PERCEIVED BARRIERS AND FACILITATORS OF PHYSICAL ACTIVITY AMONG POST MENOPAUSAL WOMEN IN THE UNIVERSITY OF BENIN

BY

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A PROJECT SUBMITTED TO THE DEPARTMENT OF PHYSIOTHERAPY, SCHOOL OF BASIC MEDICAL SCIENCES UNIVERSITY OF BENIN IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF PHYSIOTHERAPY (B.PT) DEGREE

JANUARY, 2025

CERTIFICATION

This dissertation by AMAHIA VERA CHIKA is accepted in its present form as satisfying dissertation requirement of the degree of the degree of Bachelor of Physiotherapy of the School of Basic Medical Sciences of the University of Benin.

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DEDICATION

This work is dedicated to my beloved parents, whose unwavering love, encouragement, and sacrifices have shaped me into the person I am today. Your endless support and belief in my dreams have been my greatest motivation. I am deeply grateful for your guidance, prayers, and unconditional love, which have carried me through every challenge. This work is a reflection of your enduring faith in me.

ABSTRACT

Background: Menopause marks a significant transition in women's lives, often accompanied by physiological, psychological, and social challenges that impact quality of life. Postmenopausal women often struggle to meet recommended physical activity levels due to barriers such as lack of motivation, time constraints, and inadequate facilities. Conversely, facilitators such as social support and health awareness can encourage participation. This study explores the perceived barriers and facilitators of physical activity among postmenopausal women within an academic environment.

Aim: This study aims to investigate the perceived barriers and facilitators influencing physical activity participation among postmenopausal women at the University of Benin, Edo State, Nigeria.

Method: This cross-sectional study investigated the perceived barriers and facilitators of physical activity among postmenopausal women at the University of Benin, Edo State, Nigeria. Fifty participants were selected using a convenience sampling technique. Data were collected through self-administered questionnaires, including the International Physical Activity Questionnaire (IPAQ), Menopause-Specific Quality of Life Questionnaire (MENQOL), Physical Activity Barriers Questionnaire (PABQ), and Exercise Self-Efficacy Scale (ESES). Descriptive and inferential statistics were conducted using SPSS, with significance set at $p<0.05$.

Results: Among the respondents, 44% demonstrated high physical activity levels, 38% moderate, and 18% low. The mean self-efficacy, barriers, quality of life, and metabolic equivalent scores were 44.02±9.20, 88.28±18.09, 90.34±7.44, and 2961.93±3730.76, respectively. Spearman's correlation analysis showed no significant relationships between barriers and physical activity levels ($p=0.539$) or self-efficacy and activity levels ($p=0.105$). Additionally, a positive but non-significant relationship was observed between physical activity levels and quality of life ($p=0.080$).

Conclusion: The study concluded that perceived barriers and facilitators had non-significant relationships with physical activity levels and quality of life among postmenopausal women in the University of Benin. While demographic factors such as education and marital status likely mediate these associations, the findings emphasize the complexity of physical activity behaviors in this population. There is a need to address individual and contextual factors to better understand and promote physical activity.

Keywords: Physical activity, Postmenopausal women, Perceived barriers, Facilitators.

ACKNOWLEDGEMENTS

I am most grateful to God Almighty for His grace, mercy, love, protection, and faithfulness throughout this program. My deep gratitude and indebtedness goes to my caring and kind-hearted supervisor, PROF. A.O. EZEUKWU for his invaluable encouragement, suggestions, guidance and support in completing this project. Thank you, Sir, for always going out of your way for me and your other supervisees.

My sincere appreciation also goes to the HOD, Dr. Mrs. Obaseki for her assistance which went a long way in the realization of this project, your teachings and guidance for sure have made me a better reviewer. My profound appreciation goes to Professor Kayode Oke for his efforts towards me and my colleagues and all the lecturers and staff of the Department of Physiotherapy, University of Benin. A special thanks to the Head of the department, directors, chiefs, interns and other clinicians in the Department of Physiotherapy, University of Benin Teaching Hospital for imparting us with clinical knowledge and skills over the years.

My gratitude also goes to my dad, Mr. Rueben Uche Amahia, my mum Mrs Nneka Toyin Amahia, my big brother Patrick Favour Ifunaya, my big sister Amahia Progress and the rest of my siblings for your support, prayers, encouragement and guidance towards me, I also appreciate my friends; Iyoha Charity, Imeokor Favour Joy, Eruya Laju Favour, Nwobu Chika, Prosper Emmanuel who have inspired me to be a better version of myself.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Physical activity is defined as any bodily movement produced by skeletal muscle that requires energy expenditure (WHO, 2016). Physical activity includes recreation, active transportation, household activities, and sports participation (Draper & Stratton, 2018). Exercise is a subset of physical activity with the aim of maintenance of physical fitness. Given the relevance of physical activity for primary and secondary disease prevention, efforts to enhance this measure are of paramount importance not only for postmenopausal women but also for the general public. Physical activity results to a 30-50% reduction in

cardiovascular disease in postmenopausal women, Low impact activities such as walking, gardening or light sports appear to have beneficial effects (Roma et Al., 2015). A physically active lifestyle helps to improve general well-being (Bartholomew et al., 2005), quality of life (Conn et al., 2009; Gillison et al., 2009) and cognitive function (Kramer & Erickson, 2007; Smith et al., 2010). Participation in regular PA can also improve muscular fitness, cardio respiratory fitness and sleep (WHO, 2022). Previous research has consistently demonstrated a strong correlation between PA and improved health outcomes, particularly in the prevention and management of cardiovascular disease, cancer, stroke, diabetes, osteoporosis, and mental health conditions (WHO, 2024). Promoting daily physical activity would significantly enhance public health and lead to a substantial reduction in healthcare costs (Duijvestijn et al., 2018). PA and exercise enhance insulin sensitivity, improve lipoprotein profile and C-reactive proteins, lower blood pressure and play a significant role in weight management (Physical Activity Guidelines Advisory Committee Report, 2008). The World Health Organization (WHO, 2022d) recommends older adults engage in at least 150-300 minutes of moderate-intensity aerobic PA per week, 75-150 minutes of vigorous-intensity aerobic PA per week, or an equivalent combination of moderate and vigorous activities throughout the week. This recommendation applies to both men and women, highlighting the universality of PA benefits for older adult. Despite the well-established positive impact of PA on health, adherence to the World Health Organization's PA guidelines remains disappointingly low within the older adult population (Bauman et al., 2016). Regular PA has numerous and significant performance-enhancing and health-improving benefits (Vuori, 2001). There is undeniable evidence that regular PA contributes to the primary and secondary prevention of a variety of chronic diseases, as well as a lower risk of premature death (Warburton et al., 2006). Studies have demonstrated healthful effects on prevention or management of hypertension, coronary disease, diabetic mellitus and osteoporosis, among other conditions (Lawrence et al., 1997). A

research carried out by Felipe et al, (2020) shows that Sedentary lifestyle is a condition that affects a large number of the population of postmenopausal women, further aggravating the consequences inherent to aging. On the other hand, physically active people have longer longevity and lower morbidity and mortality rates. Postmenopausal women with sedentary behavior have decreased resistance, strength, and lower limb muscle velocity (Felipe et al., 2020). Furthermore, regular PA contributes to healthy and active aging which extends to the realm of cognitive function, with research demonstrating its efficacy in enhancing cognitive function, reducing dementia risk, and improving overall health in older adults with pre-existing dementia (Sofi et al., 2011). Research has also demonstrated that participation in physical activity decreases with age, beginning in early adolescence (Corder et al., 2019), with a more significant drop occurring during late adolescence and early adulthood (Lu et al., 2017). For instance, a study demonstrated that PA tends to decline during adolescence in comparison to childhood (Dumith et al., 2011), and a similar decrease is observed during undergraduate level in university (Van Dyk et al., 2015).

Perceived barriers refer to an individual's evaluation of the potential obstacles that prevents him or her from participating in a health behavior. Perceive barriers include insufficient time, lack of motivation, child care responsibilities, and lack of interest (Seth, 2005). Obstacles to engaging in physical activity, often termed "activity barriers" are subjective hurdles that individual perceive as hindering their ability to exercise or stay active (Bowles, 2002). Lack of money was the most frequently reported barrier, followed by feeling too tired, lack of company, and lack of time (all these with a prevalence greater than 30%). Feeling too old for physical activity and disliking exercising were the least frequently reported barriers (6.8% and 15.1%, respectively). The most cited barriers among women were feeling too tired (45.9%) and lack of money (45.6%), whereas among men it was lack of money (33.6%). Women were more likely than men to perceive all reported barriers to physical activity,

except fear of injuries (Felipe et al., 2005). Psychological, cognitive, emotional states, one's motivation and persistence to be active are personal barriers to physical activity (Bodde, 2009). These barriers may be categorized into two main types: intrinsic and extrinsic factors (Herazo-Beltran et al., 2017), Intrinsic factors arise from within the individual, encompassing personal beliefs, motivations, and inclinations, while extrinsic factors, arise from the surrounding environment and circumstance, including available facilities and societal influences such as lack of motivation, resources or social support; socioeconomic level, marital status, fear of injury; e.t.c (Herazo-Beltran et al., 2017).

