

**IMPACT OF AEROBIC DANCE ON SELECTED MOTOR FITNESS
VARIABLES OF MALE STUDENTS IN FONKO HIGH SCHOOL, ANI-
LEMO HADIYA ZONE, SNNPR, ETHIOPIA**

MSc THESIS

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EMEBET AWOL KELBORE

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**Impact of Aerobic Dance on Selected Motor Fitness Variables of Male
Students in Fonko High School, Ani-Lemo Hadiya Zone, SNNPR, Ethiopia**

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Emebet Awol Kelbore

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APPROVAL SHEET

HARAMAYA UNIVERSITY

POSTGRADUATE PROGRAM DIRECTORATE

As a research Advisor, I hereby certify that I have read and evaluated this thesis entitled "Impact of Aerobic Dance on Selected Motor Fitness Variables of Male Students in Fonko High School, Hadiya Zone, SNNPR, Ethiopia", prepared under my guidance by Mrs. Emebet Awol Kelbore. I recommend that it can be submitted as fulfilling the thesis requirements.

Abinet Ayalew (PhD) _____ Major Advisor

Signature _____ Date _____

Shemelis Mekonnen (PhD) _____ Co-Advisor

Signature _____ Date _____

As a member of the board of examiners of the MSc Thesis Open Defense Examination, I certify that I have read and evaluated the thesis prepared by Mrs. Emebet Awol Kelbore and examined the candidate. I recommend that the thesis can be accepted as fulfilling the Thesis requirements for the Degree of Master Science in Sport Medicine.

Chairperson Signature Date

Internal Examiner	Signature	Date
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DEDICATION

This thesis manuscript is dedicated to my family who had committed with strong prayer for the betterment and success of my life.

STATEMENT OF THE AUTHOR

By my signature below, I declare and affirm that this Thesis is my own work. I have followed all ethical and technical principles of scholarship in the preparation, data collection, data analysis and compilation of the Thesis. Any scholarly matter that is included in the Thesis has been recognition through citation.

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Name: Emebet Awol

Signature: _____

Date of submission: September 2021

School/Department: Sport Science

Program: Sport Medicine

Place: Haramaya University

BIOGRAPHICAL SKETCH

The Author was born in South Region Hadiya Zone An-Lemo Woreda Bilagela Kebele in December 1990 from her Father Awol Kelbore and her Mother Erome W/Hana. She completed her primary school education in Fonko primary school and her secondary and preparatory education at Wachemo Preparatory School. After successfully passing the Ethiopian Higher Education Entrance Examination (EHEEE), she joined Hawassa University in 2013 G.C and graduated in 2015 G.C with BSc Degree in Sport Science. After her graduation, she was employed in Anlemo woreda, Hadiyya zone, SNNPR Education office, Hachemo high school teaching for three year and in 2019/21 she joined Haramaya, University Sport Science Academy to pursue her postgraduate studies in Sport Medicine.

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ACRONYMS AND ABBREVIATIONS

ACSM	American Collage of Sport Medicine
ATP	Adenosine Triphosphate
AWFEDO	Anlemo Woreda Finance and Economic Development Office
EG	Experimental Group
IART	Illinois Agility Run Test
MD:	Mean difference
PoT	Post – Test
PT	Pre –Test
SD	Standard Deviation
SNNPR	South Nations Nationality People Representatives
SNNPRS	Southern Nation, Nationalities and Peoples Regional State
TG	Target group
VJT	Vertical Jump Test
30mST	30m Sprint Test

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Effect of Aerobic Dance on Selected Motor Fitness Variables of Male Students in Fonko High School, Hadiya Zone, SNNPR, Ethiopia

ABSTRACT

The purpose of this study was to investigate the Impact of aerobic dance on selected motor fitness variables of grade 11 Male Students in Fonko High School, Hadiya Zone. To conduct the study 40 male students with age of 18-20 from Fonko high school grade 11 were selected after completed the health status questionnaire. The samples were selected by census method and purposive sampling method. Pre-test and post-test were conducted on motor fitness variables such as Illinois agility run test, sit and rich test, 30m sprint and standing vertical jump and the pre-test and post-test data were collected.. The collected data from subjects were analyzed by using R software for Windows version 3.5.2 and the Microsoft Excel for comparison of mean value results were carried out by paired sample t-test. The level of significance was $p < 0.05$. The finding of the study indicated that there is a significant change between pre-test and post-test. The result of the study reveals the mean difference values for each variable. For instance, the Mean Difference of pre-test and post-test for Illinois agility run test, sit and rich test, 30m sprint and standing vertical jump was 3.42sec, -4.19cm, 0.492sec and -11.25cm respectively for study subject. So this indicates that 12week aerobic dance exercise have a positive effect on improving these selected motor fitness variables of grade 11 Male Students in Fonko High School, Hadiya Zone. Therefore, different responsible bodies should take considerable actions for the improvement of the students, the Athletics proficiencies as well as others youth.

Key words: Aerobic dance, Power, 30m sprint, Agility, Flexibility Motor fitness

1. INTRODUCTION

1.1. Background of the Study

Physical education is part and parcel of general educational curriculum. This is because of its valuable contributions to the development of personality and helps to meet the demands of social needs (Beashel & Taylor, 1996). It also strives for excellence that it is become an increasingly dynamic force in general education.

The basic instructional physical education programmed should provide students with the opportunity to receive instruction develop essential skills and have the required experience. Based on this idea Charles A. Buchr wrote that “Physical education is an integral part of total education is a field of endeavor that has its aim the development physically, motor and skill mentally and socially fit citizens though the medium of physical activities that have been selected with a view to realize these out comes.”

Physical education is a wider concept and an all-encompassing and comprehensive term among these athletics is one part of it. Field events originated almost along with the first human kind on earth. To survive, early humans engaged themselves in running, jumping and throwing activities, all of which are natural body movements that enabled early humans to overcome the challenges of nature.

Sports science is a discipline that studies how the healthy human body works during exercise, and how sport and physical activity promote health and performance from cellular to whole body perspectives. Sports scientists and performance consultants are growing in demand and employment numbers, with the ever-increasing focus within the sporting world on achieving the best results possible. Through the study of science and sport, researchers have developed a greater understanding on how the human body reacts to exercise, training, different environments and many other stimuli. (https://en.wikipedia.org/wiki/Sports_science may 15,2019)

Aerobics, meaning "with oxygen," refers to physical exercise to improve cardio respiratory endurance. Aerobic Dance, Aerobic movement is rhythmic and repetitive, engaging the large muscle groups in the arms and legs for at least twenty minutes at each session. The ensuing demand for a continuous supply of oxygen creates the aerobic dance training effect, physiological changes that enhance the ability of the

lungs, heart, and blood vessels to transport oxygen throughout the body (Sridhar *et al.*, 2017).

Aerobic dance is the fitness sport that combines the health and figure benefits of jogging with the fun of dancing. Aerobic dancing is a fun way to get fit. Aerobic dances include ballet, disco, jazz and samba and zumba that tone up your entire body with enjoyable music that not only improves your physical fitness but also improves your mental health by reducing depression and anxiety (Best, 2010). It combines fat burning aerobic movements, muscle building exercises and stretching into routines that are performed according to music. Aerobic dancing is a series of callisthenic exercise movements, accompanied by music, the use of music is a technique of motivation that has been increased in recent years. It is a type of dance that overloads the heart and lungs and causes them to work harder than they do when a person is at rest. Aerobic dancing is challenging for sport science students. They felt as though they were performing, while firming up their body and strengthening their cardiovascular system (Bavli, 2016). The Previous studies which are conducted on agility, flexibility and static balance of hand ball and basketball player summarized that Step aerobic dance practices have positive effects (Bavli, 2016).

1.2. Statement of the Problem

As identified by different researchers, Bavli, (2016), aerobic dance training is the type of activity in which the amount of oxygen taken is equal to the amount of oxygen required. Also the steps of aerobic dance exercise have positive effect in improving motor fitness variables of athletes. There are also some studies that are conducted by Irez *et al.*, (2014) summarized that strong relationship between athletic performances with balance and flexibility.

However, the reality in our country as well as at Fonko High school male students shows the value of aerobic dances has been known theoretically not practically. So that it needed farther" investigation of effective type of aerobic dance for the development of motor fitness. Hence, in this study area there were rare applications of agility, power, flexibility and speed for the development of motor fitness. The merely application of the above aerobic dances catch the attention of researcher to conduct this research for the development of motor fitness improvement of Fonko High school

male students. Therefore, to develop the selected motor fitness variables, it was necessary participating in training especially in aerobic dance training. In addition to this, conducting research was mandatory to see the impact of aerobic dance practically as well as to minimize the gap. As a result, this study was expected to investigate the impact of aerobic dance on selected motor fitness variables of male students of Fonko High school. In line with this, the study was focused on the following basic research hypothesis.

1. H₁. Aerobic dance have a significant effect on agility of male students of Fonko High School.
2. H₁. Aerobic dance have a significant effect on power of male students of Fonko High School.
3. H₁. Aerobic dance have a significant effect on speed of male students of Fonko High School.

1.3. Scope of the Study

This study was applied at Fonko High school, male students Hadiya zone at SNNPR. It was employed on impact of aerobic dance which can affect agility, power and speed performance of the students.

1.4. Significance of the Study

The findings of this study were to investigate the impacts of aerobic dance in improving motor fitness performance of selected male students at Fonko High school. The outcome of the study were reduced the problems that occur on selected male students at Fonko High school in relation to their abilities to motor fitness performance. But that did not mean the outcome of this research was limited to the area under study. Moreover, it helped to know the type of training for aerobic dance given to trainees in order to see the effect of aerobic dances in motor fitness abilities of the students.

1.5. Objective of the Study

1.5.1. General objective

The general objective of this study is to assessing the impact of aerobic dance on selected motor fitness variables of male students, at Fonko High school.

1.5.2. Specific objectives

1. To identify the impact of aerobic dance on agility of male students of Fonko High school.
2. To identify the impact of aerobic dance on power of male students of Fonko High school.
3. To assess the impact of aerobic dance on speed of male students of Fonko High school.

2. REVIEW OF RELATED LITERATURE

2.1. Aerobic exercise

Aerobic exercise is a physical exercise of relatively low intensity that depends primarily on the aerobic energy-generating process (Patel *et al.*, 2017). Aerobic means “with oxygen”, and refers to the use of oxygen to adequately meet energy demands during exercise via aerobic metabolism (Dawei, 2017). Generally light to moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended periods of time and it refers to exercise that requires the consumption of substantially more oxygen than at rest and can be undertaken for a prolonged duration without excessive fatigue. Aerobic exercise is physical exercise of low to high intensity that depends primarily on the aerobic energy-generating process.

