# EFFECTS OF EIGHT-WEEK WALKING PROGRAMME ON HEALTH-RELATED FITNESS AND PERCEIVED BODY IMAGE OF PREMENOPAUSAL TEACHERS IN MOMBASA COUNTY, KENYA

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## DECLARATION

This Thesis is my original work and has not been presented for a degree in any other University.

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## DEDICATION

This work is dedicated to my family (Lazaro, Ray, Carson and Alfred), mother, sisters and brothers for their support and encouragement during my Master's programme at Kenyatta University.

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## LIST OF ABBREVIATIONS AND ACRONYMNS

**ANOVA**: Analysis of Variance.

**BDD**: Body Dissatisfaction Disorder.

**BI**: Body Image.

**BMI**: Body Mass Index.

**FITT**: Frequency, Intensity, Time, Type of Exercise.

**HRF**: Health-Related Fitness

**KU-ERC**: Kenyatta University Ethics Review Committee

**MET**: Metabolic Equivalence of Task.

**MoEST**: Ministry of Education Science and Technology.

**NACOSTI**: National Commission for Science, Technology & Innovations

**NCDs**: Non-Communicable Diseases.

**OW**: Over-Weight.

**PA**: Physical Activity level.

**SD**: Standard Deviation

**SPSS**: Statistical Package for Social Scientists

**UW**: Under Weight.

**$VO_2$Max**: Maximum oxygen consumption

**WHO**: World Health Organization

## OPERATIONAL DEFINITION OF TERMS

**Abdominal Muscular Endurance:** The ability of abdominal muscles to sustain a workload for long periods without strain.

**Body Image:** Mental picture a person has of own physical body (including size, shape, and appearance) and one's attitude toward the physical self (such as thoughts, feelings and beliefs about one's body).

**Body Mass Index**: An indicator of a person's health status regarding over-weightiness or under-weightiness.

**Cardio-Vascular Endurance:** The ability of the heart, lungs and blood vessels to deliver oxygen to body tissues for carrying out activities for longer period with less fatigue and for removing waste.

**Exercise:** Planned, structured and repetitive physical movement performed in order to improve or maintain physical fitness.

**Fitness:** A state of health and well-being enabling people to carry out daily tasks with vigor and alertness.

**Frequency:** How often the exercise programme runs per week as measured by number of sessions per week.

**Health-Related Fitness:** The combined optimum health status attained in cardiovascular-endurance, abdominal muscular-endurance, low-back flexibility, upper body strength-endurance, lower body strength-endurance and Body Mass Index (BMI) through participation in physical activity.

**Intensity:** The degree of difficulty exerted by an exercise workout on the physiological and/or muscular systems of the body or the amount of stress

exerted by the systems during exercise and categorized as low, moderate, or high intensity.

**Low Back Flexibility:** The range of motion of a joint or a group of joints in the lower back and hips.

**Perceptions:** Human ability for processing, interpreting, and attributing meaning to information received via the sensory receptors of seeing, hearing, smelling, tasting as well as touching.

**Physical Activity:** Bodily movement produced by skeletal muscles that requires expenditure of energy.

**Physical Fitness:** Ability of the body systems to work together efficiently to allow one to be healthy and perform daily activities without undue fatigue or stress.

**Premenopausal**: The stage in a woman's life prior to ceasing of menstruation.

**Self-esteem:** An evaluative element of personal values, approval or disapproval of self.

**Social Anxiety:** Extreme fear of being scrutinized and judged by others in social or performance situations.

**Time:** The duration, a person exercises (length of each exercise session).

**Type:** The kind/characteristics of the exercise an individual engages in or performs.

**Upper Body Strength-Endurance:** The ability of the upper body to carry out its daily tasks without undue fatigue or stress.

**Walking Programme:** A timed plan of low impact physical exercises, including walking and callisthenic exercises targeting the health-related components of interest in this study and done for specified number of days.

## ABSTRACT

The combined optimum health status attained from Health-Related Physical Fitness through participation in exercise and a positive mental picture a person has of one's own physical body and one's attitude towards the physical self are all vital for the enhancement of overall health and contentment. This study sought to determine the relationship between health-related fitness (HRF) and perceived body image; and to assess the effects of an 8-week walk programme (with in-built conditioning sessions) on these two factors. The study used a quasi-experimental design. The target population was premenopausal female teachers aged between 30-45 years in Mvita Sub-county, Mombasa. Purposive sampling technique was used to select the sample of 50 premenopausal teachers. Health-Related Fitness tests and a Perceived Body Image questionnaire was used to capture data before and after the Eight-week walk programme. The Health-Related Fitness tests comprised (i) the 20 metre bleep test to estimate cardiovascular endurance, (ii) the one-minute sit-up test to determine abdominal muscle strength endurance, (iii) the sit-and-reach test to assess low back flexibility, (iv) the modified push-up test to establish upper body strength; and finally, (v) measured heights and weights to calculate Body Mass Index (BMI). The experimental group (n=23) received the intervention of a walking programme, while the control group (n=26) was excluded from the walking programme. Data collected was analysed using Statistical Package for the Social Sciences (SPSS) Version 22. One Way ANOVA was used for analysis. Hypotheses were tested at 5% significance level. The ANOVA results indicated significant mean differences (pre-test and post-test) between the experimental and control groups ($p<0.05$) indicating a positive effect of the 8-week walk programme to Abdominal muscular endurance ($F(1, 48) = 56.72$. $P< 0.001$), upper body strength-endurance ($F (1, 48) = 55.86$. $P<0.001$), cardiovascular endurance ($F (1, 48) = 39.96$. $P< 0.001$), low back flexibility ($F (1, 48) = 37.75$. $P< 0.001$) and Body Mass Index ($F (1, 48) = 29.05$. $P< 0.001$). Based on the statistically significant differences between pre-test and post-test means ($t$ (48) = 2.07. $P$=.044), the perceived body image results suggest that participants consciously monitored their body weight. On whether participants wanted perfect bodies, the difference in pre-test and post-test means were statistically significant ($t$ (48) = 3.15. $P$=.003) suggesting that they had preference for a perfect body. On whether the participants felt that their bodies did not represent them, the difference in pre-test and post-test means were statistically significant (t (48) = 3.26. P=.002) suggesting that the Eight-Week Walk Programme had a positive impact on perception of their body image. In addition, on whether the participants followed exercise regimes to the letter to maintain a good figure, the difference in means were statistically significant (t (48) = 4.28. P<.001) implying participants were more strict on exercise regime to maintain a good figure post the exercise. On whether the participants felt physically attractive, the difference in means were also statistically significant (t (48) = 2.72. P=.009) indicating that they felt more attractive after the exercise. On whether the participants were concerned about their body weight all the time, the difference in means were statistically significant (t (48) = 3.15. P=.003), an indication that the participants were keen to maintain a healthy body. Given the positive significant effects of the Eight – Week Walk Programme the study recommends this Walk Programme for female pre-menopausal teachers to improve their Health-Related Physical Fitness Components as well as body image. It concludes that further research should determine the best ways of integrating walking into daily life routine to enhance HRF components and perceived body image.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

In scientific and physiological terms, generally physical fitness is a blend of a number specific independent qualities/traits/elements/components that involve definite physiological and biological factors and adaptations. The elements or components of physical fitness comprise of cardiovascular function, flexibility, muscular endurance, strength and body-composition; these all contribute to performance of daily tasks, engagement in recreational exercises and prevention of injuries (Bukhala, 2017*).* Other attributes of physical fitness that relate to sporting abilities include coordination, balance, speed, agility, power and reaction time (Iyakrus & Ramadhan, 2021).

Generally, cardiovascular endurance denotes to the collective functions of the heart, lungs and blood vessels. Muscular strength is the amount of force or energy exerted by a muscle or set of muscles in one maximal contraction. On the other hand, muscular endurance is defined as the duration a muscle or group of muscles can work incessantly without undue fatigue. Flexibility is the range of motion at a joint or a group of joints (Wilmerding & Krasnow, 2017*).* Though the component of body composition refers to everything that makes up the body – bone, muscle, fat, organs, water, and connective tissues (Braun, 2022), it is fat or adiposity that has been identified as a culprit in most lifestyle non-communicable diseases (NCDs). Ultimately, the specific nature of each components and the aims, objectives and needs of the individual will determine which of these components or their subdivisions to emphasis more than others (Corbin & Masurier, 2014).

The specific focus or objective of this study concerned the Health-Related Fitness (HRF) components of:

(i) Cardiovascular endurance as reflected by the ability of the heart, lungs and the blood vessels to efficiently and continuously deliver energy to all working tissues and to remove the subsequent waste in normal daily living (Limbu, 2014; Cheng, Chiu & Su, 2019).

(ii) Abdominal muscular endurance, which, in addition to ensuring digestive health also contributes to pelvic stability, posture and respiration.

(iii) Low Back Flexibility that is enhanced by the collective muscular tendinous and ligament stretch ability for the low back trunk functional mechanical advantage (Wilmerding & Krasnow, 2017).

(iv) Upper-body strength-endurance, a key factor in ensuring correct postural alignment for the safe execution of upper body daily tasks such as carrying, opening doors, cooking and without undue fatigue.

(v) Body Composition or more specifically percentage body fat that has been implicated as the prime risk factor in several non-communicable diseases (NCDs). Body Mass Index (BMI), which has been identified as a valuable, inexpensive, non-invasive and easy to calculate screening tool of a person's weight inclination to either overweightness or under-weightiness has often been used as the surrogate for percentage body fat (Sommer et al., 2023).

Body image on the other hand is an individual's perception, belief, emotional and cognitive attitude regarding his or her own body (Brazier, 2017). Body image refers to

perception one has of his or her own physical body (including size, shape, and look) as well as one's attitude towards the physical self (such as feelings, thoughts and beliefs about one's body). Societies have differing perceptions about body image ranging from thin to curvy to proportionately even (Waldman et al., 2013). Documented research has shown that socio-cultural forces usually impose different perceptions on men and women regarding body size. Some appreciate slender bodies while others prefer larger bodies, resulting in extreme under-weightiness or overweightness, both conditions being detrimental to health. The African culture, which includes the Kenyan culture, tends to lean towards the latter view. This could be the reason for overweightness among women in particular. Previous studies offer insight into African American women's dissatisfaction with their weight status and body image; the authors noted that overweight or obese women experienced fluctuating levels of negative body images, based on feedback from their social interactions (Baturka, Hornsby & Schorling, 2000).

Studies concerning menopausal symptoms in Croatia and Lithuania indicate that body dissatisfaction is closely related to perceived socio-cultural pressures (Esnaola, Goni & Rodriguez, 2010). According to Bessenoff and Snow (2006), such influences come with urbanization, westernization, fashion, with mass media being the major cause for changing perceptions of body image among women. Thus, mass media puts women at a high risk of nutritional disorders and western beauty body type ideals (Bessenoff & Snow, 2006). Age, gender, marital status and BMI have major relationship to body dissatisfaction (Luo, Parish &Laumann, 2005). Arasa (2017) explored related analysis along gender lines and found that body image ideals are changing and dissatisfaction is spreading in Kenya.

In addition to enhancing HRF and positive perception for health and well-being, the menopause stage of a woman's life presents additional concerns. Women between aged between 40 to 55 years have menopausal symptoms such as hot flashes/flushes, night sweats, decreased bone density and fat gain (Sternfeld & Dugan, 2011). Engaging in moderate physical activities during the perimenopausal stage helps in reducing menopausal symptoms (Kim, Cho, Ahn, Yim& Park, 2014). The Atan, Tural, Imamoglu, and Cicek, (2012) study examined the extent of physical activity of teachers and health professionals in Turkey. Their study concluded that female health professional workers have better physical activity levels compared to female primary school teachers who become less physically active as they advance in age. Similar reduced physical activity levels were found among female teachers aged between 31 to 42 years compared to the male teachers in Brazil (Brito, Santos, Marcolongo, & Campos, 2012). This study clearly revealed relationships between ideal body image and body dissatisfaction, between gender and declining physical activity (PA), between PA and the teaching profession, socio-cultural pressures, age, fashion and mass media. These seemed to be influencing factors for dissatisfaction (Westfall's, 2015).

The 2018 Physical Activity Guidelines Advisory Committee of the Department of Health and Human Services (Katzmarzyk, et al., 2019) identified walking as one of the most popular aerobic activities for lowering BMI and for contributing positively to life-long Health-Related Fitness. The guidelines suggest that intensity, a key variable in the overload principle of frequency, intensity, time and type in physical training, played a vital role in describing exercise as light, moderate, or vigorous. It directs

relationship between energy expenditure that is expressed as multiples of the Metabolic Equivalence of Task (MET). Non-sedentary walking behaviour is a reflection of low/light-intensity activity expending below 3.0 METs; moderate intensity expends between3.0 to 6.0 METs; and high intensity walking expends over 6 METs. Regular walking has previously been linked to Health-Related Fitness and perceived Body Images (Rabbitt, 2020). Therefore, a walk programme, incorporating the right intensity, frequency and duration embedded in one's daily routine in an enabling and supporting environment, would be ideal for a working population to develop both HRF and body image (Bai et al., 2022).

The coastal region of Kenya has a diverse population with rich cultural backgrounds. Mombasa experiences high humidity and average annual temperature of between 24 to 30 degrees Celsius (75 to 86 degrees Fahrenheit) (STATE of the CLIMATE – KENYA, Kenya Meteorological Department, 2020) throughout the year compared to other parts of Kenya. This, coupled with the influence of the Swahili cultural practices regarding women, might influence their physical lifestyle and body image. This study involved premenopausal professional female teachers in coastal Kenya, who form a large population of professional working women.

### 1.2 Statement of the Problem

Studies have explored relationships between body image, health and psychological wellbeing (Kim et al., 2014); Physical Activity and Health-Related Fitness among premenopausal and menopausal women (Ransdell et al., 2004); and PA among teachers in public schools and health professionals (Westfall, 2015). The findings of

these studies recommend a need for further investigations that include interventions to address the varying concerns.

According to the researcher's understanding, no study has applied a Health Related Fitness PA intervention for enhancing physical fitness and perceived body image among premenopausal teacher in Mvita. In addition, no study has established the physical activity levels of Kenyan premenopausal teachers nor their perceived body image. This is despite the detrimental effects of dissatisfaction with perceived body image and poor health-related fitness on the performance and health of teachers. In view of the uniqueness of this study, the researcher sought to examine any association between the Health-Related fitness and Body Image among these teachers. In the same vein, no study has sought to establish the impact of a walking programme on the Health-Related Fitness and perceived body image of women in Kenya. Such a programme, if found effective could be instrumental in the promotion and advocacy of a healthy active lifestyle and improved body image among the Kenyan women.

Mombasa, a coastal city in Kenya, was chosen as the study location because of availability of 22 public primary schools that could provide adequate study population, supportive environment for walking, scenic routes and pedestrian-friendly infrastructure, which could sustain the eight-week walking programme. In view of the high humidity and temperature encountered in Mombasa, walking was considered the better suited physical activity for the environment than the more intense physical activity such as running or cycling. This study set out to establish the effects of Eight-Week Walking programme with built-in conditioning sessions on the health-related

fitness and Perceived Body Image of pre-menopausal primary school teachers in Mvita, Mombasa County.

### 1.3 Purpose of the Study

The intent of the study was to assess the effects of an Eight-Week Walk Programme with built-in conditioning sessions on the Health-Related Fitness and Perceived Body Image of 30 to 45year old pre-menopausal teachers in public primary schools in Mvita, Mombasa County.

### 1.4 Objectives of the Study

The study was guided by the following objectives:

i. Establish the effects of an eight-week walk programme on the Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance and Body Mass Index (BMI) of 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County.

ii. Establish the effects of an eight-week walk programme on the Perceived Body Image of 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County.

iii. Determine the relationship between Health-Related Fitness and Perceived Body Image of 30 to 45year old premenopausal female primary school teachers subsequent to an eight-week walk programme.

### 1.5 Research Hypotheses

The study was steered by the following null hypotheses:

**$H_{01}$:** There is no significant effect of the eight-week walk programme on Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance and Body Mass Index (BMI) of 30 to 45year old premenopausal female primary school teachers in Mvita, Mombasa County.

**$H_{02}$:** There is no significant effect of the eight-week walk programme on perceived Body Image of 30 to 45year old premenopausal female primary school teachers in Mvita, Mombasa County.

**$H_{03}$:** There is no significant relationship between Health-Related Fitness and Perceived Body Image of 30 to 45 year old premenopausal female primary school teachers subsequent to an eight-week walk programme.

### 1.6 Significance of the Study

The results of the study may aid premenopausal teachers appreciate benefits of walking on their Health-Related fitness, well-being and their Perceived Body Image. Concurrently, the study may contribute to the development of a Kenyan based fitness training programme for premenopausal Kenyan women. It may also serve as a platform for generating further investigation into the programme's efficacy for overall promotion of Health-Related- Fitness and body image among varying populations. The study may also draw the attention of the Ministries of Education, Sports and Health into addressing issues relating to female teachers' health, well-being and their performance linked to Health-Related Fitness, PA and body image. The findings of the study may also provide necessary information to support further research, investigations and interventions within this study's scope and beyond in the future.

### 1.7 Assumptions of the Study

The study assumed that all participants would provide honest answers to the questionnaires concerning perceived body image, premenopausal status; and would do their best to adhere to the eight week-walking programme.

### 1.8 Limitations of the Study

The study was limited by the researcher's lack of control on the participants' dietary intake, their participation in other physical activities of daily living and their current health-status, all of which could have affected the walking programme or the outcome of the study. There was no intention to discontinue or interrupt the normal lifestyle of any of the participants. The idea was to add the Eight-Week Walking Programme including conditioning sessions to their normal routine and then determine the effect on the variables under test.

### 1.9 Delimitations of the Study

The study was delimited to the following:

i. Public primary schools in Mvita, Mombasa County.
ii. All 30 to 45 years old female teachers working in public primary schools in Mvita, Mombasa County.
iii. Specific tests for the five Health-Related Fitness components of the study: cardio-vascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance, and body mass index (BMI); and a questionnaire specific to determining perceived body image
iv. A researcher developed eight-week walk programme with built-in conditioning sessions.

### 1.10 Conceptual Framework

The study was based on the models adapted from Akusala's research model (Akusala, 2014) which revealed that an individual's body image is prejudiced by various factors such as health, perception, and physical activities. Consequently, many individuals tend to evaluate their body against an idealized body image, which may not be suitable for everyone. The following framework (Figure 1), based on literature explaining the link between PA (such as walking), Health-Related Fitness and Perceived Body Image, guided the study. Walking has a direct positive effect on Health- Related Fitness, which in turn, also has an effect on Perceived Body Image. Kim et al., (2014), and Bai, Soh, Omar Dev, Talib, Xiao, and Cai (2022) in their investigations ascertained that brisk walking improved Health-Related Fitness and general life satisfaction. Therefore, a PA programme based specifically on walking with built-in conditioning sessions, and designed to develop HRF may, by extension, influence a person’s body image and consequently improve overall health, well-being and professional output.

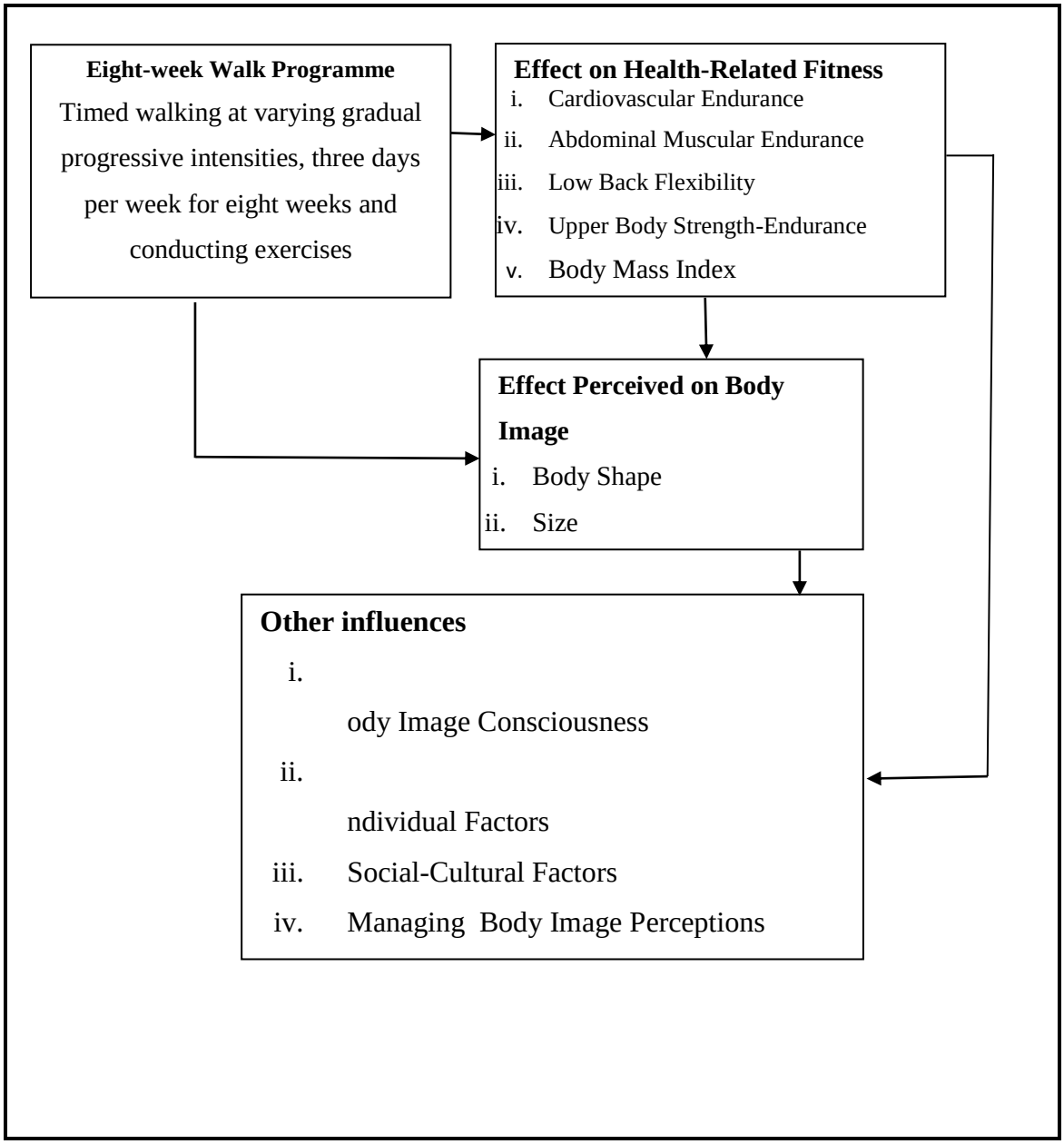


**Figure 1.1** Conceptual framework showing relationship between Eight-Week Walk Programme and HRF as well as perceived Body Image.

**Source:** Adapted from Arasa, (2017) and Akusala, (2014).

# CHAPTER TWO: LITRATURE REVIEW

## 2.1 Walking

Any activity that involves the larger muscle groups (especially the legs), is rhythmic and continuous for at least 15 minutes rather than being intermittent is deemed to be aerobic and beneficial for cardiovascular development (Millstein,2013). It is termed 'Aerobic' because energy is generated in the presence of increased oxygen inhaled during any increase in physical activity (Hadders-Algra, 2018). Brisk walking is one such activity (Johnson, 2020).The American Journal of Preventive Medicine (2015) defines walking as a moderate-paced physical activity that involves use of the legs for propulsion. Walking empowers the body muscles and leads to good health. Walking is a healthy natural activity that makes one feel better. It is an excellent, simple and safe form of exercise for people of all ages and abilities (Alnasyan, Alareefy & Alrahili, 2018). An extensive review by C3Collaborating for Health (2012), which examined the benefits of exercise to health and well-being, concluded that walking contributed a lot towards reducing risk of non-communicable diseases (NCDs).