Facilitators can be someone or something that helps to promoting something especially one who helps to bring about an outcome (such as learning, productivity or communication) by rendering direct or unobtrusive assistance, support or supervision (Merriam-Webster, 2024). A facilitator is a person who helps a group of people to work together and better understand their common objectives and plan how to achieve these objectives (Wikipedia, 2024). Some of the facilitators of physical activity includes accessibility and availability of recreational facilities, health benefits, supports from family and friends, opportunities to socialize and then the opportunities to try new types of physical activity (WHO, 2021).

Menopause is clinically defined as amenorrhea of 12months duration after the final menstrual period. Menopause represents complete ovarian follicular depletion and the absence of estrogen secretion by the ovaries (Iris, 2013), and as a result of the decrease in estrogen level the vagina, vulva, urethra, and trigone of the bladder will undergo atrophy (Karacan, 2009). Menopause can also be defined as the permanent cessation of menstruation and fertility. It depends on the loss of follicular activity in the ovaries, during the period of aging. A woman who has not menstruated within at least 12 months retrospectively is deemed to have entered the stage of menopause and then postmenopausal period starts from this moment (N.Teomanetal, 2004). People in post-menopause are at an increased risk for osteoporosis

because their bodies do not make a lot of estrogen which is essential for maintaining strong and healthy bone. The clinical manifestation of menopause includes hot flushes, sleep disturbance, depression, mood disturbance, memory and attention deficits, vaginal dryness, sexual dysfunction, frequent urinary tract infections, urinary incontinence, joint pain, osteoporosis, and coronary artery disease (Iris, 2013). The risk of CVD in women increases dramatically after menopause (Szmuilowicz et al., 2011). During the past few years, many women and doctors have revised their opinions of hormone replacement therapy or menopausal symptoms, and a substantial number of individuals have discontinued its use because of concerns about side-effect (Martha et al., 2005). Estrogen is the most effective treatment for the management of hot flashes and night sweats (Karacan, 2009).

Menopause is a normal physiological process that all women reaching a certain age will undergo. It signals the end of the reproductive years and is associated with signs of estrogen deficiency and has a considerable impact on women's health-related quality of life. Progressive estrogenic deficiency during the menopausal transition leads to the presentation of a wide array of clinical signs and symptoms (Karacan, 2009). In women age 45-49, the incidence of CVD is 3 times lower than men of matched age. However, data from the Framingham study have shown that by age 75-79, a woman's risk of heart disease increases and equals a man's risk for her age (Cassandra et al., 2018).

In observational studies, physically active postmenopausal women reported fewer and less severe somatic symptoms than an age-matched control group with sedentary lifestyles; significant decreases of more than 50% were noted. (Karacan, 2009). Furthermore, physically active lifestyle can reduce the perceived intensity of menopausal symptoms and increase the state of being psychologically fine (Ayşegül et al., 2010). Many postmenopausal women have been treated with ovarian hormone in an attempt to alleviate the symptoms of menopause and, more recently, in the hope of preventing osteoporosis and reducing the risk of ischemic heart

disease (Paul E. Belchetz, 1994).

In addition to a hormonal decrease, it was noted that postmenopausal women consume low dosages of calcium and vitamin D and without proper intake of these components, bone remodeling is inefficient. Furthermore, lack of vitamin D causes poor calcium absorption. These deficiencies may influence the effect of physical activity on bone remodeling. In order to increase the positive effect, a number of interventions including physical activity in conjunction with calcium and vitamin D supplements is needed (Daria et al., 2018).

1.2 Statement of problems

In a cross-sectional population-based study, Mansikka-mäki et al., found that postmenopausal women who were physically inactive were more likely to have anxiety, depression, decreased well-being, somatic and vasomotor symptoms, which were opposed to those of the women who were involved in the recommended amount of physical activity, as they have higher self-perceptive health level and better health and overall quality of life (Juliana et al 2020).

Postmenopausal women are at increased risk of developing health complications such as cardiovascular disease, osteoporosis, and obesity due to hormonal changes associated with menopause. Engaging in regular physical activity is a proven way to mitigate these risks and improve overall well-being. However, many postmenopausal women, particularly those within academic institutions, often struggle to maintain sufficient levels of physical activity. One of the main reasons for the lack of movement or exercise is that machines are now doing much of the work that was previously done manually. Diseases emerging as a result of people forgetting to remain active have become a global problem. Several of the severe and sometimes fatal diseases of today are reported to be associated directly or indirectly with the sedentary life. As the life cycle of human beings is lengthened, the health and quality of life for menopausal women is of vital importance. Physiological and psychological diseases,

foremost in menopausal periods, and which affect life quality negatively, can be reduced by getting accustomed to regular exercise which has no active effects on economy and health (S. Karacan, 2009).

Despite the known benefits, there is a limited understanding of the specific barriers and facilitators that affect physical activity among this population. Factors such as time constraints, cultural attitudes, lack of motivation, inadequate access to exercise facilities, or a lack of awareness of the benefits of exercise may prevent women from being physically active. Conversely, some facilitators, such as social support, access to information, or community-based programs, could encourage participation but are underexplored in this context. Therefore, determining the perceived barriers and facilitators of physical activity among postmenopausal women in the University of Benin may help to provide insight that may possibly lead to improved quality of life and function among postmenopausal women.

1.3 Aim of study

This determined the perceived barriers and facilitators of physical activity among postmenopausal women in the University of Benin, Edo state, Nigeria.

1.3.1 Specific Objectives

The specific objectives of this study would be:

- To determine the relationship between perceived barriers (lack of money and motivation) and level of physical activity among postmenopausal women in the University of Benin.
- To determine the relationship between facilitators (Potential prevention of health problem, health benefit awareness e.t.c) of physical activity and level of physical activity among postmenopausal women in the University of Benin.

1.3.2 Research Questions

The study therefore aims to answer the following questions:

- What is the relationship between perceived barriers (lack of money and motivation e.t.c) and level of physical activity among postmenopausal women in the University of Benin.
- What is the relationship between facilitators (Potential prevention of health problem, health benefit awareness e.t.c) of physical activity and level of physical activity among postmenopausal women in the University of Benin.

1.4 Hypotheses

1.4.1 Main Hypotheses

i. There would be no significant relationship between barriers to physical activity and the level of physical activity among postmenopausal women.

ii. There would be no significant relationship between self-efficacy to exercise and the level of physical activity among postmenopausal women

iii. There would be no significant relationship between physical activity and the quality of life among postmenopausal women

iv. There would be no significant relationship between self –efficacy to exercise and the quality of life among postmenopausal women

v. There would be no significant relationship between barriers to physical activity and the quality of life among postmenopausal women

1.5 Significance of study

i. This study will reveal the perceived barriers and facilitators of physical activity among postmenopausal women in the University of Benin.

ii. The outcome of this study will help postmenopausal women see the benefit of engaging in physical activities.

iii. This study will help to inform health care providers, fitness experts and family members about the support postmenopausal women needs to engage in physical activity.

1.6 Scope of Study

This study was delimited to:

Postmenopausal women in the University of Benin.

1.7 Definition of terms

- Physical fitness: Is one's ability to execute daily activities with optima performance, endurance, and strength with management of disease, fatigue, and stress and reduced sedentary behavior (Nerissa et al., 2020).

- Facilitators: These are factors, conditions, or interventions that makes it easier for individuals to engage and sustain physical activity, and they work to reduce barriers and enhance motivation, accessibility, and support for being physically active (Bauman et al., 2012)

- Postmenopausal women: These are women who have gone through menopause, marking the end of their menstrual cycles. This phase typically begins 12 months after a woman's last period and signifies the end of her reproductive years.

1.8 Lists of Abbreviations

PA Physical Activity

CVD Cardiovascular Disease

CHAPTER TWO

LITERATURE REVIEW

2.1 Definition

Physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure (WHO, 2016). Physical activity includes recreation, active transportation, movement during/as part of work, household activities, and sports participation (Draper & Stratton, 2018). Physical activity refers to all movement from boarding a bus to cycling. Exercise is a subset of physical activity that is planned, structured,

and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness (C J Caspersen, 1985). The health benefits of physical activity and exercise are undeniable, Literally everyone benefits from being physically active. Regular physical activity is an effective primary and secondary preventive measure for more than 25 chronic medical conditions (including cardiovascular disease) and premature death (Darren E.R. Warburton, PhD, and Shannon S.D. Bredin, PhD, 2016). According to the World Health Organization, physical inactivity is the fourth leading risk factor for global mortality accounting for approximately 3.2 million deaths annually.