ACSM, (1990) defines aerobic exercise as any activity that uses large muscle groups, can be maintained continuously and is rhythmic in nature. As the name implies, muscle groups activated by this type of exercise rely on aerobic metabolism to extract energy in the form of ATP from amino acids, carbohydrates and fatty acids. According to Ronald *et al.*, (2004) there are different types of aerobic exercise include cycling, dancing, hiking, jogging/long distance running, swimming and walking (Hillman *et al.*, 2005). These activities can best be accessed *via* the aerobic capacity, which is defined by the ACSM as the product of the capacity of the cardio respiratory system to supply oxygen and the capacity of the skeletal muscles to utilize oxygen (Siqiang G., 2018). The criterion measure for aerobic capacity is the peak VO_2 , which can be measured either through graded exercise ergometry or treadmill protocols with an oxygen consumption analyzer or *via* mathematical formulas. The value of peak VO_2 can be appreciated by a study performed by which the $\text{VO}_{2\text{max}}$ was calculated along with other dimensions, to conclude that higher physical conditioning status was directly correlated with reduced arterial stiffness (Patel, 2017).

Aerobic means with air or oxygen. A person should be able to carry on a conversational while doing aerobic exercise. It may not be need to be carrying on conversation, but should be able to. It would be able to. It would be noticed that body respond quickly. Breathing will become more rapid and deeper. When this happens, it is known that the amount of oxygen in the blood gets maximized. Small blood vessels

(capillaries) will widen to deliver more oxygen to the muscles and carry away waste products such as carbon dioxide and lactic acid. Regardless of current levels of physical condition, aerobic activity is good (Tanice, 2012). Aerobic exercise is a measure of the combined efficiency of the lung, heart, blood stream and exercising muscle capacity increases the body's efficiency to perform daily activities (Stephens *et al.*, 1990).

And also, Microsoft Encarta Encyclopedia Deluxe (MEED) (2003) classified Exercise into aerobic and anaerobic exercise. Aerobic exercise, which uses oxygen to keep large muscle groups moving continuously at intensity that, can be maintained for at least 20 minutes. As stated in Kathleen, (2006) aerobic exercise uses several major muscle groups throughout the body, resulting in greater demands on the cardiovascular and respiratory systems to supply oxygen to the working muscles. Aerobic exercise includes swimming, running, cycling, walking; jogging, rope jumping and etc. are the form recommended for reducing the risk of heart disease and increasing endurance MEED (2003). Thus, aerobic activity generally has a low to moderate-intensity and long duration.

2.2. Aerobic Dance

Aerobic Dance is one of the most enjoyable forms of aerobic exercises that can be performed with no risk factors and is highly beneficial as well as entertaining is aerobic dancing. These types of aerobic exercises are usually performed at aerobic dance classes or general aerobic classes and some gyms. Aerobic dances include ballet, disco, jazz and samba and zumba that tone up our entire body with an enjoyable music that not only improves your physical fitness but also improves our mental health by reducing depression and anxiety (Best, J. R. 2010).

2.2.1. Types of aerobic dance

i. Zumba:

The first and most interesting kind of Aerobic Dance is Zumba. It is a great fitness program that combines Latin, International, and Salsa music with some amazing and fun filled dance moves. We will find interval training, resistance training, and strength training. There will be slow and fast rhythms alternating throughout so that you can

keep burning calories. Zumba comes with a lot of benefits. For instance: - tones the entire body, it makes us to come back, reduces stress and etc.

ii. Jazzercise:

It works all those bulky sections of our body and helps us achieve our fitness goals. Famous since the 1970s, this workout is effective, heart rate elevating, and has a great combination of cardio and resistance training. There are over 78,000 Jazzercise instructors today, and almost every country conducts weekly classes on Jazzercise. Benefits of Jazzercise are:-reduces the risk of heart disease, gives energy, works for everyone, gives a whole body workout and makes us happy.

iii. Ballroom Dancing

According to Silvester, (1977) although ballroom dancing might not be the most strenuous aerobic dance to do, it is surely full of benefits. It is a moderate activity and is popular throughout the world. The only downside with this dance form is that we cannot do it alone. We need a partner for the purpose. Once we have found someone to dance with, we are surely going to have a great experience. As stated by Moore, (2002) there are some of the benefits of ballroom dancing. These are: - tones our muscles, burns calories, makes us confident and great for bones.

iv. Belly Dancing

Belly Dancing is beautiful and exotic. It emerged from Arabic countries such as Egypt and Turkey several decades ago (Lo iacono, 2019). The name is entirely western and is a solo dance form where torso articulation is a must. There are different forms of belly dancing, and they all have unique styles. It does fall under the category of aerobic dances and is used these days in fitness classes too. According to Arbaoi, (2016), belly dancing also has a host of benefits. For example: helps us experience the spirit, improves our fitness level, it is a great exercise for the stomach etc.

v. Masala Bhangra

India is a diverse country where numerous cultures coexist. The country is known for its culture, religions, languages, ethnicity, and cuisine, and of course dances! One of the most popular dances which fall under the category of aerobics is Masala Bhangra. This dance form is cool, fun, exciting and something that will make us love it. It

originated in Punjab ages ago and is the cultural dance of the state. Benefits that should convince us for Masala Bhangra are: it is fun, helps us to lose weight and tones our body.

2.2.2. The advantages and disadvantages of Aerobic dance

Aerobic dancing is also one such form of fitness activity, which has garnered a lot of limelight in the recent past. The high-intensity and rhythmic aerobic exercise is good for the entire body. There are some advantages and disadvantages of aerobic dancing that stay healthy Niu *et al.*, (2018).

The advantages of Aerobic dance

According to James Meschino, (2000) Aerobic exercises mainly show an effect in components of fitness especially cardiovascular endurance and body composition.

It increases stamina

Aerobics is a fast pace dancing style. It can make us feel tired in a short time, but will make us feel strong and increase our stamina gradually. It fills us up with energy and boosts all our body processes.

Weight loss

If we are looking to add some fun activity in our weight loss plan, then aerobic dancing can be an excellent choice. It is a full-body movement and a person can burn a lot of fat and calories super-fast.

Increases respiration efficiency

Our lungs have to work harder while performing an aerobic dance. The dance is set at high pace and rhythm, so our body demands more oxygen while performing it. To meet the demand of oxygen, our lungs and heart would have to work harder, which will increase our lungs' capacity. This also makes our diaphragm stronger.

Increases artery health

Aerobic dancing helps to keep the arteries clear and blood vessels healthy. Performing this dance regularly will keep our cholesterol level in check.

Reduce stress and anxiety

Another benefit of aerobic dancing is that it reduces stress and uplifts our mood. By enrolling in an aerobics class, we will also get a chance to meet new people.

✎ Strengthens and tone muscles

This dance form can strengthen our body and tone our muscles.

The disadvantages Aerobic dance

✎ Muscle pain

If we are new to aerobic dancing, then try not to overdo it. Rigorous and regular aerobics can lead to pain in the chest, shoulders, calf muscles.

✎ Joint pain

If we are suffering from bone-related health issues such as arthritis, osteoporosis, low bone density, then consult our doctor before trying aerobic dancing.

2.2.3. Effect of dance/ motor therapy on the cognitive development of adolescent

Physical attractiveness becomes very important in adolescence, which can lead to a negative body image (Meekums, 2002). The peer pressure and excessive emphasis on body appearance in the media can contribute to the body dissatisfaction among adolescents. The above scholars tried to determine the therapeutic value of dance/movement therapy and its impact on body image in female adolescents. The participants described Dance/ movement therapy as a positive experience and an opportunity to express their feelings through movement, while the self-exploration helped them improve their self-knowledge (Levy, 1988). Dance/movement therapy enhanced their acceptance of their physical characteristics, it affected their definition of beauty, made them discover new positive feelings about themselves and about others, and increased their confidence. Thus, Likesas & Zachopoulou, (2006), said that dance and movement can improve self-consciousness, body image and low self-concepts of the participants, which make it a valuable tool for wellbeing and self-actualization.

2.3. Motor Fitness

Motor fitness is a term that describes that the individual's ability to perform effectively during sports or other physical activity. An athlete's motor fitness is a combination of five different components, each of which is essential for high levels of performance (Malina 1994).

There are many different manifestations of fitness. Some examples include strength, stamina, speed, and flexibility. Certain types of fitness, such as an athlete's cardiac fitness level, are more important than others. An athlete needs to be aware of the various types of fitness to develop an effective training program that focuses on weak or important areas. For instance flow yoga can help people develop cardiovascular stamina and boost flexibility and balance.

Motor fitness, or motor physical fitness, refers to how an athlete can perform at his or her sport, and involves a mixture of agility, coordination, balance, power, and reaction time (Da Silva *et al.*, 2008). Improving this form of fitness is an indirect result of training in any of these attributes. All five components of fitness are essential for competing at high levels, which is why the concept is seen as an essential part of any athlete's training regime.

2.4. Physical Fitness

Physical fitness is a state of health and well-being and, more specifically, the ability to perform aspects of sports, occupations and daily activities. According to Tremblay, (2010), de Groot & Fagerström, (2011) and Malina (2010) physical fitness is generally achieved through proper nutrition, moderate-vigorous physical exercise and sufficient rest. Generally, as indicated in Caspersen, (1985) Physical fitness can be defined as the capacity to do physical work within granted levels of performance quantitatively and qualitatively.

2.4.1. Components of Physical Fitness

As stated in President's council on physical fitness and sports definitions for health, fitness, and physical activity (2012) fitness is defined as a condition in which an individual has enough energy to avoid fatigues and enjoy life. Physical fitness is divided into four health and skill related components. Skill related fitness components

are fitness types which enhance ones' performance in athletic or sport setting. Health related fitness is the ability to become and stay physically health.

The development of a high level of functional capacity for necessary and discretionary tasks of life and the maintenance or enhancement of physiological functions in biological systems that are not involved in performance but is influenced by habitual activity (Polwman, 2011). Maintaining an appropriate level of health related fitness allows a person to meet emerge, reduce the risk of disease and injury, work efficiency, participate and enjoy physical activity, look ones physical best.

Kruk, (2007) conduct the study in Poland that showed that engaging in moderate physical activity is very important for the primary prevention of chronic diseases, decreasing all cause of mortality and that exercise is one of the determinants for physical and psychological wellbeing. And six performance related physical fitness speed, agility, power, coordination, reaction time, balance.

2.4.1.1. Health related physical fitness

According to Toriola & Monyeki, (2012) Health-related physical fitness is defined as fitness related to some aspect of health. This type of physical fitness is primarily influenced by an individual's exercise habits; thus, it is a dynamic state and may change. Health related fitness focus on optimum health benefits and prevents the onset of disease and problem associated with in activity (Toriola & Monyeki, 2012). Physical characteristics that constitute health-related physical fitness include strength and endurance of skeletal muscles, joint flexibility, body composition, and cardiorespiratory endurance. All these attributes change in response to appropriate physical conditioning programs, and all are related to health (Sunni, 1996).

2.4.1.1.1. Cardiovascular endurance

Cardiovascular endurance is the ability to be active for a prolonged period of time at a moderate to high intensity level and is aerobic in nature (Ciccomascolo and Sullivan, 2013). It is also referred to as cardio respiratory endurance or aerobic capacity. This component is generally evaluated using peak VO_2 or VO_2 max. This measurement

quantifies the body's ability to circulate oxygen and utilize oxygen during moderate to vigorous exercise (Leger, Lambert, 1982).

