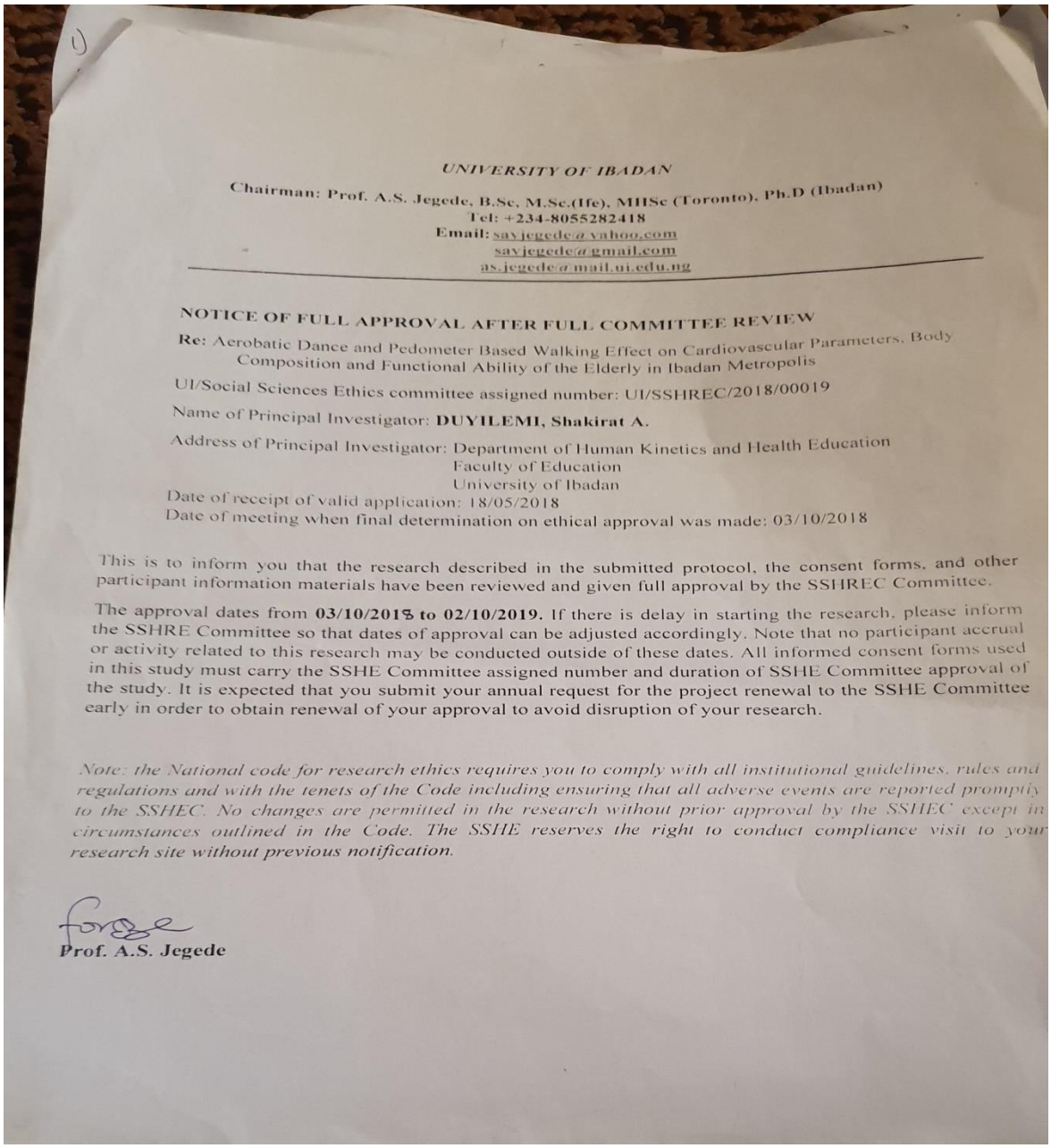
BMI Norm Table

Classification BMI(kg/m2)	Sub classification	BMI (kg/m2)
Underweight <18.50	Severe thinness	<16.00
	Moderate thinness	16-16.99
	Mild thinness	17.00-18.49
Normal 18.5-24.99	Normal	18.5-24.99
Overweight > 25.00	Pre- obese	25.00-29.99
	Obese class1	30.00-34.99
	Obese class 11	35.00-39.99
	Obese class 111	≥40

https://www.topendsports.com/testing/tests/

Appendix XII

Ethical Approval



UNIVERSITY OF IBADAN

Chairman: Prof. A.S. Jegede, B.Sc, M.Sc.(Ife), MHSc (Toronto), Ph.D (Ibadan)
Tel: +234-8055282418
Email: sayjegede@yahoo.com
sayjegede@gmail.com
as.jegede@mail.ui.edu.ng

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: Aerobatic Dance and Pedometer Based Walking Effect on Cardiovascular Parameters, Body Composition and Functional Ability of the Elderly in Ibadan Metropolis

UI/Social Sciences Ethics committee assigned number: UI/SSHREC/2018/00019

Name of Principal Investigator: **DUYILEMI, Shakirat A.**

Address of Principal Investigator: Department of Human Kinetics and Health Education
Faculty of Education
University of Ibadan

Date of receipt of valid application: 18/05/2018
Date of meeting when final determination on ethical approval was made: 03/10/2018

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and given full approval by the SSHREC Committee.

The approval dates from **03/10/2018 to 02/10/2019.** If there is delay in starting the research, please inform the SSHRE Committee so that dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the SSHE Committee assigned number and duration of SSHE Committee approval of the study. It is expected that you submit your annual request for the project renewal to the SSHE Committee early in order to obtain renewal of your approval to avoid disruption of your research.

Note: the National code for research ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the SSHEC. No changes are permitted in the research without prior approval by the SSHEC except in circumstances outlined in the Code. The SSHE reserves the right to conduct compliance visit to your research site without previous notification.

Prof. A.S. Jegede

Appendix XIII

Picture Showing The Researcher Taken Waist-Hip Measurement

Pictures Showing Participants Measuring Their Weight

Pictures Showing The Participant Performing Chair Sit And Stand Test

Pictures Showing Research Assistants Helping In Taken Blood Pressure

Pictures Showing Participants Performing Chair Sit And Reach Test

Pictures Showing Participants Performing Arm Curl Test

Picture Showing Researcher And Her Asistant Taken Skinfold Measurement

Pictureres Showing Group Pictures Taken With Some Of the participants