This multifaceted nature of PA necessitates its characterization through three key components, as outlined by the Physical Activity Guidelines Advisory Committee Scientific Report (2018): intensity, frequency, and duration. Understanding these parameters facilitates the effective prescription and monitoring of PA for optimal health benefits,

- Intensity: This refers to the level of work or energy necessary to do PA. It can be quantified in a variety of ways, including heart rate, ratings of perceived exertion (RPE), and metabolic equivalents (METs). A standard definition of high-intensity physical exercise is any activity that demands six METs or more, or seventy percent of one's maximal heart rate. Activity that demands 3 to 6 METs, or 50% to 70% of maximal heart rate, is classified as moderate-intensity PA. Activities requiring less than 3 METs or 50% of maximal heart rate are classified as low-intensity PA (Physical Activity Guidelines Advisory Committee, 2018). The Borg RPE scale ranges from 6 to 20 where low intensity ranges from 9 to 11, moderate intensity from 12 to 14 and vigorous intensity from 15 to 20 (Williams, 2017).

- Frequency: This is a reference to the frequency of PA. According to the Physical Activity Guidelines Advisory Committee (2018), individuals should engage in at least

150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic PA each week, spread out over at least three days.

- Duration: This is a reference to the duration of PA. Adults should engage in moderate-intensity PA for at least 150 minutes or vigorous-intensity PA for at least 75 minutes each session, according to the Physical Activity Guidelines Advisory Committee (2018).

Beyond the key parameters of intensity, frequency, and duration, the very nature of the physical activity itself plays a crucial role in optimizing its health benefits. This "type" or "mode" of PA refers to the specific form of movement engaged in, each offering unique physiological and health advantages. Examples of types of PA include aerobic exercise, resistance training, flexibility exercises, and balance exercises (National Heart, Lung and Blood Institute (NHLBI), 2022).

2.1.2 Global and Local Statistics of Physical Activity

The World Health Organization estimates that over 80% of adolescents worldwide are not physically active enough, and that 1 in 4 people worldwide are not active enough. There are wide variations in the prevalence rates of physical activity across African nations, and it's not always obvious. Burkina Faso, Malawi, and Ghana, for example, had comparatively low prevalence rates of physical inactivity at 7.8%, 8.4%, and 8.8%, respectively, whereas Mauritania, Swaziland, and South Africa reported prevalence of 52.6%, 49.1%, and 44.7%, respectively (Guthold et al., 2008). Furthermore, compared to Mali and Mauritania, two West African nations, which had a prevalence of roughly 50%, Mozambique and Malawi, both in southeast Africa, had high reported prevalence rates of physical activity about 95% (Guthold et al, 2011).

According to World Health Organization (WHO), Globally, for older adult 50-70% of older adult do not meet recommended level of physical activity, while in Nigeria a study published in the Journal of Physical Research found that a significant proportion of older adult in urban settings are physically inactive, about 60-70% of older Nigerians do not engage in sufficient physical activity as recommended by WHO guidelines.

For postmenopausal women, approximately 40-60% do not meet the World Health Organization (WHO) recommended guidelines for physical activity which call for 150 minutes of moderate intensity aerobic exercise per week. In high income countries like the United States, studies show that nearly 60% of postmenopausal women do not meet physical activity guideline, Research from the Women's Health Initiative reported that 65% of postmenopausal women in the United States are physically inactive, Similarly in European countries about 40-50% of postmenopausal women are not meeting recommended physical activity levels. (Bellettiere et al., 2019). And then in low and middle income countries, physical inactivity rates among postmenopausal women are higher, For instance in Africa and South Asia, research suggests that 60-70% of postmenopausal women do not engage in sufficient physical activity, In countries like Brazil, physical inactivity among postmenopausal women is reported to be around 50-60%, driven by factors such as socioeconomic challenges and limited access to recreational spaces (Dumith et al., 2020). A research carried by Lingkan et al. (2018) among 265 postmenopausal women, more than half (58.1%) were habituated to live a sedentary lifestyle, one fourth (26%) were detected as low active, and rest of the participant's physical activity varied from active to very active

2.1.3 Guidelines for Physical Activity

The World Health Organization's guidelines and recommendations offer specific physical activity prescriptions for different age groups and subpopulations, outlining the optimal amount of activity needed for optimal health outcomes (WHO, 2022d).

1. For children and adolescents aged 5-17 years, it is recommended that they:

- Should do at least an average of 60 minutes per day of mostly aerobic moderate to vigorous intensity PA weekly.
- Should include vigorous intensity aerobic activities, as well as those that strengthen muscles and bones, at least 3 days a week.
- Should limit the amount of time spent being sedentary, especially the amount of recreational time (WHO, 2022d).

2. For adults aged 18-64 years, it is recommended that they:

- Should do at least 150-300 minutes of moderate intensity aerobic PA or at least 75-150 minutes of vigorous intensity aerobic PA; or an equivalent combination of moderate and vigorous intensity activity, across the week.
- Should also engage in muscle-strengthening activities at moderate or greater intensity that involve all the major muscle groups on 2 or more days per week, as these provide additional benefits.
- Should limit and reduce the amount of time spent being sedentary. Replacing sedentary time with PA of any intensity, including light intensity, provides health benefits (WHO, 2022d).

3. For pregnant women

- Should do at least 150 minutes of moderate intensity aerobic physical activity throughout the week for substantial health benefits
- Should incorporate a variety of aerobic and muscle strengthening activities, adding gentle stretching may also be beneficial
- Women who before pregnancy, habitually engaged in vigorous intensity aerobic activity or who were physically active, can these activities during pregnancy and the postpartum period (WHO),

4. For older adults aged 65 years and above, it is recommended that they:

- Should do at least 150-300 minutes of moderate intensity aerobic PA or at least 75-150 minutes of vigorous intensity aerobic PA; or an equivalent combination of moderate and vigorous intensity activity, across the week.
- Should also engage in muscle-strengthening activities at moderate or greater intensity that involve all the major muscle groups on 2 or more days per week, as these provide additional benefits.
- Should limit and reduce the amount of time spent being sedentary. Replacing sedentary time with PA of any intensity, including light intensity, provides health benefits.
- Should engage in varied multi-component PA that emphasizes functional balance and strength training at moderate or higher intensity, 3 or more days a week to improve their functional ability and prevent falls (WHO, 2022d).

5. For postmenopausal women

- Should do at least 150 minutes' moderate intensity aerobic exercise per week,

- Should also engage in along muscle strengthening twice a week.

2.1.4 Types and examples of PA

There are five types of PA namely; aerobic, muscle-strengthening, bone-strengthening, balance and flexibility activities (National Heart, Lung and Blood Institute (NHLBI), 2022).

i. Aerobic activity: This is also called endurance activity which causes large muscles such as those in the arms and legs to contract and it helps to increase cardiovascular endurance (Patel et al., 2017). It is low to high intensity physical exercise that is primarily dependent on the aerobic energy-generating process (Plowman & Smith, 2007). Examples are; walking, cycling, running, jumping, swimming, basketball, jogging, and hiking (Patel et al., 2017; NHLBI, 2022).

ii. Resistance training exercise: This is also known as muscle-strengthening activity, uses weight machines, exercise bands, hand-held weights, or an individual's body weight (American College of Sports Medicine, 2009). Exercises that strengthen muscles include push-ups and sit-ups, lifting weights, climbing stairs, and gardening (NHLBI, 2022). This activity helps to develop skeletal muscle strength, power, endurance, and bulk (Garber et al., 2011).

iii. Bone strengthening exercise: Running, walking, jumping rope, and lifting weights are a few examples of bone-strengthening exercises that apply stress to the bones to encourage bone growth and strength (NHLBI, 2022).

iv. Balance activity: Engaging in these exercises enhances one's capacity to withstand forces that may result in falls, whether one is moving or not. Exercises for balance include walking backwards, sitting and standing, standing on one leg, walking heel-to-toe, and utilising a wobble board (Havarsson et al., 2015; NHLBI, 2022).

v. Flexibility activity: Stretching improves range of motion and flexibility in the joints. Examples include yoga poses, side stretches, and touching your toes (O'Connor et al., 2006).

2.1.5 Levels of Physical Activity

Mendes et al. (2018) state that the metabolic equivalent of task (METs) is used to measure the three degrees of PA: low, moderate, and vigorous. Based on intensity levels, PA can be divided into three primary groups: low, moderate, and vigorous, as per the 2018 Physical Activity Guidelines Advisory Committee. ferocious intensity Exercise that puts a lot of effort into raising heart rate and breathing is referred to as physical activity (PA). Examples of PA include running, swimming laps, and playing sports like hockey, basketball, or soccer. Physical activities classified as moderately intense PA have a moderate effort need, a slight increase in heart rate and respiration, but not as much as robust intensity. PA, including brisk walking, hiking, modest cycling, and yard or garden work. Any physical activity that doesn't demand a lot of energy and doesn't noticeably raise heart rate or respiration is considered low intensity PA. Examples of this type of physical activity include light housework, such as folding laundry or dishwashing, as well as recreational pursuits like reading, watching TV, or playing board games. The Physical Activity Guidelines Advisory Committee (2018) states that the division of PA into these three groups facilitates the evaluation of PA intensity and the development of suitable PA programs to meet certain health objectives by both individuals and health professionals.