Walking can encompass speed variations and use of implements to increase intensity. Brisk walking is a faster-paced walk that raises the heart rate and generates muscle force (Pavlović, Petrović, &Vrcić, 2021).While power walking involves longer strides and arm swings. The use of poles as in Nordic walking encourages greater involvement of upper body muscles, while treadmill walking offers a controlled workout. Hiking on natural terrain, while being physically more challenging, has the advantage being able to enjoy nature. Walking meditation is a mindfulness practice that involves walking slowly and focusing one's attention on the immediate

surroundings, keeping the mind free from all other thoughts and focusing on how the body is moving. On the other hand, race walking is a competitive sport that requires specific training and technique (Cazzola, Pavei & Preatoni, 2016).

Liang, Li, Jiaying, Wenjun, and Yaping (2017) conducted a walk combined with a health education intervention among 80 community living Chinese menopausal women. Apart from walking at 60% intensity of the heart rate for one hour, each of sessions included a 10-minute warm-up and cool-down. They determined that a three times per week, 16-week walking intervention under the supervision of a trained assistant, was effective in reducing menopausal characteristics. Though the results revealed psychological benefits of reductions in depression and improvements in physical self-esteem, there was no improvement in the body mass index (BMI) among these Chinese women.

Yang and Kim (2022) sought to determine the effectiveness of a walk based health promotion programme on the health of middle-aged Korean women. They saw increased involvement physical activity, improvement in health promoting lifestyles, decreases in waist circumferences and perceived stress. Despite the lack of clarity about the outcome on BMI, the authors recommend the programme for future interventions.

### 2.2 Health-Related Fitness

Physical inactivity and the resulting lack of physical fitness have become a major public health concern. Patterns of sedentary lifestyles seem to worsen among people of all ages worldwide. Sedentary inactive lifestyle has been implicated in an array of

adverse unhealthy conditions affecting the cardiovascular system, metabolic disorders, diabetes mellitus, cancer and musculoskeletal disorders (Park, Moon, Kim, Kong, & Oh, 2020; WHO, 2020). Thus, inactive sedentary lifestyle has a profound impact on physical fitness, in particular Health-Related Fitness, which is a key concept of the current study.

Physical fitness has been explained as a person's efficiency and effectiveness in being healthy, avoiding disease and coping with emergencies. Physical fitness is a complex construct including the specific independent components or traits of Agility, Speed, Power, Reaction Time, Coordination, Balance, Cardiovascular Endurance, Body Composition, Muscular Strength and Muscular Endurance. Each component has specific metabolic and neuromuscular training and developmental needs (Quinn, 2022; Pappas, 2020). The aims, objectives and needs of the individual determine the concept of fitness that the individual should pursue. For example, an individual seeking supremacy in physical performance would benefit best by adopting the concept of Skill/Performance-Related fitness and its dominant components of agility, coordination, speed, power, reaction time and balance (Rieck & Lundin, 2021).

On the other hand, the individual whose objective is to attain and maintain a general state of healthy well-being, to be functionally active without undue fatigue and to reduce risk of early health conditions, should focus on the concept of Health-Related Fitness. The components considered crucial throughout out life because of their tremendous impact on health are cardiovascular endurance, muscular endurance, flexibility, muscular strength and body composition (Berduszek, Geerdink, van der Sluis, Reneman, & Dekker, 2021). Health-Related Fitness demands optimum

effectiveness and efficiency in each of these components (Rieck & Lundin, 2021). The functional status or condition of these components change depending on the regularity and intensity of physical activities (Gronek & Holdys, 2013). The current study endeavoured to establish the efficacy of an eight-week walking programme, inclusive of warm-up, conditioning and cool-down on the Health-Related Fitness. The current study sought to focus on a particular aspect within each of the Health-Related Fitness components or dimension. The dimension of cardiovascular endurance involved walking. Abdominal muscular endurance represented dimension of muscular endurance. Low back or trunk flexibility represented the category of flexibility; whereas upper-body strength-endurance merged the dimensions of strength and endurance. Body Mass Index examined the weight tendency within the scope of percentage body fat in body composition

### 2.2.1 Cardiovascular Endurance and Walking

Cardiovascular endurance, also referred to as aerobic endurance, cardiopulmonary endurance, cardiorespiratory endurance and physical work capacity (PWC), is the ability of the heart, lungs and blood vessels to deliver oxygen to body tissues for carrying out activities for longer periods with less fatigue; and for removing waste metabolites that come with fatigue (Limbu, 2014; Cheng, Chiu & Su, 2019). The more efficiently the body delivers oxygen to its tissues, the lower the breathing rate (Marty, 2020). Based on the study conducted by American College of Sports Medicine (2018) there is notable reduction in cardiovascular endurance and strength as people age.

Teychenne and Miller (2017) established that walking improves efficiency of the heart for transporting oxygen to body muscles. The authors determined that moderate intensity walking helped the body in breaking down fat while efficiently increasing cardiovascular endurance. The study revealed that walking improved the supply and uptake of oxygen in the muscles, which in turn, improved mitochondrial density and efficiency that resulted in greater capacity for undertaking tasks with less fatigue. Since a bout of 30 minutes is not a very long duration, these authors recommend 30 minutes of brisk walking five days per week to enhance aerobic fitness. The in-depth review by Murtagh, Murphy & Bonne-Heinonen (2010) determined that walking could be a key factor in the prevention of cardiovascular disease. Participation in the simplest and the most natural physical activity of walking has been linked to the development of the health-related fitness components (Better Health Channel, 2023).

When recommending at least 150 minutes of moderate physical activity once a week, the American Heart Association ( May 2023) contends that this could translate to as little as a 20 minute walk daily for managing varied  in heart conditions. The Omuro, Ussery, Loustalot, Fulton and Carlson (2019) analysis of walking data from 29,742 participants in the 2015 National Health Interview Survey in the Cancer Control Supplement, found that any decrease in prevalence of walking, increased the risk of Cardiovascular Disease (CVD). The survey recommends the promotion and encouragement of walking to avoid inactivity among adults.

Just as in training, specificity must also be observed in testing.  The most accurate method or the gold standard for assessing cardiovascular fitness involves stringent laboratory based $Vo_2$Max exercise testing methods either when walking or running

(Letnes, Dalen, Vesterbekkmo, Wisloff & Nes, 2019). However, as recognized by ACSM (2014), laboratory testing may not always be feasible. Circumstances or logistics may render the laboratory test impractical. The equipment may be too expensive. It may be very bulky and heavy to transfer. The actual test may take a longer duration for each participant. The equipment and procedures may require very specialized personnel. The procedure may put the participant at greater risk during laboratory testing.

Incognizance of these difficulties, exercise physiologists over the years have endeavoured to develop logistically practical, simple, feasible, reliable and valid alternative field test. As explained by Tomkinson and Olds (2008), the common characteristics of most such alternative field tests are based on walking or running either as time taken to walk/run a distance or the distance completed to walk/run within a prescribed time. The authors also included the 20 m endurance shuttle run (sometimes called the beep test) in this category of walk/run field test. A participant in the shuttle run is required to complete progressively faster laps until unable to complete a lap.

### 2.2.2 Abdominal Muscular Endurance and Walking

Muscular endurance refers to the ability of muscles to maintain force against sub-maximal resistance within a period of time without undue fatigue. The status is reflected in the maximum repetitions completed at a percentage of the individual's maximum ability in a single maximal contraction. Much of the literature concerning the benefits of muscular endurance in Health-Related Fitness takes its cue from the generalized roles attributed to it by the American Council on Exercise (Sissons, 2021).

The American Council of Exercise attributes maintenance of good upright posture and stability over longer durations, aerobic capacity of muscles, performance of day-to-day functional activities such as carrying, and increasing endurance in sporting activities as the functions of muscular endurance in Health-Related Fitness in general. However, as emphasized by Sissons (2021), collective critical Health-Related dynamics of the rectus abdominis, the transverse abdominis, the internal and the external obliques in the abdominal region, raise particular concern for the abdominals in satisfying the non-stop continuous functional demands on this region during daily living, recreational/leisure activities and in sports.

Endurance and concomitant strength of the abdominal muscles are important not only for protecting delicate organs within the abdominal cavity, but also for regulating the correct positional location and pressure of the contents of the abdominal region. Deeper abdominal muscles along with the muscles and ligaments of the low back constitute the ‘core’ structures that keep the body stabilized and the spine protected (Better Health Channel, 2012). Alivertiet et al., (2010) suggest that the simultaneous contraction of the abdominals that occurs during elevated activity augments or enhances the diaphragm’s function in ventilation and together, the two could act as an abdominal circulatory pump. Bedosky, (2019) contributed that those with good muscular endurance find it easier to maintain a good body. The abdominals support good posture by ensuring correct alignment of the pelvic tilt while helping the low back muscles in stabilizing the vertebral column and achieving the optimum curvature at the mid body section of the lumbar region (Barclay, 2020). Abdominal muscles contribute to trunk stability and minimalize the compressive forces on the lumbar spine (Nimkar, Bera, Bagchi & Narnolia (2020). Rathore, Trivedi, Abraham & Sinha

(2017) declared that stabilizing and mobilizing the spine is the most important function of the abdominals. The authors further explain that the transverse abdominis and internal obliques act as the stabilizers while rectus abdominis and external obliques are involved more in mobility.

Boldt (2019) contends that walking improved the tone of the abdominal muscles by consuming fat, making one appear slim, tall, lean, and fit. Hong et al., (2014) found that walking for 50 to 70 minutes three times every week for 12 weeks promoted the loss of abdominal fat in obese women as compared to those who lived a sedentary lifestyle. However, none of these studies addressed the role of walking specifically on abdominal muscular endurance. In view of the multiple continuous functions of the abdominals, there can be no doubt about the need for endurance in them. Given the important functions of the abdominals in health, this study sought to determine the effect of an Eight-Week Walk Programme, inclusive of warm-up, conditioning and cool-down on enhancing abdominal muscular endurance.

Given the significant role of the abdominals in physical health, it is also important to select an appropriate reliable, valid and objective method for evaluating the endurance of the abdominals. Caputo (2020), acknowledged Electromyography (EMG) as the gold standard for measuring muscle response during voluntary contraction. As explained by Farnsworth (2018), Electromyography is the record of a muscle's activation during a contraction. Any contraction in a muscle generates a burst of electrical activity, which vibrates through neighbouring tissues. The magnitude of the muscle's contraction is detected and recorded by the EMG electrodes. Interestingly, a review by Gechev, Kane, Koltzenburg, Rao& van der Star (2016) warn that the needle

electrodes in EMG could cause bruising and asymptomatic hematoma. However, an Electromyography machine is relatively expensive and cumbersome to move around.

The urgent need for quick, reliable and valid methods of physical training and evaluating during World War II led to the identification of the sit-up exercise as suitable, not only for conditioning but also for evaluation (Esmail,1983). The sit-up and its several curl-up variations have gradually gained popularity over time not only because of the relative ease in performance but also because of their ability to activate the deep hip flexors – iliopsoas (Anders, Ludwig, Sanger, & Marks.2020). Though Bianco, Lupo, Alesi, Spina, Raccuglia et al., (2015) determined the sit-up test (SUT) not quite optimum for global muscular endurance evaluation, the authors suggest that the minimal cost and high safety render the sit-up test appropriate for testing abdominal muscular endurance of the core abdominal region in both men and women. Diener, (1992) had no hesitation in recommending implementation of the 1-minute sit-up test as a measure of abdominal muscular endurance, after finding high test-retest reliability (.97 and .94) and moderately high concurrent validity (.69) for the test.

### 2.2.3 Low Back Flexibility and Walking

Flexibility, as explained by the American College of Sports Medicine (ACSM (2017) is the possible range of motion (ROM) at a joint or a group of joints that is achieved exclusively by the voluntary action of the muscles and without any involuntary impetus from an external force. The Committee on Fitness Measures and Health Outcomes in Youth (Pate et al., 2012) declared that unlike most other components, flexibility is extremely joint specific. The Committee further explains that while

flexibility is joint specific, the multi-jointed structure and nature of the lumbar spine in the low back trunk area combined with the multiplicity of its functions, raise serious health concerns for flexibility in this region. As explained by Sassack and Carrier (2020), the five largest durable and mobile vertebrae in the low back lumbar spine, not only protect the spinal cord, but also allow dispersal of axial forces. The low back lumbar spine provides support for the upper body. Its diverse truncal movements allow flexion, extension, rotation and lateral flexion. The variability of the concave curve, called the lumbar lordosis, ensures correct positioning of the upper body over the pelvis, which allows the efficient bipedal movement during locomotion.

The abdominals and the muscles of the low back work in coordination during bending, straightening and lifting. The core multifidus, transverse abdominis, the pelvic floor and the Diaphragm work in conjunction to stabilize the spine and the pelvis. Since the abdominals act as an anchor for the spine, any malfunction in the abdominals forces the erector spinae to work harder (Polat, Demirsoy & Tokqoz (2022). Studnicka and Ampat (2022) elaborate that the ‘box-like structure comprising the abdominal muscles in the front and the sides, the gluteal and the spinal muscles at the back, the diaphragm as the roof at the top, and the pelvis and the hip girdle muscles lining the floor, make up the critical core abdominal-lumbar mid-region.

The hamstring muscles’ attachment to the ischial tuberosity has led to the speculation that any tightness in the hamstrings, could encourage a posterior pelvic tilt resulting in a reduction in lumbar lordosis and subsequent low back pain (LBP) (Nourbakhsh & Arab, 2002). Similar suspicions led Johnson and Thomas (2010) to investigate further, but they find no significant relationship between hamstring flexibility and forward

lumbar flexion among those presenting with LBP or recovering from LBP. Likewise, Jandre-Reis and Macedo (2015) found no differences in hamstring tightness between those with LBP and their asymptomatic volunteer counterparts. However, Mistry, Vyas and Sheth (2014) revealed significant hamstring tightness differences between those with LBP and healthy participants.

Physical activity, especially walking has been associated with reduced stiffness in low back muscles and joints (Shao, Lu, Zheng, Sun & Gu, 2022). Cole, (2019) explains that inactive sedentary lifestyle leads to stiffening in the low back muscles and joints such that the increased pressure on the lumbar spine alters its normal alignment, which causes pain. The authors add that walking improves blood circulation, increases supply of oxygen and nutrients to the muscles, and eliminating pain-causing toxins accumulated within the low back.

According to Gordon and Bloxham (2016), while muscular strength provides the stability in the lumbar spine, joint flexibility in the ligaments of the low back increase the range of motion during functional movement. Verburnt, Smeets & Wittink, (2010) argue that a physical exercise programme inclusive of muscular strength, flexibility and the aerobic activity of walking is good for improving persistent low back pain. Walking improves the range of movement of the ligaments in the low back, the legs and the buttocks by activating the hamstrings, hip flexor and erector muscles of the spine.

The Vanti et al., (2019) in-depth systematic meta-analysis did not find any significant differences between walking and other forms of exercises in the effectiveness of

managing LBP. Instead, in view of walking's aerobic characteristics, minimal amplitude in the low back, pelvic rotation and movement oscillation in the lower limbs, Vanti et al., recommend that walking be included in the same group of non-specific exercises for chronic LBP. Additionally, for its minimal simplicity, its cost compared to supervised programmes and physical therapy, the authors determine walking a very viable option.

As with all the other components of Health-Related Fitness, the determination or evaluation of low back flexibility must ensure practicality, reliability and validity. Goniometry, a protractor-like instrument for measuring flexibility or range of motion at a joint has been in practice since the early 1900s. Samuel Lewis Penfield patented the first goniometer for measuring range of motion in human beings in 1901(Arm Protractor and Goniometer Invented by Samuel L. Penfield). In an attempt to provide a simple and objective measure of flexibility, Leighton (1942) developed the flexometer. From their endeavours to establish the validity and test-retest reliability of hand held goniometers for measuring passive of range of motion at the hip, Nussbaumer et al., (2010) established that the hip's ROM was considerably over-estimated when measured by the goniometer. The disadvantages of Goniometry include difficulties in placing the instrument correctly, use of both hands by the administrator, which did not allow proper stabilization of the arms, and too much reliance on the administrator's subjective estimation. Despite its earlier promise, even the Leighton Flexometer was deemed unsuitable in many situations (Cotton, 1972).

The Sit-and-Teach test, developed by Wells and Dhillon in 1952 has come to be recognized as the most common and popular measure for evaluating low back

flexibility (French et al., 2016). The simplicity, speed and ease in performing and administering the test has probably accounted for its inclusion in internationally acclaimed fitness protocols (Baltaci, Un, Tunay, Besler & Gerceker, 2003). The test is simple, quick and easy, not only to perform, but also to administer. Since the subject is seated on the floor there is no anxiety about falling.

### 2.2.4 Upper-Body Strength-Endurance and Walking

The upper body constitutes the entire region of the body above the waist - the hands, lower arms, upper arms, chest, shoulders, neck, the upper back and upper abdominals. Based on the earlier explained distinguishing functional characteristics of muscular strength and endurance, it becomes obvious that the concept of "strength-endurance" appended to the Upper Body demands a combination of both, strength and endurance. Interestingly, the same exercises in resistance training are used to improve both, the muscular functions of strength and endurance (Fisher et al., 2011). The difference appears to be in the appropriate amount of resistance and number repetitions (ACSM, 2018).

Fragala et al., (2019), determined that resistance training counteracts age-associated declines in contractile function, sarcopenic decline in muscle mass and strength, and morphology of skeletal muscle in older adults. This in turn, contributes to the muscular strength, power and neuromuscular coordination in aging adults. Resistance training also brings about neuromuscular, neuroendocrine and hormonal adaptations. Ultimately, the aging adult's carrying out every day's tasks like lifting, carrying, and cleaning improves with resistance training. There is preservation in independent living, a reduction in chances of injury and falling, and a psychological boost in sense

of well-being. Fragala et al., (2019), agree with the earlier contention by the American Council of Exercise that muscular endurance carried a big responsibility for the maintenance a good upright posture and stability in the upper body.

Upper body strength is important for the everyday demands placed on the arms, shoulders and back (Lindberg, 2019). Bedosky, (2019) added that those with good muscular endurance find it easier to maintain good body. Biswas and Gupta (2019) recommend upper body strength exercises as the best way for strengthening the upper body, improving body image and general life style among women. Interestingly, they deduced that women who have 50% less upper body strength compared to the lower body, build a positive body image by adding strength training to their workout routine. Ginis, Arbour, Hartman and Phillips (2005) examined gender discrepancies in body image changes among both, men and women proceeding a 12-week strength-training programme. The results revealed that body image improvements in women were in line with subjective physical changes and objective increases in strength attributed to strength training.

On the determination that a 30-minute walk, five days a week at a moderate intensity helped in preventing sarcopenia or age-related loss in muscle size and strength of the body, Teychenne & Miller (2017), recommended the introduction of such walking programmes. Holviala et al., (2012) sought to establish the effects of three types of training, on the neuromuscular coordination, endurance, walking and dynamic balance of 108, 56.3$\pm$9.9 year old healthy men. Each training regime was administered twice a week over the 21 weeks. Distribution of participants by the three experimental training regimes and one control group were strength training (ST) n=30, endurance

training (ET) n=26 and combined strength-endurance training (SET) n=31 and control (C) n=21). Whereas the control group showed minor changes in the variables, the strength (ST) and combined training (SET) groups revealed significant improvements in maximal and explosive strength, speed of walking and dynamic balance. The ST and SET groups also showed significantly moderate relationships between strength and dynamic balance and speed of walking. However, the ET group did not reveal any such relationships.

There appears to be a lack of laboratory-based test for upper body strength endurance. With specific reference to upper body strength endurance, Thomas et al (2020) realized that, while the most often tests used were the push-up and the pull-up tests, the parallel dip and the handgrip might also be alternatives. They sought to evaluate which one out the push-up, the pull-up, the hand-grip and the parallel bar dip would be most suitable for determining over-all upper body strength endurance. The Thomas study disclosed that the push-up, the pull up and the parallel dip tests could all be useful for evaluating upper body strength endurance. However, the hand grip was categorically deemed unsuitable for measuring upper body strength endurance.

Both exercises, the push-up and the pull-up target different muscles in the upper body, and as such, have not brought about a consensus about which one of the two is more beneficial for upper body strength endurance. On the other hand, the pull-up exercise for the most part involves the trapezius, the deltoids, pectoralis major, biceps, triceps and latissimus dorsi. It also has some effect on the obliques, the rectus abdominis and the erector spinae. The performance needs a bar for pulling up. This study sought to

delve into the effect of an eight-week walk programme that included a warm-up, the walk treatment, conditioning and a cool-down on the upper body strength endurance.

### 2.2.5 Body Mass Index and Walking

The Editorial Comment in Medicina Universitaria on Body Composition explains that it was not until early in the 20$^{th}$Century that Body Composition received prominence when major advances were made in its understanding and its evaluation (Vol. 16 issue 64 July 2014 Medicina Universitaria).Body Composition refers to every tissue and all material that make up the body. These include muscle, bone, fat, skin, water and minerals. In the context of health and fitness, relevant respective professionals use the term 'Body Composition' to denote percentage fat.

Studies have shown that classification of health, based on the total composite weight of the whole body, without special consideration for the adipose fat content in the body, may not give accurate results (Ortega, Ruiz, Labayen, Lavie & Blair, 2018). Subsequent to establishing the relatively low specific gravity of adipose fat using hydrostatic weighing technique, the authors declared the measurement of the specific gravity of the whole body to be a valid estimate of its fat content and obesity. The authors concluded that such information allows a more accurate categorization of obesity and physical fitness, in contrast to the earlier age-height-weight standards which erroneously classified muscularly well-developed individuals overweight and obese individuals with lower body mass as normal (Ortega, Ruiz, Labayen, Lavie & Blair, 2018).

During the World Obesity Day, the World Health Organization (WHO, 2022) relayed some startling statistics –over one billion people in the world were obese. When broken down, 650 million were adults, 340 million were adolescents and 34 million of were children. The organization estimates that Obesity will be responsible for the deterioration in health among 167 million people round the world. Overweight and obesity are explained as abnormal or excessive accumulation of fat that poses a risk health factor. Obesity and fat, in general, has been implicated in multiple physical and mental co-morbidities (Ortega, Ruiz, Labayen, Lavie & Blair, 2018).

An in depth examination by Abdelaal, le Roux and Docherty (2017) concerning overweight and obesity as risk health factors reveals a myriad of conditions. The most important of these include diabetes, hypertension, chronic vascular disease (CVD), chronic kidney disease (CKD), cardiac heart disease (CHD), non-alcoholic fatty liver disease (NAFLD), subfertility, and varied cancers. They also reveal that the increased body mass, connective tissues and total body water result in physiological changes that alter responses in pharmacokinetics and pharmacodynamics of medications. Similarly, the changes in morphology alters body mechanics that leads to functional impairment, and arthritis. The changes in body size brings about psychological issues of depression, loss of self-esteem, body image and social interaction.