Aerobic fitness or cardio respiratory fitness is considered to be a key component of health related physical fitness. It is a measure of heart ability to pump oxygen- rich blood to the working muscle during exercise. It is also measure of muscles ability to take up and use the delivery oxygen to produce the energy needed to continue exercise. In practical terms, cardio respiratory endurance types of exercise (jogging, distance running, cycling, swimming, rope skipping and others. Cardio respiratory fitness lower the risk of heart disease and increase longevity, reduce the risk of type II diabetes, lower blood pressure, and increase bone density in weight –bearing bone (Stephens *et al.*, 1990).

2.4.1.1.2. Muscular Strength

Muscular strength refers to the maximum amount of force a muscle can exert against an opposing force. Fitness testing usually consists of a one- time maximum lift using weight, bench press, leg press, etc. muscular strength and performed have direct relationship. According to the research result on skeletal muscle mass and low muscle strength in relation to extremity performance of older men and women suggest that low muscle strength, but now muscle mass, is associated with poor physical function (Paul *et al.*, 2000)

The development of muscular strength through physical training is significance to overall muscle fitness and function in performance. Muscle strength can be defined as the maximal exertion of force against resistance. The components are developed during conditioning process in an international manner relative to the number of repetition and load lifted. The generality and specificity of muscle force production is influenced by the relationship of muscle groups and muscle function relative to strength training, fiber types used, the speed of muscle contraction, the amount of force produced, and designated pattern of movement utilized (Battinelli, 2007)

2.4.1.1.3. Body composition

Body composition is the health-related fitness component that is used to describe the proportion of fat mass to fat-free mass in the body. Bone, muscle, connective tissue,

blood, and organs make up the bulk of the fat-free mass (Health and wellness for life, 2010). There are several ways to measure body composition, but the two main methods are BMI and percent body fat.

Body composition is the body's relative amount of fat-free mass. Usually it's expressed as a ratio of lean mass to fatty mass. Lean mass includes muscle, bone, skin, internal organs and body water. Fatty mass is mostly composed of body fat (subcutaneous fat) as well as internal essential fat surrounding organs. According to Bangsbo, *et al.*, (2006) body composition will be typically being displayed as a percentage of fat (body fat percentage or % fat). Those with optimal body composition are typically healthier, move easily and efficiently, and general, feel better than those with less- than-ideal body composition. Achieving a more optimal body composition goes a long way toward improving body composition goes a long way to improving quality of life and overall wellness (wellborn *et al.*, 2003)

2.4.1.2. Skill-Related Physical Fitness

Motor-performance fitness is defined as the ability of the neuromuscular system to perform specific tasks (Peltzer, 2010). Test items used to assess motor-performance fitness include chin-ups, sit-ups, the 50-yard dash, the standing long jump, and the shuttle run (a timed run in which the participant dashes back and forth between two points). The primary physical characteristics measured by these tests are the strength and endurance of the skeletal muscles and the speed or power of the legs. These traits are important for success in many types of athletics. Muscular strength and endurance are also related to some aspects of health, as stated above.

According to Hoeger WWK, Hoeger SA., (2014) the motor potential to carry out physical activity with regard to speed, agility, power, balance, coordination and reaction time is described by skill related physical fitness. There is disagreement among experts about the relative importance of health-related and motor-performance physical fitness. While both types of fitness are obviously desirable, their relative values should be determined by an individual's personal fitness objectives. If success in athletic events is of primary importance, motor-performance fitness should be emphasized. If concern about health is paramount, health-related fitness should be the

focus. Different types of fitness may be important not only to different individuals but also to the same individual at different times.

2.4.1.2.1. Agility

According to Bruce, (2005) Agility is the ability to move and change the direction and position of the body quickly and effectively while maintaining a constant, rapid motion. It requires quick reflexes, coordination, balance, speed, and correct response to the changing situation (Sheppard & Young, 2006). For example changing directions to hit a tennis ball is one activity of agility.

2.4.1.2.2. Balance

Balance is the ability to control or stabilize the body when a person is standing still or moving (Kulkarni *et al.*, 2018). For example, in-line skating. Also as stated in Pollock AS., (2000) balance is the ability to stay upright or stay in control of body movement. There are two types of balance. These are static and dynamic types of balances.

2.4.1.2.3. Power

Power is the ability to move the body parts swiftly while applying the maximum force of the muscles (Felsenthal *et al*, 1998). Power is a combination of both speed and muscular strength. For example, fullbacks in football muscling their way through other players and speeding to advance the ball and volleyball players getting up to the net and lifting their bodies high into the air (Aldershot *et al*, 1996).

2.4.1.2.4. Speed

Speed is the ability to move your body or parts of your body swiftly (Gabbett *et al.*, 2008b). Many sports rely on speed to gain advantage over your opponents. For example, a basketball player is making a fast break to perform a layup, a tennis player moving forward to get to a drop shot, a football player out running the defense to receive a pass (Gabbett *et al.*, 2008a).

2.4.1.2.5. Coordination

Coordination is the ability to use the senses together with body parts during movement, for example, dribbling a basketball. Using hands and eyes together is called hand-eye coordination. Therefore, coordination is the ability to execute smooth, accurate, controlled motor responses (optimal interaction of muscle function). Coordination is the ability to select the right muscle at the right time with proper intensity to achieve proper action. So, coordinated movement is characterized by appropriate speed, distance, direction, timing and muscular tension. It is the process that results in activation of motor units of multiple muscles with simultaneous inhibition of all other muscles in order to carry out a desired activity (Zetou *et al.*, 2012).

2.4.1.2.6. Reaction Time

Reaction Time is the ability to reach or respond quickly to what you hear, see, or feel (Schouten and Bekker, 1967). For example an athlete quickly coming off the blocks early in a swimming or track relay, or stealing a base in baseball. Also reaction time is the time taken for a person to respond to a stimulus. For example if we touch something very cold, there is a slight delay between us touching it and moving our hand away, because it takes time for the information to travel from our hand, to our brain where it is processed and then a response started (Welford, and Brebner, 1980).

3. MATERIALS AND METHODS

3.1. Description of the Study Area

The study was conducted at Fonko High School in Ani-Lemo Woreda of the Hadiya Zone. The geographical location of the study area is 7° 30' to 7° 45' North latitude and 37° 54' 30'' to 38° 3' 30'' East longitude (AWFEDO, 2014). As far as its boundaries in relation to its neighboring zones and/or woredas, it bounds with Silte Zone in the north and north-west, Shashogo Woreda in the east, Lemo Woreda in the south-east and south west (ibid). Ani-Lemo Woreda is 18 km far from Hosanna, town of Hadiya Zone in Southern Nation, Nationalities and Peoples Regional State (SNNPRS) and it is about 216 km far from Addis Ababa (AWFEDO, 2014).

3.2. Research Design

This study was employ quasi experimental design in a single experimental group (EG) and standard norms. There is no control group in this study. A single experimental group was used for providing pre-test (PT) and post-test (PoT) in order to identify the impact of aerobic dance on selected motor fitness variables. The training schedule was given three days per week i.e., Monday, Wednesday, and Friday. A total of 36 days were given in a three-month time (May, June and July 2021) for training sessions in which 60 minutes were allotted for each session. Pre- test (PT) and post-tests (PoT) were the preferred methods to compare target groups and measure the degree of changes occurring as a result of exercise or interventions and the result was recorded by the researcher and the assistance data recorder at the same time of day for each subject.

3.3. Sources of Data

The primary data was collected from the subjects of study subject through pre-test and post tests on impact of aerobic dance on selected motor fitness variables and the result was compared with standard norms.

3.4. Experimental Materials

For experimental activities and field tests the study was used Fonko High School football ground other than conducting the training program of the study subjects. The materials were used throughout the study were music, stopwatch, measuring tape, whistle, mats, marking cones, rope, pen, and score recording sheet.

3.5. Study Population

The study populations were 40 selected male students between the ages of 18 and 20 years from the total of 300 of grade 11 at Fonko Town of Hadiya Zone in SNNPR. Fonko High School includes grade 11 and 12 students.

3.6. Sample Size and Sampling Technique

This study was used purposive sampling technique (Babbie, 2007). The selection of population (target group) depends on their grade level, age, health status and on their interest to participate in aerobic dance training for the improvement of motor fitness performance for maximizing technical or tactical skills. The sample size of this study was contained 40 selected male students between the ages of 18 and 20 year from Fonko High School of Fonko town, Hadiya zone, SNNPR through purposive selection.

3.7. Inclusion and Exclusion Criteria

Selected grade 11 male students of Fonko High school were included as the study population after completing their health history and fitness status questionnaire. That was helps the researcher to obtain information on the health and fitness status of the subjects participating for the research study. Target groups according to their health history questionnaire results and who had a medical condition restricted by the physician and recent physical injury and the ages less than 18 and over 21 was not including as target groups of this study. Subjects with any known cardiovascular disease, smokers, taking regular medication or psychiatric disorder and also any recent physical injury was excluded from experimental trial.

3.8. Method and Procedure of Data Collection

3.8.1. Method of data collection

Quantitative data was collected pre-test and post- tests through the appropriate motor fitness test measures like, Illinois agility run test (IART) to measure agility, sit and rich test (SRT) to measure flexibility, vertical jump test to measure power and 30m sprint test to measure speed. Pre-test data was collected before they undergo aerobic dance and after giving aerobic dance training for 12 successive weeks' post-test data was collected. The training was three days per week (Monday, Wednesday, and Friday) and the duration for each day was 60 minutes. The data were documented by

the researcher with the help of assistant data recorder. The appropriate aerobic dance training workouts were given by the investigator.

3.8.2. Procedure of data collection

First of all the ethical clearance was obtained from concerning body and met the participants of the study, during the familiarization session; participants were informed all procedures and familiarized with all performance measures to reduce the possibility of a learning effect. Then, before the participants were going to aerobic dance training pre-test of selected motor fitness variables were given to them and the experimental group was participated for eight weeks aerobic dance training program. This study was used for pre-test and post- tests design.

3.9. Fitness Test Procedure or Protocol

3.9.1. Agility test

3.9.1.1. Illinois Agility Run Test (IART)

The objective of the Illinois Agility Run Test (IART), Getchell, (1979) is to monitor the development of the athlete's agility. This test evaluates the speed of movement, zigzag crossing, speed and agility (Raya, 2013).

To do the test we need: a flat surface, 8 cones and a stopwatch. The test started with the student lying face down on the floor at the “Start” cone. At the command “GO” the student started the test and the trainer turn on the stopwatch. The student rises from the ground and started running following the red line route shown in the diagram towards the finish. The stopwatch is stopped when the student passes the finish cone.

3.9.2. Speed fitness tests

3.9.2.1. 30m Sprint

These fitness tests measure pure speed. The aim of this test is to determine acceleration and speed. The test procedure to the subject was explained during Pre-test season. Then the screening of health risks was performed to obtain informed consent. The basic information such as age, height, body weight, gender, test conditions was record on the prepare forms. Measure and mark out the test area. An appropriate warm up was performed.

The test involves running a single maximum sprint over 30 meters, with the time recorded. A thorough warm up should be given, including some practice on starts and accelerations. Start from a stationary position, with one foot in front of the other. The front foot must be on or behind the starting line. This starting position should be held for two seconds prior to starting, and rocking movements are not allowed. The hint was provided by tester for maximizing speed (such as keeping low, driving hard with the arms and legs) and encourage them to continue running hard through the finish line.