2.1.6 Measurements of Physical Activity

The intensity of program efforts and the utilization of different interventions impact the efficacy of PA programs (CDC, 2020). In order to investigate and assess the health benefits of physical activity, measurement is essential for both clinical and research purposes. PA can be

quantified using numerous ways (Welk, 2002a) such as self-report techniques, objective monitors and direct observation. Self-report methods rely on participant's capacity to remember their physical activity in hindsight, and they can be recorded using daily logs and diaries (Sylvia, 2014) or a self-administered or interview-administered questionnaire (Matthews, 2002). In order to measure PA, objective monitors employ monitoring tools including heart rate monitors, pedometers, and accelerometers (Taylor, 2014). When worn, these devices use an integrated electronic component to quantify the degree of body acceleration (Graham & Hipp, 2014).

- **Subjective Measurements of Physical Activity**

i. PA Questionnaire: These are used to assess the dimensions and domains of PA behavior using either self-reported responses or interviews (Strath et al., 2013). The aspects of physical activity include modality, frequency, intensity, and duration; the domains of physical activity include occupational, domestic, transportation, and leisure time (Strath et al., 2013; Lee & Ellingson, 2018). The Global Physical Activity Questionnaire (GPAQ) (WHO, 2021) and the International Physical Activity Questionnaire (IPAQ) (Hagströmer et al., 2006) are two examples. As part of the WHO STEPWISE Approach to Chronic Disease Risk Factor Surveillance for PA monitoring and observation, the WHO created the GPAQ in 2002 (WHO, 2005). According to Strath et al. (2013), it is used to categorize individuals as active or inactive or to assess if they meet PA requirements, such as 150 minutes per week of moderate-to-intense PA. An international team of experts created the IPAQ to assess patterns of PA in populations from various nations and sociocultural backgrounds (Craig et al., 2003).

ii. PA diaries/logs: These are often used to obtain a comprehensive record of an individual's PA, hour by hour or activity by activity (Strath et al., 2013). The diaries are completed by the user and can be either a paper-and-pencil booklet (Ainsworth & Coleman, 2013) or a cell phone app that reminds the user to record information about what they are doing right now or what they have done in the last one to four hours (Sternfeld et al., 2012). Typically, the sort of information recorded consists of the start and end times of the activity, an intensity rating, and the mode or kind of physical activity (Strath et al., 2013). Two such are the Bouchard PA Record (Bouchard et al., 1983) and the PA logbook (Ainsworth and al., 2000).

- **Objective Measurements of Physical Activity**

i. Accelerometer: These have the benefit of logging the frequency, duration, and intensity of PA over time and are used to assess PA by measuring the body's accelerations during movement (Strath et al., 2013). These devices are non-invasive, portable, and offer accurate data regarding human movements (Welk, 2002b). The gadget is typically fastened to the user's body by a strap at the lower back, hip, ankle, or wrist (Strath et al., 2013; Arvidsson et al., 2019).

ii. Pedometers: These are motion sensor devices that are typically worn on the wrist or waist. They may estimate the distance walked (Strath et al., 2013) and monitor and record the number of steps a person takes over time (Tudor-Locke & Bassett, 2004; Bassett et al., 2010).

iii. Heart rate monitor: The gadget has an electrocardiogram (ECG) transmitter that transmits signals to a receiver, which computes and displays the average heart rate in beats per minute at intervals of five to fifteen seconds (Welk, 2002). For observational

and intervention research, they are usually worn on the wrist or chest and are used to measure physical activity and energy expenditure (Janz, 2002).

iv. Direct observation: This is the process of gathering precise data regarding the quantity, duration, kind, and intensity of a person's physical activity (Taylor, 2014). In direct observation, a trained observer or videotaping (Welk, 2002a) can be used to measure PA levels in certain environments, such as playgrounds, classrooms, etc. (Dughill & Stratton, 2007).

2.1.7 Health Benefits of Physical Activity

Consistent physical activity has been shown to improve body composition through reduced abdominal adiposity and improved weight control, it also enhances lipid lipoprotein profiles, reduce blood pressure, improve autonomic tone, reduce systemic inflammation, decrease blood coagulation and improve coronary blood (Darren E.R. et al.,2006). In a Research carried out by Blair et al, (1992) a cross-sectional study showed lower blood pressures in active and fit persons, compared with their unfit and sedentary peers in individual who were hypertensive. Over the past two decades, numerous studies consistently have shown that higher levels of physical activity are associated with decreased risks of coronary heart disease, cerebrovascular disease, hypertension, non-insulin dependent diabetes mellitus, colon and, possibly, breast cancer, as well as osteoporosis (Lee et al., 1997). Regular physical activity helps to prevent bone mass loss and some types of physical exercises improves muscle strength and balance which help to reduce the frequency of falls and subsequent fractures, especially among the elderly. (Glauber et al., 2016). Intense physical activity is associated with a reduced incidence of hip fracture. This observation supports findings from an earlier investigation in which fracture rates were lower among people who performed more weight-bearing activities than among sedentary people. It also improves musculoskeletal fitness,

Research had showed that enhanced musculoskeletal fitness is associated with an improvement in overall health status and a reduction in the risk of chronic disease and disability (Darren E.R. et al., 2006). The integration of regular physical activity (PA) into a holistic lifestyle stands as a cornerstone for successful aging, demonstrably mitigating the adverse effects of genetic predispositions (Chodzko-Zajko et al., 2009). Beyond its physical benefits, PA plays a pivotal role in bolstering mental well-being and serves as a crucial preventive measure against osteoporosis and sarcopenia (WHO, 2004). For older adults, PA presents a potent tool to preserve muscle strength and foster independent living through the principles of active aging and functional status maintenance, ultimately translating to a higher quality of life (Hupin et al., 2015). Furthermore, regular PA's contributions to healthy and active aging extend to the realm of cognitive function, with research demonstrating its efficacy in enhancing cognitive function, reducing dementia risk, and improving overall health in older adults with pre-existing dementia (Sofi et al., 2011).

2.1.8 Risk Factors of Physical Inactivity

The majority of chronic diseases are caused by physical inactivity, making it one of the most important public health concerns of the twenty-first century (Blair, 2009). One of the main risk factors for coronary artery disease, according to the World Health Organization is physical inactivity (Bijnen et al., 1994). Conditions including Type II diabetes, colon cancer, back pain, high blood pressure, obesity, osteoporosis, anxiety, depression, and stress are further exacerbated by physical inactivity (Centers for Disease and Prevention Control, 1996). Individual and environmental factors are the two primary groups into which (Lee & Ellingson, 2018) divide the risk factors of physical inactivity. Individual factors are further subdivided into three categories: health (e.g., obesity, functional limitations, injury, depression, and chronic diseases), psychological (e.g., low self-efficacy, low perceived enjoyment of exercise, low knowledge and beliefs in exercise benefits), and socioeconomic (e.g., female gender,

older adults, low income, low education, low cultural and societal norms for PA). Physical inactivity can be caused by psychological variables such low self-efficacy, a lack of motivation, and a high level of perceived barriers (Idowu et al., 2013; Rhodes & Kates, 2015).The four PA domains are as follows: leisure (television, social media, inactive gaming, low social support, unsafe neighbourhood no pet ownership, bad or cold weather), occupational/school (sedentary jobs, labor-saving robots, lifts or lifts, no employee fitness program, low physical exercise in schools and limited school playground), household/domestic (washing machines, dishwasher, cleaning robot, motorised lawnmower, no garden or backyard, long distance to grocery and supermarkets).

2.2 Barriers and Facilitators of Physical Activity

Barriers can be real or perceived and can represent significant potential obstructions to the adoption, maintenance, or resumption of participation in physical activity (Micheal et al., 2002). Perceived barriers refer to an individual's evaluation of the potential obstacles that prevents him or her from participating in a health behavior. Perceive barriers include insufficient time, lack of motivation, child care responsibilities, and lack of interest (Seth, 2005). Thus, perceived barriers also represent obstacles to engaging in behavior which might otherwise help to prevent disease and enhance health. Perceived barriers may reflect environmental factors or external barriers, such as a lack of support from friends and family, low resources, or a lack of time due to other responsibilities. Additionally, perceived barriers may represent psychologically based factors or internal barriers, such as a lack of motivation, other interests, or concerns about engaging in physical activity in public (Kenneth et al., 2018). In a Research carried out by Hilary et al. (2014), they divided the perceived barriers and facilitators of physical activity into sub groups;

- Physical and mental health: Barriers under this group include pain, decreased endurance and balance, increased recovery time, risk of injury and fear of falling, Facilitators includes Potential prevention of health problems, management of existing conditions, maintenance of balance, strength, and mental acuity, potential weight loss and mood boost.