It is evident from the above input by authors' that body fat has a tremendous impact on maintaining normal body structure, health and fitness. Such an impact demands appropriate evaluation of the body to prevent levels from becoming risk factors. Early diagnosis of risk levels facilitates provision of interventions for potential metabolic disorders. The British Heart Foundation's (BHF) Chief Dietician, Tracy Parker,

provides the advantages and disadvantages of 12 different methods for measuring body fat in the nutrition section of its online Hearts Matter Magazine (Hearts Matter, 2023.). Similarly, Grant Tinsley of Healthline, another online information site, has given an analysis of 10 different ways for measuring percentage body fat (The 10 best ways to measure your body fat percentage Updated May 18, 2023).

The BHF (Heart Matters, n.d) and Healthline (The 10 best ways to measure your body fat percentage, Updated May 18, 2023), both seem to agree about some of the methods identified for measuring or estimating body fat. These include skinfold measurements, body circumference measurements, Dual Energy X-Ray Absorptiometry (DEXA), Hydrostatic or underwater weighing, Air Displacement Plethysmography (BOD POD), and Bioelectrical Impedance Analysis (BIA) and Body Mass Index. In addition to these, the British Heart Foundation includes the Thigh Gap and the Circumference Body Fat Calculator. On the other hand, Health line introduces the 3-D Body Scanner and the Multi-Compartment Models. Healthline deems the latter to be the new Gold Star measure in body fat evaluations.

Both, the BHF (Heart Matters, n.d.) and Healthline (The 10 best ways to measure your body fat percentage, Updated May 18, 2023) agree that ultimately, tests that require expensive laboratory analysis, sophisticated equipment and well-trained administrators are probably the most accurate measures. Examples of these are the DEXA, Hydrostatic Weighing, the BOD POD, and the BIA. Unfortunately, these are expensive, require highly qualified personnel, are time consuming and available only in hospitals and laboratories. And therefore, beyond the reach of most people. Though the relatively lower cost, ease in administration, portability convenience and accuracy

make the skinfold callipers a viable alternative; due to lack of anatomical knowledge, they are subject to human error during the pinch, and need highly trained personnel. Besides, not all subjects are agreeable to being pinched.

The Centre for Disease Control (CDC) (About Adult BMI, n.d.) explains Body Mass Index (BMI) as an assessment of a person's weight tendency towards health problems. Despite its flaw in not revealing accurate fat content, BMI has been a useful tool is screening for potential risk for health. It is based on the simple calculation of ones' weight relative to the height. It is calculated by dividing the weight (in kilograms or pounds) by the square of the height (in metres or feet). Zierle-Ghosh and Jan, (2022) expounded that BMI allowed the broad placement of individuals into the categories of underweight, normal weight, overweight and obese. BMI's potential in forecasting future health issues has been a key factor in public health policies.

The Suligaet al., (2018) cross-sectional study concerning the relationship between sitting time, physical activity, and metabolic syndrome among adults used Body Mass Index. The study emphasized that those who walked more and sat less had lower BMI. Brisk walking burnt about 300 kilocalories (kcls) an hour; thus, shedding excess weight (C3 Collaborating for Health, 2012). For the same reason, those who spent more time sitting had significantly higher risk for coronary heart disease, a larger waist size, higher triglycerides and lower HDL cholesterol. Kim et al., (2004) concluded that their eight week at the rate of 6000 to 7000 steps per hour, 40minutes, four times a week walking programme, had a beneficial effect on reducing BMI in obese Korean women. Hirsch, Roux, Moore, Evenson and Rodriguez, (2014) in their search to determine the viability of living in closer proximity to destinations and

larger street connectivity, encouraged people to walk more and reduce their BMI. They declared that neighbourhood infrastructures with closer proximities not only increased walk ability but also reduces BMI. It becomes apparent that despite its drawbacks, BMI is a suitable screening tool and surrogate for evaluating a person's weight related health conditions.

La New and Borer, (2022) conducted a study to examine the influence of different walking speeds on total body fat and fat distribution in postmenopausal women. The study included 50 healthy postmenopausal women who had an average age of 60 years. The researchers measured skinfolds and circumferences at specific body parts to evaluate the participants' body composition, including total body fat and regional fat distribution.

The findings revealed that faster walking speeds were linked to lower total body fat percentages and reduced fat accumulation in specific regions, such as the trunk, arms, legs, abdominal and upper arms. This suggests that walking at low, moderate and vigorous pace may result in varied beneficial effects on body composition in postmenopausal women.

### 2.3 Body Image (inclusive of Body Shape and Body Size) and Walking

Body image is the mental picture an individual has of his or her physical self, with the provision that recognition of the image is based on cultural ideals (Ahamed, Hilton & Pituch, 2002). However, the authors also reiterated that positive body image reflects how a woman looks at herself and her weight relative to her overall sense of self-esteem and exercise habits. Body image also involves a person's perception,

imagination, emotions and physical sensations about own body in relation to values that are not necessarily learned or expected culturally (Lightstone, 2006). Cash, Santos & Williams (2005) deem body image to be a multidimensional constraint integrating the individual's attitudes, perceptions and experiences concerning own physical appearance. Body shape is the general figure outline or silhouette of an individual while body size is the physical measurement of the body.

Women's shape and size are both affected by ageing, childbirth, hormonal fluctuations, changes in diet and physical activity level (Slevec & Tiggemann, 2011). Changes in body shape and size during middle age affect body image (Polotsky & Polotsky 2010). Davison and McCabe (2006) found that individuals suffering from Body Dissatisfaction Disorder (BDD), also experience weight and shape concerns, compared to those who are not bothered by body image issues. Individuals with BDD end up being preoccupied with imaginary physical flaws such as having fat around the abdominal area therefore have impaired perception about shape and weight.

According to Ransdell et al., (2004) women over the age of 30 years incline to physically inactive, look sluggish and are overweight due to lack of time for exercise, child-care and home responsibility. An exploration of body image and psychological well-being among African American and European women revealed that women rated their satisfaction with particular features of the body, perception of bodily functions and appearance (Sabik, 2012). For African American women, femininity was not relevant to body perception. Instead, it moderated relationship, social ways, and perception of bodily satisfaction and appearance of European Americans women. Those who engage in social comparisons were associated more with positive self-

esteem. Older women were primarily concerned with aspects related to functionality (Sabik, 2012).

A study regarding body image and ethnicity by Haytko, Motley, Parker and Torres, (2014) revealed that women tended to compare their bodies with those of celebrities; which ultimately led to dissatisfaction, depression and other negative consequences. The study showed that women develop a lot of pressure in trying to adhere to media images.

In traditional African culture, increased body mass was regarded a sign of well-being, beauty, strength, prosperity and fertility among women. In the African culture, those who have bigger bodies are assumed healthier and richer because of easy access to abundant food. On the other hand, those with slim or lean bodies are deemed unhealthy and poor (Bukachi & Shilabukha, 2008). The study also revealed that family, peer pressure, cultural and socio-economic issues affect people's perceptions about various body types such that a slim or slender body was associated with poverty while a heavy built or a well-endowed body was associated with, good appearance and abundance of wealth. Socio-cultural pressures such as the western ideal of thinness from the media, differ from African views, causing conflict and greater risk for the development of body dissatisfaction among women (Groesz, Levine &Murnen, 2002).

Misperceptions have resulted in thin individuals overestimating their weight, while many overweight women are ignorant about their body weight, resulting in weight-related behaviours. Body image ideals and dissatisfaction with their bodies have been

associated with unhealthy factors such as disordered eating and lack of exercise among women (Esnaola, et al., 2010). Arasa, (2017) also examined the predictors of body image dissatisfaction and the findings deduced that those with poor body image consciousness and discontent were free from negative consequences of body image dissatisfaction among undergraduate students at the United States International University (USIU).

Pop (2017) expounds on the benefits of taking part t in physical activity as crucial for maintaining bodily functions and promoting overall well-being. The author adds that regular exercise plays a protective role in reducing the risk of various health issues that affect the heart, metabolism, bones and mind. Physical activity bestows positive effects on an individual's body image, self-acceptance, self-confidence, and self-esteem, and inspiring individuals to adopt a healthier lifestyle. Walking, a moderate intensity exercise, can improve the control of body image, self-esteem and satisfaction (Grogan, 2008).

Czepczor-Bernat, et al., (2022) set out to evaluate the impact of 40 minutes woodland walking on the body image of 87 Polish women. They found that walking in a natural environment for 40 minutes each day significantly increase body appreciation. The Ginis, et al., (2014) experimental study sought to compare the effects of aerobics versus strength training on the body image of 43 young women with pre-existing body image concerns. Their study established that both, aerobic training and strength training groups contributed to positive perception of fat reduction, improved fitness and appearance.

## 2.4 Physical Activity Levels among Teachers

A comprehensive national health survey in Kenya by World Health Organization (WHO, 2018) revealed that 12% males and 24% females aged 18 and above years are physically inactive and consequently overweight. Brito, Santos, Marcolongo, and Campos, (2012) conducted a cross-sectional study concerning physical activity levels among public school teachers. The study conducted in 2009, involved 1,681 teachers in Sao Paulo city, South Eastern Brazil, found significantly low physical activity levels (42.9%) among female teachers, as opposed to the male teachers (53%).Specifically, 19.5% of female teachers aged 31 to 42 years recorded inadequate physical activity levels. The Brazilian study only looked at the prevalence of low, moderate and high levels of physical activity without isolating walking or considering the impact on perceived body image and health-related fitness. The present controlled eight-week walking study, sought to unravel the effects of walking, as a physical activity, on the perceived body image among premenopausal teachers.

Atanet al., (2012) compared difference in physical activity levels between 108 female primary school teachers and 138 female health professionals, all aged 36.28±6.58 years. Results revealed that physical activity level of female healthcare professional workers was higher than female teachers owing to their walking and sitting time by ($p<0.05$; $p<0.01$). However, as age advanced and lifestyles changed, there was an increase physical activity among teachers and decrease among healthcare professional workers.

Interestingly, a study by Shah (2012) on the impact of physical appearance of teachers on students learning environment, suggested that a teacher is a role model in the society, and students learn a lot by imitating them. Therefore, teachers have a responsibility of keeping good appearance to enable students focus, feel at ease and motivated (Westfall, 2015).

### 2.5 Developing the Exercise Programme

The Eight-week walking programme was designed to follow the principle of overload that incorporates concepts of frequency, intensity, time and type (F.I.T.T) of activity The Waehner, (2020) study, 'The F.I.T.T. Principle for an Effective Workout', suggests observance of the Overload principle incorporating the four variables of FITT. This helps in monitoring and creating an effective exercise programme for the achievement of fitness goals. The principle of overload in fitness training involves gradual systematic manipulation of the variables of FITT above the person's current level to improve that person's endurance, strength and muscle size. A person's progress to the next level is achieved by manipulating one the variables when the person shows signs of improvement in execution and performance (this could take two to four weeks) (Faigenbaum & Mcfarland, 2016; Quinn,2019; Waehner, 2020). The programme included three walking sessions per week, with a gradual increase in intensity and duration over the eight weeks. This approach was based on the understanding that brisk walking improves Health-Related Fitness components and general health (Bai et al., 2022; WHO 2020 guidelines).

None of the cross-sectional studies considered the effects of walking on the Health-Related components of cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper-body strength-endurance and body mass index. Therefore,

there was need to establish whether the eight-week walk programme that incorporated warm-up, conditioning and cool-down conferred any effects on premenopausal women teachers aged 30 to 45. The current study also sought to establish the effect of the eight-week walk programme on the perceived body image among premenopausal teachers in Mvita, Mombasa County.

### 2.6 Summary of Literature Review

Literature, concerning concepts of Health-Related Fitness components, body image and physical activity, including walking on its own, has presented evidence. However, most of the literature involves one or two of the independent variables among populations outside Kenya. It is notable that Health-Related Fitness components are paramount- for good health and Body image issues, particularly Body Dissatisfaction Disorders that are more prevalent among women than men. It is worth investigating whether the reported effects can also be experienced on fitness and positive body image. Previous studies, as presented in this chapter have drawn important conclusions linking such factors but in isolation and across different population groups.

Premenopausal women, especially in a developing economy like Kenya, that is characterized by varying societal, lifestyle roles and behaviours, still remain a population of interest for further investigation, especially in the provision of effective, sustainable behavioural interventions to address these and other women's health issues. This study, therefore, sought to assess the effects of an Eight-Week Walk Programme on the Health-Related Fitness and perceived body image of 30 to 45year old pre-menopausal teachers in Mvita, Mombasa County

# CHAPTER THREE: METHODOLOGY

## 3.1 Research Design

The study used a quasi-experimental design with an experimental and a control group. Eliopoulos et al., (2004) explain that a Quasi-experimental research design is a pre-post intervention design with no random assignment. It involves treatment and comparison of outcome between an experimental and a control group such that the experimental group receives a treatment, while the control group does not receive the same treatment. The control group serves as a benchmark, allowing researchers to compare the group under study to the control group to establish impact of changes on the dependent variables. The participants in this study underwent an Eight-week walk programme inclusive of warm-up, conditioning and cool-down, to determine its effect on the Health-Related fitness and Perceived Body Image of premenopausal female teachers working in public primary school in Mvita, Mombasa County.

## 3.2 Measurement of Variables

### 3.2.1 Independent Variable

The Eight-week walk programme treatment as detailed in Appendix B, Section I, was the Independent variable. The participant regulated intensity during the walk. Each participant was thoroughly trained to determine own maximum heart rate per minute; and thereafter on how to compute the beat count for 15 seconds for both, the higher and lower limits of her intensity-training zone. At regular intervals during the walk, the participant was required to count her own heart rate for 15 seconds. This informed her whether she was within the training zone. If too high, she was required to slow

down and if not sufficiently high, she was required to speed up. (Appendix B, section III).

### 3.2.2 Dependent Variables

The dependent variables in this study were the Health-related Fitness components of cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance and BMI**.** Every participant in both, the experimental group and the control group, was assessed in each of the dependent variables. The component of cardiovascular endurance was assessed using the 20 metres bleep test. The one-minute sit up test assessed abdominal muscular endurance. The sit-and-reach test assessed low back flexibility. The modified push-up test assessed upper-body strength-endurance and BMI was calculated based on the height and weight measurements using the Stadiometre and a digital weighing scale. The details of these are described in Appendix B Section I. The perception of body shape, size and appearance constituted the dependent variables in the context of Body Image. The Perceived Body Image Questionnaire (Appendix B, Section III), adapted from Arasa, (2017) was used to collect data concerning body image.

## 3.3 Location of the Study

The study was conducted in Mvita sub-county, Mombasa County in Kenya (map presented in Appendix J). Mvita is an urban area with 26 public primary schools; making it the sub county with the highest numbers of primary schools in Mombasa County, hence the best selection among the sub-counties to achieve a sufficient sample pool. Mvita sub-county was chosen as a study location due to its supportive environment for walking, scenic routes and pedestrian-friendly infrastructure, which could sustain walking programme for research participants.

### 3.4 Target Population

Teachers constitute one of the largest working professional groups in Kenya. According to data from the Kenya National Bureau of Statistics in 2020 (Basic Education Statistical Booklet 2020) with over one million people, the education sector was the largest employer in Kenya. Teachers constituted a significant portion of this workforce, with an estimated 350,000 primary school teachers and 145,000 secondary school teachers in the country. The large number of teachers in Kenya could potentially provide a significant participant pool for research studies. In order to provide an intervention that could promote both Health-Related status and perceived body image among majority of working pre-menopausal women, this study chose to target female primary school teachers in Kenya. The target population was premenopausal female teachers aged between 30 to 45 years working in the public primary schools in Mvita, Mombasa. According to the Teachers Service Commission records, (Mvita Sub County Teachers Records 2022) there were approximately 146 female teachers in Mvita Sub-county.

#### 3.4.1 Inclusion Criteria

The study included;

i. All registered and consenting premenopausal female teachers aged 30-45 years teaching in public primary schools in Mvita, Mombasa County.
ii. All registered premenopausal female teachers aged 30-45 years who had not had regular menstruation over the last 12 months.
iii. All registered premenopausal female teachers aged 30-45 years who were given a medical clearance to take part in the Eight-week walk programme.

### 3.4.2 Exclusion Criteria

The study excluded:

i. Any registered public primary school female teacher aged between 30 – 45 years teaching in Mvita, Mombasa County who had an underlying medical condition.

ii. Any premenopausal female primary school teacher who was pregnant at the point of recruitment or at any time during the programme.

iii. Any premenopausal female primary school teachers aged 30-45 years who did not consent to participate in the study.

## 3.5 Sampling Technique

Purposive sampling technique employed to select Mvita Sub-county and the premenopausal female teachers after the initial screening during recruitment. This technique was ideal since it is judgmental, selective and based on the researcher's own intention when choosing subjects within population to participate in the study (Sharma, 2017). The technique was useful because it did provide a wide array of non-probability sampling techniques for the researcher to draw on. Subsequently, simple random sampling was used to assign recruited participants to the experimental or control groups.

## 3.6 Sample Size

Sample size was calculated using G Power 3.1 software. T-test statistical test was used as reference test family of difference between two dependent means (matched pairs) with significance power of 0.95, error of probability of 0.05 and an effect of 0.5,

which gave a sample size of 45. A non-response of 10% was factored in to get a sample size of 50. The researcher then randomly apportioned participants to the experimental (25 participants) and control (25 participants) groups.

## 3.7 Research Instruments

### 3.7.1 Premenopausal Screening Questionnaire

The Premenopausal screening questionnaire (Appendix A) was used to ascertain menopausal status of participants. This questionnaire sought to establish the status in order to verify/confirm that each participant was indeed premenopausal by asking questions associated with a premenopausal stage. Some of the questions sought to know whether they were on contraceptives, had regular menstruation or had stopped menstruating, whether they were experiencing hot flushes or were experiencing breast sensitivity.

### 3.7.2 The Perceived Body Image Questionnaire

A perceived body image questionnaire is a self-administered tool used to establish body image consciousness, individual factors, social-cultural factors affecting body image among study respondents as well as coping strategies concerning body image perceptions among study respondents. It involves 54 questions on a five-point Likert scale responses ranging from 1 (strongly disagree) to 5 (strongly agree).

### 3.7.3 Health-Related Fitness Tests

The experimental and the control groups all underwent ideal physical fitness tests to determine their pre and post Eight-week walk programme Health-Related Physical fitness. The following are brief descriptions of the tests. However, the detailed descriptions and procedures are presented in Appendix B, Section I.

The following fitness tests were used to assess the health related fitness components that included cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance and Body Mass Index (BMI)

### 3.7.3.1 20Metre Shuttle Run Test (Bleep Aerobic Fitness Test)

Cardiovascular endurance was assessed by 20m-SRT.This test entails repeated running between the two marked lines (20m apart) as beeps are recorded. The participants start by standing before one of the marked lines that faced the second line. On the command start, they start running at a slow pace. The participants keep running and turn when signalled by the recorded beeps. Increased speed is signalled by a unique sound and closer beep after about one minute at every stage. If a participant reaches the line prior to the beep sound, she is compelled to wait for the next beep sound before continuing. Inability to reach the line within two meters a head of the beep sounds leads to a warning and the participant will have to continue running and turning to catch up with the pace within two additional ‘beeps to avoid elimination after the second warning. Rating of participants is determined by the number of shuttles (20m) reached before elimination or completion of the run.

### 3.7.3.2 One-minute Sit-Up Test

This test is used to evaluate abdominal muscle strength and endurance of the abdominals and hip-flexor muscles which are part of the lower body. Abdominal muscle strength and endurance is necessary for stability, support, and movement of the back as well as that of the lower body. The participant is required to lay flat on their back, on an even surface with knees bent (hook-lying), soles of feet are flat on the floor and hands on the thighs where they remain during the course of the test. The

associate researcher holds the subject's feet to keep them on the ground. On the command to start the test, which is concomitant with the start of the stopwatch, the participant squeezes the stomach, pushes back flat and raises the trunk, the hands slide on the thighs to hold the top of both knees while the low back is kept flat on the mat/cushioned floor. The participant returns to the previous position. The subject is advised not to pull the neck or head. Only the number of correctly completed sit-ups, according to the norms for females, are counted and recorded as the participant's performance.

### 3.7.3.3 Sit -and -Reach Test

The Sit-and-reach is a test determining lower back and hamstring flexibility. The participants take off their shoes, sit on the floor with locked knees flat on the ground and straight leg out in front. Soles of feet are placed flat against the box. One hand on top of the other, palms facing down and fingertips lined up or side by side. The participant leans forward as far as possible to reach the measuring line. Both hands should remain at the same level. To record the distance that determines low back flexibility, the participant holds the maximum reach position for one to two seconds with no jerky movements. The pre-test low back flexibility measurements were compared with the post-test measurements to ascertain whether there was an improvement.

### 3.7.3.4 Modified Push-Up Test

The Modified Push-Up test measured the upper body strength-endurance among premenopausal female teachers. The participant kneels down such that the knees are pivot point. On the command to start, the body is lowered with the spine in neutral position until the elbows are flexed at a right angle at the bottom of movement. The

participant pushes back to starting position. Regardless of the tempo, only the correctly completed number of push-ups in good form during the 40 seconds are recorded as the participant's performance.

### 3.7.4 Eight-Week Walk Programme

The eight-week walk programme was based on the understanding that training is very specific in energy requirement, neural transmission, the type of muscle fibre activated, and the component involved (Yaserifar et al., 2021. The Eight week walk programme was designed by the researcher to ensure not only observance of the principles of training for every component of Health-Related Fitness, but also each component received the appropriate type of exercise training, at the appropriate intensity, and for the appropriated adequate duration in line with principle of specificity. Walking, an aerobic form of exercise, addressed the two components of cardiovascular endurance and the specific trait of percentage body fat in body composition. After completion of the walk, the participants performed appropriate exercises for developing abdominal endurance, improving low back flexibility and upper-body strength-endurance. Session details of the program are included in Appendix C (Sections I and II).

The programme was conducted thrice a week with intensity progressing gradually from low to moderate to vigorous or high. Each session had a schedule of activities starting with a warm up session of 15 minutes followed by the walk, which was initially for 20 minutes but gradually increased to 50 minutes by the eighth week. After every walk session and prior to the final cool down, the experimental group participants went through a variety of conditioning callisthenic exercises that focused on abdominal muscular endurance, low back/trunk flexibility and upper-body

strength-endurance followed by a final cool down of ten minutes (details are indicated in Appendix C SECTION I).

### 3.8 Pre-Testing the Research Instruments

The study underwent a pre-testing exercise in Mvita Sub-County. The Health-Related Fitness tests, the premenopausal screening and the perceived Body Image questionnaire were administered to 20 premenopausal female primary school teachers who were not included in the study. This was for purpose of checking the administrability of the tests, efficiency, efficacy and logistical requirements. This exercise also retrained and tested the efficiency of the research assistants. This study used Physical Education graduate teachers as research assistants. Though graduate Physical Education teachers are conversant with tests and measurements, for the intent of this study, the pre-testing sessions proved an ideal situation for revising and retraining those who agreed to be research assistants.

### 3.9 Validity and Reliability of the Research Instrument.

Validity refers to the accuracy and extent to which a test measures what it is meant to measure. Content validity of the questionnaires was established with the assistance of the supervisors whose feedback and recommendations were included in the final instruments. The worldwide use of the HRF test used in the study attest to their acceptability as supported by Arifin, S., Retnawati, H., & Putranta, H. (2020) in their study on one minute sit up test and push up test. The reliability and validity of the all the HRF tests used in this study have been previously established by Garcia et al (2022) and are used and acceptable worldwide.