Three trials are allowed, and the best time was recorded to the nearest 2 decimal places. The timing starts from the first movement (if using a stopwatch) or when the timing system is triggered, and finishes when the chest crosses the finish line and/or the finishing timing gate is triggered.

3.9.3. Power tests

3.9.3.1. Vertical jump test

This test was measures the power in athlete leg muscles. To apply the test the following procedures were followed. Make the athlete to stand sideways on to a wall with the arms rose above the athlete, and mark the highest point that he can reach. Still guide the athlete to stand sideways, jump as high as the athlete can, marking the point he can reach. The score the difference between the standing and jumping score was recorded.

3.10. Methods of Data Analysis

The data was collected through inducing effective aerobic dance on selected motor fitness variables and were analyzed by using computerized R software for Windows version 3.5.2 and the Microsoft Excel. In this study R software for Windows version 3.5.2 was used to summarize motor fitness status and their changes observed during training by measures of dispersion like standard deviation. Also paired T-test was used by using Microsoft Excel to summarize the change. Level of significance is < 0.05%.

3.11. Data Quality Control

To ensure quality of the data of selected motor fitness variables such as, agility flexibility power and speed, the selected standardized fitness test was used with appropriate tools. To reduce the mistakes which can be occurred during data collection and to collect the appropriate data the assistant fitness test recorder was trained among physical education teachers at the school under study.

3.12. Protocol and Ethical Consideration

The study was designed in the way that ethical issues have properly addressed. Privacy of the subjects and confidentiality was strictly observed and maintained throughout the study. The study can make guarantees and confidentiality of the information that was given about the study, and risk of harm due to participation. The study was conducted under school rules and code of conduct and policies concerning to research ethics. The written consent/ agreement form was given and informed to the concerned bodies.

4. RESULTS AND DISCUSSIONS

4.1. Overview

In this chapter, the results of the study were presented and discussed in detail to address the objectives of the research. The research was aimed to examine the Effect of 12week Aerobic dance exercise on Selected Motor Fitness Variables in Case of male students of Fonko High school. To achieve the objectives of these study 40 male students from Fonko High school grade 11 were selected as study subjects and their age was 18-20 years. The participants were engaged in a designed aerobic dance exercise program for 12 weeks and 3 days per week for 60 minutes. In this study, Motor fitness tests were taken two times at before the start of the experiment (Pre) and three times at the end of 12 week (Post exercise test). Under this, four motor fitness variables such as agility, power and speed had been evaluated by Illinois Agility Run Test (IART), 30m Sprint and Vertical jump test (VJT) respectively. The collected data were analyzed by paired sample t-test using R software for Windows version 3.5.2 and the Microsoft Excel. The results of those variables are discussed below in the tables and figures.

4.2. Demographic Characteristics of the Study Subjects

A total of 40 male students of Fonko High school were selected as study subjects. From the total number of the study subjects; no one was lost. 100% of the participants were followed up the training program properly from beginning till end.

Table 1: Demographic Characteristics of the Study Subjects

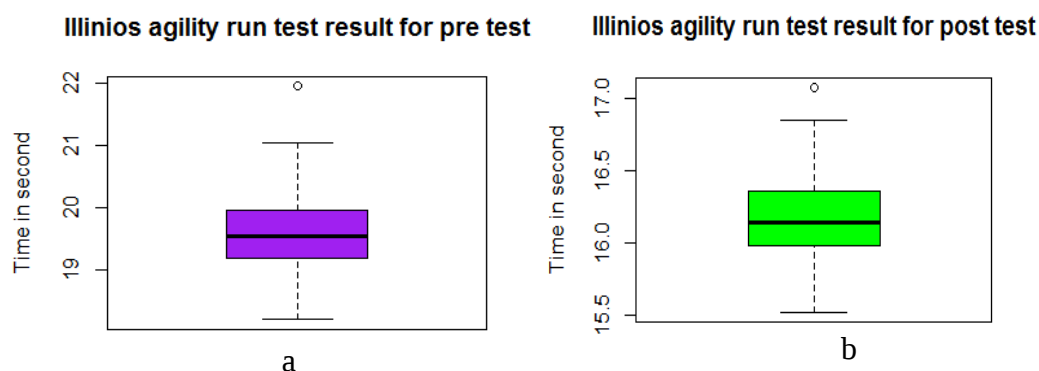
<i>No. of participants</i>	<i>Ave. Age (Years)</i>	<i>Ave. Height (m)</i>	<i>Ave. Weight (Kg)</i>
40	18.625	1.676	59.05

4.3. Illinois Agility Test Results and Discussions

The male students of Fonko High school show and score different results in Illinois agility run test before they took aerobic dances (pre-test) and after aerobic dances (post-test). As indicated in Figure 1a, 19.59 second is the pre-test average score of

Illinois agility run test and 50% of the male students complete the distance between 19.21 and 19.95 second (Figure 1a). The result of the study showed that the male students complete the distance between the times from 18.22 to 21.00 seconds but there were few male students that score about 21.94 seconds to complete the distances of Illinois agility run (Figure 1a). However, the score of Illinois agility run test after aerobic dances were taken (post-test) is different from the score of pre-test. The average score of post-test of Illinois agility run test was 16.17 second and 50% of the male students complete the distance after aerobic dance (post-test) was between 15.98 and 16.35 second (Figure 1b). Almost all students complete the distance of post-test illinois agility run between the times from 15.52 to 17.00 seconds, but there were few male students that score about 17.08 seconds to complete the distances of Illinois agility run after they taken aerobic dances (Figure 1b).

Figure 1. Illness agility run test result (a) Illness agility run test result for pre-test (b) Illness agility run test result for post-test



The table 2 below showed that there was significant difference observed between pretest and post test results on the study subjects. Thus, as its indicated on the table the average value of agility was significantly increase on male students after twelve week aerobic exercise training, The mean value of agility for study subjects was 19.59 ± 0.647467 before they underwent to the aerobic dance exercise and 16.17 ± 0.3270124 after 12 week aerobic dance exercise training. So from the table below

we can say that there is significance change in agility of post-test result on male students due to 12week aerobic exercise. Hence, based on this result 12 week aerobic dance exercise have a positive effect on agility of male students of Fonko High school that means the null hypothesis was rejected while the alternative hypothesis accepted.

Table 2: Mean and standard deviation values of Illinois agility run test results of the study subjects (in second).

<i>Variable</i>	<i>No.</i>	<i>PT</i>	<i>PoT</i>
IAT	40	19.59 ± 0.647467	16.17 ± 0.3270124

Values (mean ± SD) SD = standard deviation, IAT: Illinois agility test, PT, = pre training test, PoT= post training test

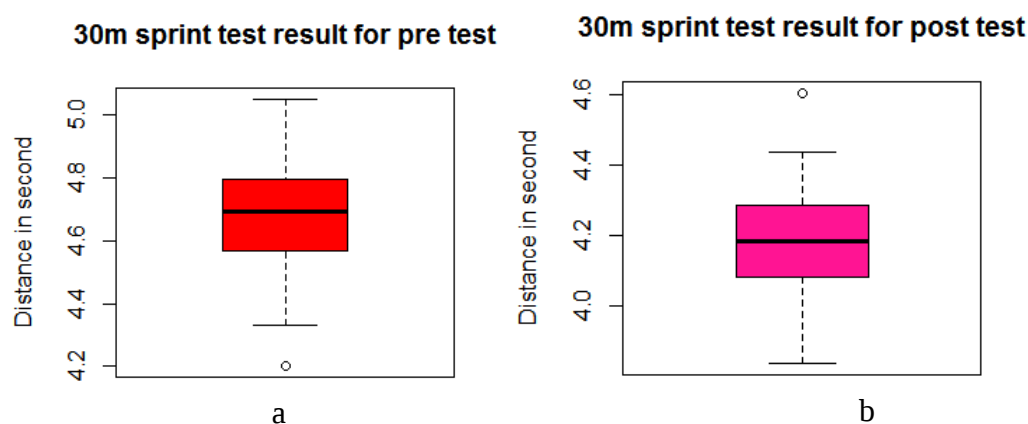
This result is in line with a research which is conducted by the title Impact of aerobic dance training on motor fitness parameters and dribbling ability of football players conclude that twelve weeks aerobic dance significantly improved the agility and flexibility of the athletes (Sridhar, R., & Giridharaprasath, R.G, 2017). In addition the researchers suggest that aerobic exercise is the most appropriate means to bring the desirable change on the selected variables. Hallage *et al.* (2010) found that strength of the upper and lower body; dynamic balance and agility, and cardio respiratory fitness were significantly positively affected after step aerobic exercises in adults. Similar findings were reported by Marion *et al.* (2006) who found that a bench step exercise program effectively improved aerobic capacity, lower extremity power and static balance ability in the elderly.

4.4. 30m Sprint Results and Discussions

By measuring the running of a single maximum sprint over 30 meters, with the time recorded, the male students of Fonko High school show and score different results in speed before they took aerobic dances (pre-test) and after aerobic dances (post-test). As indicated in Figure 3a, 4.672 second is the pre-test average score of speed when it was measured by 30m sprint test and 50% of the male student's complete the 30m

sprint distance in 4.574 second to 4.792 second (Figure 3a). The result of the study in figure 3a showed that all the male students run 30m sprint on the time between the times from 4.3 second to 5.052 second but there were few male students that cover the distance in 4.202 seconds (Figure 3a). However, after taking the aerobic dances (post-test) the average time of the speed was 4.180 second and 50% of the male students of Fonko High school stretch about 4.081 second to 4.282 second (Figure 3b). All students in study area show the stretch result of post-test 3.835 second to 4.5 second by using 30m sprint test (Figure 3b) but there were few male students that cover the distance in 4.603 seconds (Figure 3b). This indicates that there is significant difference on speed of between pre and post-tests

Figure 3. 30m Sprint test results (a) 30m Sprint test results for pre-test (b) 30m Sprint test results for post-test



As

table 4 showed that there was significant difference observed between pre-test and post test results in flexibility of male students of Fonko High school. Thus, the table below reveals that the average time of speed to cover the distance was decrease after twelve week aerobic exercise training, The mean time of speed in which the distance measured by using 30m Sprint test, the male students at Fonko High school before they underwent to the aerobic dance exercise was 4.672 ± 0.1765505 but after 12 week aerobic dance exercise training was 4.180 ± 0.1577834 which was taken as pre and post test result respectively and the mean value difference were considered statically significant at $p < 0.05$.

Table 4: Mean and standard deviation values of 30m Sprint test results of the study subjects (in second).