- Individuals Preferences: Barriers under this group include dislike of PA, gyms/indoor PA, lack of motivation, intimidation/embarrassment, unsure of appropriate PA, preference for sedentary activities, boredom with PA, not accustomed to doing PA, Facilitators include enjoyment of PA, belief that PA is important, awareness of benefits, PA as part of a routine, sense of self-efficacy, proactive pursuit of programs, PA combined with enjoyable/useful activity.

- Physical environment factors: Barriers include hills and stairs, uneven sidewalks, bad weather, unsafe neighborhood, PA location not aesthetically pleasing, inconvenient PA locations, difficult parking. Facilitators includes, proximity of store, places to rest, even walking surfaces, alternatives in bad weather, PA options at home, convenient/nearby PA locations, pleasurable weather.

- Structural and organizational factors: Barriers include expense to drive to or use facilities. inadequate information, lack of quality instructor programs that are not engaging or too challenging, instructor s who are not knowledgeable about the program. Facilitators include Free low-cost programs, high-quality instructor, flexible program schedule, engaging classes, programs appropriate for different fitness levels.

2.3 Relevant Anatomy

Hormonal changes during menopause significantly influence physical activity in postmenopausal women. Understanding the anatomy and physiology of the endocrine system and its role in maintaining musculoskeletal, cardiovascular, and metabolic health is critical for exploring the relationship between hormones and physical activity.

- **Estrogen and the Skeletal System:**

  Estrogen plays a vital role in maintaining bone density by inhibiting osteoclast activity, the cells responsible for bone resorption. After menopause, the sharp decline in estrogen levels leads to an increased risk of osteoporosis, characterized by reduced bone mineral density (BMD) and increased fracture risk (Sipos et al., 2022). This decline may discourage physical activity due to the fear of injury. Weight-bearing exercises, however, help stimulate bone remodeling and maintain bone strength.

- **Progesterone and Energy Regulation:**

  Progesterone, another sex hormone, decreases significantly after menopause. While its direct role in physical activity is less pronounced than estrogen's, it influences fatigue levels and energy regulation. Progesterone also affects thermoregulation, which can impact exercise performance (Baker et al., 2021).

- **Testosterone and Muscle Mass:**

  Testosterone, though present in lower concentrations in women, contributes to maintaining muscle mass and strength. The postmenopausal decline in testosterone contributes to sarcopenia, the age-related loss of muscle mass and function, leading to reduced physical performance (Azziz et al., 2020). Resistance training can counteract these effects by promoting muscle hypertrophy and strength gains.

- **Cortisol and the Stress Response:**

Cortisol, the primary stress hormone, tends to increase with age and fluctuates with menopause. Elevated cortisol levels are associated with muscle breakdown, abdominal fat deposition, and fatigue, which can negatively affect physical activity levels (Kirwan & Hickey, 2020). Stress-reducing exercises, such as yoga and mindfulness-based activities, help regulate cortisol levels.

- **Insulin and Metabolic Health:**

  Postmenopausal women often experience reduced insulin sensitivity due to hormonal imbalances, increasing the risk of type 2 diabetes and metabolic syndrome. Regular physical activity improves insulin sensitivity, thereby mitigating the adverse effects of hormonal changes (Colberg et al., 2021).

- **Other Hormones (Leptin and Ghrelin):**

  Leptin and ghrelin, hormones involved in appetite regulation, also play a role in postmenopausal weight gain and energy balance. Hormonal shifts lead to increased leptin resistance and altered ghrelin levels, which may contribute to weight gain and reduced exercise motivation (Bluher, 2022). Physical activity, particularly aerobic exercises, helps restore hormonal balance and supports weight management.

2.4 Menopause

Menopause is clinically defined as amenorrhea of 12 months duration after the final menstrual period. Menopause represents complete ovarian follicular depletion and the absence of estrogen secretion by the ovaries (Iris, 2013). Menopause can also be defined as the permanent cessation of menstruation and fertility which depends on the loss of follicular activity in the ovaries, during the period of aging. A woman who has not menstruated within at least 12 months retrospectively is deemed to have entered the stage of menopause and then postmenopausal period starts from this moment (N.Teomanetal., 2004). According to the

World Health Organization, it takes 12 months of amenorrhea to confirm that menopause has set in (Akanksha Singh & Shishir Kumar Pradha, 2014). Menopause can cause physical health problems for women, in addition to climacteric symptoms as sweating, hot flashes, mucosal dryness, and mood swings. Furthermore, a woman's self-identity is altered by menopause (Lee et al., 2010).

2.4.1 Physiological Changes Associated with Menopause

Studies have showed that approximately two-thirds of postmenopausal women will experience hot flushes, with 10–20% experiencing severe symptoms. For most women, symptoms spontaneously resolve within a few years. However, one third of postmenopausal women will experience symptoms for up to 5 years, and 20% will have symptoms for up to 15 years (Iris et al., 2014). There are physiological changes associated with menopause such as hot flushes, sleep disturbance, depression and mood disturbance, memory and attention deficits, Vaginal dryness, sexual dysfunction, frequent urinary tract infections, urinary incontinence, Joint pain, osteoporosis and coronary artery disease (Iris et al., 2014). Menopause is also an adaptation process during which women go through a new biological state. This process is accompanied by many biological and psychosocial changes. During menopause, loss of skin flexibility, a decrease in libido, an increase in the risk of cardiovascular disease, bone loss, somatic and vasomotor symptoms may appear and other psychological problems which reduces the quality of life in postmenopausal women (Ayşegul et al., 2010). According to Glauber et al. (2016) Elderly people, particularly women after menopause, are at a greater risk of developing osteoporosis which predispose one to fall and subsequent fractures. Others changes may include irritability, fatigue, anxiety, loss of concentration, risk of coronary artery disease (Nursen et al., 2004)

2.5 Benefits of Physical Activity Among Postmenopausal Women

Physically active lifestyle can reduce the perceived intensity of menopausal symptoms and increase the state of being psychologically fine, Recently, it has been confirmed in the studies that the effects of exercise programs which contain aerobic exercise, muscle strength training and exercise training programs has positive effects on the body composition of postmenopausal women (Aysegul et al., 2010). Physical activities such as stair climbing and brisk walking are associated with increased bone mineral density at the hip and whole body in postmenopausal women. Both are feasible forms of activity for promoting to middle-aged women (Carol et al., 1999).

Mitchell et al. (2004) applied an exercise program with components of aerobics, strengthening, and flexibility to 30 postmenopausal volunteers for 12 weeks, they recorded significant increases in VO max, flexibility, balance, and increase in strength of the quadriceps, and reported that this kind of exercise was appropriate for postmenopausal women, and could help decrease the risk of falling down by improving physical properties (Nursen et al., 2004). In addition, physical activity for postmenopausal women should include proper loading and be performed consistently several times a week. At the same time, it should be safe, easy to perform and accessible, as well as adapted to physical changes (Daria et al., 2018).

2.6 Barriers and Facilitators of Physical Activity among Postmenopausal women

The most cited barriers of physical activity among postmenopausal women were limitations due to poor physical health or physical impairment. Physical health problems reduced participant's ability to be physically active and thus made physical activity difficult. The physical health problems reported to interfere with physical activity practice included arthritis, gout, heart disease, stroke, Parkinson disease, poor eyesight, dizziness, physical disabilities (Yuh-Min, 2010). Apart from health impediments other prominent barriers includes fear of

injury or pain, lack of time, weather, expense, aging, lack of professional guidance, and inadequate distribution of information on available and appropriate PA options and programs (Hilary et al., 2014)

Facilitators of physical activities among postmenopausal women include encouragement from others, companionship of others, guidance from a professional, social contact, others as role models or incentives, enjoyment of PA, belief that PA is important, awareness of benefits, PA as part of a routine, sense of self-efficacy, daily activities provide PA, PA combined with enjoyable/useful activities (Hilary et al., 2014).

2.7 Risks of Physical Inactivity to Postmenopausal Women

Recent data have also shown that excessive sedentary behavior (for example prolonged sitting) can reduce gravitational loading on bone and lead to premature bone loss (Saori et al., 2016). Physical inactivity is a behavioral risk factor that gives rise to certain cardio metabolic risk factors such as obesity, hypertension, DM, and abnormal lipid profile.

Some risk factors associated with physical inactivity in postmenopausal women includes high proportion of central obesity, hypertension, diabetes, hypercholesterolemia and hypertriglyceridemia among postmenopausal women (Lingkan et al., 2018). Sedentary lifestyle in postmenopausal women have an increased risk of frailty, which leads to falls, fractures, hospitalization, disabilities and eventually leads to death (Glauber et al., 2016).