According to Heale and Twycross (2015), a reliable instrument should give consistent results or responses each time the test is completed. For the intention of this study, the Test re-test method was used to ensure reliability. The initial test was conducted among a sample of twenty participants recruited from public primary schools where they work based on specific inclusion criteria but who were not part of the main study. This aimed to assess the consistency of questionnaire responses. The reliability pre-test and post-test for both, the questionnaire and the Health-Related Fitness tests were administered in a two week intervals. Participants completed two questionnaires (premenopausal screening questionnaire and perceived body image questionnaire). In addition, the participants in the pre-test were also administered the five Health-Related fitness components tools of 20metre shuttle run test (bleep aerobic fitness test) for Cardio-vascular endurance, One-minute sit-up test for Abdominal Muscle Strength Endurance, Sit -and -Reach test for Lower back flexibility, Modified push-up test for Upper body strength-endurance, and Body Mass Index (BMI) test were administered. After a two-week interval, the pre-test participants returned for the re-test phase. Perceived body image questionnaire was re-administered, and the assessment the five Health Related fitness components were repeated using identical protocols. Every effort was made to ensure similar conditions and instructions as would be during the actual pre- and post-tests. Alpha Cronbach test was used at adequate values of 0.7 and above to establish the reliability of questionnaire in this study. The study questionnaire had a validity score of 0.78 which was found suitable for use in data collection. Consistency during the eight-week walk programme was enhanced by the presence of the researcher or the trained research assistant. The progress throughout the programme was monitored very closely by the researcher.

### 3.10 Data Collection Techniques and Procedures

Menopausal status of participants was established according to the menopausal screening status questionnaire (Appendix A) prior to the participants signing consent forms. Those who were recruited according to the inclusion criteria were given a full explanation of the study procedures and protocol prior to being requested to give their written consent (Appendix I) to participate in the study. Thereafter, the researcher randomly assigned the participants into either the experimental or the control group. Data was collected at every participant's school. The researcher began by administering the body image questionnaire. Thereafter, and just before the start of the eight week walk programme, the researcher administered the HRF tests as pre-test for setting the entry point baseline.. The same assessment procedures were applied during the post-tests at the end of the eight-week walk programme. The data were recorded in data sheets detailing scores for each type of test.

Participants in the treatment group were required to follow the prescribed Eight-week walk programme protocol of warm-up, walking, conditioning exercises and cool-down (Appendix C, Section I). Prior to the start of the programme, the researcher clarified the details of the programme to the participants, presented demonstrations and emphasized the expectations of each stage.

Checking the heart rate at the carotid pulse site is a simple and effective way to assess a person's heart rate. The following were the steps: First, participant had to locate the carotid pulse on either side of the neck, below the jaw and beside the windpipe. Next, using the first two fingertips of either hand, they had to place them lightly on the carotid pulse of one side of the neck. They began counting the number of beats felt for 15 seconds using a stopwatch with a second hand. Finally, the pulse count within 15

seconds was multiplied by four to register the participant's heart rate per one minute. For example, a count of 23 beats in 15 seconds was computerized as 23 x 4 = (23 x 4) =92. The participants were strongly advised against too much pressure on the carotid pulse site to avoid light-headedness.

Each participant was also trained on how to ensure maintaining her personal intensity based on the likely maximum heart-rate formula of 220 minus age; and calculated the beat count for 15 seconds for both the higher and lower limits of her intensity-training zone. Intensity in this case referred to the ease or difficulty of the exercise being performed. It is generally accepted that exercising at 40% to 55%of the maximum heart rate represents low intensity, 55% to 70% of the maximum heart rate represents moderate intensity, and a heart rate of 70% and above the maximum heart rate represent vigorous intensity for maximum benefit (Dix, 2019). At regular intervals during the walk, the participant was required to monitor her own heart rate for 15 seconds to ascertain that she was within the training zone. Each participant was advised to repeatedly practice the pulse monitoring procedure to be absolutely sure that she was able and confident about monitoring pulse rate on her own. The Eight-week walk programme treatment commenced after the researcher was satisfied that every participant was conversant with the procedures and had no further questions. The researcher and research assistants contacted the participants periodically to motivate and monitor their progress throughout the programme.

As for the control group, they continued to lead their normal lifestyle and were not involved in any programme. At the end of the eight-week programme both the experimental and control groups underwent the post-test measurement and assessments. The HRF assessments, just like the pre-test measurements, were

administered by the research team and the results recorded on the recording sheets. The questionnaires were administered at the participants' respective schools subsequent to the completion of the eight-week walk programme. All data captured was appropriately recorded.

### 3.11 Data Analysis and Presentation

Data collected relating to the Health-Related Fitness components and the Perceived Body Image was recorded and presented using tables as presented in various sections of Chapter Four.

#### 3.11.1 Data Scoring and Interpretation

Data concerning the Health-Related Fitness components was scored and interpreted against the specific standard relevant to the particular HRF component as presented in various segments of this chapter.

##### 3.11.1.1 Cardiovascular Endurance Scores

The data collected in the 20metre shuttle run test was recorded according the number of shuttles completed per level. This data was then compared against the norms table to identify the category for each participant. The categories are as follows:

**20 Metre Shuttle Run Test (bleep aerobic fitness test)**

| Rating | Norm |
|---|---|
| Excellent | >12 |
| Very good | 10-12 |
| Good | 8-10 |
| Average | 6-8 |
| Poor | 4-6 |
| Very poor | <4 |

Adapted from Robert Wood (2018) "Pre-Fitness Testing Procedures. "Top end Sports

### 3.11.1.2 Abdominal Muscular Endurance Scores

The number of sit-ups completed by a participant in one minute was recorded as her achievement. This was subsequently compared against the table of norms for interpretation. The score categories are as follows:

**1 Minute Sit-up Test (Women)**

| Age | 18-25 | 26-35 | 36-45 | 46-55 | 56-65 | 65+ |
|---|---|---|---|---|---|---|
| Excellent | >43 | >39 | >33 | >27 | >24 | >23 |
| Good | 37-43 | 33-39 | 27-33 | 22-27 | 18-24 | 17-23 |
| Above Average | 33-36 | 29-32 | 23-26 | 18-21 | 13-17 | 14-16 |
| Average | 29-32 | 25-28 | 19-22 | 14-17 | 10-12 | 11-13 |
| Below Average | 25-28 | 21-24 | 15-18 | 10-13 | 7-9 | 5-10 |
| Poor | 18-24 | 13-20 | 7-14 | 5-9 | 3-6 | 2-4 |
| Very poor | < 18 | < 13 | < 7 | < 5 | < 3 | < 2 |

Adapted from Robert Wood (2018) "Pre-Fitness Testing Procedures. “Top end Sports”

### 3.11.1.3 Low Back Flexibility Scores

The distance reached by a participant’s stretched index fingers was recorded to the nearest centimetres as her achievement which was subsequently interpreted using table of norms. The score categories are as follows:

**Sit –and- Reach Test Norm for Adult Women**

| Rating | Centimetres (cm) | Inches | No of participants |
|---|---|---|---|
| Super | >+ 30 | > + 11.5 | |
| Excellent | + 21 to + 30 | + 8.0 to + 11.5 | |
| Good | + 11 to + 20 | + 4.5 to + 7.5 | |
| Average | + 1 to + 10 | + 0.5 to + 4.0 | |
| Fair | - 7 to 0 | -2.5 to 0 | |
| Poor | -15 to –8 | _ 6.0 to -3.0 | |
| Very poor | < -15 | < - 6.0 | |

Adapted from Robert Wood (2018) "Pre-Fitness Testing Procedures. Top end Sports and Quinn, E & Ferrara, T. (2019)

### 3.11.1.4 Upper Body Strength-Endurance Scores

The maximum number of accurately executed push-ups was documented as a participant's achievement. This was subsequently compared against the table of norms for interpretation in the following manner:

**Norms for Females Using the Modified Push-Up Test**

| Age(Years) | Very poor | Poor | Average | Good | Excellent |
|---|---|---|---|---|---|
| 18-29 | < 17 | 17-22 | 23-29 | 30-35 | 36-44 |
| 30-39 | < 11 | 11 -18 | 19-23 | 24-30 | 31-38 |
| 40-49 | < 6 | 6 -10 | 13-17 | 18-23 | 24-32 |
| 50-59 | < 5 | 5 -9 | 12-16 | 17-20 | 21-27 |

Adapted from Robert Wood (2018) "Pre-Fitness Testing Procedures Top end"

### 3.11.1.5 Body Mass Index Scores

For the purpose of calculating the BMI each participant's weight was measured on an analogue standard weighing machine; and the height was taken using a standiometer mounted on a hard, straight wall with its base at the floor level. The BMI was calculated by dividing the Weight by the Height in kg/cm squared (Weight in kg/Height in $cms^2$. The resultant BMI scores were then classified using the WHO BMI Chart in Figure 2.1

| WHO CLASSIFICATION OF WEIGHT STATUS | |
|---|---|
| **WEIGHT STATUS** | **BODY MASS INDEX (BMI), kg/m$^2$** |
| Underweight | <18.5 |
| Normal range | 18.5 – 24.9 |
| Overweight | 25.0 – 29.9 |
| Obese | ≥ 30 |
| Obese class I | 30.0 – 34.9 |
| Obese class II | 35.0 – 39.9 |
| Obese class III | ≥ 40 |

**Figure 2. 1** Standardized BMI Chart

### 3.11.2 Data Analysis

Data collected was analysed using Statistical Package for the Social Sciences (SPSS) Version 22 and presented using tables and percentages. Descriptive statistics (mean and standard deviation) were used to calculate the difference between pre-tests and post-tests; and relationships among variables of interest respectively. One-way ANOVA was used for analysis of inferential statistics necessary for testing the objectives that were:

All the hypotheses were tested at the significance level of 5% (0.05).

## 3.12 Logistical and Ethical Considerations

The researcher was granted approval by the Kenyatta University Graduate School to carry out the research (Appendix D). Ethical approval was acquired from Kenyatta University Ethics Review Committee (KU-ERC) (Appendix E). National Council for Science and Technology (NACOSTI) (Appendix F) granted government permit. Permission for involving female teachers aged 30-45 years in primary public schools in Mvita, Mombasa County was sought and obtained from the County Director of

Education (Appendix H). Participants consented by signing the informed consent form (Appendix I). Confidentiality was maintained throughout the study. To ensure that all participants benefit from the study, those in the control group were taken through the eight-week walk programme after the study.

# CHAPTER FOUR: RESULTS AND INTERPRETATIONS

## 4.1 Introduction

The overall objective of the study was to assess the effects of an Eight-Week Walk Programme on the Health-Related Fitness and Perceived Body Image of 30 to 45year old pre-menopausal teachers in public primary schools in Mvita, Mombasa County.In this study, 23 out of the 25 participants in the experimental group successfully completed the eight week walk programme. This chapter is organized into five sections. The first section presents demographic characteristics of the study participants. The second section presents descriptive results of the Health-Related Fitness components detailing the participants' results in both, the pre-test and post-test. The third section addresses objective (i) which sought to establish the effects of an eight-week walk programme on the Health-Related Fitness components. This includes the results of the corresponding hypotheses ($H_{01}$) that had not expected any significant effect of the eight-week walk programme on each of the Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance and Body Mass Index (BMI) of 30 to 45year old premenopausal female primary school teachers.

Results of both, the pre-test and post-test concerning the Perceived Body Image are presented in the fourth section. This is followed by the results of objective two, which had sought to determine the effects of the Eight-week walk programme on the perceived body image. Results of the corresponding Hypothesis ($H_{02}$) that had expected no significant effect of an eight-week walk programme on the Perceived

Body Image of 30 to 45year old premenopausal female primary school teachers are included in this section.

Lastly, section five presents results of objective three that had sought to determine the relationship between Health-Related Fitness and Perceived Body Image of 30 to 45year old premenopausal female primary school teachers subsequent to an eight-week walk programme. The corresponding Hypothesis ($H_{03}$) that had not expected any significant relationship between Health-Related Fitness and Perceived Body Image of 30 to 45year old premenopausal female primary school teachers subsequent to an eight-week walk programme was rejected as results indicated that though there were a number of differences in post-test and pre-test mean among the control and experimental groups as discussed herein.

## 4.2 Demographic Information: Pre-Menopausal Primary School Female Teachers

The demographic results presented in Figure 2 indicate that most of the participants (23, 46.9%) were between 35-39 years followed those between 30-34 years old (13, 26.5%) and those aged 40-44 years (11, 22.4%) while only 2 (4.1%) were above 45years.

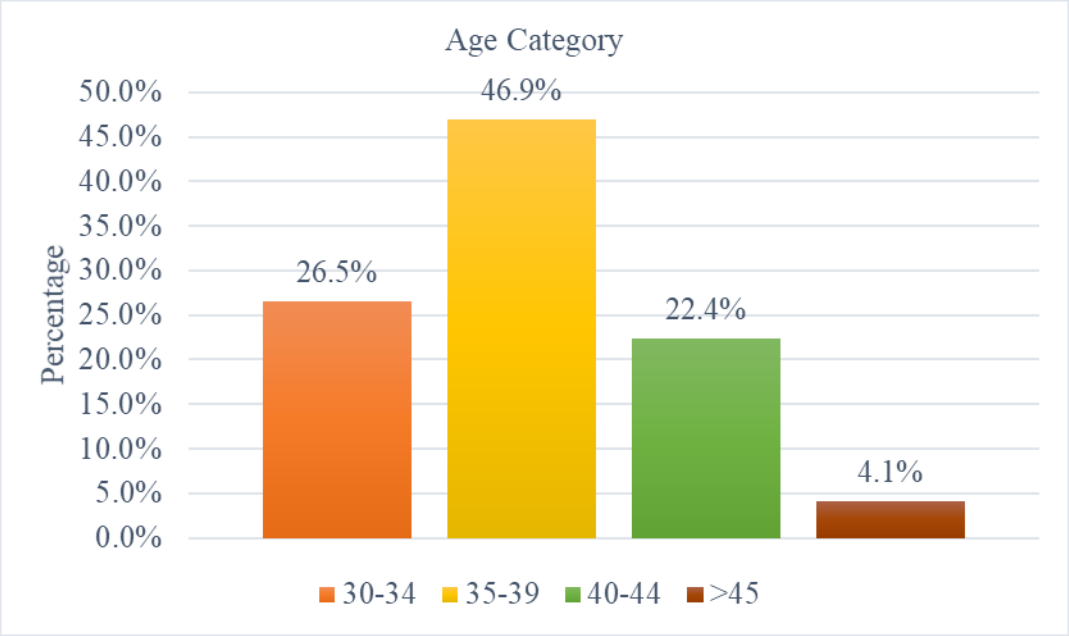


**Figure 4. 1**: **Distribution of the Participants by Age**

### 4.3 Health-Related Fitness Components: Pre- and Post-Tests Ratings

Prior to the start of the Eight-Week Walk programme, pre-tests were administered to both the experimental and control groups to establish their base lines in the five selected Health-Related Fitness components. The same participants were similarly post-tested to establish their status following the Eight-Week Walk treatment programme. The pre- and post-tests results, including the means and standard deviations, for each of the five Health-Related Components are presented hereafter. Table 4.1 presents the means and standard deviations of Cardiovascular Endurance.

### 4.3.1 Cardiovascular Endurance: Pre-and Post-Test Ratings

Table 4.1 indicates that 91.3% (21) of the experimental group were rated as very poor, while 8.7% (2) of them were rated as poor for Cardiovascular Endurance at the pre-test stage. Subsequent to the Eight-Week Walk treatment programme, all the participants underwent the post-test. Results at the post-test stage revealed that 78.3% (18) of the experimental group were rated as very poor, 17.4% (4) were rated as poor, and 4.3% (1) rated average. This suggested an improvement in cardiovascular endurance among the experimental group. However, at both the pre- and post-test stages 100% (26) of the control group received a rating of very poor. Thus, the control group did not reveal any observable differences in Cardiovascular Endurance between the pre-test and post-test scores.

**Table 4.1 Pre-and Post-Test Ratings: Cardiovascular Endurance**

| Rating | Pre-test scores | | | | Post-test scores | | | |
|---|---|---|---|---|---|---|---|---|
| | Experimental | | Control | | Experimental | | Control | |
| | n | % | n | % | N | % | N | % |
| Excellent | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Very good | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Good | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Average | 0 | 0% | 0 | 0% | 1 | 4.3% | 0 | 0% |
| Poor | 2 | 8.7% | 0 | 0% | 4 | 17.4% | 0 | 0% |
| Very poor | 21 | 91.3% | 26 | 100% | 18 | 78.3% | 26 | 100% |

An ANOVA (Table 4.2) computed to test the significance of the observed differences between the pre-test and the post-test, revealed statistically significant differences

between the pre-test and post-test scores (F (1,47) = (39.96), p=<.001). Consequently, the null hypothesis that there would be no significant effect of the eight-week walk programme on cardiovascular endurance of 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County, was rejected.

**Table 4.2 ANOVA: Means and Standard Deviations: Cardiovascular Endurance**

| Component | Group | N | Mean Diff (Post-Pre) | Std. Deviation | ANOVA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sum of Squares | df | Mean Square | F | Sig. |
| Cardiovascular endurance | Experimental | 23 | .6870 | .63124 | 12.545 | 1, 47 | 12.545 | 39.955 | < 0.001 |
| | Control | 26 | -.3269 | .48954 | | | | | |

### 4.3.2 Pre- and Post-Test Ratings: Abdominal Muscular Endurance

As shown in Table 4.3, Abdominal Muscular Endurance at the pre-test stage indicated that 30.4% (7) of the experimental group were rated as very poor, 43.5% (10) were rated as poor, and 26.1% (6) rated below average. However, at the post-test stage, the experimental group showed equal distribution of 13.3% (3) in the very poor and poor categories. In comparison, 39.1% (9) of them were reported to be below average, 26.1% (6) were average; and 8.7 % (2) were in the above category. The descriptive results also indicate that the control group remained mostly unchanged between the pre-test and post-test scores.

**Table 4.3 Pre-Test and Post-Test ratings: Abdominal Muscular-Endurance**

| Rating | Pre-test scores | | | | Post-test scores | | | |
|---|---|---|---|---|---|---|---|---|
| | Experimental | | Control | | Experimental | | Control | |
| | N | % | n | % | N | % | N | % |
| Excellent | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Good | 0 | 0% | 0 | 0% | 0 | 0% | 2 | 7.7% |
| Above average | 0 | 0% | 1 | 4.3% | 2 | 8.7% | 1 | 3.8% |
| Average | 0 | 0% | 2 | 8.7% | 6 | 26.1% | 2 | 7.7% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Below average | 6 | 26.1% | 5 | 21.7% | 9 | 39.1% | 4 | 15.4% |
| Poor | 10 | 43.5% | 10 | 43.5% | 3 | 13% | 12 | 46.2% |
| Very poor | 7 | 30.4% | 5 | 21.7% | 3 | 13% | 5 | 19.2% |

In addition, an ANOVA was computed to test the significance of the observed differences. Table 4.4 reveals that there are statistically significant differences between the Pre-test and Post-test scores (F (1,47) = (56.724, p=<.001). Therefore, the null hypothesis that there would be no significant effect of the eight-week walk programme on abdominal muscular endurance of 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County was rejected

**Table 4.4 ANOVA: Means and Standard Deviations - Abdominal Muscular Endurance**

| Component | Group | N | Mean Diff (Post-Pre) | Std. Deviation | ANOVA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sum of Squares | df | Mean Square | F | Sig. |
| Abdominal Muscular endurance | Experimental | 23 | 6.6522 | 3.39262 | 707.454 | 1, 47 | 707.454 | 56.724 | < 0.001 |
| | Control | 26 | -.9615 | 3.64945 | | | | | |

### 4.3.3 Pre- and Post-Test Ratings: Low Back Flexibility among Pre-Menopausal Primary School Female Teachers

As shown in Table 4.5, both, the experimental 100% (23) and the control groups 100% (26) were rated as very poor for low back flexibility at both, the pre-test and the post-stages.

**Table 4.5 Pre and Post-Test Ratings: Low Back Flexibility**

| Rating | Pre-test scores | | | | Post-test scores | | | |
|---|---|---|---|---|---|---|---|---|
| | Experimental | | Control | | Experimental | | Control | |
| | N | % | N | % | N | % | N | % |
| Super | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Excellent | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Good | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Average | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Fair | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Poor | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Very poor | 23 | 100% | 26 | 100% | 23 | 100% | 26 | 100% |

In addition, ANOVA was computed to test the significance of the observed differences. As shown in Table 4.6, there are statistically significant differences between the Pre-test and Post-test scores (F (1,47) = (47.75, p=.057).Therefore, the null hypothesis that there would be no significant effect of the eight-week walk programme on low back flexibility of 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County, was not accepted.

**Table 4.6 ANOVA: The Means and Standard Deviations for Low Back Flexibility**

| Component | Group | N | Mean Diff (Post-Pre) | Std. Deviation | ANOVA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sum of Squares | df | Mean Square | F | Sig. |
| Lower Back Flexibility | Experimental | 23 | 1.8783 | 1.74355 | 46.7 | 1 | 46.8 | 47.753 | .057 |
| | Control | 26 | -.7885 | 1.28322 | | | | | |

### 4.3.4 Upper Body Strength-Endurance

As shown in Table 4.7, the upper body strength-endurance results for the experimental group indicated that 39.1% (9) of the participants at the pre-test stage were rated as very poor in the modified press-up test, 47.8% (11) were rated poor, whereas 13% (3) were rated as average. However, at the post-test stage, 13% (3) of the experimental group were rated as very poor, 30.4% (7) were rated as poor, 39.1% (9) as average, and 17.4% (4) were rated as good. On the surface, this suggests an improvement in upper body strength-endurance among the experimental group. The descriptive results also indicated that results for the control group remained majorly unchanged between the pre-test and post-test scores.

**Table 4.7 Pre and Post-Test Ratings: Upper Body Strength-Endurance**

| Rating | Pre-test scores | | | | Post-test scores | | | |
|---|---|---|---|---|---|---|---|---|
| | Experimental | | Control | | Experimental | | Control | |
| | N | % | N | % | N | % | N | % |
| Excellent | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Good | 0 | 0% | 1 | 3.8% | 4 | 17.4% | 1 | 3.8% |
| Average | 3 | 13% | 7 | 26.9% | 9 | 39.1% | 6 | 23.1% |
| Poor | 11 | 47.8% | 11 | 42.3% | 7 | 30.4% | 10 | 38.5% |
| Very poor | 9 | 39.1% | 7 | 26.9% | 3 | 13% | 9 | 34.6% |

In addition, an ANOVA was computed to test the significance of the observed differences. As seen in Table 4.8, there are statistically significant differences between the Pre-test and Post-test scores (F (1,47) = (55.86, p=<.001). Therefore, the null hypothesis that there would be no significant effect of the eight-week walk programme on upper body strength-endurance of 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County, was rejected.

**Table 4.8 ANOVA: Means and Standard Deviations - Upper Body Strength-Endurance**

| Component | Group | N | Mean Diff (Post-Pre) | Std. Deviation | ANOVA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sum of Squares | df | Mean Square | F | Sig. |
| Upper body strength-endurance | Experimental | 23 | 5.0435 | 3.54809 | 598.857 | 1 | 598.857 | 55.855 | < 0.001 |
| | Control | 26 | -1.9615 | 3.01305 | | | | | |

### 4.3.5 Pre and Post-Test Ratings: Body Mass Index (BMI)

As shown in Table 4.9, at the pre-test stage39.1% (9) of the experimental group were categorized as being obese and a similar 39.1% (9) were deemed to be overweight. In contrast, 21.7% (5) were rated within the normal range. However, subsequent to the Eight-Week Walk programme intervention, at the-the post-test stage, 34.8% (10) of

the experimental group were deemed obese and another similar 30.4% (10) of them were overweight. At the same time 30.4% (7) fell within the normal BMI range. This suggested an improvement in BMI. The descriptive results for the control group remained mostly unchanged between the pre-test and post-test scores. In addition, through the computation of an ANOVA, the study investigated the significance of the observed differences. The results of the ANOVA, as seen in Table 4.10.