<i>Variable</i>	<i>No.</i>	<i>PT</i>	<i>PoT</i>
30mST	40	4.672 ± 0.1765505	4.180 ± 0.1577834

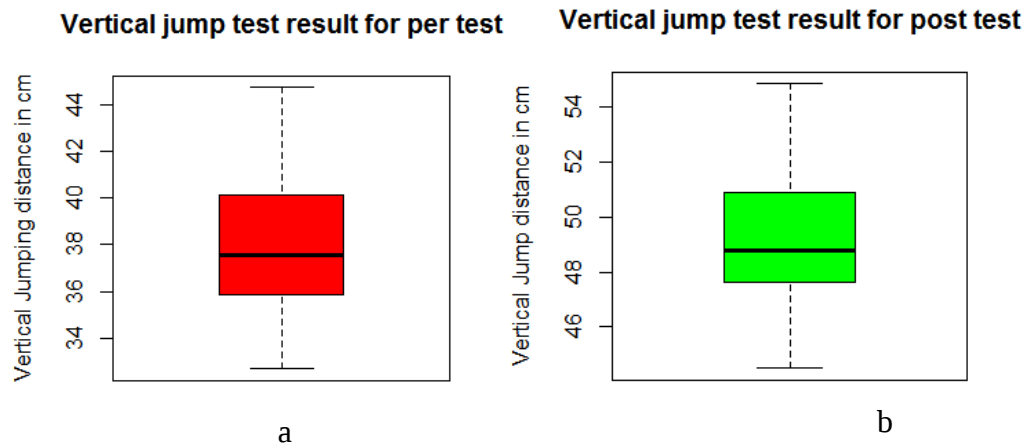
Values (mean ± SD) SD = standard deviation, 30mST: 30m Sprint Test, PT = pre training test, PoT= post training test

According to Davis *et al.*, (2000) normative data of speed test, the mean time value that is recorded on post-test (4.180 second) was above average. So the result in table 4 showed that there is significance change in speed of male students of Fonko High school in post-test due to 12week aerobic dance exercise. Hence, based on this result 12 week aerobic dance exercise have a positive effect on speed of male students of Fonko High school, that means the null hypothesis was rejected while the alternative hypothesis accepted.

4.5. Standing Vertical Jump Test Results and Discussions

Vertical Jump is the act of jumping upward in to the air. It is an exercise for building endurance and strength. The male students of Fonko High school jump different vertical distances before and after aerobic dances they took. As indicated in Figure 4a, 37.9cm was the pre-test average standing vertical jumping score of the male students and 50% of the male students jump a vertical distance from 35.98cm to 40.04cm (Figure 4a). The result of the study in figure 4a showed that all the male students jump the vertical distance from 32.67cm to 44.75cm. However, after taking the aerobic dances (post-test) the average vertical jumping distance was 49.15cm and 50% of the male students jump about 47.65cm to 50.85cm (Figure 4b). All the study subjects show the post-test result from 44.50cm to 54.83cm by using standing vertical jump test (Figure 4b). This indicates that there is significant difference on power of the students before they took aerobic dance exercise (pre-test) and after they took aerobic dance exercise (post-tests).

Figure 4. Standing Vertical Jump test results(a) Standing Vertical Jump test results for pre-test (b) Standing Vertical Jump test results for post-test



As the table 5 below showed there was significant difference on standing vertical jump test of pre to post test result on the experimental group. As indicated on the table, the mean value of stork balance stand test for the experimental group was increase from pre-test mean value (37.90 ± 3.074931) to post-test mean value (49.15 ± 2.504181) due to the 12 week aerobic dance exercise Thus, the finding reveals that 12week aerobic dance exercise was significantly improve the power of the students at difference between mean values were considered statically significant at $p < 0.05$. So, based on this result 12 week aerobic dance exercise have a positive effect on improvement of power of Fonko High school male students that means the null hypothesis was rejected while the alternative hypothesis accepted.

Table 5: Mean and standard deviation values of Vertical Jump Test results of the study subjects (in centimeter)

Variable	No.	PT	PoT
VJT	40	37.90 ± 3.074931	49.15 ± 2.504181

Values (mean $\pm$ SD) SD = standard deviation, VJT: Vertical Jump Test, PT = pre training test, PoT= post training test

4.6. The mean difference values and significance level of each variables

The table 6 below indicated that both variables (Agility, Speed and Power) showed positive improvement on the study subject because of 12 week aerobic dance exercise, as indicated in the table there was significant change between pre-test and post-test on male students of Fonko high school for all variables. So this indicates that 12week aerobic dance exercise was significant in order to improve these selected motor fitness variables of the study subject.

Table 6: the mean difference values and significance levels of pre and post test result of subject in all variables i.e., Agility, Speed and Power.

<i>Variables</i>	<i>Group</i>	<i>Parameter (A)</i>	<i>Parameter (B)</i>	<i>MD (A-B)</i>	<i>SIG.</i>
Agility	40	(PT) 19.59	(PoT) 16.17	3.42	$4.55114 * 10^{-34}$
Speed	40	(PT) 4.672	(PoT) 4.18	0.492	$7.90037 * 10^{-35}$
Power	40	(PT) 37.9	(PoT) 49.15	-11.25	$1.62968 * 10^{-35}$

MD: Mean difference, SIG: Significance level, PoT: Post Test, PT: Pre Test

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This section includes summary, conclusions and recommendations

5.1. Summary

The study assessed and tried to investigate the Impact of Aerobic Dance on Selected Motor Fitness Variables of Male Students in Fonko High School, Hadiya Zone, SNNPR, and Ethiopia. To achieve the purpose of this study, 40 Male Students in Fonko High School with age of 18-20 years were selected by purposive sampling technique and they underwent twelve weeks aerobic dance exercise program, three days per week and the duration was 1 hour. Thus, forty (40) Male Students in Fonko High School were filled the health status questionnaire, and it was checked that all are free from health problem. So finally, Forty (40) subjects were participated on this study. In this study, the Impact of Aerobic Dance exercise on agility, flexibility, speed and power, have been seen and these were the dependent variables of the study. Motor fitness tests used to measure the dependent variables were; Illinois Agility Run Test (IART), Sit & Reach tests (SRT), 30m Sprint test and Standing Vertical Jump test (SVJT) respectively within two intervals (pre-test and post-test) for each.

The data were collected by using the appropriate motor fitness tests before the starting of 12 week aerobic dance exercise and after 12 week aerobic dance exercise training. The data were analyzed by R software for Windows version 3.5.2 and Microsoft Excel was used to do paired T-test was used for comparisons of means and with significance level of 0.05%. Final result of the study summarized and demonstrated that the result of post-test to pre-test showed significant improvement in the study subject in parameters (agility, flexibility, Speed and power) as compared with the standards. Generally the improvement was seen in the students as all variables were tested. As a result we can conclude that 12 week aerobic dance exercises have a positive effect on Fonko High School male students motor fitness performance.

5.2. Conclusions

Based on the major findings of the study to examine aerobic dances in improving motor fitness performance of Fonko High School male students the following points were stated as conclusions.

1. By using Illinois agility run test, the result of the study showed that the students cover the distance with in short time after 12 weeks aerobic dance exercises as compared with pre-test score. This indicates that there was a significant change on the score students agility exercise after 12 week aerobic dance exercise as compared with pre-test.
2. It was observed that an intimate improvements during post-test on flexibility of the participants after 12 weeks aerobic dance exercises when we compared the flexibility of pre-test values of the subjects.
3. From the results of the research findings it was shown that the speed of the students was increased after 12 weeks exercises. The students complete 30 m sprint distance with in short time as compared the time they complete the distance.
4. When we compared the result of standing vertical jump test during pre-test and post-test of the participants after 12 weeks aerobic dance exercise program, there was significant increments on the performance of the students' power. The result showed that aerobic dance had significant effect in power performance of the participants.

Therefore, it was observed that an intimate difference on motor fitness performances between pre-test and post-tests of the study subject. Thus, the finding of this study showed that, there were significant improvements on motor fitness performance of the participants after 12 weeks aerobic dances.

5.3. Recommendations

Considering the major findings and conclusions of the study, the following points were made as recommendations to investigate more about the impact of selected aerobic dance exercise in improving motor performance of male students at Fonko High School.

- ❖ To empower the motor fitness performance of the individuals, the responsible bodies provide financial, material, motivational and physical fitness support for schools and other academic centers.
- ❖ Aerobic dance exercises of three months were effective in increasing performances of agility, speed and power in Fonko High School male students. Therefore, aerobic dance training methods are recommended to male students for improving their agility, speed and power.
- ❖ Efforts might be taken to popularize the benefits of aerobic dance exercises to Fonko High School male students, which, in turn would make the nation to produce skillful and physically fit generation.
- ❖ It is highly recommended that sport and exercise science professionals could guide and train on selected aerobic dance exercises to achieve the advancement of general physical fitness qualities.
- ❖ Further researches would be conducted on effect of aerobic dance exercises for further understanding of aerobic dance exercises.

6. REFERENCE

- ACSM, (1990). America College of sport medicine; guideline for exercise testing and prescription. (5th ed);Baltimore, William and Wilkins 127p.
- Aldershot Elgar. Dowding, Keith, (1996). Power. Buckingham: Open University Press/Minnesota
- Arbaoui Larbi, (2016). Egyptian scholar; belly dance permissible in Islam. Morocco world news.
- Babbie.2007. Research Methodology in sociology, India Edition. pp165.
- Bavlı, Ö., (2016). Investigation in to the Effects of Eight Weeks of Step Aerobic Dance Practice on Static Balance, Flexibility and Selected Basketball Skills in Young Basketball Players. *Journal of Education and Training Studies*,4(5), pp.233-238.
- Bavli, Ö., 2016. Investigation in to the Effects of Eight Weeks of Step Aerobic Dance Practice on Static Balance, Flexibility and Selected Basketball Skills in Young Basketball Players. *Journal of Education and Training Studies*,4(5), pp.233-238.
- Beashel, P. and Taylor, J. (1996). Advanced studies in Physical Education and Sport.UK: Thomas Nelson and sons. Ltd
- Best, J. R. (2010). Effects of physical activity on children's executive function: Contributions of experimental research on aerobic exercise. *Developmental Review*, 30(4), 331-351.
- Bekker, (1967).Reaction Time is the ability to reach or respond quickly to what you hear, see, or feel Schouten and
- Brebner,(1980).where it is processed and then a response started Welford,
- Bruce, L. 2005. The development of a test of reactive agility for netball: a new methodology. *Journal of Science and Medicine in Sport* 8(1):52-60
- Cady, L.D., Bischoff, D.P., O'Connell, E.R., Thomas, P.C. and Allan, J.H., 1979.Strength and fitness and subsequent back injuries in firefighters. *Journal of occupational medicine: official publication of the Industrial Medical Association*, 21(4), pp.269-272.
- Caspersen. (1985). Basic Concepts of Physical Fitness Health Fitness Instructor's Handbook (4th Ed.). (Champaign, Ed.) Human Kinetics.