2.8 Empirical table

S/N	Author	Tittle	Method	Sample size	Objectives	Results
.	S.Karacan, 2010	Effects of long-term aerobic exercise on physical fitness and postmenopausal symptoms with menopausal rating scale	This study was conducted using observational study with the voluntary participation of 65 menopausal women whose age and height averages were 50.13 ± 3.38 years and 154.23 ± 4.51 cm, respectively. The study group was given a 55-minute aerobic exercise program 3 days in a week for 24 weeks. The training intensity was determined 75—80% according to the Karvonen method. Before and after training, the body weight, body mass index, resting heart rate, blood pressures, flexibility, aerobic power, body composition,	65 postmenopausal women were recruited	The purpose of this study was to determine the effects of a 24-week aerobic callisthenic exercise program administered on menopausal women on some physical fitness parameters and to look at its effects on symptoms in the postmenopausal period.	As a result of the study, significant reductions were observed in body weight, body mass index, body fat percentage, fat weight resting heart rate, systolic and diastolic blood pressures of the subjects, whereas significant increases were observed in aerobic power flexibility, right hand grip, sit-up and push-up values ($p < .01$, $p < .05$). 3-month and 6-month periods of exercise were observed to lead to significant reductions in somatic, psychological and uro-genetic symptoms and complaints ($p < .05$).

			sit-ups, push-ups and hand grips were measured, thus deter-mining the probable symptoms and complaints with the help of the Menopause Rating Scale (MRS) method.			
2.	Juliana Felipe, Juliana Viezel, Andréa Dias Reis, Emili Amice da Costa Barros, Thais Reis Silva de Paulo, Lucas Melo Neves and Ismael Forte Freitas Júnior 2020	Relationship of different intensities of physical activity and quality of life in postmenopausal women	This is a cross sectional study there were evaluated 102 women, aged 50 to 79 years, all postmenopausal. Physical activity was measured by triaxial accelerometers. The quality of life was assessed using a Brazilian validated version of the SF-36 questionnaire. The sample was divided in three groups (G1, G2 and G3) according to tercile of time spent per week on light, moderate and moderate+vig	102 women were recruited for this study	The purpose of this study was to evaluate whether postmenopausal women who spend more time in mild, moderate, moderate+vigorous weekly physical activity have a better quality of life and associate the time in each of these activities with the domains of Qol	We found that the amount of time of light physical activity shows a higher correlation values compared to the moderate and moderate+vigorous physical activity ($p < 0,05$) and presented significant correlation in all domains of quality of life. Vigorous physical activity did not presented significant correlation in all domains of quality of life.

			orous physical activity. The comparisons between groups were made by ANOVA One Way, and the relationship between variables were made through the Spearman's correlation coefficient, and the significance was set at 5%			
3.	Darren E.R. Warburton, Crystal Whitney Nicol, Shannon S.D. Bredin 2006	Health benefits of physical activity: the evidence	we selected individual studies that were frequently included in systematic reviews, consensus statements and meta-analyses and considered them as examples of the best evidence available. We also have included important new findings regarding the relation between physical activity and fitness and all		The primary purpose of this narrative review was to evaluate the current literature and to provide further insight into the role physical inactivity plays in the development of chronic disease and premature death. We confirm that there is irrefutable evidence of the effectiveness of regular physical activity in the primary and	We confirm that there is irrefutable evidence of the effectiveness of regular physical activity in the primary and secondary prevention of several chronic diseases (e.g., cardiovascular disease, diabetes, cancer, hypertension, obesity, depression and osteoporosis) and premature death. We also reveal that the current Health

			cause and cardiovascular-related mortality.		secondary prevention of several chronic diseases	Canada physical activity guidelines are sufficient to elicit health benefits, especially in previously sedentary people. There appears to be a linear relation between physical activity and health status, such that a further increase in physical activity and fitness will lead to additional improvements in health status.
4.	Hilary J. Bethancourt, Ma. Dori E. Rosenberg, PhD, MPH; Tara Beatty, MA; and David E. Arterburn, MD, MPH 2014	Barriers to and Facilitators of Physical Activity Program Use Among Older Adults	We conducted a qualitative study on four focus groups with 13 participants each. Focus group discussions were audio-recorded, transcribed, and analyzed using an inductive thematic approach and a social-ecological	52 older adults were recruited for this study	The goal of this qualitative study was to better understand the barriers to and facilitators of PA and participation in PA programs among older adults	Men and women were nearly equally represented among the participants, and the sample was largely white (77%), well-educated (69% college graduates), and relatively physically active. Prominent barriers to PA and PA program

			framework.			participation were physical limitations due to health conditions or aging, lack of professional guidance, and inadequate distribution of information on available and appropriate PA options and programs. Facilitators included the motivation to maintain physical and mental health and access to affordable, convenient, and stimulating PA options.
5.	Nursen Teomana, Ays e Özcana, Berrin Acarb 2004	The effect of exercise on physical fitness and quality of life in postmenopausal women	Participants were recruited through three middle schools located in adjacent counties (two urban schools and one rural school) in eastern North Carolina. Schools were chosen due to their geographic proximity and their respective service area	81 postmenopausal women were recruited.	This study was designed to determine the effect of exercise on the physical fitness level and quality of life in postmenopausal women. 81 volunteer postmenopausal women who entered the menopause naturally and have been taking hormone replacement	At the end of 6 weeks exercise period, when the two groups were compared after the exercise period, we found statistically significant differences in strength, endurance, flexibility and balance parameters in the exercise group (P <

			diversity, detailed below. Parents were contacted through letters sent home with students via their homeroom teacher. Letters were distributed only once to minimize the burden on the homeroom teachers. Recruitment letters were made available in English and Spanish in both counties and the version sent home was selected based upon the preference of the student. Interested parents were instructed to contact the project director via phone or email to arrange a convenient time for the focus group session. An incentive of $20 per person was offered for participation.		treatment (HRT) were divided randomly into two groups: exercise (n = 41) and control (n = 40).	0.05). There was also a statistically significant change in the exercise group for the NHP indicating an improvement in the quality of life (P < 0.05).

			This is a randomized controlled trial study.			

CHAPTER THREE

METHOD

3.1 Participants

- **Participants Selection**

This study was conducted among postmenopausal women in the University of Benin, who are willing to participate in this study. Participants will include postmenopausal women among the teaching staffs of the University of Benin and postmenopausal women among the non-teaching staffs of the University of Benin.

3.1.2 Inclusion Criteria

i. Participants were teaching and non-teaching staff who had attained menopause in the University of Benin.

ii. Postmenopausal women who were present on the main campus of the University of Benin during the study period'.

3.1.3 Exclusion Criteria

i. Women who were not currently in their premenopausal stage or had not attained menopause.

ii. Postmenopausal women with severe illness or medical condition that prevents participation in physical activity.

iii. Women who were pregnant or breastfeeding as these conditions may affect physical activity levels and menopausal status.

3.2 Materials

3.2.1 Apparatus/Instruments

A five section questionnaire was used which included;

Social Demographics (Appendix 1)

A document containing socio demographics variables including age, marital status, level of education and employment status.

International Physical Activity Questionnaire (Appendix 1)

To assess physical activity levels across the population of postmenopausal women in the University of Benin. There are two forms of this questionnaire; the short and long form, for the purpose of this study we would be making use of the long form of this questionnaire.

Menopause Specific Quality of Life Questionnaire (Appendix 2)

An adopted self-administered questionnaire which consists of a total of 29 items in a Likert-scale format. Each item assesses the impact of one of four domains of menopausal symptoms, as experienced over the last month: vasomotor (items 1–3), psychosocial (items 4–10), physical (items 11–26), and sexual (items 27–29). Items pertaining to a specific symptom are rated as present or not present, and if present, how bothersome on a zero (not bothersome) to six (extremely bothersome) scale.1,2 Means are computed for each subscale by dividing the sum of the domain's items by the number of items within that domain.2 Non-endorsement of an item is scored a "1" and endorsement a "2," plus the number of the particular rating, so that the possible score on any item ranges from one to eight.

Physical Activity Barriers Questionnaire (Appendix 3)

An adopted questionnaire designed to assess various barriers that individuals perceive in relation to engaging in physical activity. This tool is often used in research and clinical settings to identify common obstacles that prevent people from being active. Understanding

these barriers can inform tailored interventions to help people overcome obstacles and improve their physical activity levels.

Exercise Self-Efficacy Scale (Appendix 4)

An adopted questionnaire used to measure an individual's confidence in their ability to engage in physical exercise, particularly in challenging situations. The concept of self-efficacy or belief in one's capability to perform behaviors necessary to achieve specific goals is crucial in understanding how likely a person is to maintain regular physical activity. This tool is valuable in research, clinical, and fitness settings for predicting exercise adherence and guiding interventions.

3.3 Methods

3.3.1 Sampling Technique

Postmenopausal women in the University of Benin, Edo State was selected via a convenience sampling method.