**Table 4.9 Pre and Post-Test Ratings: Body Mass Index**

| | BMI PRE-TEST | | | | BMI POST-TEST | | | |
|---|---|---|---|---|---|---|---|---|
| | Exp. | % | Cont. | % | Exp. | % | Cont. | % |
| >18.5 Underweight | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| 18.5-24.9 normal | 5 | 21.7% | 3 | 11.5% | 7 | 30.4% | 3 | 11.5% |
| 25.0-29.9 overweight | 9 | 39.1% | 14 | 53.8% | 8 | 34.8% | 13 | 50.0% |
| >30 obese | 9 | 39.1% | 9 | 34.6% | 8 | 34.8% | 10 | 38.5% |
| Total | 23 | 100.0% | 26 | 100.0% | 23 | 100% | 26 | 100% |

Table 4.10 shows statistically significant differences between the Pre-test and Post-test BMI scores (F (1,47) = (29.05, p=<.001). Therefore, the null hypothesis that had not expected any significant effect of the eight-week walk programme on body mass index of the 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County, was not accepted. .

**Table 4.10 ANOVA: The Means and Standard Deviations - Body Mass Index (BMI)**

| Component | Group | N | Mean Diff (Post-Pre) | Std. Deviation | ANOVA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sum of Squares | Df | Mean Square | F | Sig. |
| Body Mass Index (BMI) | Experimental | 23 | -.9522 | .91564 | 26.551 | 1 | 26.551 | 29.053 | < 0.001 |
| | Control | 26 | .5228 | .99009 | | | | | |

### 4.4 Perceived Body Image

The study endeavoured to determine the Perceived Body Image of the participants based on their responses to the 54 item perceived body image questionnaire. The questionnaire required each participant to indicate the extent to which they agreed with each item. The responses were categorized on a 5-point Likert scale (1-Strongly Disagree, 2-Disagree, 3-Don't Know, 4-Agree, 5-Strongly Agree). Mean ranges were used to grade the responses such that 1 to 1.80 meant the participants Strongly Disagree, 1.81 to 2.60 Disagree, 2.61 to 3.40 Don't know, 3.41 to 4.20 Agree and 4.21 to 5.0 Strongly Agree.

In order to understand the perception of body Image, the researcher further classified the 54 statements into 4 categories of; (i) Body Image Consciousness, (ii) Individual factors affecting Body Image, (iii) Social-cultural factors influencing Perceived Body Image and (iv) Handling of Body Image Perceptions adopted from Akusala and Arasa Models. The following sections present the pre and post-test descriptive results of means and standard deviations for both the experimental and control groups.

#### 4.4.1 Body Image Consciousness

As shown in Table 4.11, body image consciousness among the pre-menopausal teachers had notable difference among the pre and post-test results. As far as monitoring of body weight was concerned, the experimental group had a mean of 3.22 (1.126) at pre-test and 3.48 (1.039) at post-test; and the control group 2.46(1.140) and 2.54(1.174) at the start and end of eight weeks. . With regard to the need to reduce waist size, the pre-test mean was 4.04 (1.065) and 4.13 (0.968) at post-test for the experimental group. The control group revealed 3.54(1.555) at the beginning and the

end of eight weeks. As far as adherence to following an exercise regime was concerned, the pre-test the mean was 1.91 (0.515) and 3.17 (1.072) at post-test for the experimental group. The control group showed 2.42(2.120) and 2.50(1.140) at the beginning and the end of 8 weeks respectively. When considering the issue of allowing age to mess their physical appearance, at pre-test the experimental group the mean was 4.09 (0.596) and 4.22 (0.518) at post-test. The control group in the same item showed remained 4.27(.874) at the beginning and the end of 8 weeks respectively. On the issue of physical attractiveness the experimental group pre-test mean was 3.26 (1.176) and 3.65 (1.027) at post-test. The control group revealed 3.96 (1.113) and 4.08 (1.093) at the beginning and the end of 8 weeks respectively. The mean of the experimental group participants' concern about their body weight was 2.83 (1.072) at pre-test and 3.65 (0.935) at post-test. While the control group's was 2.77(1.306) and 2.77(1.306) at the beginning and the end of 8 weeks respectively. With regard to whether they were proud of their looks, the experimental group pre-test mean was 3.39 (1.196) and 3.52 (1.123) at post-test. The control group in the same item showed 3.81(1.297) at the beginning and the end of 8 weeks.

**Table 4.11 Body Image Consciousness**

| Body Image Consciousness among Study Respondents | | | PRE-TEST | | POST-TEST | |
|---|---|---|---|---|---|---|
| | | N | Mean | SD | Mean | SD |
| I consciously monitor my body weight. | Exp | 23 | 3.22 | 1.126 | 3.48 | 1.039 |
| | Cont | 26 | 2.46 | 1.140 | 2.54 | 1.174 |
| I accept and appreciate my natural body shape | Exp | 23 | 4.09 | .949 | 4.09 | .949 |
| | Cont | 26 | 4.31 | .679 | 4.12 | .909 |
| I want a perfect body. | Exp | 23 | 3.39 | 1.196 | 3.39 | 1.196 |
| | Cont | 26 | 3.81 | 1.327 | 3.81 | 1.327 |
| I feel like my body does not represent me. | Exp | 23 | 2.22 | 1.313 | 2.22 | 1.313 |
| | Cont | 26 | 2.15 | 1.461 | 2.15 | 1.461 |
| I want to reduce the size of my waist. | Exp | 23 | 4.04 | 1.065 | **4.13** | .968 |
| | Cont | 26 | 3.54 | 1.555 | 3.54 | 1.555 |
| I follow exercise regimes to the letter to maintain my figure | Exp | 23 | 1.91 | .515 | **3.17** | 1.072 |
| | Cont | 26 | 2.42 | 2.120 | 2.50 | 2.140 |
| I am determined not to allow age to | Exp | 23 | 4.09 | .596 | **4.22** | .518 |

| | | | | | | |
|---|---|---|---|---|---|---|
| mess my physical appearances | Cont | 26 | 4.27 | .874 | 4.27 | .874 |
| I am very concerned about what others think of my body weight. | Exp | 23 | 2.87 | 1.140 | 2.96 | 1.147 |
| | Cont | 26 | 2.58 | 1.301 | 2.50 | 1.273 |
| I am physically attractive. | Exp | 23 | 3.26 | 1.176 | **3.65** | 1.027 |
| | Cont | 26 | 3.96 | 1.113 | 4.08 | 1.093 |
| I experience emotional distress on account of my body | Exp | 23 | 2.52 | 1.344 | 2.57 | 1.376 |
| | Cont | 26 | 1.85 | .613 | 1.85 | .613 |
| I am concerned about my body weight all the time | Exp | 23 | 2.83 | 1.072 | **3.65** | .935 |
| | Cont | 26 | 2.77 | 1.306 | 2.77 | 1.306 |
| I feel uncomfortable and awkward in my body | Exp | 23 | 2.09 | 1.240 | 2.00 | 1.044 |
| | Cont | 26 | 2.12 | 1.177 | 2.12 | 1.177 |
| I often feel proud because of my looks | Exp | 23 | 3.39 | 1.196 | **3.52** | 1.123 |
| | Cont | 26 | 3.81 | 1.297 | 3.81 | 1.297 |
| I often feel that people ignore me because of my looks | Exp | 23 | 2.04 | .928 | 1.87 | .815 |
| | Cont | 26 | 1.96 | .916 | 1.96 | .916 |
| I feel that my body does not measure up to image of an ideal body depicted by the social media | Exp | 23 | 3.09 | 1.203 | 3.00 | 1.243 |
| | Cont | 26 | 2.85 | 1.317 | 2.85 | 1.317 |
| I accept and appreciate body differences | Exp | 23 | 4.04 | .475 | 4.26 | .449 |
| | Cont | 26 | 4.12 | .816 | 4.12 | .816 |
| I feel comfortable around persons with different looks | Exp | 23 | 3.70 | .926 | 3.83 | .984 |
| | Cont | 26 | 3.77 | .992 | 3.77 | .992 |

### 4.4.2 Individual Factors Affecting Body Image

All participants, who completed the requirements of the study, responded to statements concerning individual factors that could affect their body image. Table 4.12 reveals the results of their responses. With regard to whether their looks caused low self-esteem, the experimental group recorded a mean of 1.83 (1.337) and 1.87(1.325) at pre-test and at post-test respectively. Whereas the control group recorded a mean of 1.73(0.919) at the beginning and the end of 8 weeks respectively. With regard to whether their body image caused them a lot of anxiety, the mean at pre-test was 2.57 (1.376) and 2.61 (1.340) at post-test but remained unchanged in the control group at 1.88(0.909).With regard to whether their body made them feel ashamed, insecure and anxious, at pre-test the mean was 2.26 (1.214) and 2.30 (1.259) at post-test but remained unchanged in the control group at 2.04(1.371).With regard to whether they believed that growing older made them less physically attractive, the

experimental group reported a mean of 3.0 (*SD*=1.243) during pre-test and a mean of 3.17 (*SD*=1.403) during post-test as compared to the control group which indicated a slight decline. On whether a nice body would be good-looking to the opposite sex, the experimental group reported a mean of 4.09 (*SD*=1.041) during pre-test and a mean of 4.26 (*SD*=1.010) during post-test. The control group's perception remained unchanged at a mean of 3.92 (*SD*=1.383) during pre and post-test. On if they were dissatisfied with their bodies, the experimental group reported a mean of 3.22 (*SD*=1.347) during pre-test and a mean of 3.57 (SD=1.037) during post-test and for the experimental group the pre-test mean was 2.69 (*SD*=1.258) AND 3.08 (*SD*=1.412). On whether they were ashamed of their body, the experimental group reported a mean of 1.30 (*SD*=.703) during pre-test and a mean of 1.78 (*SD*=0.998). On the other hand, the control group had a mean of 2.08 (*SD*=1.294) and 2.15 (*SD*=1.347) for Pre and post-test.

**Table 4.12 Individual Factors Affecting Body Image**

| | | | Pre-test | | Post-test | |
|---|---|---|---|---|---|---|
| Individual factors affecting Body Image among respondents | Group | N | Mean | SD | Mean | SD |
| I make friends easily across individuals with varied body images. | Exp | 23 | 3.48 | .994 | 3.48 | .994 |
| | Cont | 25 | 3.48 | 1.388 | 3.48 | 1.388 |
| My looks cause me to have low self-esteem | Exp | 23 | 1.83 | 1.337 | 1.87 | 1.325 |
| | Cont | 26 | 1.73 | .919 | 1.73 | .919 |
| Overall I am satisfied with life. | Exp | 23 | 3.30 | 1.259 | 3.30 | 1.259 |
| | Cont | 26 | 3.58 | 1.172 | 3.58 | 1.172 |
| I feel comfortable and confident in my body. | Exp | 23 | 3.48 | 1.163 | 3.48 | 1.163 |
| | Cont | 26 | 3.92 | 1.197 | 3.92 | 1.197 |
| My body image causes me a lot of anxiety | Exp | 23 | 2.57 | 1.376 | 2.61 | 1.340 |
| | Cont | 26 | 1.88 | .909 | 1.88 | .909 |
| I believe that there is something wrong with my body. | Exp | 23 | 2.00 | .953 | 2.00 | .953 |
| | Cont | 26 | 1.69 | 1.050 | 1.69 | 1.050 |
| I am a keen follower of beauty pageants on television | Exp | 23 | 2.35 | 1.112 | 2.35 | 1.112 |
| | Cont | 26 | 2.04 | 1.371 | 2.04 | 1.371 |
| My body has made me feel ashamed, | Exp | 23 | 2.26 | 1.214 | 2.30 | 1.259 |

| | | | | | | |
|---|---|---|---|---|---|---|
| insecure and anxious | Cont | 26 | 2.04 | 1.371 | 2.04 | 1.371 |
| I have constant negative thoughts about my body | Exp | 23 | 2.30 | 1.222 | 2.35 | 1.191 |
| | Cont | 26 | 1.77 | .815 | 1.77 | .815 |
| Body shape, size and image are everything to me | Exp | 23 | 3.26 | 1.176 | 3.39 | 1.196 |
| | Cont | 26 | 3.31 | 1.644 | 3.31 | 1.644 |
| I believe that growing older makes one less physically attractive | Exp | 23 | 3.00 | 1.243 | **3.17** | 1.403 |
| | Cont | 26 | 3.12 | 1.505 | 3.08 | 1.521 |
| I care very much what my friends and peers think about my body weight | Exp | 23 | 3.09 | 1.203 | 2.96 | 1.261 |
| | Cont | 26 | 2.54 | 1.421 | 2.54 | 1.421 |
| A nice body will be attractive to the opposite sex | Exp | 23 | 4.09 | 1.041 | **4.26** | 1.010 |
| | Cont | 26 | 3.92 | 1.383 | 3.92 | 1.383 |
| I am always concerned about my shape, size and image. | Exp | 23 | 3.17 | 1.154 | **3.57** | 1.037 |
| | Cont | 26 | 3.08 | 1.412 | 3.08 | 1.412 |
| I am dissatisfied with my body | Exp | 23 | 3.22 | 1.347 | **3.57** | 1.037 |
| | Cont | 26 | 2.69 | 1.258 | 3.08 | 1.412 |
| I am ashamed of my body | Exp | 23 | 1.30 | .703 | **1.78** | .998 |
| | Cont | 26 | 2.08 | 1.294 | 2.15 | 1.347 |

### 4.4.3 Social-Cultural Factors Influencing Perceived Body Image

The study set out to determine whether the participants' perception of their body images were influenced by social cultural factors. The results are as presented in Table 4.13. On whether ethnicity was responsible for how they look, the experimental group reported a mean of 1.70 (*SD*=1.020) during pre-test and a mean of 1.83 (*SD*=1.114) during post-test while the control group remained unchanged between the pre-test and the post-test. With regard to whether their Body Image not mattering much as one grew older the experimental group reported a mean of 2.77 (*SD*=1.066) during pre-test and a mean of 2.82 (*SD*=1.053) during post-test as compared to the control group whose means remained unchanged. On whether they thought their peers found them physically attractive, the experimental group reported a mean of 3.87 (*SD*=0.968) during pre-test and a mean of 3.91 (*SD*=0.949) during post-test; while the control group remained unchanged. However, with regard to (i) there being no such thing as a perfect body,(ii) reading fashion magazines had strongly influenced their description

of the 'ideal body'(iii) their parents influenced their body image ideals and (iv) religion influenced how they took care of their bodies, the means for both, the experimental and the control group stayed unchanged from the pre-test to the post-test.

**Table 4.13 Social-Cultural Factors Influencing Perceived Body Image**

| Social-cultural factors Influencing Perceived Body Image among Respondents | Group | N | Mean | SD | Mean | SD |
|---|---|---|---|---|---|---|
| There is no such thing as a perfect body | Exp | 23 | 2.52 | 1.310 | 2.52 | 1.310 |
| | Cont | 26 | 2.35 | 1.495 | 2.42 | 1.301 |
| My ethnicity is responsible for how I look | Exp | 23 | 1.70 | 1.020 | **1.83** | 1.114 |
| | Cont | 26 | 2.65 | 1.355 | 2.65 | 1.355 |
| Body image does not matter as much as one grows older | Exp | 22 | 2.77 | 1.066 | **2.82** | 1.053 |
| | Cont | 26 | 2.58 | 1.206 | 2.58 | 1.206 |
| Reading fashion magazines has strongly influenced my definition of the 'ideal body | Exp | 23 | 3.48 | 1.123 | 3.48 | 1.123 |
| | Cont | 26 | 2.77 | 1.451 | 2.77 | 1.451 |
| My parents influence my body image ideals. | Exp | 23 | 1.91 | 2.729 | 1.91 | 2.729 |
| | Cont | 26 | 2.77 | 1.478 | 2.69 | 1.463 |
| My peers find me physically attractive | Exp | 23 | 3.87 | .968 | 3.91 | .949 |
| | Cont | 26 | 3.46 | 1.029 | 3.46 | 1.029 |
| My religion influences how I take care of my body | Exp | 23 | 2.30 | 1.222 | 2.30 | 1.222 |
| | Cont | 25 | 2.72 | 1.308 | 2.72 | 1.308 |

### 4.4.4 Management of Body Image Perceptions

The study also sought to understand how the participants coped with or managed their body image perceptions. The results of their responses are presented in Table 4.14. In

response to the question of whether they always did their best to have an ideal body, the experimental group reported a pre-test mean of 3.26 (*SD*=1.096) and a pre-test of 3.35 (*SD*=1.071).The control group also reported a change between the pre-test of 2.73 (1.151) and their post-test mean of 3.31 (1.050). With regard to their inability to cope well with criticism about their body size, the experimental group reported a mean of 2.22 (*SD*=1.151) during pre-test and a mean of 2.30 (*SD*=1.608) during post-test as compared to the control group which remained unchanged. On whether they talk a lot to others about their body image, the experimental group reported a mean of 2.04 (*SD*=.928) during pre-test and a mean of 2.17 (*SD*=.887) during post-test while the control group remained unchanged. In response to whether the participants were sometimes compelled to withdraw from company of friends because of their perceived body image, the experimental group reported a mean of 1.61 (*SD*=.499) during pre-test and a mean of 1.52 (*SD*=.511) during post-test while the control group remained unchanged. On the issue of whether they became depressed because of their body, the experimental group reported a mean of 1.65 (*SD*=.714) during pre-test and a mean of 1.78 (*SD*=.998) during post-test as compared to no change that was noted in the control group that posted a mean of 1.42 (*SD*=0.703) and 1.38 (*SD*=.697) at pre and post exercise respectively. This implies that the exercise helped those in the programme to become less depressed. Further on whether they had attempted suicide because of their body, the experimental group reported a mean of 1.13 (*SD*=.344) during pre-test and a mean of 1.09 (*SD*=.288) during post-test while the control group remained unchanged. Finally, on whether their bodies often forced them to withdraw socially from friends, peers and colleagues, the experimental group reported a mean of 1.57 (*SD*=.507) during pre-test and a mean of 1.65 (*SD*=.487) during post-test. On whether they worked consistently towards improving their body image, the

experimental group reported a mean of 2.91 (*SD*=1.240) during pre-test and a mean of 3.91 (*SD*=.900) during post-test while the control group remained unchanged.

**Table 4.14 Management of Body Image Perceptions**

| Handling of Body Image Perceptions among Respondents | Group | N | Mean | SD | Mean | SD |
|---|---|---|---|---|---|---|
| I have been discriminated by my peers because of my looks. | Exp | 23 | 2.09 | 1.083 | 2.09 | 1.083 |
| | Cont | 26 | 2.46 | 1.240 | 2.46 | 1.240 |
| I always do my best to have an ideal body | Exp | 23 | 3.26 | 1.096 | **3.35** | 1.071 |
| | Cont | 26 | 2.73 | 1.151 | 3.31 | 1.050 |
| I cannot cope well with criticism about my body size. | Exp | 23 | 2.22 | 1.565 | **2.30** | 1.608 |
| | Cont | 26 | 3.08 | 1.412 | 3.08 | 1.412 |
| I am skilled in handling those who criticize my body image | Exp | 23 | 2.30 | 1.020 | 2.30 | 1.020 |
| | Cont | 25 | 2.84 | 1.214 | 2.84 | 1.214 |
| I have a good word for everyone regardless of their looks | Exp | 23 | 3.00 | 1.087 | 3.00 | 1.087 |
| | Cont | 26 | 3.38 | 1.134 | 3.38 | 1.134 |
| I have tried unhealthy dieting | Exp | 23 | 2.96 | 1.186 | 2.96 | 1.186 |
| | Cont | 26 | 2.69 | 1.463 | 2.69 | 1.463 |
| I always forgive those who criticize my body image | Exp | 23 | 3.35 | 1.191 | 3.35 | 1.229 |
| | Cont | 26 | 3.73 | 1.079 | 3.73 | 1.079 |
| I talk a lot to others about my body image. | Exp | 23 | 2.04 | .928 | **2.17** | .887 |
| | Cont | 26 | 2.31 | 1.087 | 2.31 | 1.087 |
| Sometimes I am forced to withdraw from company of friends because of my body image. | Exp | 23 | 1.61 | .499 | **1.52** | .511 |
| | Cont | 26 | 2.04 | 1.113 | 2.04 | 1.113 |
| I can become depressed because of my body | Exp | 23 | 1.65 | .714 | 1.78 | .998 |
| | Cont | 26 | 1.42 | .703 | **1.38** | .697 |
| I want to increase my Body Mass Index | Exp | 23 | 2.30 | 1.185 | 2.17 | 1.267 |

| | | | | | | |
|---|---|---|---|---|---|---|
| (BMI). | Cont | 26 | 2.31 | 1.225 | 2.31 | 1.225 |
| I have attempted suicide because of my body | Exp | 23 | 1.13 | .344 | **1.09** | .288 |
| | Cont | 26 | 1.19 | .491 | 1.27 | .533 |
| My body often forces me to withdraw socially from friends/ peers/ colleagues. | Exp | 23 | 1.57 | .507 | **1.65** | .487 |
| | Cont | 26 | 2.08 | 1.230 | 1.96 | 1.216 |
| I work consistently towards improving my body image | Exp | 23 | 2.91 | 1.240 | **3.91** | .900 |
| | Cont | 26 | 2.50 | .949 | 2.50 | .949 |

### 4.5. Effects of the Eight-Week Walk Program on Perceived Body Image

The study also set out to establish the effects of the eight-week walk programme on their perceived body image. Results of the paired t-test computed between the pre-test and the post-test to determine whether participation in the eight-week walk programme had any effect on their perceived body image are presented in Table 4.16.

#### 4.5.1 Significance of differences in body image consciousness

As indicated in Table 4.15, although there were numerous variations between the pre-test and the post-tests, for both, the experimental and the control groups only the few that were statistically significant are presented. On considering whether the participants consciously monitored their body weight, the statistically significant difference between pre-test and post-test means ($t$ (48) = 2.066. $P$=.044) suggests that the exercise helps participants to consciously monitor their body weight. With regard to whether participants wanted a perfect body, the statistically significant difference between the pre-test and the post-test ($t$ (48) = 3.150. $P$=.003) implies that the participants wanted a perfect body. Similarly, the statistically significant difference between the pre-test and the post-test ($t$ (48) = 3.263. $P$=.002) with regard to whether the participants felt that their bodies did not represent themselves reveals that the participants felt that their body did represent them post the exercise unlike before. On

whether the participants followed exercise regimes to the letter to maintain a good figure, the statistically significant difference in pre-test and post-test means (t (48) = 4.280. P<.001) reveals that participants believe in following the exercise regime to maintain good figure confirming the quest for a perfect body. The statistically significant difference between the pre- and post-test means (t (48) = 2.720. P=.009) concerning the participants feeling physically attractive, indicates that participants felt more attractive post the Eight week walk programme. Another statistically significant outcome (t (48) = 3.150. P=.003), that focused on the participants' concern about their body weight all the time confirmed that participants were concerned about their body weight.