- Ciccomascolo, L.E. and Sullivan, E.C., 2011. The dimensions of physical education. Jones & Bartlett Publishers.
- Charles A. Buchr wrote that Based on this idea “Physical education is an integral part of total education is a field of endeavor that has its aim the development physically, motor and skill mentally and socially fit
- Clark, B.A., 1989. Tests for fitness in older adults: AAHPERD Fitness Task Force. *Journal of Physical Education, Recreation & Dance*, 60(3), pp.66-71.
- Da Silva, C. D., Bloomfield, J., & Marins, J. C. B. (2008). A review of stature, body mass and maximal oxygen uptake profiles of U17, U20 and first division players in Brazilian soccer. *Journal of sports science & medicine*, 7(3), 309
- Davis, B. *et al.*, (2000) *Physical Education and the study of sport*. 4th ed. London: Harcourt Publishers. p. 125
- Dawei L. (2017) Experimental research on the influence of aerobic exercise combining resistance exercise on the physical health of middle-aged and elderly people. *Biomedical Research* ;28.
- de Groot GC, Fagerström L (2011). "Older adults' motivating factors and barriers to exercise to prevent falls". *Scandinavian Journal of Occupational Therapy*. 18 (2): 153–60.
- Felsenthal, Daniel S. and Machover, Moshe, (1998). The measurement of voting power. Alder-shot:
- Gabbett, T.J., Kelly, J.N., and Sheppard, J.M. 2008b. Speed, change of direction speed, and reactive agility of rugby league players. *Journal of Strength and Conditioning research* 22(5):1434-1442
- Gabbett, T.J., Sheppard, J.M., Pritchard-Peschek, K.R., Leveritt, M.D., and Aldred, M.J. 2008a. Influence of closed skill and open skill warm-ups on the performance of speed, change of direction speed, vertical jump, and reactive agility in team sport athletes. *Journal of Strength and Conditioning Research* 22(5):1413-1415
- Getchell G. (1979). *Physical Fitness a way of life*, New Jersey, John Wiley and Sons.
- Hallage, T., Krause, M. P., Haile, L., Miculis, C. P., Nagle, E. F., Reis, R. S., & Da Silva, S. G. (2010). The effects of 12 weeks of step aerobics training on functional fitness of elderly women. *The Journal of Strength & Conditioning Research*, 24(8), 2261-2266.

- Health and wellness for life. (2010). Champaign, IL: Human Kinetics
- Hillman CH, Castelli DM, Buck SM., (2005) Aerobic fitness and neurocognitive function in healthy preadolescent children. *Med Sci Sports Exercise*;37:1967-74.
- Hoeger WWK, Hoeger SA., (2014). *Fitness and wellness*. 11th ed. Stamford: Cengage Learning.
- Irez, G. B. (2014). The effects of different exercises on balance, fear and risk of falling among adults aged 65 and over. *The Anthropologist*, 18(1), 129-134.
- James Meschino (2000). Benefits of Aerobic Exercise. Available from: <https://www.youtube.com/watch?v=IbIfHDlBoHs> [last accessed 25/5/2021]
- Johnson BL, Nelson JK. (1979) *Practical measurements for evaluation in physical education*. 4th Edit. Minneapolis: Burgess.
- Kathleen, K., 2006. Understanding the benefit of aerobic exercise. *The new England wellness web*
- Kruk, J., 2007. Physical activity in the prevention of the most frequent chronic diseases: an analysis of the recent evidence. *Asian Pacific Journal of Cancer Prevention*, 8(3), p.325.
- Kulkarni, Shweta & Shaikh, Rahat & Yeole, Ujwal., (2018) Effects of Aerobic Exercises on Balance And Gait In Geriatric. *Int J Recent Sci Res*. Jan 9(1):22878-81.
- Leger A, Lambert J., (1982). A maximal multistage 20-m shuttle run test to predict VO₂ max. *Eur J Appl Physiol*.;49:1–12.
- Levy, F. (1988). *Dance/Movement Therapy: A Healing Art*. American Alliance for Health, Physical Education, Recreation and Dance, Reston, VA. National Dance Association.
- Likesas, G., & Zachopoulou, E., (2006). Music and movement education as a form of motivation in teaching Greek traditional Dances. *Perceptual and Motor Skills*, 102, 552-562.
- Lo iacono, (2019) items of famous belly dancers. *World belly dance*
- Malina R (2010). *Physical activity and health of youth*. Constanta: Ovidius University Annals, Series Physical Education and Sport/Science, Movement and Health.

- Malina RM. (1994) Anthropometry, strength and motor fitness. In: Ulijaszek SJ, MascieTaylor CGN, editors. *Anthropometry: The Individual and the Population*. Cambridge: Cambridge University Press 160-177.
- Marion, V., Paillard, T., Noe, F., Riviere, T., Montoya, R. and Dupui, P., 2006. Postural performance and strategy in the unipedal stance of soccer players at different levels of competition. *Journal of athletic training*, 41(2), p.172.
- Mathewos Hosiso, Sangeeta Rani, Shemelis Rekoninne (2013). The effect of aerobic exercise on improving health related physical fitness components of Dilla University sedentary female community, *International Journal of Scientific and Research Publications*,. 3(12),
- Meekums, B. (2002). *Dance Movement Therapy: A creative Psychotherapeutic Approach*. Sage Publications Ltd.
- Moore, A., (2002). *Ballroom Dancing*, 10th ed.; A&C Black Publishers Ltd.: London, UK; pp. 1–308.
- Nikić, N., & Milenković, D. (2013). Efficiency of step aerobics program in younger women. *Acta Medica Medianae*, 52(3), 25-34.
- Niu Y, Zhou D, Ma Z., (2018) Effect of aerobic exercises on students' physical health indicators. *Science & Sports*. 2018 Apr 1;33(2):e85-9.
- Outevsky, D., & Martin, B. C. (2015). Conditioning methodologies for dancesport: lessons from gymnastics, figure skating, and concert dance research. *Medical problems of performing artists*, 30(4), 238-250.
- Patel H, Alkhawam H, Madanieh R, Shah N, Kosmas CE, Vittorio TJ. (2017) Aerobic vs anaerobic exercise training effects on the cardiovascular system. *World journal of cardiology*. 26;9(2):134.
- Peltzer, K. (2010). Leisure time physical activity and sedentary behaviour and substance use among in-school adolescents in eight African countries. *International journal of behaviour & medicine*, 17, 271–278.
- Pollock AS., (2000). What is balance? *Clin Rehabil* 14:402–406 - PubMed - DOI – PMC
- Polwman, A.S., and L.S., Denise , 2011. *Physiology for health , fitness and performance* edition Pp: 31

- President's Council on Physical Fitness and Sports Definitions for Health, Fitness, and Physical Activity (2012). fitness.gov. Archived from the original.
- Raya MA, Gailey RS, Gaunaud IA, Jayne DM, Campbell SM, Gagne E, Manrique PG, Muller DG, Tucker C. (2013) Comparison of three agility tests with male service members: Edgren Side Step Test, T-Test, and Illinois Agility Test. *Journal of Rehabilitation Research & Development*. 1;50(7).
- Ronald, J., p. GLEN, H. Davis and C. Carmen, 2004. Physical activity exercise and types 2 diabetes. Pp 513
- Sargent, D.A. (1921), *The Physical Test of a Man*. American Physical Education Review, 26, 188-194.
- Schouten, J. F., and Bekker, J. A. (1967). Reaction time and accuracy. *Acta Psychologica* 27, 143–153.
- Scott, E. W., Terada, N., Hamazaki, T., Oka, M., Hoki, M., Mastalerz, D. M., & Nakano, Y., (2002). Bone marrow cells adopt the phenotype of other cells by spontaneous cell fusion. *Nature*, 416(6880), 542.
- Sheppard, J. M., & Young, W. B. (2006). Agility literature review: Classifications, training and testing. *Journal of sports sciences*, 24(9), 919-932
- Silvester, V., (1977). *Modern Ballroom Dancing: History and Practice*; Barrie and Jenkins, Ltd.: London, UK,; pp. 1–249.
- Siqiang G., (2018) Experimental study of aerobic exercise on the weight loss effect of obese female college students. *Biomedical Research* ;29.
- Smith, M. A., Bertrand, C., Crosby, K., Eveleigh, E. S., Fernandez-Triana, J., Fisher, B. L., ...& Hrcek, J. (2012). Wolbachia and DNA barcoding insects: patterns, potential, and problems. *PloS one*, 7(5).
- Sridhar, R., & Giridharaprasath, R. G. (2017). Impact of Aerobic Dance Training on Motor Fitness Parameters and Dribbling Ability of Football Players. *International Journal of Physiology, Nutrition and Physical Education*, 2(1).
- Stephens, T., Sutton, J.R. Bouchard, C., Shephard, R.J., and McPherson, B.D., 1990. Exercise, fitness, and health: a consensus of current knowledge: proceedings of the International Conference on Exercise, fitness, and health, May 29-June 3, 1988, Toronto, Canada. In *Exercise, fitness, and health: a consensus of current knowledge: proceedings of the International Conference on Exercise, fitness, and health, May 29, 1988, Canada.. Human Kinetics Publishers*.

- Sunni 1996. Giftedness, excellence and sport. Report of a small scale research project for the Scottish sport council. The Scottish sport council.
- Tanice , M., 2012a. what are benefit of aerobic exercise? Pp 134
- Toriola, O. M. & Monyeki, M. A. (2012). Health-related fitness, body composition and physical activity status among adolescent learners: The PAHL study. *African journal of physical, health, education, recreation & dance*, 18, p795
- Tremblay MS, Colley RC, Saunders TJ, Healy GN, Owen N (2010). "Physiological and health implications of a sedentary lifestyle". *Applied Physiology, Nutrition, and Metabolism*. 35 (6): 725–40.
- Vácz, M., Tollár, J., Mészler, B., Juhász, I., & Karsai, I. (2013). Short-term high intensity polymeric training program improves strength, power and agility in male soccer players. *Journal of human kinetics*, 36(1), 17-26.
- Welford, A. T., and Brebner, J. M. T. (1980). *Reaction Times*. Academic Press Waltham, US.
- Wellborn T.A., S.D. Satvinder and A.B stanley, (2003). Waist to hip ration is the dominant risk factor predicting cardiovascular death in Australia. *The medical journal of Australia*, 179(11): 80-585.
- Wuest, D. A., & Lombardo, B. J. (1994). *Curriculum and instruction: The secondary school physical education experience*. Mosby.
- Zetou E, Vernadakis N, Tsetseli M, Kampas A, Michalopoulou M. (2012) The effect of coordination training program on learning tennis skills. *The Sport Journal*. Jan 1;15

7. APPENDIX

APPENDIX –1

Physical Activity Readiness Questionnaire (PARQ)

Please read the following questions carefully and indicate your correct responses to each question by ticking (X) for your answer “YES” or “NO”

Table 1: Health status questioner

No	Questions	Yes	No
1	Do you have a bone or joint problem such as arthritis, which has been aggravated by exercise or might be made worse with exercise?		
2	Do you have high blood pressure?		
3	Do you have low blood pressure?		
4	Do you have Diabetes mellitus or any other metabolic disorder?		
5	Do you have or ever suffered from heart condition?		
6	Have you ever felt pain in your chest when you do physical exercise?		
7	Is your doctor currently prescribing you drugs or medication?		
8	Have you ever suffered from shortness of breath at rest or with mild exercise?		
9	Is there any history of Coronary Heart Disease within your family?		
10	Do you currently smoke?		

If you have answered **YES** to any of the above questions please give details:

APPENDIX – 2

Participants Information Sheet and a Consent Form

- ✎ Researcher`s Name Emebet Awol Kelbore
- ✎ Major Advisor`s Name: Abinet Ayalew(PhD)
- ✎ Co-Advisor`s Name: Shemelis Mekonnen (PhD)

Thesis proposal title: Impact of Aerobic Dance Motor Fitness variables of male Students,in Fonko High school. Ethiopia you are being asked to participate in this research study as described below. All research studies carried out like this one are governed by the regulations for research on human beings. These regulations require that the researcher should obtain a sign agreement (consent) from you to participate in this research project. The researcher will explain to you in the detail purpose of the project, the procedures to be used, the potential benefits and the possible risk of participation in this study. You can ask a researcher any questions that you may have about a study and expect to receive satisfactory answers regarding the same. A basic explanation of the project is summarized below.

1. Purpose and procedures

The purpose of this research project is to examine the Impact of Aerobic Dance on Motor Fitness Variables of male Students, in Fonko High school. Ethiopia. The target groups to be involved in this study will be 40 male students. This study requires your participation to perform a certain tests in measuring the Agility, Flexibility, speed and power variables.

2. Risks and Safeguards

The risks of this research study are small. While administering the tests and during training sessions you may experience localized skeletal muscle fatigue. You might feel some muscle soreness and fatigue during and after the cessations of the training exercises and tests. But we do not expect any unusual risks as a direct result of this study. If any unexpected physical injury occurs, appropriate first aid will be provided, but no financial compensation will be given.

3. Confidentiality

The information obtained about you will be kept in confidence, although you are free to release it to your own physician. The information will be used only for scientific purposes without identifying you as an individual.

Contact Address

- Emebet Awol Kelbore
Phone number +251916728953
E-mail Address; emutawol@gmail.com
- Abinet Ayalew (PhD)
Phone number +251911827322
E-mail Address: amenab2012@gmail.com
- Shemelis Mekonnen (PhD)
Phone number +251913893850
E-mail Address; shemelismm@gmail.com

I certify that I have fully understood the above project; therefore, I consent to participate in this study.

Name of target: -----

Signature: -----

Address: -----

Date: -----

I certify that I clearly explained the nature of the study, purpose of potential benefits and that may be possible risks involved in this research study.

Signature of Investigator: -----

Date: -----

APPENDIX -3

Selected motor fitness variables test result record sheet of target group

Name_____

Initial Height/M _____ Age_____

Initial Weight/Kg_____ Sex_____

Code_____

Table 2:- Motor fitness variables test result record sheet

Code of Test	Type of Test	Parameters to be Measured	Experimental Group	
			PT	PoT
T - 1	Illinois Agility Run Test (IART)	Agility		
T - 2	Sit & Reach tests (SRT)	Flexibility		
T – 3	30m Sprint	Speed fitness		
T – 4	Standing Vertical Jump test (SVJT)	Power		

APPENDIX - 4

Description of the Training Schedule

The students of sport science need fitness as they are involved in various vigorous practical activities during their practical class. As a result, the research was done at Fonko High school, male students. They have practical class they don't involve in regular exercise mainly in aerobic dance for the purpose of improving their agility, flexibility, power and speed.

Training protocol

According to Jakl (2008) 8 to 12 weeks of training program is essential to maximize individual's physiological fitness abilities. Based on this idea the investigator purposively prepared 12 weeks training program. Thus, the subjects underwent 3 months (12weeks) of training, which is May – July 2021).

The Training Days per Week

According to ACSM (1990) 3-5 days per week and 20-60 minutes is needed for developing and maintaining fitness through aerobic exercise. So, the investigator will take a minimum of 3 days (60 minutes per session) that are Monday, Wednesday and Friday since they are student the schedule was prepared by considering their convenient time for them. The researcher will undertake pre and post-test to know the change that occurred due to the 12-week aerobic dance exercise and the dependent variables for this study are agility, flexibility, power and speed and independent variable is aerobic dance exercise.

The following table (Appendix -5) includes different types of aerobic exercise which will be performed by the subjects within 12 weeks in order to improve their agility, flexibility, power and speed. The exercises that will be involved in this study are warming up exercise, step aerobic exercise and cooling down exercises which help to develop the students' fitness level. Also FITT (Frequency, Intensity, Time and Type of Exercise) principle of training will be applied in the schedule;

1. **Frequency of training:** the repetition of exercise in one set. The training schedule will be completed 3 days per week that are Monday, Wednesday and Friday.
2. **Intensity of training:** is how hard the body exercising or how much energy is expended when exercising. It can be defined on either an absolute or a relative scale. Absolute intensity refers to the amount of energy expended per min of activity, while relative intensity takes a person's level of exercise capacity or cardio respiratory fitness into account to assess the level of effort. Either scale can be used to monitor the intensity of aerobic dance exercises. In this study the researcher will used low intensity, moderate intensity to adapt the exercise to

high intensity for increasing load in the consecutive three months. These levels include Low (40-50% MHR), Moderate (50-65% MHR), and Vigorous (65-85% MHR) for aerobic dance exercise and are measured by the metabolic equivalent of task. The effects of exercise are different at each intensity level (i.e. training effect). Recommendations to lead a healthy lifestyle vary for individuals based on age, weight, and existing activity levels.

There are different ways to measure intensity of training;

- ✎ **Heart rate:** - Heart rate can be an indicator of the challenge to the cardiovascular system that the exercise represents.

- ✎ **VO₂max-** the amount of oxygen consumed by the body during exercise.

3. **Duration of training:** the subjects perform the exercise for 60 minutes per day in this study. Duration is dependent on the intensity of the activity, thus, medium-intensity
4. Activity should be conducted over a longer period of time (25 min or more) and conversely individuals training at higher levels of intensity should train at least 10min or longer (ACSM, 1990).

Type of activity

Any activity that uses large muscle groups, which can be maintained continuously, and is rhythmical and aerobic in nature, e.g., walking-hiking, running, jogging, bicycling, cross-country skiing, aerobic dance/group exercise, rope skipping, rowing, stair climbing, swimming, skating, turn step, step touch, box step V-step and basic step and various endurance game activities or some combination thereof (ACSM, 1990).

i. Basic Step

This move can be performed on an aerobics step bench or on the floor. Do several in a row with the lead leg, or alternate lead legs for variety. How to do it: Start with your feet side by side, about hip-distance apart. Step about two feet forward with your lead leg. Bring the back leg forward to meet it. Step back two feet with your lead leg and draw the other foot back to meet it (Outevsky & Martin, 2015).

ii. V-Step

This dance step is also doable on an aerobic step or the floor. It gets its name from the wide, V- shape of the movement. How to do it: Stand with your feet parallel and hip-distance apart. Step your lead foot 2 to 3 feet forward to the corresponding corner of the floor or the bench. Step the opposite foot wide to its corner. Step back to the original position with your lead leg. Bring the opposite leg back to meet it. You may alternate lead legs or repeat the step on the same leg several times before switching (Outevsky & Martin, 2015).

iii. Step Touch

Step touch is commonly found in floor-based classes. It's an easy move to master. How to do it: Stand with your feet side by side and hip distance apart. Step your lead leg to the side and bring the other foot to meet it. Switch the direction as you alternate touching side to side. Sometimes, you might do two to four steps to the right, and then an equal number to the left (or vice versa) (Outevsky & Martin, 2015).

iv. Mambo

The mambo step in aerobics dance takes its cue from the dance style. It's a fundamental move that has you swinging your hips. How to do it: Stand with your feet hip-distance apart. For a right leg lead, take a small step forward on your right foot; keep your left foot where it is. Shift weight onto the right foot, and then shift weight onto the left foot as you step the right foot backward. Shift weight onto the right foot, then to the left; immediately take the step forward with the right to repeat the step (Outevsky & Martin, 2015).

v. Box Step

A box step is sometimes called a "jazz square". How to do it: Stand with your feet hip-distance apart and parallel to one another. For a right leg lead, step the right foot slightly forward and in front of your left foot. Step the left foot out to the side. Bring the right foot a step back and cross over it with your left foot. Repeat multiple times (Outevsky & Martin, 2015).

vi. Grapevine

The grapevine offers a way to travel side to side during a floor-based aerobics class. Sometimes, an instructor adds a knee lift or hamstring curl instead of the tap before switching directions. How to it: Stand with your feet hip-distance apart. To move to the right, step your right foot to foot next to it to switch directions (Outevsky & Martin, 2015).

vii. Turn step

Do the turn step on an aerobic bench, also in four counts. Start the move facing the step sideways. How to do it: Leading with the right foot, step up on right corner of the bench sideways. Then bring the left foot up onto the bench to the left corner as you turn. Step off the bench with the right foot; bring the left foot down next to the right foot. Repeat with the left side for as many reps as desired (Outevsky & Martin, 2015).

Load and Effort:

Within the area of aerobic dance exercise, intensity is generally considered to represent the effort required by the body at a given velocity, incline, and resistance (or other variable) at a given work rate and is typically expressed relative to quantities such as heart rate (HR), % of heart rate maximum blood lactate or oxygen uptake (VO₂). With regard to muscular effort, however, the percentage of one repetition maximum is purely a representation of load. Whilst increasing or decreasing a given

load might indeed require greater or lesser effort, it should never be considered a measure of the effort or intensity that the body is working at. As stated by Smith *et al.*, (2012) it is surely not acceptable that terminology can be used with different meanings based on differing modalities of exercise being performed.

Components of workload

- i. The amount of weight lifted during an exercise.
- ii. The number of repetitions completed for a particular exercise.
- iii. The length of time to complete all exercises in a set or total training session

APPENDIX -5

Aerobic dance training schedule for three months

Table 3:- Training Schedule for Month One (May, 2021)

Day	Mode of exercise	Reps	Duration (60 minute)	Rest (min/sec)	Intensity
Monday	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body.	3*	10'		
	Main phase: Step aerobic dance exercises Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-4 *	40'	30 second for each repetition	Low intensity 40-54 %
	Cool down: static stretching and relaxation exercise	-	10'		
Wednesday	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body.	3*	10'		
	Main phase: Belly Dance Walk, Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-4*	40'	30 second for each repetition	Low intensity 40-54 %
	Cool down: static stretching, relaxation exercise and seating on the ground	-	10'		

Friday	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body.	3*	10'		
	Main phase: Jazzercise,BellyDancing Knee rise, Walk , Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-4*	40'	30 second for each repetition	Low intensity 55-69 %
	Cool down: static stretching, relaxation exercise		10'		

Table 4:- Training Schedule for Month Two (June, 2021)

Day	Mode of exercise	Reps	Duration (60 minute)	Rest (min/sec)	Intensity
Monday	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body	3*	10'		
	Main phase: Ballroom Dancing Step aerobic dance exercises Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-6 *	40'	30 second for each repetition	Moderate intensity 55-69%
	Cool down: static stretching and relaxation exercise	-	10'		
Wednesday	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body.	3*	10'		

	Main phase: Zumba,Jazzercise Walk, Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-6*	40'	30 second for each repetition	Moderate intensity 55-69%
	Cool down: static stretching, relaxation exercise and seating on the ground	-	10'		
	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body.	3*	10'		
Friday	Main phase: Masala Bhangra Knee rise, Walk , Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-6*	40'	30 second for each repetition	Moderate intensity 55-69%
	Cool down: static stretching, relaxation exercise		10'		

Table 5:- Training Schedule for Month Three (July, 2021)

Day	Mode of exercise	Reps	Duration (60 minute)	Rest (min/sec)	Intensity
Monday	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body.	3*	10'		

	Main phase: Step aerobic dance exercises,Belly Dancing Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-8 *	40'	30 second for each repetition	High (vigorous) is $\geq 70\%$
	Cool down: static stretching and relaxation exercise	-	10'		
Wednesday	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body.	3*	10'		
	Main phase: Jazzercise,Belly Dacing Walk, Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-8*	40'	30 second for each repetition	High (vigorous) is $\geq 70\%$
	Cool down: static stretching, relaxation exercise and seating on the ground	-	10'		
Friday	Warming up exercises: eg:- walking, slow jogging, standing side bending, leg bends, leg swimming, shoulder/ arm circles, jumping jacks, jumping rope, torso twists, lateral shuffle, butt kickers, knee bends and ankle circles for general and specific body.	3*	10'		
	Main phase: Knee rise, Walk , Hip role, Basic Step, V-Step, Step Touch, Mambo, Box Step, Grapevine, and Turn step	2-8*	40'	1minute for each repetition	High (vigorous) is $\geq 70\%$
	Cool down: static stretching, relaxation exercise		10'		

The above training schedule is performed in each given day.

APPENDIX-6**Table 6: Raw data's for the motor fitness variables of Target group (TG)**

Target group code	Age	Agility (IART) in sec		Speed (30m ST) in sec		Power (SVJT) in cm	
		PT	PoT			PT	PoT
TG 1	18	19.46583333	16.1725	4.755	4.2625	44.75	54.83333333
TG 2	18	19.9	16.16833333	4.33	3.916666667	41.08333333	51.58333333
TG 3	18	20.305	16.65	4.849166667	4.245	40.41666667	51.16666667
TG 4	19	21.94083333	16.39083333	4.6275	4.029166667	44.5	50.41666667
TG 5	18	21.03	16.15083333	4.763333333	4.214166667	41	50.58333333
TG 6	18	20.05666667	16.68333333	4.799166667	4.279166667	39.33333333	48.33333333
TG 7	19	20.04416667	16.44083333	4.93	4.398333333	35.66666667	46.16666667
TG 8	19	19.63916667	16.37833333	4.6475	4.176666667	36.25	47.58333333
TG 9	18	19.65083333	16.2725	4.433333333	4.001666667	35.25	48.91666667
TG 10	19	20.01583333	16.115	4.530833333	4.0925	37.91666667	49.58333333
TG 11	20	19.01833333	15.86666667	4.830833333	4.38	38.75	50.58333333
TG 12	18	19.59666667	16.3425	4.625833333	4.120833333	40.5	51.16666667
TG 13	18	19.51166667	16.42333333	4.785	4.133333333	38.16666667	50.75
TG 14	18	20.2275	17.0775	4.771666667	4.204166667	36.08333333	47.83333333
TG 15	18	19.51083333	16.21166667	4.860833333	4.301666667	42.75	53.91666667
TG 16	19	19.93833333	16.38833333	4.7475	4.244166667	36.66666667	48.66666667
TG 17	19	19.22416667	15.9225	4.500833333	3.979166667	37	47.91666667
TG 18	20	19.21083333	15.72166667	4.615	4.104166667	39.08333333	48.58333333
TG 19	19	19.9275	16.23833333	4.725833333	4.323333333	40.66666667	51.33333333
TG 20	18	19.28416667	16.12916667	4.858333333	4.433333333	35.16666667	46
TG 21	20	19.58166667	16.11916667	4.559166667	4.164166667	38.5	50.25
TG 22	18	20.0125	16.66416667	4.815833333	4.291666667	33.75	45.58333333
TG 23	19	19.37083333	16.05916667	4.789166667	4.329166667	44	53.75
TG 24	18	19.5775	16.14416667	4.676666667	4.0425	37.08333333	46.41666667
TG 25	19	18.8825	15.615	4.7125	4.176666667	38.08333333	50.91666667

TG 26	18	19.21583333	16.23416667	4.7725	4.323333333	39.91666667	50.83333333
TG 27	18	19.9075	16.27416667	5.051666667	4.603333333	37.08333333	49.08333333
TG 28	18	20.0375	16.84583333	4.725	4.274166667	34.58333333	45.75
TG 29	20	19.00916667	15.84	4.4775	4.036666667	38.41666667	50.58333333
TG 30	19	19.04666667	16.12583333	4.404166667	3.940833333	36.91666667	47.66666667

TG 31	18	19.0125	15.67666667	4.5975	4.079166667	40.5	52
TG 32	18	18.21583333	15.80083333	4.628333333	4.121666667	37.25	48.33333333
TG 33	18	18.7875	15.8975	4.413333333	3.98	36.16666667	45.75
TG 34	18	19.08666667	16.13916667	4.201666667	3.835	33.41666667	44.5
TG 35	19	19.19333333	16.05416667	4.6775	4.0925	32.66666667	44.58333333
TG 36	18	18.725	15.51833333	4.6625	4.190833333	35.08333333	48.41666667
TG 37	19	19.38083333	15.98090909	4.890833333	4.385	36.08333333	48.66666667
TG 38	20	19.335	15.9825	4.8	4.216666667	38.66666667	51.25
TG 39	19	19.855	15.97833333	4.579166667	4.183333333	33.33333333	48.25
TG 40	20	19.98833333	16.0325	4.461666667	4.081666667	33.5	47.33333333

APPENDIX-7

Fitness Norms: The norm charts included in this appendix are a representation of how individuals compare to others with regard to performance on the physical fitness tests. The Cooper Institute has one of the largest and most valid data bases in the world with respect to fitness norms.

There are two types of norms that the Coast Guard uses for fitness testing:

1. **Age and Gender Norms.** Age and gender norms are a representation of how individuals in a specific age and gender group compare to one another with regard to performance on physical fitness tests. Age and gender norms are acceptable for use in all Coast Guard fitness tests unless specified by the specific unit instruction.
2. **Absolute Norms.** Absolute norms are minimal scores or “cut-points” that have been determined in law enforcement validation studies as the fitness standard that must be attained by everyone regardless of age, gender, or handicapping conditions for the person to be considered fit for duty. Absolute norm tables are not depicted in this appendix but can be found in the manuals that require absolute norm standards.

Table 7:- Normative data of Agility test (Illinois Agility Run Test) in second

Gender	Excellent	Above Average	Average	Below Average	Poor
Male	<15.2	15.2 - 16.1	16.2 - 18.1	18.2 - 19.3	>19.3
Female	<17.0	17.0 - 17.9	18.0 - 21.7	21.8 - 23.0	>23.0

Source:- Davis *et al.*, 2000

Table 8:- Normative data of the flexibility test (sit and reach test) in centimeter

Fitness category	Males	Females
Excellent	>46.5cm	>45.5cm
Good	46.5 – 38.0	45.5 – 38.0
Average	37.5 – 27.0	37.5 – 29.0
Below Average	26.5 – 17.0	28.5 – 20.

Source:- Davis *et al.*, 2000

Table 9:- Normative data of the Speed test (30m sprint) in second

Gender	Excellent	Above Average	Average	Below Average	Poor
Male	<4	4.0 - 4.2	4.3 - 4.4	4.5 - 4.6	>4.6
Female	<4.5	4.5 - 4.6	4.7 - 4.8	4.9 - 5.0	>5.0

Source:- Davis *et al.*, 2000

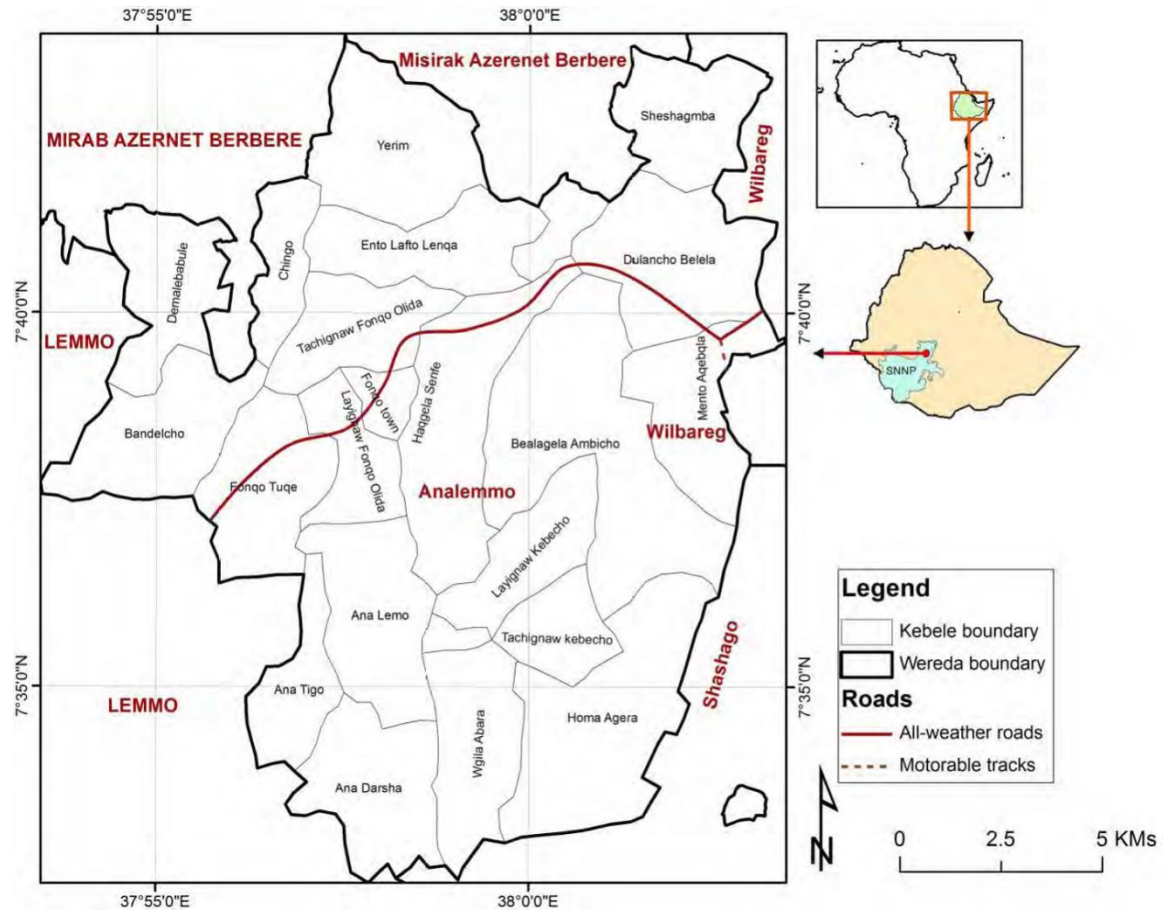
Table 10:- Normative data of the Power test (Standing vertical jump test) in centimeter

Rating	Males (cm)	Females (cm)
Excellent	> 70	> 60
Very good	61-70	51-60
Above average	51-60	41-50
Below average	41-50	31-40
Poor	31-40	21-30
Very poor	21-30	11-20

Source:- Sargent, D.A. 1921

APPENDIX-8

Figure 5. Map of the study area



Source; Ethiopian national mapping agency (AWFEDO, 2014).