The minimum sample size for this study was calculated using this formular

$n_0 = (Z^2 * p * (1 - p)) / e^2$

Given:

Z = 1.96 (for 95% confidence level)

p = 0.5 (since no prior estimate is given)

e = 0.05 (margin of error)

Substituting the values:

$n_0 = (1.96)^2 * 0.5 * (1 - 0.5) / (0.05)^2$

$n_0 = 3.8416 * 0.5 * 0.5 / 0.0025$

$n_0 = 0.9604 / 0.0025$

$n_0 = 384.16$

Since the total population (N) is 100, we use the finite population correction formula:

$n = n_0 / (1 + (n_0 - 1) / N)$

Substituting values:

$n = 384.16 / (1 + (384.16 - 1) / 100)$

$n = 384.16 / (1 + 383.16 / 100)$

$n = 384.16 / (1 + 3.8316)$

$n = 384.16 / 4.8316$

$n = 79.53$

Since sample size must be a whole number, we round 79.53 up to 80.

Therefore the minimum sample size required for this study was approximately 80 paticipants.

3.3.2 Research Design

This research design is a cross-sectional study.

3.3.3 Procedure for Data Collection

The data for this study was administered using self-administered questionnaire. Postmenopausal women who were willing to participate in this study were recruited among the teaching staffs of the University of Benin and postmenopausal women among the non-teaching staffs of the University of Benin, while the researcher clarified any questions.

The questionnaire was administered on a platform specifically designed for participants in their postmenopausal stage. Additionally, I engaged in one on one interactions with the participants and after obtaining their consent, distributed the questionnaire directly to them.

3.3.4 Ethical Consideration

Ethical approval for this study was obtained from the Ethics Research Committee of College of Medical Sciences, University of Benin, Benin City.

Participation would be voluntary and informed consent was secured from each participant.

Confidentiality was maintained by making responses anonymous and data was stored securely. Participants was informed of their right to withdraw from the study at any time without any consequences.

3.3.5 Data Analysis

Quantitative data was computed as mean and standard deviation and qualitative data were presented as frequencies and percentages. Spearman analysis was used to determine the relationship between the perceived barriers, facilitators, menopausal symptoms and the level of physical activity. A $p< 0.05$ was considered significant throughout the study. Data analysis was carried out using Statistical Package of Social Sciences (SPSS version 29) software.

CHAPTER FOUR
RESULTS

4.1 RESULTS

4.1.1 Socio-demographic Characteristics of Respondents

A total of eighty participants were recruited for this study. Of these, 61 (76.3%) were married, and 9 (11.3%) were single. 22 (27.5%) were between the ages of 46-50 years, 21 (26.3%) were between the ages of 40-45 years, and 18 (22.5%) were between the ages of 56-60 years. 48 (60.0%) of the respondents had tertiary education, and 28 (35.0%) had secondary education. 45 (56.3%) were civil servants, 30 (37.5%) were self-employed, and 5 (6.3%) were retired, as shown in Table 4.1.

Table 4.1: Socio-demographic variables of the respondents

			N=80
Variable	**Category**	**Frequency**	**Percentages**
Age	40-45	21	26.3
	46-50	22	27.5
	51-55	13	16.3
	56-60	18	22.5
	61 and above	6	7.5
Marital status	Single	9	11.3
	Married	61	76.3
	Divorced	10	12.5
Educational level	Primary	4	5.0
	Secondary	28	35.0
	Tertiary	48	60.0
Occupation	Civil servants	45	56.3
	Retired	5	6.3
	Self-employed	30	37.5

4.1.2 Descriptive Statistics of Respondents

The mean SEES, PABQ, MENQOL, and MET scores of the respondents were 43.56 ± 9.09, 87.58 ± 18.72, 90.24 ± 7.46, and 3551.59 ± 4118.88, respectively. 41 (51.2%) of the respondents had high physical activity levels, 27 (33.8%) had moderate physical activity levels, while 12 (15.0%) had low physical activity levels, as shown in Table 4.2.

Table 4.2: Descriptive statistics of the respondents

Variable	Minimum	Maximum	Mean ± SD
SEES	25	59	43.56 ± 9.09
PABQ	31	125	87.58 ± 18.72
MENQOL	73	103	90.24 ± 7.46
MET	231	15732.0	3551.59 ± 4118.88
Physical Activity Level		**Frequency**	**Percentages**
Low (<600 MET minutes/week)		12	15.0
Moderate (600-3000 MET minutes/week)		27	33.8
High (>3000 MET minutes/week)		41	51.2

SEES=Self-efficacy Exercise Scale, PABQ=Physical Activity Barrier Questionnaire, MENQOL=Menopause specific Quality of Life, MET=Metabolic Equivalent of Task

4.1.3 Relationship between PABQ, SEES, MENQOL, and Physical Activity Level

Spearman's Rank Order Correlation test results show that there was a negative, non-significant relationship between barriers to physical activity and physical activity levels ($r = -0.013$, $p = 0.906$). A positive, non-significant relationship was found between self-efficacy to exercise and the level of physical activity ($r = 0.160$, $p = 0.157$). A positive, non-significant relationship was observed between physical activity levels and quality of life ($r = 0.094$, $p = 0.409$). A negative, non-significant relationship was observed between barriers to physical activity and quality of life ($r = -0.166$, $p = 0.142$). A positive significant relationship was observed between self-efficacy to exercise and quality of life ($r = 0.232$, $p = 0.039$). Also, there was a negative significant relationship between self-efficacy to exercise and barriers to physical activity ($r = -0.560$, $p < 0.001$) (Table 4.3).

Table 4.3: Spearman Relationship between PABQ, SEES, MENQOL, and Physical Activity Level

Variable	r	p
PABQ Total MET	-0.013	0.906
SEES Total MET	0.160	0.157
Total MET MENQOL	0.094	0.409
SEES MENQOL	0.232	0.039
PABQ MENQOL	-0.166	0.142
PABQ SEES	-0.560	0.000

4.2 Hypothesis Testing

Hypothesis 1: There would be no significant relationship between barriers to physical activity and the level of physical activity among postmenopausal women

Test: Spearman's Rank Order correlation

Alpha level: 0.05

Observed p value: 0.906

Judgement: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED.

Hypothesis 2: There would be no significant relationship between self-efficacy to exercise and the level of physical activity among postmenopausal women

Test: Spearman's Rank Order correlation

Alpha level: 0.05

Observed p value: 0.157

Judgement: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED.

Hypothesis 3: There would be no significant relationship between physical activity and the quality of life among postmenopausal women

Test: Spearman's Rank Order correlation

Alpha level: 0.05

Observed p value: 0.409

Judgement: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED.

Hypothesis 4: There would be no significant relationship between self-efficacy to exercise and the quality of life among postmenopausal women

Test: Spearman's Rank Order correlation

Alpha level: 0.05

Observed p value: 0.039

Judgement: Since the observed p value is less than 0.05, the null hypothesis is therefore REJECTED.

Hypothesis 5: There would be no significant relationship between barriers to physical activity and the quality of life among postmenopausal women

Test: Spearman's Rank Order correlation

Alpha level: 0.05

Observed p value: 0.142

Judgement: Since the observed p value is greater than 0.05, the null hypothesis is NOT REJECTED.

CHAPTER FIVE
DISCUSSION, CONCLUSION, RECOMMENDATIONS, AND IMPLICATIONS

5.1 Discussion

This study examined the perceived barriers and facilitators of physical activity, as well as self-efficacy to exercise and its relationship to quality of life among postmenopausal women.

The sociodemographic profile indicated that the majority of participants were married, within the age range of 46-50 years, and possessed tertiary education. This suggests that postmenopausal women in the University of Benin are mostly older adults, married, employed and an educated and well-informed group. This is comparable to the results of a study by Ogwumike et al. 2012 which found that Postmenopausal women were predominantly married (89%), had secondary/postsecondary education (90.1%), and were mostly employed in the government sector (88.7%).

Despite this, a considerable percentage of participants (15.0%) exhibited low physical activity levels, while 85% achieved moderate to high activity levels. The present study's finding are comparable to the results of studies by Ogwumike et al. 2012 and Awotidebe et al. 2017 which found that most postmenopausal women in Nigeria reported that they engaged in moderate to vigorous physical activity.

The present study's results contrast with the results of a study by Ogwumike et al. 2014 which found that majority of menopausal women from secondary and tertiary health centers in the Southeastern region of Nigeria 212 (69.5%) reported low physical activity levels. This contrast may be due to the fact prevalence of chronic conditions in the sample used in the study by Ogwumike et. al (2014).

The results of the present study also contrast with the results of a study by Everson et al. (2024) which found that most postmenopausal women in the United States spent approximately 62% of their waking time in sedentary behaviors, with only 5.6% of their time engaged in moderate-to-vigorous physical activity. This disparity may be due to the sociodemographic differences between African and Caucasian postmenopausal women.