**Table 4.15 Significance of Differences in Body Image Consciousness**

| Paired Samples Test | | | | | |
|---|---|---|---|---|---|
| Body Image Consciousness among Study Respondents | Paired Differences | | T | Df | Sig. (2-tailed) |
| | Mean | Std. D. | | | |
| I consciously monitor my body weight | -.163 | .553 | -2.066 | 48 | .044* |
| I accept and appreciate my natural body shape | .102 | .743 | .962 | 48 | .341 |
| I want a perfect body. | -.388 | .862 | -3.150 | 48 | .003* |
| I feel like my body does not represent me. | -.265 | .569 | -3.263 | 48 | .002* |
| I want to reduce the size of my waist. | -.041 | .286 | -1.000 | 48 | .322 |
| I follow exercise regimes to the letter to maintain my figure | -.633 | 1.035 | -4.280 | 48 | < 0.001* |
| I am determined not to allow age to mess my physical appearances | -.061 | .317 | -1.353 | 48 | .182 |
| I am very concerned about what others think of my body weight. | .000 | .408 | .000 | 48 | 1.000 |

| | | | | | |
|---|---|---|---|---|---|
| I am physically attractive. | -.245 | .630 | -2.720 | 48 | .009* |
| I experience emotional distress on account of my body | -.020 | .249 | -.573 | 48 | .569 |
| I am concerned about my body weight all the time | -.388 | .862 | -3.150 | 48 | .003* |
| I feel uncomfortable and awkward in my body | .041 | .498 | .573 | 48 | .569 |
| I often feel proud because of my looks | -.061 | .475 | -.903 | 48 | .371 |
| I often feel that people ignore me because of my looks | .082 | .344 | 1.662 | 48 | .103 |
| I feel that my body does not measure up to image of an ideal body depicted by the social media | .041 | .200 | 1.429 | 48 | .159 |
| I accept and appreciate body differences | -.102 | .421 | -1.698 | 48 | .096 |
| I feel comfortable around persons with different looks | -.061 | .556 | -.771 | 48 | .444 |

*** Significant differences**

### 4.5.2 Significance of Individual Factors Affecting Body Image

The study also sought to establish whether the changes in the individual factors affecting body image were statistically significant. The results of these are presented in Table 4.16. Though numerous differences were noted between the pre and post-test means, only the statistically significant results are presented here. The statistically significant difference ($t$ (48) = 2.274. $P$=.027 between the pre- and post-test concerning the participants' satisfaction with their lives indicates that participants were not satisfied with their lives. The statistically significant result ($t$ (48) = 3.263. $P$=.002) concerning the participants' comfort and confidence in their bodies confirms that they were not comfortable and confident hence the reason for exercise uptake. The statistically significant outcome ($t$ (48) = 2.274. $P$=.007) about the participants' opinion that a nice body could be attractive to the opposite sex indicates that

participants were agreeable. The statistically significant result ($t$ (48) = 3.263. $P$=.002) between the pre- and post-test means reflecting the participants dissatisfaction with their bodies reveals that they were not satisfied with their bodies.

**Table 4.16 Significance of Individual Factors Affecting Body Image**

| Paired Samples Test | | | | | |
|---|---|---|---|---|---|
| Individual factors affecting Body Image among respondents | Mean | SD | t | df | Sig. (2-tailed) |
| I make friends easily across individuals with varied body images | -.041 | .200 | -1.429 | 48 | .159 |
| My looks cause me to have low self-esteem. | -.020 | .143 | -1.000 | 48 | .322 |
| Overall I am satisfied with life. | -.184 | .565 | -2.274 | 48 | .027* |
| I feel comfortable, confident in my body | -.265 | .569 | -3.263 | 48 | .002* |
| My body image causes me a lot of anxiety. | -.041 | 1.290 | -.221 | 48 | .826 |
| I believe that there is something wrong with my body | -.020 | .143 | -1.000 | 48 | .322 |
| I am a keen follower of beauty pageants on television. | -.020 | .322 | -.444 | 48 | .659 |
| My body has made me feel ashamed, insecure and anxious | -.020 | .143 | -1.000 | 48 | .322 |
| I have constant negative thoughts about my body | -.061 | .317 | -1.353 | 48 | .182 |
| Body shape, size and image are everything to me | -.061 | .377 | -1.137 | 48 | .261 |
| I believe that growing older makes one less physically attractive | .061 | .429 | 1.000 | 48 | .322 |
| I care very much what my friends and peers think about my body weight | -.082 | .344 | -1.662 | 48 | .103 |
| A nice body will be attractive to the opposite sex | -.184 | .565 | -2.274 | 48 | .027* |
| I am always concerned about my shape, size and image | -.041 | .200 | -1.429 | 48 | .159 |
| I am dissatisfied with my body | -.265 | .569 | -3.263 | 48 | .002* |
| I am ashamed of my body | -.041 | 1.290 | -.221 | 48 | .826 |

*** Significant differences**

### 4.5.3 Significance of Social-Cultural Factors Influencing Perceived Body Image

The study endeavoured to establish whether the social-cultural factors influencing perceived body image were statistically significant. The results presented in Table 4.17 indicate that though there were numerous differences between the pre-test and the post-test means among both the control and experimental groups, only the statement that their peers found the participants physically attractive was statically significant ($t$ (48) = 3.263. $P$=.002).Thus suggesting that body approval by peers played a big role in influencing body image.

**Table 4.17 Significance of Social-Cultural Factors Influencing Perceived Body Image**

| Social-cultural factors Influencing Perceived Body Image among Respondents | Mean | SD | T | df | Sig. (2-tailed) |
|---|---|---|---|---|---|
| There is no such thing as a perfect body | -.061 | .429 | -1.000 | 48 | .322 |
| My ethnicity is responsible for how I look | -.043 | 1.560 | -.187 | 46 | .852 |
| Body image does not matter as much as one grows older | -.041 | .611 | -.468 | 48 | .642 |
| Reading fashion magazines has strongly influenced my definition of the 'ideal body | .041 | .286 | 1.000 | 48 | .322 |
| My parents influence my body image ideals | -.020 | .143 | -1.000 | 48 | .322 |
| My peers find me physically attractive | -.265 | .569 | -3.263 | 48 | .002* |
| My religion influences how I take care of my body | -.061 | .317 | -1.353 | 48 | .182 |
| I have been discriminated by my peers because of my looks | -.041 | 1.290 | -.221 | 48 | .826 |

*** Significant differences**

### 4.5.4 Significance of Managing Body Image Perceptions

The results, concerning the management of Body Image Perceptions presented in Table 4.18 indicate that though there were numerous differences between the pre- and

post-test means among both, experimental and the control groups, only those that were statistically significant have been presented here. The statistically significant result ($t$ (48) = 2.085. $P$=.042) between the pre- and post-test means that looked at whether the participants did their best to have an ideal body, indicates that indeed participants did their best. The statistically significant result ($t$ (48) = 3.263. $P$=.002) between the pre-and post-test means with regard to whether the participants had skills in handling those who criticized their body image, clearly indicates that indeed the participants were skilled in handling body image criticism. The statistically significant outcome ($t$ (48) = 4.280. $P$<.001) between the pre- and post-test regarding whether the participants had tried unhealthy dieting reveals that indeed the participants had tried unhealthy diet. Finally, the statistically significant result ($t$ (48) = 3.783. $P$<.001) concerning whether the participants worked consistently towards improving their body image, reveals that the participants had been trying to improve their body image, a more reason for even accepting to join the Eight-Week Walk Programme.

**Table 4.18 Significance of Managing Body Image Perceptions**

| Managing of Body Image Perceptions among Respondents | Mean | SD | T | Df | Sig. (2-tailed) |
|---|---|---|---|---|---|
| I always do my best to have an ideal body | -.347 | 1.165 | -2.085 | 48 | .042* |
| I cannot cope well with criticism about my body size | -.041 | .286 | -1.000 | 48 | .322 |
| I am skilled in handling those who criticize my body image | -.265 | .569 | -3.263 | 48 | .002* |
| I have a good word for everyone regardless of their looks | -.041 | .286 | -1.000 | 48 | .322 |
| I have tried unhealthy dieting | -.633 | 1.035 | -4.280 | 48 | <.001 |
| I always forgive those who criticize my body image | .000 | .204 | .000 | 48 | 1.000 |
| I talk a lot to others about my body image | -.061 | .317 | -1.353 | 48 | .182 |
| Sometimes I am forced to withdraw from company of friends because of my body image | .041 | .200 | 1.429 | 48 | .159 |
| I can become depressed because of my body | -.041 | .611 | -.468 | 48 | .642 |
| I want to increase my Body Mass Index (BMI). | .061 | .429 | 1.000 | 48 | .322 |
| I have attempted suicide because of my body | -.020 | .249 | -.573 | 48 | .569 |
| My body often forces me to withdraw socially from friends/ peers/ colleagues | .020 | .381 | .375 | 48 | .710 |
| I work consistently towards improving my body image | -.469 | .868 | -3.783 | 48 | <.001 |

*** Significant differences**

## 4.6 Relationship Between Health-Related Fitness and Perceived Body Image of Premenopausal Female Primary School Teachers

The study also sought to find out whether participation in the Health-Related Fitness Components had an effect of their perceived body image. This was done by running a paired t-test on the pre-test and post-test data. The results are presented in Table 4.19 and indicated that though there were numerous differences in post-test and pre-test

mean among the control and experimental groups, only cardiovascular endurance and lower back flexibility had statistically significant relationship with body image. According to results in Table 4.19, the experimental group's cardiovascular endurance had a significant relationship with body image r=.78 p<.001 while the control group did not have a significant relationship. Similarly, the experimental group had a positive relationship between lower back flexibility and body image r=.453 p=.001.

**Table 4.19 Relationship Between Health-Related Fitness and Perceived Body Image of Premenopausal Female Primary School Teachers**

| Component of fitness | Group | N | R | Df | Sig. |
|---|---|---|---|---|---|
| Cardiovascular endurance | | | .784 | | |
| | | 26 | .243 | | |
| Low Back Flexibility | | 23 | .453 | | |
| | | 26 | .157 | | |
| Abdominal Strength | | 23 | .246 | | |
| | | 26 | .187 | | |
| Upper Body Strength | | 23 | .246 | | |
| | Control | 26 | .223 | 47 | .128 |

# CHAPTER FIVE: DISCUSSIONS

## 5.0 Introduction

The aim of this study was to establish the effects of an Eight-Week Walk programme on the Health-Related Fitness levels and the Perceived Body Image of premenopausal Primary School teachers in Mvita, Mombasa County. The major findings centred on the Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance, and Body Mass Index (BMI). Perceived Body image was examined in the four thematic areas of Body Image Consciousness, factors influencing Body Image, social-cultural factors affecting Body Image, and strategies for coping with Body Image perceptions among the study participants.

## 5.1 Eight-Week Walk Programme and Health-Related Fitness Components among Premenopausal Female Primary School Teachers

This study revealed that the Eight-Week Walk programme had a significant beneficial effect on four of the five Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, upper body strength endurance and Body Mass Index (BMI) of 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County. The findings for cardiovascular endurance, abdominal muscular endurance, upper body strength endurance and Body Mass Index (BMI) were consistent with those by Bai, Soh, Omar, Talib, Xiao &Cai, (2022) who found that generally, brisk walking improves cardiorespiratory fitness, muscular strength, and body composition. A study by Teychenne and Miller, (2017) also deduced that moderate intensity walking helps the body breakdown fat while efficiently increasing

cardiovascular endurance. However, there was no substantial discrepancies between low back flexibility pre and posts-tests.

### 5.1.1 Effects of Eight-Week Walk Programme on Cardiovascular Endurance

The pre- and post-test results for cardiovascular endurance of the experimental group registered a significant improvement from the levels of "very poor"(pre-test 91.3% reduced to post-test78.3%) and “Average,” (4.3%) as rated by the 20- meter shuttle run test (bleep aerobic fitness test) norms for females. However, there were no observable discrepancies in the control group between the pre-test and post-test scores. This result concurs with the findings of a study by Weg and Zitz, (2022) that indicated that walking being a form of cardiovascular exercise, effectively raised the heart rate sufficiently to improve cardiovascular health making it suitable for individuals who are less active or have joint issues. Their study recommended brisk walking for about 30 minutes on most days of the week for multiple benefits, such as improved heart health, increased muscle tone, better respiratory function, enhanced digestion, and boost to the immune system.

### 5.1.2 Effects of the Eight Week Walk Programme on Abdominal Muscular Endurance

Participants in both, the experimental and control group showed beneficial improvements in abdominal muscular endurance after the eight-week walk programme. In this study, 30.4% of the participants in the experimental group at the pre-test were rated as very poor in the sit-up test. However, only 13% were rated as poor in the post-test among the experimental group. Prior to administering a brisk 12-Week walking exercise programme in his study, Valsaraj (2013) considered the

modified sit-up test a simple and cost-effective alternative for evaluating abdominal muscular strength and endurance. The periodization of brisk walking exercise and data collection details revealed a consistent and significant improvement in abdominal muscular strength and endurance (Valsaraj, 2013). Overall, the study revealed that a structured brisk walking regimen could lead to notable enhancements in abdominal muscular strength and endurance. This is consistent with the current eight-week walk programme which also revealed an improvement in the abdominal muscular endurance among the premenopausal female primary schoolteachers in Mvita. Another study conducted by Olowe, O., Sokunbi, O., Salisu, Okafor, A. (2022) aimed at investigating the efficacy of treadmill walking, both with and without abdominal bracing, in reducing pain while simultaneously activating abdominal muscles, stabilizing the torso, and supporting the spine. The study established that strength and endurance of the abdomen was improved by treadmill walking. Their study observed numerous benefits of walking for patients suffering from lower back pain (LBP), including marked improvements in back muscle strength, increased flexibility of movement, and enhanced offset rotation between the thorax and pelvis. These findings emphasize the significance of incorporating treadmill walking into rehabilitation programmes for individuals with LBP, as it offers a comprehensive approach to improving their overall physical well-being and alleviating pain.

### 5.1.3 Effects of the Eight-Week Walk Programme on Low Back Flexibility

The experimental and control groups recorded very poor results in both pre and post-tests for low back flexibility. Flexibility of lower back is dependent on the flexibility of muscles of the lower back as well as that of the hamstrings. Walking impacts on the hamstring muscles and therefore it was expected to have some effect on the low back

flexibility. Lack of improvement on low back flexibility could be attributed to stiffness of the hamstring and muscles of the lower back which may have needed more specific stretching activities. Lan and Feng, (2022) in their study that examined the effects of brisk walking on bone mineral density (BMD) among healthy pre-menopausal women aged 45 to 50 years working at the universities and government departments, reported contrary findings. Though that study focused on bone mineral density, the authors recommended a 30 minutes per day 3 or more times per week brisk walking as a remedy for preventing not only bone loss, but also for strengthening leg muscles, limb girdle, lower and upper trunk joint flexibility and stability of the low back. This difference in opinion between the two studies could be explained by the fact that Lan and Feng study did not assess body composition and percentage body fat prior to brisk walking. This makes it unclear whether the positive effects of brisk walking on pre-menopausal women were directly related to brisk walking itself or brought about by changes in body composition (Lan and Feng, 2022).

This result also contradicts the Viollt and Oshman, (2018) study which conducted a randomized controlled eight-week trial among 246 18 to 65-year-old adults who suffered from low back pain. The research participants were divided into three intervention groups of an individualized walking programme group (N=82), an exercise group (N=83), and a physiotherapy intervention group (N=81). Participants in the individualized walking program had their pace monitored using pedometer and their walking intensity was gradually increased under the guidance of a physiotherapist on a weekly basis. The results showed significant improvement in low back pain.

### 5.1.4 Effects of the Eight-Week Walk Programme on Upper Body Strength-Endurance

Findings of the current study showed a positive effect of the Eight-Week Walk programme on upper body strength endurance among the pre-menopausal primary school teachers in Mvita. This is reflected by the improvement of upper body strength endurance among the experimental group. This supports the study by Valsaraj, (2013) which determined walking as being vital for upper body strength endurance because of its effect in strengthening muscles of the shoulders, back, and core abdomen for good posture. As pointed out by Valsaraj (2013), a Six-Week Walk training programme with a swinging arm action, engaged muscles of the arms, such as the biceps, triceps and deltoids, thus, eliciting improvement in Upper Body Muscular Strength.

### 5.1.5 Effects of the Eight Week Walk Programme on Body Mass Index (BMI)

The experimental group participants were engaged in an eight-week walk programme inclusive of prescribed callisthenic exercises. A comparison of results between the pre-test and post-test established a significant improvement in body mass index among experimental group. During pre-test 39.1% of the participants were obese, 21.7% were overweight and 21.7% had normal weight. Subsequent to the eight-week programme, post-test results indicated an improvement such that 34.8% of them were rated obese and overweight, while 30.4% were deemed normal weight. A study by Lee, Seo and Chung, (2013) reported a significant decrease in weight and body fat in its exercise group that participated in the 12-weeks of walking exercise. Interestingly, the positive findings of the current study in Mvita Mombasa County suggests that an eight-week programme could be just as beneficial for improving weight and BMI

profile as a 12-week programme. On the other hand, Nindl et al., (2000) found that weight and body fat decreased significantly subsequent to a 24-week aerobic exercise 5 times a week.

### 5.1.6 Overall Effect of the Eight-Week Walk Programme on Health-Related Fitness Components

It is evident from the current study that the eight–week walk programme generally has positive effects on Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, upper body strength-endurance and Body Mass Index (BMI) as evidenced by improvements from pre to post-test. The only component that remained unchanged for the better between the pre- and the post-test was low back flexibility. On the other hand, all the parameters remained mostly unchanged in the control group. It can therefore be concluded that an eight-week walking exercise programme performed at prescribed frequency, intensity and time is beneficial for Health-Related fitness and overall health.

In view of this, the null hypothesis that there would be no significant effect of an eight-week walk programme on the Health-Related fitness components of cardiovascular endurance, abdominal muscular endurance, upper body strength endurance and Body Mass Index (BMI) of 30 to 45 years old pre-menopausal female primary school teachers in Mvita, Mombasa County were rejected. However, the null hypothesis that there would be no significant effect of an eight-week walk programme on low back flexibility of 30 to 45 years old pre-menopausal female primary school teachers in Mvita, Mombasa County was accepted.

## 5.2 Eight-Week Walk Programme and Perceived Body Image

This study had major findings on perceived body image and effect of Eight Week-walk programme among premenopausal teachers. The perceived body image was examined from the four thematic perspectives of body image consciousness, factors affecting body image, social cultural factors affecting body image as well as handling/managing body image perceptions among study respondents.

### 5.2.1 Body Image Consciousness

From the perspective of body image consciousness, the study showed that a good number of the study participants were image conscious when it came to body image, perfect body, waist size, physical appearance, being physically attractive, proud of their looks, accepting and appreciative of body differences as well as feeling comfortable around people with different looks. These findings are similar to those in the study conducted by Deeks and McCabe (2001) which showed that pre-menopausal women endorsed higher positive evaluations of their appearance.

On the other hand, a good number of the study respondents did not agree or disagree (were neutral) when it came to consciously monitoring their body weight, being worried about what others think of their body weight, being concerned about their body weight or their bodies, and not being concerned about measuring up to ideal body weight. This could be because of being preoccupied with other things like family life and the demands that come with being a working mother.

The current study also revealed that there were those who felt their bodies did not represent them. At the same time, there were those who did not believe in following

exercise regimes to the letter to maintain a perfect body. Respondents also revealed that they did not experience emotional stress because of how their bodies looked nor did they feel uncomfortable and awkward in their bodies. This could be because of the body image's relationship to a person's perceptions, feelings and thoughts about his or her body.

### 5.2.2 Individual Factors Affecting Body Image

With regard to individual factors affecting perceived body image, majority of the respondents in the current study revealed that they made friends easily; overall, being satisfied with life; being comfortable and confident in their bodies. At the same time they agreed that a nice body could be attractive to the opposite sex. A big proportion of the respondents were not ashamed of their bodies; neither did they attribute low self-esteem to their looks nor did they believe that there was anything wrong with their bodies. This could be because an ideal body is in one's perception. The respondents did not agree to the contention that body image caused them a lot of anxiety and, that their bodies made them feel ashamed, insecure and anxious. The respondents did not have constant negative thoughts about their bodies. This could be because population in the study is socialized to appreciate themselves as they are. As rationalized by Tylka and Wood-Barcalow (2015b), a positive body image reflects the individual's strong pride in the body's appearance for being consistent with sociocultural ideals. It is also notable that the respondents were neutral on whether body shape, size and image were everything to them. Just as they were neutral about the belief that growing older made one less physically attractive. This could be because the study population comprised midlife women transitioning from the young

to older age groups which contradicts study conducted by Ashleigh M. Bellard A., Cazzat V., Cornelissen P., Mian E. (2021).

### 5.2.3 Social-Cultural Factors Influencing Perceived Body Image

Most of the respondents did not agree with the contention that there is no such a thing as a perfect body, that ethnicity was responsible for how they looked, that parents influenced their body ideals, as well as to the contention that religion influenced how one took care of their body. This was in contrast to Gordon, (2000) who postulated that parental and peer influences are implied in the development of ideas concerning what is an 'ideal' female image. On whether body image matters as one grows older; or whether fashion magazines have a strong influence on definition of ideal body or one having been discriminated by peers because of their looks, most respondents had a neutral feeling. A study by Lee and Lee, (2000) showed that economic liberalization has encouraged deregulation of the mass media, which projects a powerful image that "rigidly equates success with a young, slender and glamorously adorned woman'' which could be the case in this study. However, the findings of the current Eight-Week Walking programme were in contrast to a study by Groesz et al., (2002) which showed growing evidence that body image is subjective, and open to change through social influence.

### 5.2.4 Management of Body Image Perceptions

Several respondents in the current study did not think their bodies were not representative of themselves. At the same time, several others did not believe in following exercise regimes to the letter to main a perfect body. Quite a few others were not emotionally distressed because of their bodies; neither did they feel uncomfortable or awkward about their bodies. This is probably because body image

relates to a person's discernments, feelings and thoughts about his or her body, and is usually conceptualized as including body size estimation, evaluation of body attractiveness and emotions associated with body shape and size (Grogan, 2006). These finding did not agree with those of Jackson et al., (2014) who suggested an association between feeling unattractive and reporting clinically significant levels of depressive symptoms .It is also notable that the respondents were neutral on whether body shape, size and image meant everything to them or whether they believed that growing older made one less physically attractive. It is also notable that the respondents were neutral on whether body shape, size and image meant everything to them or whether they believed that growing older made one less physically attractive.

### 5.2.5 Overall Effect of Eight-Week Walk Programme on Perceived Body Image among Premenopausal Female Primary School Teachers

It was evident from this study that the Eight-Week programme played a significant role in improving body image consciousness while enhancing an individual's perception of their bodies. The media continued to play a big role in defining the ideal body, while society and religion had no such influence. Lastly, the participants were better equipped and coped better in managing body image perceptions post the Eight-Week walk programme. It would therefore be prudent to confirm that overall, the Eight-Week programme impacted positively on an individual's perceived body image.

This study revealed that the Eight week-walk program had a significant positive effect on Health-Related fitness components of cardiovascular endurance, abdominal muscular endurance, upper body strength endurance and Body Mass Index (BMI) of 30 to 45year old premenopausal female primary school teachers in the Mvita,

Mombasa County. This was consistent with a previous study by Bai et al, (2022) which showed that generally brisk walking improves cardiorespiratory fitness, muscular strength, and body composition. Another study by Teychenne and Miller (2017) also deduced that moderate intensity walking helps the body breakdown fat while efficiently increasing cardiovascular endurance. Another study by Lee, Seo, and Chung, (2013) showed significant decrease in weight and body fat in the exercise group subsequent to participation in12-weeks of walking exercise. Nindl et al. (2000), showed that weight and body fat were significantly decreased as a result of 24 weeks of aerobic exercise 5 times a week. In the Park (2009) and Park (2011) concerning body composition, significant decreases in weight and body fat were shown following aerobic exercise and walking study.

### 5.2.6 Relationship between Health-Related Fitness and Perceived Body Image of Premenopausal Female Primary School Teachers

From this study it was evident that the improvement on the Health Related Components played a significant role in improving body image consciousness while enhancing an individual's perception of their bodies. The results indicated that cardiovascular endurance and lower back flexibility had statistically significant relationship with body image. From the results in Table 4.20, the experimental group's cardiovascular endurance had a significant relationship with body image $r=.78$ $p<.001$ while the control group showed no significant relationship. Similarly, the experimental group had a positive relationship between lower back flexibility and body image $r=.453$ $p=.001$. It is therefore imperative to confirm that overall the Eight-Week programme positively impacts on an individual's perceived body image. Results for cardiovascular endurance of the experimental group registered a

significant improvement. This results concur with the findings of a study by Weg and Zitz, (2022) that indicated that walking being a form of cardiovascular exercise, effectively raised the heart rate sufficiently to improve cardiovascular health making it suitable for individuals who are less active or have joint issues. Their study recommended brisk walking for about 30 minutes most days of the week for multiple benefits, such as improved heart health, increased muscle tone, better respiratory function, enhanced digestion, and boost to the immune system. Although there was no significant improvement on low back flexibility the difference in means of pre-tests and post-tests of the experimental and control groups indicated a relationship with body image.

# CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 6.1 Summary of findings

A total of 23 premenopausal teachers aged between 30 and 45 years took part in the Eight-week Walk programme. All of them were drawn from Mvita Sub-county. Every participant's Health Related Fitness components were evaluated before and after the eight-week walk programme. Similarly, all of them responded to the Perceived Body Image questionnaire before and after the eight-week walk programme.

The number one objective of the study was to establish the effects of eight week-walk programme on Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance and Body Mass Index. As was evident from the results, apart from low back flexibility, significant improvements were noted in cardiovascular endurance, abdominal muscular endurance, upper body strength endurance and Body Mass Index (BMI) of the 30 to 45year old premenopausal female primary school teachers in the Mvita, Mombasa County.

The second objective was to establish the perceived body image among the premenopausal primary teachers in Mvita sub-county. Results from majority of the respondents indicate that they:(i) appreciate their body images, (ii) want a perfect body, (iii) want to reduce the size of the waist, (iv) are determined not to allow age to spoil their physical appearances, (v) consider themselves attractive, (vi) are often

proud of how they look, (vii) accept and appreciate body differences and (viii) are generally comfortable around people with different looks.

On the other hand, a good number of the participants were neutral with regard to: (i) issues such as consciously monitoring their body weight, (ii) being concerned about what others thought of their body weight, and (iii) adherence to ideal body weight. Majority of the participants rejected the notions that (i) their bodies were not representative of them, (ii) one had to follow exercise regimes to the letter to maintain a perfect body, (iii) they experienced emotional distress because of their bodies, (iv) they felt uncomfortable or awkward about their bodies, and (v) people ignored them because of their looks.

Consequently the following null hypothesis;

**$H_{01}$:** There is no significant effect of the eight-week walk programme on Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, low back flexibility, upper body strength-endurance and Body Mass Index (BMI) of 30 to 45year old premenopausal female primary school teachers in Mvita, Mombasa County.

**$H_{02}$:** There is no significant effect of the eight-week walk programme on perceived Body Image of 30 to 45year old premenopausal female primary school teachers in Mvita, Mombasa County.

**$H_{03}$:** There is no significant relationship between Health-Related Fitness and Perceived Body Image of 30 to 45 year old premenopausal female primary school teachers subsequent to an eight-week walk programme were all rejected and alternate hypothesis to the same accepted

## 6.2 Conclusions

The Eight-Week Walk Programme was beneficial to the participants because it improved their Health-Related Fitness components of cardiovascular endurance, abdominal muscular endurance, upper body strength endurance and Body Mass Index.

The Second finding is that perceived body image is person-specific and is minimally affected by social media ideals. This is a paradigm shift from the major earlier beliefs that media influenced body ideal. The premenopausal teachers' body ideals in this study were shaped more by individual rather than any other external factors.

## 6.3 Recommendations

### 6.3.1 Recommendations on practice and policy

The study's recommendations for practice and policy implementation are as follows:

i) Use of walking as a way of enhancing Health-Related Fitness components is highly recommended to populations similar to those of the study sample.

ii) Reinforcement of walking programmes by governing bodies and authorities such as the Teachers Service Commission as a way of promoting and enhancing better health through Health-Related Fitness components among teachers and general population.

iii) There is need to design simple exercises, such as the walking exercise used in the study, and incorporating them into daily professional lifestyle that can be undertaken at the convenience of participants.

### 6.3.2 Recommendations for Further Research

The study's recommendations for further research are as follows;

i) There is need to conduct further research on the best way of integrating walking into the lives of all teachers and other professionals as a way of enhancing HRF components to optimize on its effects.

ii) Further, there is need for more research on how to reinforce a positive image among the premenopausal women regardless of the cadres.

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# APPENDICES

## APPENDIX A: PREMENOPAUSE SCREENING QUESTIONNAIRE

Code: _____

The following questions are designed to gauge your menopause status. You are required to complete the questionnaire by selecting only the most appropriate response that corresponds to each statement. Your feedback will be treated with maximum confidentiality and the information will be used for screening purposes only

(Only one answer is to be selected for each statement)

What is your date of birth? ……

Are you on contraceptives?

☐ Yes ☐ No

Do you menstruate regularly?

☐ Yes ☐ No

Has your menstruation stopped?

☐ Yes ☐ No

If yes, what was your age when you had your last menstruation? Last period?

……..

Have your menstrual cycles been regular during the last twelve months?

☐ Yes ☐ No

Do you experience hot flashes?

☐ Yes ☐ No

Are you experiencing any mood changes?

- Rarely
- Sometimes
- Most of the time
- All the time
- Not sure
- Are you easily irritated?
- Rarely
- Sometimes
- Most of the time
- All the time
- Not sure

Do you have sleep problems?

☐ Yes ☐ No

Have you noticed an increase in breast sensitivity?

☐ Yes ☐ No

Do you have loss of interest in sexual activities?

☐ Yes ☐ No

Menopause Screening Questionnaire Adapted from The North American Menopause Society, 2005

**APPENDIX B: (SECTION I): HEALTH-RELATED FITNESS TESTS**

Wood (2018) emphasized that Physical fitness testing sessions should always be smooth and safe by ensuring standardized testing conditions, procedures, equipment, warm-up and cool-down. The researcher is required to seek consent from the participants, ensure reliable processes and accuracy during data collection. General and specific Pre-test warm-up and cool down activities should be done depending criteria on the tests that will be conducted.

The Health-Related Fitness will be assessed using the following:

(i) 20metre shuttle run test (bleep aerobic fitness test) for Cardio-vascular endurance.

A 20metre course between two lines is measured and marked out in preparation for the actual test. The procedure involves repeated running between the two marked lines and beeps are recorded. The participants will start by standing behind one of the marked lines facing the second line. At the command start, they start running at a slow pace. The participants keep running and turning when signalled by the recorded beeps. Increased speed is signalled by a unique sound and closer beep after about one minute at every stage. If a participant reaches the line prior to the beep sound, she is compelled to wait until the next beep sounds before continuing. Inability to reach the line within two meters before the beep sounds leads to a warning and the participant will have to continue running and turning to catch up with the pace within two more ‘beeps to avoid elimination after the second warning.

Rating of participants is determined by the number of shuttles (20m) reached before elimination or completion of the run. The table below shows norms for the beep test among adult female participants.

20metre shuttle run test (bleep aerobic fitness test)

| Rating | Women |
|---|---|
| Excellent | <12 |
| Very good | 10-12 |
| Good | 8-10 |
| Average | 6-8 |
| Poor | 4-6 |
| Very poor | <4 |

Adapted from Robert Wood (2018) "Pre-Fitness Testing Procedures."Topend Sports"

Resources:

Flat non-slip surface

Marking cones

20m measuring tape

Beep test audio

Audio player

Recording sheets.

(ii) One-minute sit-up test for Abdominal Muscle Strength and Endurance

One-minute sit-up test measures strength and endurance of the abdominals and hip-flexor muscles which are part of the lower body. Abdominal muscle strength and endurance is necessary for stability, support, and movement of the back as well as the lower body.

The participant lies on the mat or cushioned flat surface with knees bent, feet flat on the floor and hands on the thighs where they will stay throughout the test. The assistant researcher holds the subject's feet to keep them on the ground.

At the command to start the test and start of the stopwatch, the participant squeezes the stomach, pushes back flat and raises high enough for the hands to slide along the thighs to touch the top of both knees. Lower back is kept on the floor then returned to the starting position. The subject is advised not to pull the neck or head Count and record the number of correct sit-ups completed, rate using sit up norm for female.

**1 Minute sit-up test (Women)**

| Age | 18-25 | 26-35 | 36-45 | 46-55 | 56-65 | 65+ |
|---|---|---|---|---|---|---|
| Excellent | >43 | >39 | >33 | >27 | >24 | >23 |
| Good | 37-43 | 33-39 | 27-33 | 22-27 | 18-24 | 17-23 |
| Above Average | 33-36 | 29-32 | 23-26 | 18-21 | 13-17 | 14-16 |
| Average | 29-32 | 25-28 | 19-22 | 14-17 | 10-12 | 11-13 |
| Below Average | 25-28 | 21-24 | 15-18 | 10-13 | 7-9 | 5-10 |
| Poor | 18-24 | 13-20 | 7-14 | 5-9 | 3-6 | 2-4 |
| Very poor | < 18 | < 13 | < 7 | < 5 | < 3 | < 2 |

Adapted from Robert Wood (2018) "Pre-Fitness Testing Procedures."Top end Sports

Resources:

Non-slip surface

Exercise Mat

Stopwatch

An assistant

(iii)Sit -and -Reach test for Lower Back Flexibility.

Sit-and- reach is a test determining lower back and hamstring flexibility. The participants will be required to remove their shoes, sit on the floor with locked knees flat on the ground and straight leg out in front. Soles of feet will be placed flat contacting the box. One hand on top of the other, palms facing down and fingertips lined up or side by side, participant lean forward to reach the measuring line as far as possible. Both hands should remain at the same level. Hold on the same position for one to two seconds for recording of the distance, avoid jerky movement. The result is determined by distance covered by stretched hand is recorded to the nearest centimetres.

**Sit-and- Reach Test Norm for Adult Women**

| Rating | Centimetres (cm) | Inches | No of participants |
|---|---|---|---|
| Super | >+ 30 | > + 11.5 | |
| Excellent | + 21 to + 30 | + 8.0 to + 11.5 | |
| Good | + 11 to + 20 | + 4.5 to + 7.5 | |
| Average | + 1 to + 10 | + 0.5 to + 4.0 | |
| Fair | _ 7 to 0 | _ 2.5 to 0 | |
| Poor | _ 15 to _ 8 | _ 6.0 to _ 3.0 | |
| Very poor | < _ 15 | < _ 6.0 | |

Adapted from Robert Wood (2018) "Pre-Fitness Testing Procedures. “Top end Sports and Quinn, E & Ferrara, T. (2019)

Resources:

Sit-and-Reach box (9 inches or 23 cm)

Score sheet

Pen

An assistant

(iv) A Modified Push-up Test for Upper Body Strength-Endurance

The Modified Push-Up test will be used for measuring upper body strength-endurance to establish premenopausal female teachers' fitness ability. The participant kneels down with knees being pivot point. Elbows are flexed at 90 degrees at the bottom of movement, the body is then lowered and neutral spine maintained. Push back to starting position; counting is then done for forty seconds for complete push-ups in good form regardless of tempo. Total number of correctly performed push-ups in forty seconds will be recorded for ranking.

**Norms for Females Using the Modified Push-Up Test**

| Age(Years) | Very poor | Poor | Average | Good | Excellent |
|---|---|---|---|---|---|
| 18-29 | < 17 | 17-22 | 23-29 | 30-35 | 36-44 |
| 30-39 | < 11 | 11 -18 | 19-23 | 24-30 | 31-38 |
| 40-49 | < 6 | 6 -10 | 13-17 | 18-23 | 24-32 |
| 50-59 | < 5 | 5 -9 | 12-16 | 17-20 | 21-27 |

Adapted from Robert Wood (2018) "Pre-Fitness Testing Procedures. "Top end Sports and The Cooper Institute for Aerobics Research, Dallas Texas.,

Resources:

Stop watch

Pen

Printed score sheet.

An assistant

(v) Body Mass Index (BMI) test

BMI stands for Body Mass Index. It is an estimation of body composition. BMI is calculated by taking a person's weight in kilograms and dividing by their height squared in meters (Health Weight Guide). Therefore, BMI = (Weight / Height) *Height. The obtained data is classified using the WHO BMI chart in Figure 2.1 and Table 2.1

Procedure involves taking weight on a standard weighing machine placed on a hard surface. Height is measured using a tape measure mounted on a hard, straight wall with its base at the floor level.

Resources:

Standard Weighing machine,

Tape measure

Pen

Straight wall

Standard WHO BMI chart

An assistant

## APPENDIX B (SECTION II): STANDARDIZED BMI CHART

| WEIGHT | lbs | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | kgs | 41 | 45 | 50 | 54 | 59 | 64 | 68 | 73 | 77 | 82 | 86 | 91 | 95 | 100 | 104 | 109 | 113 | 118 | 122 | 127 | 132 |
| HEIGHT | | | Underweight | | | | | Healthy | | | | Overweight | | | | Obese | | | | Extremely Obese | | |
| ft/in | cm | | | | | | | | | | | | | | | | | | | | | |
| 4'8" | 142.2 | 20 | 22 | 25 | 27 | 29 | 31 | 34 | 36 | 38 | 40 | 43 | 45 | 47 | 49 | 52 | 54 | 56 | 58 | 61 | 63 | 65 |
| 4'9" | 144.7 | 19 | 22 | 24 | 26 | 28 | 30 | 32 | 35 | 37 | 39 | 41 | 43 | 45 | 48 | 50 | 52 | 54 | 56 | 58 | 61 | 63 |
| 4'10" | 147.3 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 59 | 61 |
| 4'11" | 149.8 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 51 | 53 | 55 | 57 | 59 |
| 4'12" | 152.4 | 18 | 20 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 35 | 37 | 39 | 41 | 43 | 45 | 47 | 49 | 51 | 53 | 55 | 57 |
| 5'1" | 154.9 | 17 | 19 | 21 | 23 | 25 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 43 | 45 | 47 | 49 | 51 | 53 | 55 |
| 5'2" | 157.4 | 16 | 18 | 20 | 22 | 24 | 26 | 27 | 29 | 31 | 33 | 35 | 37 | 38 | 40 | 42 | 44 | 46 | 48 | 49 | 51 | 53 |
| 5'3" | 160.0 | 16 | 18 | 19 | 21 | 23 | 25 | 27 | 28 | 30 | 32 | 34 | 35 | 37 | 39 | 41 | 43 | 44 | 46 | 48 | 50 | 51 |
| 5'4" | 162.5 | 15 | 17 | 19 | 21 | 22 | 24 | 26 | 27 | 29 | 31 | 33 | 34 | 36 | 38 | 39 | 41 | 43 | 45 | 46 | 48 | 50 |
| 5'5" | 165.1 | 15 | 17 | 18 | 20 | 22 | 23 | 25 | 27 | 28 | 30 | 32 | 33 | 35 | 37 | 38 | 40 | 42 | 43 | 45 | 47 | 48 |
| 5'6" | 167.6 | 15 | 16 | 18 | 19 | 21 | 23 | 24 | 26 | 27 | 29 | 31 | 32 | 34 | 36 | 37 | 39 | 40 | 42 | 44 | 45 | 47 |
| 5'7" | 170.1 | 14 | 16 | 17 | 19 | 20 | 22 | 24 | 25 | 27 | 28 | 30 | 31 | 33 | 34 | 36 | 38 | 39 | 41 | 42 | 44 | 45 |
| 5'8" | 172.7 | 14 | 15 | 17 | 18 | 20 | 21 | 23 | 24 | 26 | 27 | 29 | 30 | 32 | 33 | 35 | 37 | 38 | 40 | 41 | 43 | 44 |
| 5'9" | 175.2 | 13 | 15 | 16 | 18 | 19 | 21 | 22 | 24 | 25 | 27 | 28 | 30 | 31 | 33 | 34 | 35 | 37 | 38 | 40 | 41 | 43 |
| 5'10" | 177.8 | 13 | 14 | 16 | 17 | 19 | 20 | 22 | 23 | 24 | 26 | 27 | 29 | 30 | 32 | 33 | 34 | 36 | 37 | 39 | 40 | 42 |
| 5'11" | 180.3 | 13 | 14 | 15 | 17 | 18 | 20 | 21 | 22 | 24 | 25 | 27 | 28 | 29 | 31 | 32 | 33 | 35 | 36 | 38 | 39 | 40 |
| 5'12" | 182.8 | 12 | 14 | 15 | 16 | 18 | 19 | 20 | 22 | 23 | 24 | 26 | 27 | 28 | 30 | 31 | 33 | 34 | 35 | 37 | 38 | 39 |
| 6'1" | 185.4 | 12 | 13 | 15 | 16 | 17 | 18 | 20 | 21 | 22 | 24 | 25 | 26 | 28 | 29 | 30 | 32 | 33 | 34 | 36 | 37 | 38 |
| 6'2" | 187.9 | 12 | 13 | 14 | 15 | 17 | 18 | 19 | 21 | 22 | 23 | 24 | 26 | 27 | 28 | 30 | 31 | 32 | 33 | 35 | 36 | 37 |
| 6'3" | 190.5 | 11 | 13 | 14 | 15 | 16 | 18 | 19 | 20 | 21 | 23 | 24 | 25 | 26 | 28 | 29 | 30 | 31 | 33 | 34 | 35 | 36 |
| 6'4" | 193.0 | 11 | 12 | 13 | 15 | 16 | 17 | 18 | 19 | 21 | 22 | 23 | 24 | 26 | 27 | 28 | 29 | 30 | 32 | 33 | 34 | 35 |
| 6'5" | 195.5 | 11 | 12 | 13 | 14 | 15 | 17 | 18 | 19 | 20 | 21 | 23 | 24 | 25 | 26 | 27 | 28 | 30 | 31 | 32 | 33 | 34 |
| 6'6" | 198.1 | 10 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 20 | 21 | 22 | 23 | 24 | 25 | 27 | 28 | 29 | 30 | 31 | 32 | 34 |
| 6'7" | 200.6 | 10 | 11 | 12 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 32 | 33 |
| 6'8" | 203.2 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 29 | 30 | 31 | 32 |
| 6'9" | 205.7 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 6'10" | 208.2 | 9 | 10 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 6'11" | 210.8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 25 | 26 | 27 | 28 | 29 | 30 |

**APPENDIX B: (SECTION III): PERCEIVED BODY IMAGE QUESTIONNAIRE**

Code: _____

The following questions are designed to gauge your perceived body image. You are required to complete the questionnaire by selecting the most appropriate response that corresponds to the extent to which you agree or disagree with each statement.

(Only one answer should be selected for each statement)

| 1-Strongly Disagree 2-Disagree 3-Don't Know 4-Agree 5-Strongly Agree | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1) I consciously monitor my body weight. | | | | | |
| 2) I accept and appreciate my natural body shape. | | | | | |
| 3) I want a perfect body. | | | | | |
| 4) I always do my best to have an ideal body. | | | | | |
| 5) There is no such thing as a perfect body. | | | | | |
| 6) I make friends easily across individuals with varied body images. | | | | | |
| 7) I cannot cope well with criticism about my body size. | | | | | |
| 8) I feel like my body does not represent me. | | | | | |
| 9) My looks cause me to have low self-esteem. | | | | | |
| 10) My ethnicity is responsible for how I look. | | | | | |
| 11) Body image does not matter as much as one grows older. | | | | | |
| 12) Reading fashion magazines has strongly influenced my definition of the 'ideal body.' | | | | | |
| 13) My parents influence my body image ideals. | | | | | |
| 14) My peers find me physically attractive. | | | | | |
| 15) Overall I am satisfied with life. | | | | | |
| 16) My religion influences how I take care of my body. | | | | | |
| 17) I feel comfortable and confident in my body. | | | | | |
| 18) I want to reduce the size of my waist. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 19) I follow exercise regimes to the letter to maintain my figure. | | | | | |
| 20) I am skilled in handling those who criticize my body image. | | | | | |
| 21) I have a good word for everyone regardless of their looks. | | | | | |
| 22) My body image causes me a lot of anxiety. | | | | | |
| 23) I believe that there is something wrong with my body. | | | | | |
| 24) I am determined not to allow age to mess my physical appearances. | | | | | |
| 25) I am a keen follower of beauty pageants on television. | | | | | |
| 26) I have been discriminated by my peers because of my looks. | | | | | |
| 27) I have tried unhealthy dieting. | | | | | |
| 28) I am very concerned about what others think of my body weight. | | | | | |
| 29) My body has made me feel ashamed, insecure and anxious. | | | | | |
| 30) I have constant negative thoughts about my body. | | | | | |
| 31) I am physically attractive. | | | | | |
| 32) Body shape, size and image are everything to me. | | | | | |
| 33) I always forgive those who criticize my body image. | | | | | |
| 34) I talk a lot to others about my body image. | | | | | |
| 35) Sometimes I am forced to withdraw from company of friends because of my body image. | | | | | |
| 36) I can become depressed because of my body. | | | | | |
| 37) I believe that growing older makes one less physically attractive. | | | | | |
| 38) I care very much what my friends and peers think about my body weight | | | | | |
| 39) I experience emotional distress on account of my body. | | | | | |
| 40) I am concerned about my body weight all the time. | | | | | |
| 41) I feel uncomfortable and awkward in my body. | | | | | |
| 42) I want to increase my Body Mass Index (BMI). | | | | | |
| 43) I often feel proud because of my looks. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 44) I often feel that people ignore me because of my looks. | | | | | |
| 45) I feel that my body does not measure up to image of an ideal body depicted by the social media. | | | | | |
| 46) A nice body will be attractive to the opposite sex. | | | | | |
| 47) I am always concerned about my shape, size and image. | | | | | |
| 48) I have attempted suicide because of my body. | | | | | |
| 49) I am dissatisfied with my body. | | | | | |
| 50) My body often forces me to withdraw socially from friends/ peers/ colleagues. | | | | | |
| 51) I accept and appreciate body differences. | | | | | |
| 52) I feel comfortable around persons with different looks. | | | | | |
| 53) I work consistently toward improving my body image. | | | | | |
| 54) I am ashamed of my body. | | | | | |

**Perceived Body Image Questionnaire Adapted from Arasa, 2017.**

**APPENDIX C: (SECTION I) EIGHT-WEEK WALK PROGRAMME**

| WEEK | FREQUENCY 3 X PER WEEK<br><br>TUESDAY THURSDAT SATURDAY | INTENSITY | DURATION | ACTIVITY TYPE |
|---|---|---|---|---|
| ONE | Saturday | Low | 15 mins | Calisthenics (warm-up) |
| | | Low | 20 mins | Walk |
| | | Low | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, shoulder stretch, standing forward bend stretch, abdominal curls and modified press-ups, core abdominal stretch knee-to-chest pose, seated head-to-knee forward bend, child's pose, foot stretch. |
| | Tuesday | Low | 15 mins | Calisthenics (warm-up) |
| | | Low | 20 mins | Walk |
| | | Low | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, shoulder stretch a, legs-up-the-wall pose, core abdominal stretch, corpse pose stretch, foot stretch. |
| | Thursday | Low | 15 mins | Calisthenics (warm-up) |
| | | Low | 20 mins | Walk |
| | | Low | 10 mins (Each exercise x 30 seconds on each side) | light walking, neck stretch, shoulder stretch, wide toe touch alternating hands, standing quad stretch, side bench stretch, abdominal curls and modified press-ups core abdominal stretch, cat stretch, hamstring stretch and foot stretch. |

| WEEK | FREQUENCY 3 X PER WEEK<br><br>TUESDAY THURSDAT SATURDAY | INTENSITY | DURATION | ACTIVITY TYPE |
|---|---|---|---|---|
| TWO | Saturday | Low, Moderate | 15 mins | Calisthenics (warm-up) |
| | | Low, Moderate | 25 mins | Walk |
| | | Low, Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, chest-cross arm swing stretch, quad stretch, core abdominal stretch, glute stretch and foot stretch. |
| | Tuesday | Low, Moderate | 15 mins | Calisthenics (warm-up) |
| | | Low, Moderate | 25 mins | Walk |
| | | Low, Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, body shakes, neck stretch, marching arm circles, seated pigeon stretch, abdominal curls and modified press-ups core abdominal stretch, glutestretch,lunge calf stretch andfoot stretch. |
| | Thursday | Low, Moderate | 15 mins | Calisthenics (warm-up) |
| | | Low, Moderate | 25 mins | Walk |
| | | Low, Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, arm-cross shoulder stretch, bent knee cross-body stretch, standing quadriceps stretch, abdominal curls and modified press-ups core abdominal stretch, lunge calf stretch and foot stretch. |

| WEEK | FREQUENCY 3 X PER WEEK<br><br>TUESDAY THURSDAT SATURDAY | INTENSITY | DURATION | ACTIVITY TYPE |
|---|---|---|---|---|
| THREE | Saturday | Low, Moderate | 15 mins | Calisthenics (warm-up) |
| | | Low, Moderate | 25 mins | Walk |
| | | Low, Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, reclining butterfly pose, abdominal curls and modified press-ups core abdominal stretch, back and hip stretch, hip and thigh stretch, calf stretch and foot stretch. |
| | Tuesday | Low, Moderate | 15 mins | Calisthenics (warm-up) |
| | | Low, Moderate | 25 mins | Walk |
| | | Low, Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, shoulder stretch, standing forward bend stretch, abdominal curls and modified press-ups core abdominal stretch knee-to-chest pose, seating head-to-knee forward bend, child's pose, foot stretch. |
| | Thursday | Low, Moderate | 15 mins | Calisthenics (warm-up) |
| | | Low, Moderate | 25 mins | Walk |
| | | Low, Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, arm-cross shoulder stretch, bent knee cross-body stretch, standing quadriceps stretch, abdominal curls and modified press-ups core abdominal stretch, lunge calf |

| | | | | |
|---|---|---|---|---|
| | | | | stretch and foot stretch. |
| WEEK | FREQUENCY 3 X PER WEEK<br><br>TUESDAY THURSDAT SATURDAY | INTENSITY | DURATION | ACTIVITY TYPE |
| FOUR | Saturday | Moderate | 15 mins | Calisthenics (warm-up) |
| | | Moderate | 30 mins | Walk |
| | | Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, shoulder stretch a, legs-up-the-wall pose, abdominal curls and modified press-ups core abdominal stretch, corpse pose stretch and foot stretch. |
| | Tuesday | Moderate | 15 mins | Calisthenics (warm-up) |
| | | Moderate | 30 mins | Walk |
| | | Moderate | 10 mins (Each exercise x 30 seconds on each side) | light walking, neck stretch, shoulder stretch, wide toe touch alternating hands, standing quad stretch, side bench stretch, abdominal curls and modified press-ups core abdominal stretch, cat stretch, hamstring stretch and foot stretch. |
| | Thursday | Moderate | 15 mins | Calisthenics (warm-up) |
| | | Moderate | 30 mins | Walk |
| | | Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, chest-cross arm swing stretch, quad stretch, abdominal curls and modified press-ups core abdominal |

| | | | | |
|---|---|---|---|---|
| | | | | stretch, glute stretch and foot stretch. |
| WEEK | FREQUENCY 3 X PER WEEK<br><br>TUESDAY THURSDAT SATURDAY | INTENSITY | DURATION | ACTIVITY TYPE |
| FIVE | Saturday | Moderate | 15 mins | Calisthenics (warm-up) |
| | | Moderate | 30 mins | Walk |
| | | Moderate | 10 mins (x 30 seconds on each side) | Light walking, neck stretch, reclining butterfly pose, abdominal curls and modified press-ups core abdominal stretch, back and hip stretch, hip and thigh stretch, calf stretch and foot stretch. |
| | Tuesday | Moderate | 15 mins | Calisthenics (warm-up) |
| | | Moderate | 30 mins | Walk |
| | | Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, body shakes, neck stretch, marching arm circles, seated pigeon stretch, abdominal curls and modified press-ups core abdominal stretch, glute stretch, lunge calf stretch and foot stretch. |
| | Thursday | Moderate | 15 mins | Calisthenics (warm-up) |
| | | Moderate | 30 mins | Walk |
| | | Moderate | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, shoulder stretch a, legs-up-the-wall pose, abdominal curls and modified press-ups core abdominal stretch, corpse pose stretch and foot stretch. |

| WEEK | FREQUENCY 3 X PER WEEK<br><br>TUESDAY THURSDAT SATURDAY | INTENSITY | DURATION | ACTIVITY TYPE |
|---|---|---|---|---|
| SIX | Saturday | Moderate, Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Moderate, Vigorous | 35 mins | Walk |
| | | Moderate, Vigorous | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, shoulder stretch, standing forward bend stretch, abdominal curls and modified press-ups core abdominal stretch knee-to-chest pose, seating head-to-knee forward bend, child's pose, foot stretch. |
| | Tuesday | Moderate, Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Moderate, Vigorous | 35 mins | Walk |
| | | Moderate, Vigorous | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, chest-cross arm swing stretch, quad stretch, abdominal curls and modified press-ups core abdominal stretch, glute stretch and foot stretch. |
| | Thursday | Moderate, Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Moderate, Vigorous | 40 mins | Walk |
| | | Moderate, Vigorous | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, shoulder stretch a, legs-up-the-wall pose, abdominal curls and modified press-ups core abdominal stretch, corpse pose stretch and foot stretch. |

| WEEK | FREQUENCY 3 X PER WEEK<br><br>TUESDAY THURSDAT SATURDAY | INTENSITY | DURATION | ACTIVITY TYPE |
|---|---|---|---|---|
| SEVEN | Saturday | Moderate, Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Moderate, Vigorous | 40 mins | Walk |
| | | Moderate, Vigorous | 10 mins (Each exercise x 30 seconds on each side) | light walking, neck stretch, shoulder stretch, wide toe touch alternating hands, standing quad stretch, side bench stretch, , abdominal curls and modified press-ups core abdominal stretch, cat stretch, hamstring stretch and foot stretch. |
| | Tuesday | Moderate, Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Moderate, Vigorous | 40 mins | Walk |
| | | Vigorous | 10 mins (Each exercise x 30 seconds on each side) | Light walking, body shakes, neck stretch, marching arm circles, seated pigeon stretch, abdominal curls and modified press-ups core abdominal stretch, glute stretch, **lunge calf stretch and** foot stretch. |
| | Thursday | Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Vigorous | 50 mins | Walk |
| | | Vigorous | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, reclining butterfly pose, , abdominal curls and modified press-ups core abdominal stretch, back and hip stretch, hip and thigh |

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|---|---|---|---|---|
| | | | | stretch, calf stretch and foot stretch. |
| WEEK | FREQUENCY 3 X PER WEEK<br><br>TUESDAY THURSDAT SATURDAY | INTENSITY | DURATION | ACTIVITY TYPE |
| EIGHT | Saturday | Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Vigorous | 50 mins | Walk |
| | | Vigorous | 10 mins (Each exercise x 30 seconds on each side) | Light walking, neck stretch, arm-cross shoulder stretch, bent knee cross-body stretch, standing quadriceps stretch, abdominal curls and modified press-ups core abdominal stretch, lunge calf stretch and foot stretch. |
| | Tuesday | Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Vigorous | 50 mins | Walk |
| | | Vigorous | 10 min (Each exercise x 30 seconds on each side) | Light walking, neck stretch, shoulder stretch, standing forward bend stretch, abdominal curls and modified press-ups core abdominal stretch knee-to-chest pose, s e a t i n g head-to-knee forward bend, child's pose, foot stretch. |
| | Thursday | Vigorous | 15 mins | Calisthenics (warm-up) |
| | | Vigorous | 50 mins | Walk |
| | | Vigorous | 10 mins (Each exercise x 30 seconds on each side) | Light walking, body shakes, neck stretch, marching arm circles, seated pigeon stretch, abdominal curls and modified press-ups core abdominal |

| | | | | |
|---|---|---|---|---|
| | | | | stretch, glute stretch, **lunge calf stretch and** foot stretch. |

Adapted from: Plyometric Training programme (Researchgate.net), Gray(December, 2018) and Stiefvater (2019) Retrieved April 27, 2020

## APPENDIX C: (SECTION II): INTENSITY OF EIGHT- WEEK WALK PROGRAMME TREATMENT

Intensity is the ease or difficulty of an exercise being performed. Low intensity is represented by heart of 40% to 55%, 55% to 70% heart rate represents Moderate intensity, 70% heart rate and above represent vigorous intensity for maximum benefit (Dix, 2019).

According to Mayo Clinic (2019), maximum heart rate is estimated by subtracting age from the standard maximum heart rate of 220 beats per minute. To calculate ones' intensity, the maximum heart rate is multiplied by required or set percentage level for an activity and then divide by a hundred. The researcher instructed all participants on the procedure for monitoring own heart/pulse for a duration of 15 seconds while walking on the spot. This was to ensure adherence and consistency in intensity. The 15 second count could then be multiplied by 4 to determine the minute count. As the subject's condition improved over the weeks, she was required to progress to next level of intensity.

# APENDIX D: KENYATTA UNIVERSITY GRADUATE SCHOOL APPROVAL

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

**FROM:** Dean, Graduate School **DATE:** 5th November, 2021

**TO:** **Ms. Violet Auma Odero**
**C/o Department of Physical**
**Education, Exercise & Sports Science**

**REF:** H68/CE/25635/2014

**SUBJECT: APPROVAL OF RESEARCH PROPOSAL**

We acknowledge receipt of your Research Proposal after fulfilling recommendations raised by the Graduate School Board of 27th October, 2021.

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking and Progress Report Forms per semester. The forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

KENYATTA UNIVERSITY OFFICE OF DEAN 08 NOV 2021 P.O. BOX 43844-00100 GRADUATE SCHOOL

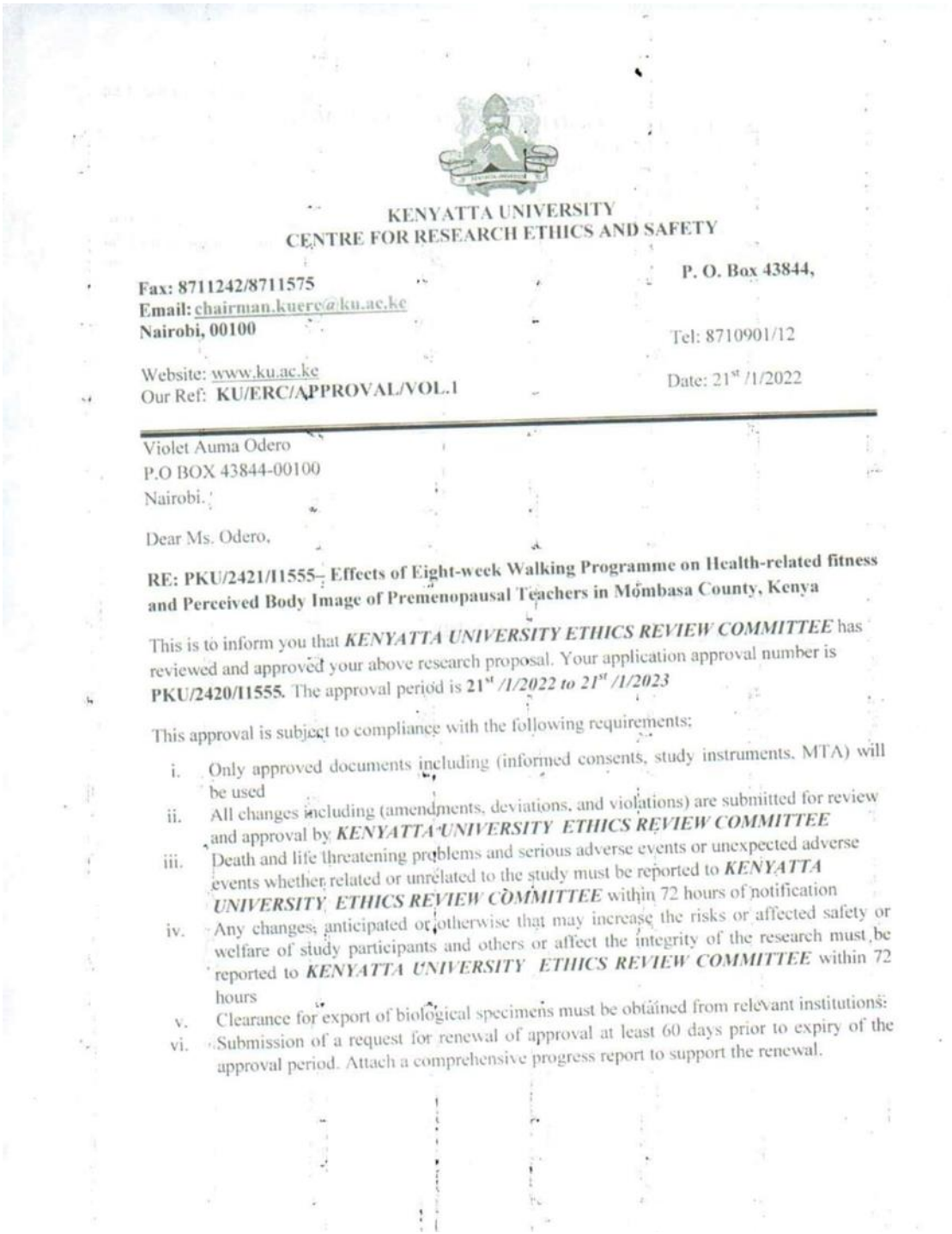
REUBEN MURIUKI
FOR: DEAN, GRADUATE SCHOOL

CC. Chairman, Department of Physical Education, Exercise & Sports Science

**Supervisors:**

1. Dr. Yasmin Goodwin
   C/o Department of Physical Education, Exercise & Sports Science
   Kenyatta University
2. Dr. Lucy-Joy Wachira
   C/o Department of Physical Education, Exercise & Sports Science
   Kenyatta University

**APPENDIX E: KENYATTA UNIVERSITY CENTER FOR RESEARCH ETHICS AND SAFETY**



KENYATTA UNIVERSITY
CENTRE FOR RESEARCH ETHICS AND SAFETY

Fax: 8711242/8711575
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

P. O. Box 43844,

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: KU/ERC/APPROVAL/VOL.1

Date: 21st /1/2022

Violet Auma Odero
P.O BOX 43844-00100
Nairobi.

Dear Ms. Odero,

**RE: PKU/2421/I1555– Effects of Eight-week Walking Programme on Health-related fitness and Perceived Body Image of Premenopausal Teachers in Mombasa County, Kenya**

This is to inform you that ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** has reviewed and approved your above research proposal. Your application approval number is **PKU/2420/I1555.** The approval period is ***21st /1/2022 to 21st /1/2023***

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions:
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.

vii. Submission of an executive summary report within 90 days upon completion of the study to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

To serve you better, researchers are kindly requested to access and complete a customer feedback form and sent it back online as you continue with research and upon completion of data collection found on the following website link; ;(https://docs.google.com/forms/d/1vtWefDwvyz5h1oz_VIn0xbxg3uGdlDzMXFWNDsMrRPQ/edit?usp=sharing

Yours sincerely

21 JAN 2021

## APPENDIX F: RESEARCH PERMIT

## NATIONAL COUNCIL FOR SCIENCE TECHNOLOGY AND INNOVATION

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **361691**

Date of Issue: **16/February/2022**

**RESEARCH LICENSE**

**This is to Certify that Ms.. Violet Auma Odero of Kenyatta University, has been licensed to conduct research in Kwale, Mombasa on the topic: EFFECTS OF EIGHT-WEEK WALKING PROGRAMME ON HEALTH- RELATED FITNESS AND PERCEIVED BODY IMAGE OF PREMENOPAUSAL TEACHERS IN MOMBASA COUNTY, KENYA[ for the period ending : 16/February/2023.**

License No: **NACOSTI/P/22/15618**

**361691**

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY &
INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

## APPENDIX G: MOMBASA COUNTY COMMISSIONER'S OFFICE

**OFFICE OF THE PRESIDENT**
***MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT***

COUNTY COMMISSIONER'S OFFICE,
P.O. BOX 90424-80100,
**MOMBASA.**

Tel. 0715 040444/0780 040445

Email: cc.mombasa@interior.go.ke
*When Replying please quote:*

Ref. no. **MCC/ADM.25 VOL.III/ (214)** **21st March, 2022**

Deputy County Commissioner,
**MOMBASA SUB COUNTY**

**RE: RESEARCH AUTHORIZATION –MS. VIOLET AUMA ODERO**
**NACOSTI LICENSE: NACOSTI/P/22/15618**

This is to authorize the above named student from Kenyatta University, to carry out research on ***"Effects of eight-week walking programme on health- related fitness and perceived body image of premenopausal teachers in Mombasa County, Kenya"*** for the period ending **16th February, 2023.**

Kindly accord her the necessary assistance.

COUNTY COMMISSIONER
MOMBASA

**LUKAS K. MWANZA**
**COUNTY COMMISSIONER**
**MOMBASA COUNTY**

**C.C.**

County Director of Education
**MOMBASA**

## APPENDIX H: TEACHERS SERVICE COMMISSION MOMBASA COUNTY

**TEACHERS SERVICE COMMISSION**
**MOMBASA COUNTY**

Email: cdirmombasa@tsc.go.ke
Web: www.tsc.go.ke

UHURU NA KAZI BUILDING
MAMA NGINA DRIVE
P.O BOX 88869 - 80100
MOMBASA, KENYA

REF: TSC/MSA/TMG/VOL.1

Date: 13th May, 2022

To all Primary Headteachers
MVITA SUB COUNTY

RESEARCH AUTHORIZATION
MS VIOLET AUMA ODERO

This is to authorize the above named student from Kenyatta University to carry out research on female teachers on "Effects of eight-week walking programme on health related fitness and perceived body image of premenopausal teachers in Mombasa County, Kenya."

Kindly accord her the necessary assistance.

ALI HUSSEIN ABDI
For: TSC COUNTY DIRECTOR
MOMBASA

**APPENDIX I: FEMALE TEACHER'S CONSENT**

Dear Madam,

My name is Violet Auma Odero. I am a Master student from Kenyatta University. I am conducting a study titled "*Effects of Eight Week Walk Programme on Health – Related Fitness and Perceived Body Image of Premenopausal Teachers in Mvita, Mombasa County*" The information will be used to help premenopausal teachers appreciate the role of walking on Health-Related Fitness and Perceived Body Image; and adopt walking as a method for improving Health-Related-Fitness and Perceived Body Image. The study may contribute to development of fitness training programme for premenopausal teachers, serve as a platform for generating further knowledge on Health-Related-Fitness and body image of premenopausal teachers. The study may also draw the attention of the Ministries of Education, Sports and Health for addressing issues relating to Health Related Fitness among premenopausal teachers.

**Procedures to be followed**

Taking part in this study will require that I ask you some questions plus your participation in Health Related Fitness Tests and Eight Week Walk Programme. I will record the information you provide in questionnaires and tables.

**Voluntarism**

You have the right to decline participating in this study. Please remember taking part in this study is voluntarily. You may ask questions related to the study at any time.

You may opt not to respond to any questions and you may stop the interview at any time. You may also stop taking part in the study at any point of the study without any

consequences to the services you receive here or any other organization now or in the future.

**Discomforts and Risks**

Some of the questions you will be asked concern a sensitive subject and may be embarrassing or make you uncomfortable. If this happens, you may refuse to answer these questions if you so choose. You may also stop the interview at any time.

**Benefits**

If you participate in this study you will help us understand the effect of this Eight Week Walk Programme on the Health-Related fitness of pre-menopausal women and their on Perceived body image.

**Reward**

There no incentivess or any payments for taking part in this study.

**Confidentiality**

Questionnaires, tests and Eight-week Walk exercise will be administered in a humane way. The respondents will be anonymous on the questionnaire. The questionnaires will be kept under lock and key at Kenyatta University. Everything will be kept strictly confidential and used strictly for this study and any publications.

**Contact Information**

If you have questions about the study, call the Violet AumaOdero on 0729538218 or my supervisors - Dr Goodwin on 0724935594 or Dr.Wachira on 0723842543.

However, if you have concerns about your rights as a study participant, you are free to contact Kenyatta University Ethical Review Committee Secretariat on chairman.kuerc@ku.ac.ke,

**Participant's statement**

The above information as provided regarding my participation in this study is clear to me. The study details have been clarified to me and I have been given the opportunity to ask questions and my questions have been answered to my contentment. My participation in this study is entirely out of my own volition. I understand that my records will be kept private and that I can leave the study at any time.

Name of Participant: _____

Signature or Thumbprint _____ Date_____

Name of Representative/Witness (where necessary) Relationship to Subject

Investigators statement

I, the undersigned, have clarified to the volunteer in a language s/he comprehends, the procedures to be charted in the study and the risks and benefits involved

Name of Interviewer _____

Signature _____ Date _____

## APPENDIX J: MAP OF MOMBASA HIGHLIGTING MVITA


Adapted from Tourist Maps Kenya Ltd

## APPENDIX K: .DATA COLLECTION SHEETS FOR HEALTH RELATED COMPONENTS TESTS

### (i) 20 METRE SHUTTLE RUN/BLEEP TEST SHEET

| CODE (EX) | SHUTTLES | CODE (CO) | SHUTTLES |
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**(ii) 1 MINUTE SIT-UP TEST SHEET**

| **C0DE ( EX )** | **NUMBER OF SIT UPS** | **CODE (CO)** | **NUMBER OF SIT UPS** |
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**(iii)SIT AND REACH TEST SHEET**

| **Code (EX)** | **Centimeters (cm)** | **Code (CO)** | **Centimeters (cm)** |
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**(iv) MODIFIED PUSH- UP TEST FOR UPPER BODY STRENGTH-ENDURANCE.**

| **Code (EX)** | **Number of push-ups** | **Code (CO)** | **Number of push-ups** |
|---|---|---|---|
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## (v) BODY MASS INDEX (BMI) TEST SHEET

| Code (EX) | Height($cm^{2)}$ | Weight (KGS) | Code (CO) | Height($cm^{2)}$ | Weight (KGS) |
|---|---|---|---|---|---|
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