The relationship between perceived barriers and physical activity levels showed a negative, but non-significant relationship. This suggests that perceived barriers may not be a strong direct predictor of physical activity levels. The present study's finding contrasts with studies by Reichert et al. (2007) and Ogwumike et al. (2014). The results of a study by Reichert et al. (2007) showed that physical activity was significantly influenced by perceived barriers and emphasized the substantial role of perceived barriers in reducing physical activity. The results of a study by Ogwumike et al. (2014) found that there was a negative significant association was between physical activity level and perceived barriers. This disparity may have been due to the fact that a smaller sample obtained in the present study.

The finding of the present study that there was a positive, but non-significant relationship between physical activity levels and quality of life ($r = 0.094$, $p = 0.409$) is comparable with the results of a study by Hao et al. (2024), which linked physical activity to improved quality of life. However, the lack of statistical significance in this study may be due to other mediating factors, such as pre-existing health conditions.

Self-efficacy to exercise showed a positive and significant relationship with quality of life ($r = 0.232$, $p = 0.039$). This suggests that high self-efficacy to exercise is associated with higher quality of life among postmenopausal women in the University of Benin. Also, there was a negative significant relationship between self-efficacy to exercise and barriers to physical activity ($r = -0.560$, $p = 0.000$). This indicates that high self-efficacy to exercise is associated

with lower perceived barriers to physical activity among postmenopausal women in the University of Benin. The current study's finding is in tandem with the results a study by McAuley et al. (2011) which found that self-efficacy influences physical activity and health outcomes.

Finally, the lack of a significant relationship between barriers to physical activity and quality of life ($r = -0.166$, $p = 0.142$) suggests that postmenopausal women who engage in physical activity, regardless of frequency or intensity, might derive sufficient psychological and physical benefits to buffer the impact of perceived barriers to physical activity.

5.2 Conclusion

Postmenopausal women in the University of Benin reported a moderate to high physical activity level. This moderate to high physical activity level was associated with better quality of life among these women.

Self-efficacy to exercise was associated with better quality of life and decreased perceived barriers to physical activity among postmenopausal women in the University of Benin.

5.3 Recommendations

Based on the findings, the following recommendations are proposed:

i. **Design targeted interventions:** Develop programs tailored to address specific barriers, and self-efficacy such as high self-efficacy leading to poor quality of life, through counseling and motivational workshops.
ii. **Increase awareness:** Conduct community-based campaigns emphasizing the health benefits of regular physical activity, particularly for postmenopausal women.
iii. **Improve accessibility:** Provide affordable or free exercise programs and facilities within the university to mitigate financial constraints.

iv. **Enhance self-efficacy**: Introduce self-efficacy management strategies, structured group activities or peer-support networks to foster confidence and commitment to physical activity.

v. **Incorporate holistic health education:** Integrate physical activity awareness into routine health services for postmenopausal women, highlighting its role in preventing chronic diseases and improving quality of life.

5.4 Implications for Further Studies

This study provides a foundation for future research on physical activity among postmenopausal women. To build on these findings, the following directions are suggested:

i. Conduct studies with larger and more diverse samples to enhance generalizability.

ii. Explore longitudinal designs to assess changes in barriers, facilitators, self-efficacy, and activity levels over time.

iii. Investigate the role of cultural and environmental factors in shaping physical activity behaviors.

iv. Assess the effectiveness of tailored interventions in overcoming barriers, managing self-efficacy, and enhancing facilitators.

v. Examine the interplay between psychological factors, such as self-efficacy and motivation, and their impact on sustained physical activity.

vi. Examine the interplay between perceived barriers, and their impact on sustained physical activity.

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APPENDICES

APPENDIX 1

Section 1: Demographic Information

Please fill or tick ( ) as necessary

1. Age (years): (a) 45-50 ( ) (b) 51-55 ( ) (c) 56-60 ( ) (d) 61 and above

2. Marital Status: (a) Single ( ) (b) Married ( ) (c) Divorced ( ) (d) Widowed ( )

3. Level of Education: (a) No formal education ( ) (b) Primary school ( ) (C) Secondary school ( ) (d) University education ( )

4. Employment Status: (a) Unemployed ( ) (b) Self employed ( ) (c) Employed ( ) (d) Retired ( )

Section 2: International Physical Activity Questionnaire

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

- During the last 7 days, on how many days did you do vigorous physical activities like running, cycling?

  _____ days per week

  No vigorous physical activities *Skip to question 3*

- How much time did you usually spend doing vigorous physical activities on one of those days?

  _____ hours per day

  _____ minutes per day

  Don't know/Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

- During the last 7 days, on how many days did you do moderate physical activities like brisk walking, swimming? Do not include walking.

_____ days per week

No moderate physical activities *Skip to question 5*

- How much time did you usually spend doing moderate physical activities on one of those days?

_____ hours per day
_____ minutes per day
Don't know/Not sure

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

_____ days per week

No walking *Skip to question 7*

- How much time did you usually spend walking on one of those days?

_____ hours per day
_____ minutes per day
Don't know/Not sure

The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

- During the last 7 days, how much time did you spend sitting on a week day?

_____ hours per day
_____ minutes per day
Don't know/Not sure

APPENDIX 2
Menopause Specific Quality of Life Questionnaire (MENOQOL)

Thank you for taking the time to participate in this study. This questionnaire is designed to understand how menopause has affected your quality of life. Please read the instructions carefully before proceeding:

	Not at all	A little	Moderately	Very much
Hot flashes				
Night sweats				
Vaginal dryness				
Sleep disturbances				
Difficulty sleeping				
Weight gain				
Frequent urination				
Feeling anxious or nervous				
Aching in muscles and joints				
Decrease in physical strength				
Drying skin				
Feeling bloated				
Feeling depressed				
Experiencing memory loss				

APPENDIX 3

Physical Activity Barriers Questionnaire (PABQ)

This questionnaire is designed to explore factors that may prevent or discourage you from engaging in physical activity. Please take a moment to read the instructions carefully:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Lack of time					
Lack of motivation					
Inadequate information					
Inconvenient physical activity location					
Pain					
Fear of injury					
Health problem					
Fear of falling					
Decreased balance					
Boredom for physical activity					
Preference for sedentary lifestyles					
Unsure of appropriate physical activity					
Increased recovery time					
Bad weather					

APPENDIX 4

Exercise Self-Efficacy Scale (ESES)

This questionnaire is designed to assess your confidence in your ability to engage in regular physical activity under various circumstances. Please carefully read the instructions before completing the scale.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Accessibility and availability of physical facilities					
Convenient location of physical activity					
High quality instructor					
Awareness of physical activity					
Free low-cost program					
Engaging session					
Pleasurable weather					
Potential weight loss					
Maintenance of balance					
Flexible program schedule					
Potential prevention of health problem					
Rest between session					
Mental acuity					
Belief that physical activity is important					

APPENDIX 5
INFORMED CONSENT FORM

TITLE OF STUDY: Perceived Barriers and Facilitators of Physical Activity Among Postmenopausal women

INSTITUTION: The Department of Physiotherapy, University of Benin, Edo State.

PRINCIPAL INVESTIGATOR: Amahia Vera Chika

PARTCIPATION: Participation of this study is voluntary. Refusal to participate will involve no penalty or loss of benefit to which you are entitled. You may discontinue participation at any time without penalty or loss of benefit. The principal investigator may decide to withdrawal you from the study if we are unable to obtain the necessary information.

INTRODUCTION: I am a final year student interested in evaluating Perceived Barriers and Facilitators of Physical Activity among Postmenopausal Women.

PROCEDURE TO BE FOLLOWED

QUESTIONNAIRE: If you agree to participate, I will give you a self-administered questionnaire which will obtain your socio demographics, physical activity level, menopausal symptoms, barriers to physical activity and facilitators of physical activity.

BENEFIT: The outcome of this study will help postmenopausal women understand the factors influencing physical activity and the importance of participating in physical activity.

COMPENSATION: There will be no financial compensation for participating in this research.

DURATION OF PARTICIPATION: The questionnaire takes three minutes to completely answer.

WHO CAN PARTICIPATE IN THIS STUDY: Postmenopausal women among the teaching staffs and non teaching staffs of the University of Benin.

ASSURANCE OF CONFIDENTIALITY OF VOLUNTEER IDENTITY: Records relating to your participation in the study will remain confidential.

PERSONS AND PLACES FOR ANSWERS REGARDING YOUR RIGHTS AS A RESEARCH SUBJECT: If during the course of the study you have a question concerning the nature or you believe you have sustained a research-related injury or assault, you should contact

Amahia Vera Chika

Phone Number: (+234) 8107243138

Email: amahiaveralove@gmail.com

IF THERE IS ANY PORTION OF THIS CONSERT FORM THAT YOU DO NOT UNDERSTAND, ASK THE FIELD WORKER OR INVESTIGATOR BEFORE SIGNING.

CERTIFICATION OF CONSENT

I, ……. having full capacity to consent for myself thereby agree to my participation in the research study. The methods and means by which the study will be conducted and the risk which may be reasonably expected have been explained to me by the Researcher, I have been given the opportunity to ask question concerning this investigational study, and any such question have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw myself from the study without prejudice.

Subject's Signature: ……..

Date: