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Comparative Effects Of Football and Aerobic Dance Training on Stu Attention Span Incase of East Belessa Woreda, Guhala Town Birhu Tesfa Elementary School

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BAHIR DAR UNIVERSITY
SPORT ACADEMY
DEPARTMENT OF SPORT SCIENCE

**COMPARATIVE EFFECTS OF FOOTBALL AND AEROBIC DANCE TRAINING ON
STUDENTS' ATTENTION SPAN INCASE OF EAST BELESSA WOREDA, GUHALA
TOWN BIRHU TESFA ELEMENTARY SCHOOL.**

BY

MAMUSH KASSAW TEREFE

SEPTEMBER, 2022
BAHIR DAR ETHIOPIA

BAHIR DAR UNIVERSITY
SPORT ACADEMY
DEPARTMENT OF SPORT SCIENCE

**COMPARATIVE EFFECTS OF FOOTBALL AND AEROBIC DANCE TRAINING ON
STUDENTS' ATTENTION SPAN INCASE OF EAST BELESA WOREDA, GUHALA
TOWN BIRHU TESFA ELEMENTARY SCHOOL GRADE 4TH MALE STUDENTS.**

By

MAMUSH KASSAW TEREFE

A THESIS PROPOSAL SUBMITTED TO THE SPORT ACADEMY OF BAHIR DAR
UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTERS OF TEACHING IN PHYSICAL EDUCATION.

ADVISOR: GASHAW TESEMA (PhD)

SEPTEMBER, 202 2

BAHIR DAR

DECLARATION

I, hereby that this thesis for the partial fulfilment of the requirement for the Degree of Master of Science in teaching physical education “ comparative effect of football and aerobic dance training on students attention span’’ is my real original work and all sources of materials used in this thesis have been acknowledged. It has not previously formed on the basis for the award of any Degree, Diploma of any University, Other institution of higher learning or publication except where due acknowledgement is made in acknowledgements.

Name of the candidate

Date

Place

ADVISOR’S APPROVAL SHEET
BAHIR DAR UNIVERSITY
SPORT ACADEMY
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I hereby certify that I have supervised, read, and evaluate this thesis entitled “comparative effect of football and aerobic dance training on students’ attention span ” by Mamush kassaw prepared under my guidance. I recommend the thesis be submitted for oral defence.

Advisor’s name

signature

date

Department Head

signature

date

EXAMINER’S APPROVAL SHEET
BAHIR DAR UNIVERSITY
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DEPRTEMENT OF SPORT SCIENCE

As members of the board of examiners, we examined this thesis entitled “comparative effect of football and aerobic dance training on students’ attention span” by Mamush Kassaw. We hereby certify that the thesis is accepted for fulfilling the requirements for the award of the degree of “Master of Science in teaching physical education”.

Board of examiners

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| _____ | _____ | _____ |
| Internal examiner’s name | Signature | Date |
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| Chair person’s name | Signature | Date |

DEDICATION

I dedicate this thesis manuscript to my wife and beloved family. As well as the researcher extended his dedication to the man who contribute even a piece of advice throughout in my life to reach in this stage.

Mr. Mamush Kassaw

Signature:-_____

Date: _____

ACKNOWLEDGEMENT

First and foremost I would like to thank God for everything he has done for me to accomplish my paper. Next I would like to offer my most sincere gratitude and appreciation to my advisor GashawTesema (PhD) for his constant guidance, restless support, concern and encouragement throughout the process of this paper. Thirdly, I would like to thank the parents and children participants who have given their trust, time and effort to take part in this study. Finally, I am grateful to my parents, Kassaw and Gela, whose love and encouragement over the years have helped, give me the confidence to believe in myself and follow my dreams.

Abstract

The aim of the study was to assess the comparative effects of football and aerobics dance training participation on students' attention span. The study was employed randomized parallel group study design. Fifty two participants with age 10-11 years old male students were selected and placed randomly into two training groups. Sample size was determined using G-power 3.1 software. The first group participated in football training and the second group participated in aerobic dance training for 12 weeks. The data was collected with D2 attention span test at the beginning pre-test and at the end of 12 weeks training post-test. The collected data was analysed using analysis of Co-variance (ANCOVA). The results showed that both training groups significantly improved answering correct answers at ($P < 0.001$) with 34.3% effect size as a result of improving attention. In addition they showed reduced percentage of error making at ($P < 0.001$) with effect size 61.6% in the post test as compared to pre-test. When we compare the two training groups football trained groups showed significantly higher attention levels compared to aerobic dance trained groups at ($p < 0.001$) with effect size 29%. In conclusion, both football and aerobic dance training are capable of improving attention span in elementary school students. However, football training has higher attention span improvement than aerobic dance training in elementary school students. Therefore, we recommended that school principals, students' families and different stakeholders should give attention to students' sport participation especially in football training to improve their attention span for learning capacity.

Key words: Aerobic dance; Attention span; Football training; sport training effect,

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List of abbreviations

AD –attention deficit

ADHD- attention deficit hyperactivity disorder

AS- academic success

ANCOVA- analysis of covariance

PA- physical activity

PD- Parkinson disease

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Attention is one of the most important elements of cognitive functioning in education and professional life as well as in most daily activities. As a cognitive skill, attention is defined as a process affecting human behaviour by which a sensory stimulus is selectively perceived while others are ignored in order for someone to be able to observe an entity or event that motivates him or her. In other words, it is characterized as being oriented towards, focused or concentrated on, or conscious of an object, event, or activity. In light of these definitions, one could say that directing attention on a particular task yields more successful results by making all relevant details noticeable. Attention is thus considered to be a necessary condition for success in a task or activity (Silah M., 2005).

Physical activity (PA) has positive effects on brain health at all stages of the lifespan and a growing body of literature indicates that PA may enhance cognition, offer protection against neurodegenerative disorders including AD and PD, and reduce incidence and severity of many psychological conditions including the common mood disorders, anxiety and depression ((Beckett, Ardern, 2015). The period between 10 and 11 years of age is an orderly and peaceful transitional stage during which children accumulate, internalize, and balance knowledge. It is also the golden age of balanced development. Attention development is especially important during the periods when children lean intensively. Attention is the first step of learning process, and it plays an important role in learning. It also guides the development of cognitive representations starting from early childhood (HYavuzer, 2001).

Attention is most commonly described as a function of the nervous system, and provides several neural stimuli for those who need it in line with their purposes ((Banich, 1997). However, attention deficit (AD) is one of the most common problems in children. Children with AD are characterized by careless, hyperactive and impulsive behavioural state (Harvey JW, 1997). Excessive AD includes problems such as delay in work, difficulty in organizing, and avoidance

of tasks requiring long-term mental effort, attention to detail, forgetfulness of supplies, failure to complete assigned tasks, and extreme forgetfulness during daily activities. When children and adolescents participate in at least 60 minutes of physical activity every day, multiple health benefits accrue (Reynolds, 2000). Regular physical activity builds healthy bones and muscles, improves muscular strength and endurance, reduces the risk for developing chronic disease risk factors, improves self-esteem, and reduces stress and anxiety.¹ beyond these known health effects, physical activity may also have beneficial influences on academic performance (Reynolds, 2000).

In Psychology, attention is defined as selective stimulus selective focus, the ability to maintain this focus, and change the way you want. Concentration ability and attention are important in learning. Learning is most effective when giving attention to a person. Poor attention can be a key sign of behavioural disorders in children, such as hyperactivity, attention deficit disorder, and learning disorders. In cases where many events occur at the same time, attention is focused only on certain points (Morgan, 2011). Attention is the most effective tool in teaching the recognition of stimuli presented in the learning process, identification of the key issues in the process of processing. One of the main causes of attention deficit and attention loss is mental and physical fatigue (NimetHasilKorkmaz, 2021).

Recently studies on learning and academic achievement related to sports branches and activity levels on children have been conducted (NimetHasilKorkmaz, 2021).

Therefore, the aim of this study is to discover if there is any significant attention span difference in children who participate in different sport types.

1.2. Statement of the Problem

As mentioned in the introductory part, attention is the most important thing in teaching learning process for human beings. Attention is the first step of learning process, and it plays an important role in learning. For a student with an active attention level, there is a direct relationship between attention processes, level of interest, previous learning experiences, and level of motivation. . (Tan tillo , Kesick , Hynd, 2002), also found that an effective and regular engagement in physical activities has positive effects in children with Attention Deficit.

Generally most Studies have shown that a positive relation between physical exercise and attention. However which type of exercise is more effective in improving attention is not yet

studied. Therefore, this research tried to see the comparative effects of football and aerobic dance training on students' attention span.

1.3. **Hypothesis:**

- **H0₁:** Participation in football training might have no significant effect on students' attention span.
- **H0₂:** Participation in aerobic dance training might have no significant effect on students' attention span.
- **H0₃:** There might have no significant differences between football and aerobic dance training on students' attention span.

1.4. **Objective of the Study**

1.4.1. General objective of the study

This research aims to assess the comparative effects of football and aerobics dance training participation on students' attention span at East Belesa woreda Guhala town Biruh tesfa elementary school grade 4th male students.

1.4.2. Specific Objectives of the Study

The specific objectives of the studies were:

- To identify the effects of football training participation on students attention span.
- To examine the effects of aerobic dance training on the students attention span.
- To compare the training effects between football and aerobic dance exercise on students' attention span.

1.5. **Significance of the Study**

This study will contribute for:

- Understanding what is the effect of exercise on attention span.
- It may help policy makers to consider sport training drafting policies
- It may serve as a standing point for further practitioners who want to conduct study on similar issues

- May help to empower fellow students through the effective application of recommended exercises.
- May help to treat attention deficit students and make them effective learner.

1.6. **Delimitation of the Study**

This thesis was conducted on the comparative effects of football and aerobic dance training participation on students' attention span in East Belesa woreda Guhala town, Biruh tesfa elementary school which is found in central Gondar zone, Amhara regional state of Ethiopia.

1.7. **Limitations of the study**

The findings of the study were limited by the following factors. One is failure to get appropriate secondary data from school about students profile or background. In addition to this, lack of experience of the researcher, unwillingness of the respondents to give reliable data and lack of infrastructural facility also limit the findings of the research. In order to fill my technical ability I was consult experienced colleagues and others who are able to help me. Regarding respondents and institutional leaders, I was employed different persuasive mechanisms to make them willing to take the initiative.

1.8. **Operational Definitions**

Aerobic dance: is a form of physical exercise that is usually performed to music and may be practiced in a group setting led by an instructor (fitness professional).

Attention: is the behavioural and cognitive process of selectively concentrating on a discrete aspect of information, whether considered subjective or objective, while ignoring other perceivable information.

Attention span: is the amount of time spent concentrating on a task before becoming distracted.

Effect: a change which is a result or consequence of an action or other cause.

Exercise: is planned, structured, repetitive and intentional movement that intended to improve and maintain physical fitness.

Football: is a family of team sports that involve to varying degrees, kicking a ball to score a goal.

1.9. **Organization of the Study**

This study has organized in to five chapters. The first chapter presents the introduction of the study. Under this chapter, background of the study, statement of the problem, objectives, significance and scope of the study is discussed.

Relevant literature on definitions and concepts related to attention, the effects of exercises on attention span and the effects of football and aerobic dance training participation on students' attention will discussed under chapter two.

Chapter three have also considered the methodological discussions of the study. It has discuss and justify the choice of methodology employed and describes the source of data, data collection techniques, sampling design, methods of data presentation and analysis.

Chapter four addresses football and aerobic dance training participation and their effects on students' attention span in East Belesa woreda Birhu tesfa elementary School. This chapter is all about the findings of the study. The last chapter deals with conclusion and recommendations of the study.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. DEFINITIONS OF ATTENTION SPAN

Attention span is the amount of time spent concentrating on a task before becoming distracted. Distractibility occurs when attention is uncontrollably diverted to another activity or sensation. Attention training is said to be part of education, particularly in the way students are trained to remain focused on a topic of observation or discussion for extended periods, developing listening and analytical skills in the process. (<https://en.m.wikipedia.org>)

Among the cognitive outcomes addressed, attention is of great relevance for students since it plays a key role in learning (Stadler, 1995). Attention and concentration are key to cognitive processes such as encoding, recalling, information processing, and problem solving. Therefore, attention and concentration play essential roles in successful academic performance (Janssen , Toussaint , Van Mechelen, 2014).

Attention is the ability to actively process specific information in the environment while tuning out other details. Attention is the behavioural and cognitive process of selectively concentrating on a discrete aspect of information, whether considered subjective or objective, while ignoring other perceivable information (<https://en.m.wikipedia.org>).

2.2.EFFECTS OF EXERCISE ON ATTENTION SPAN

Attention is defined as the ability to resist distractions and concentration is referred to the ability to stay focused (Janssen , Toussaint , Van Mechelen, 2014). In the western countries, the sports and physical activities programs at school started to draw more attention after many studies showed that physical exercise and sports have a positive impact on cognitive performance and academic success (Hillman , Pontifex , Raine , Castelli , HallEE, 2009a). (Tan tillo , Kesick , Hynd, 2002) also found that an effective and regular engagement in physical activities has positive effects in children with Attention Deficit and Hyperactivity Disorder (ADHD).

Some studies (Moffitt, 1990), identified a correlation between underachievement and presence of attention problems during primary school years. It is quite likely that these children will develop further problems later in their lives, too. Moreover, the problems of the children who perform poorly at school due to low attention levels is not limited to their academic success, they could also have problems with the concept of the self, language skills, and interpersonal communication. There is growing evidence that regular engagement in PA during childhood can influence gray and white matter integrity, and this may have implications for cognitive development (Carson, Hunter, Kuzik, Wiebe, Spence, Friedman, 2016).

Most research into the benefits of physical activity has documented fairly consistent improvements in performance on cognitive tasks after acute exercise and chronic activity (Kramer, Erickson, 2006). Regular engagement in PA in early childhood and adolescence likely optimizes the neuronal environment to influence cerebral maturation and enhance cognitive development (Chaddock-Heyman, Erickson, Holtrop, Voss, Pontifex, Raine, 2014).

2.3.EFFECTS OF FOOTBALL AND AEROBIC DANCE TRAINING ON ATTENTION SPAN

Attention is the basic brain function to ensure that we interact effectively with the environment by selectively focusing on relevant information over other information (Posner, 1990).

Aerobic dance exercise is any physical activity that makes you to breathe harder and gets your heart beating faster than at rest. Aerobic dance uses your large muscle groups, is rhythmic in nature and can be maintained continuously for at least 10 minutes. (<https://www.omicsonline.org>)

Aerobic exercise is known to have a positive impact on depressive symptoms. Studies suggest that endorphins produced in the brain during exercise contribute to a general feeling of well-being. Exercise also boosts dopamine, which improves mood and jump-starts the attention span. Thirty minutes of moderate exercise a few days a week can do wonders for students who suffer from depressive moods. (www.Wgu.edu/heyteach/article).

Aerobics Dance Movement Therapy

Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routine with a goal to improve all elements of fitness. It can be done at least

3 times a week and every sessions take about 20-30 minutes. Aerobic can helps our body and minds relax. It is usually performed to music and may be practiced in a group setting led by an instructor as well as the many physical benefits; exercise is also one of the easiest and most effective ways of improving the mental health.

Mechanism of Aerobic Dance Movement Therapy

The mental benefits of aerobic exercise have a neurochemical basis. Exercise reduces levels of the body's stress hormones, such as adrenaline and cortisol. It also stimulates the production of endorphins, chemicals in the brain that are the body's natural painkillers and mood elevators. Endorphins are responsible for the "runner's high" and for the feelings of relaxation and optimism that accompany many hard workouts — or, at least, the hot shower after the exercise is over.

Benefits of Aerobic Dance Movement Therapy

The aerobic dance movement therapy is very useful to the adolescents in many ways of easing stress and anxiety, reducing tension, lifting the mood and relieving depression, sharpening brainpower, increasing self-esteem, improving sleep, boosting energy, coping better, Gain confidence, take mind off worries and get more social interaction(*<https://biomedpharmajournal.org>*).

Football is a game played between two teams of eleven people, where each team tries to win by kicking a ball into the other team's goal. (<https://dictionary.cambridge.org>)

It is know that childhood and the young hood is the period of life in which by proper process of exercise and PA can significantly influence the physical and psychological development (Hillman , Erickso, 2008). Based on these studies, it is postulated that the cognitive benefits of acute exercise may be due to the increased cerebral blood flow, and hence oxygenation, in the frontal regions of the brain, due to the significant vascularization in this area compared to others (Verburgh, Königs, Scherder, 2014).

In a study conducted by (Coe , Pivarnik , Womack, 2006),it was found that children who were engaging in physical activities outside school hours had higher levels of academic success than those who were not. Several studies identified a positive relationship between physical activity

and academic performance and showed that engaging in physical activities positively affects the cognitive level of school children (Fields Diego, 2001).

(Yurdakul , Çamlıyer , Çamlıyer , Karabulut, 2012), conducted a study with 146 primary school students in order to investigate the relationship between AD and physical activity in children, indicating that physical activities during the 12-week period provided progress in the development of AD reduction. It is clear that exercise increases brain blood flow (Zametkin , Liotta, 1990). For example, aerobic exercise can increase tissue blood flow and O₂ uptake (Foss, 1998). In another study, it is claimed that long-term low-impact aerobic exercises (such as walking, running, etc.) reduce hyperactive and impulsive behaviours in children with ADHD, in parallel with increasing cardiovascular resistance (Putnam, 2001).

(Topcu , Yıldız, 2007a), conducted a study in which children performed folk dances for two days a week for 15 weeks and found that folk dances had a positive effect on children with AD. He also stated that positive effects of exercise can be used in the clinics as an additional support to promote health care in children with AD.

Studies have shown that physical activity affects brain structure and functions through several different mechanisms. Physical activity has been shown to improve cell capillaries, increase blood flow and brain oxygenation, increase brain neurotransmitter and neurotropic levels, nerve cells, brain tissue volume, and thus developing new nerve cell connections (Cotman , Berchtold, 2007).

Studies have shown that these physiological changes that occur in the brain develop academic success as a result of positively affecting concentration, memory and processing strategies (Cotman, 2002). Finally regular physical activity in late life is likely important for maintaining integrity of brain connections and the prevention of future decline (Burdette, Laurienti, Espeland, Morgan, Telesford, Vechlekar, 2010).

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. DESCRIPTION OF STUDY AREA

This research was conducted in Central Gondar zone, East Belessa woreda. East Belessa woreda is one of the 15th woredas in Central Gondar zone, in Amhara regional state administration, Ethiopia. The town of Guhala is among the earliest, established around 1964E.C. The woreda is 117 km far from Gondar the capital city of the zone by the newly constructed junction road, 164km from Bahir Dar which is the capital city of Amhara regional state administration and 729 km from Addis Ababa, the capital city of Ethiopia. Like that of many towns in Ethiopia, particularly in Amhara regional state, Guhala is characterized by high rural to urban migration. According to the map, East Belessa woreda have bordered Ebnat woreda in the south, Jan amora woreda in the North, west belesa woreda in the west, sahila seyemt and Dihana woredas in the east. According to the 2021/2022 population census, the woreda has the total population of 146,599. Of whom 74,714 are men 71,885 women's.

Regarding religion the majority of the population practiced Orthodox Christianity, with 98.15% while 1.39% was Muslims. Of course this information is out dated because all shows sharp increase at this time, especially the number of Muslim community shows sharp increment. Most of the economy of the population is dependent of agriculture and trade. The other section of the population is public servants in different public institutions. The 90 percent area of the woreda has rugged topography with Qolla climate conditions and the rest is woyna dega.

3.2. DESIGN OF THE STUDY

Randomized parallel group design was employed in the study the comparative effects of football and aerobic dance training participation on students' attention span.

3.3. SAMPLE FRAME AND SIZE

3.3.1. SAMPLE FRAME

The study was conducted on Birhu tesfa elementary school students at Guhala town since the research is experimental to monitor in training method as well as manageable in test

administrations. The total population was Birhu tesfa grade four male students between the age of 10 and 11 which is 75 in numbers.

3.3.2. SAMPLE SIZE

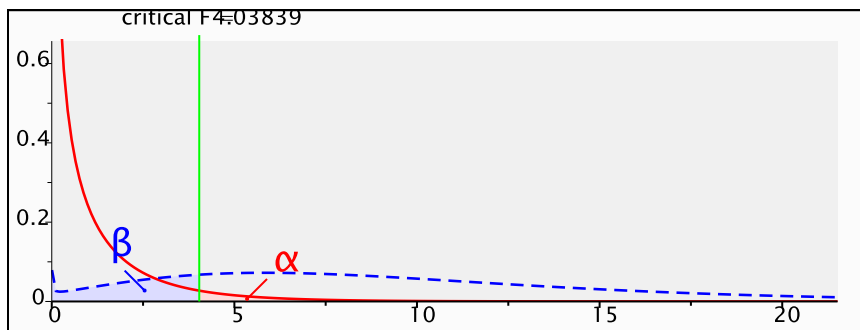
In order to select the sample size from the population simple random sampling techniques was used. Sample size was calculated using G-Power 3.1. Software with protocol of power analysis as follows:

Analysis: A priori: Compute required sample size

Input: Effect size f = 0.4
 α err prob = 0.05
 Power ($1-\beta$ err prob) = 0.8
 Numerator df = 1
 Number of groups = 2
 Number of covariates = 1

Output: Noncentrality parameter λ = 8.3200000
 Critical F = 4.0383926
 Denominator df = 49
 Total sample size = 52
 Actual power = 0.8071727

And Central and non-central distribution for critical value $F= 4.1$ as indicated bellow



Therefore, the total samples selected for the study is 52 students. Then from the total 52 children's once and again randomly assigned in to football training group (n=26) and aerobic dance training group (n=26).

3.4. MATERIAL AND METHODS

A total of 52 male grades 4th aged 10-11 volunteered in this study. This is an experimental study which employs a pre-test-post-test control group design. Both experimental groups consisted of 26 children each, who did participating in football and aerobic dance training respectively. The experimental group went through a 12-week program, engaging in sports (football and aerobic dance) three times a week. Personal information form was used to collect demographic data, and the d2 attention test was employed to assess attention levels.

Table 1:

Table 1. the study design layout

| | |
|------------------|--|
| Treatment | Football and aerobic dance program |
| Frequency | 3 days/week |
| Total duration | 12 weeks |
| Duration | 30 minutes for the 1 st week with 3 min increment per week. |
| Intensity | Moderate |
| Exercise days | Monday, Tuesday, Friday |
| Time of training | Morning 1:00-2:00 local time |

3.5. DATA COLLECTION INSTRUMENTS

The study was uses primary source of data. The primary data was collect from students using personal information form and d2 attention test.

The D2 test is a measurement of selective attention and mental concentration. It is a neuropsychological measure of selective and sustained attention and visual scanning speed and a paper and pencil test that asks participants to cross out any letter ‘d ‘ with two marks around above it or below it in any order. The surrounding distracters are usually similar to the target

stimulus, for example a 'p' with two marks or a 'd' with one or three marks. The original version of the test was created by Brickenkaamp (1981) in Germany as a cancellation task.

On the front page of the D2 test is a section where you can record your personal information and performance results, and a trial line. On the back page, there is a standard test form. The test page consists of 14 lines, each of which has 47 letters. Each line contains 16 letters consisting of the letters "p" and "d" with one, two, three and four small signs. During the test, the subject has to ignore other unrelated letters to find the letters "d" with two signs and scan the lines to draw on them. Each line is given a 20 second delay.

3.6. DATA ANALYSIS TECHNIQUES

The data obtained from the participants was analysed in terms of using inferential statistics with ANCOVA.

CHAPTER FOUR

4. RESULT AND DISCUSSION

4.1. Overview

This chapter deals with the analysis of pre and post test data collected from voluntarily selected experimental two groups under the study. The purpose of this study was find out the comparative effects of football and aerobic dance training on students' attention span living in Birhu tesfa elementary school. Pre and post d2 standard test were taken from both comparative experimental groups before and after 12 weeks of designed football and aerobic dance training, and the scores were recorded. . The collected data were analysed using ANCOVA to analyse pre-test and post-test results of the experimental two groups. In this chapter, the researcher briefly described the demographic characteristics of the respondents including sex, age, and the results of the study.

Table 2. Demographic of the respondents

As indicated in table, all of the respondents (n= 52 or100%) in this study attended in Birhu tesfa elementary school. Of those respondents age had been categorized for one group 10-11(100%).In this study 52 numbers of respondents (100%) were male and those respondents were participated in my thesis.

| Demographic characteristics | Frequency | Percentage (%) |
|-----------------------------|-----------|----------------|
| Gender | | |
| Male | 52 | 100 |
| Age | | |
| 10-11 | 52 | 100 |
| Level of education | | |
| Primary school | 52 | 100 |

Then the 52 respondents were divided in to two groups using simple random sampling technique similarly.

4.2.FINDINGS OF THE STUDY

4.2.1. ANCOVA Result of Correct Answer in the Post Test As Compared To Pre Test

The result of ANCOVA based on the correct answer in the post test as compared to pre-test to show whether or not the presence of significant difference with in the groups prior and after the treatment. Therefore, based on the analysis we find a significant difference ($P < 0.001$) result of the post-test as it compared to the pre-test in both aerobic and football trained groups with 34 % effect size. This indicates that the students' capacity of answering correct answer showed a significant improvement after both aerobic and football training Table 3. Therefore we reject the null hypothesis of participation in football training and aerobic dance training might have no significant effect on students attention span hypothesized at the beginning of the study. To the contrary a study done on the effect of different movement exercises on cognitive and motor abilities reported that not all training showed significant improvement (Thomas, 2012). However, in line with our study a meta-analysis done on older subjects reported that indeed physical activity lead to an improvement of cognitive functioning, especially executive functions (Colcombe, 2003) The differences of these inconsistencies might be the age of participants and method of training.

Table 3. Correct answer in the post test as compared to pre test

| Source | Type III Sum of Squares | Df | Mean Square | F | Sig. | Partial Eta Squared |
|-----------------|-------------------------|----|-------------|---------|------|---------------------|
| Corrected Model | 40.338 ^a | 2 | 20.169 | 17.578 | .000 | .418 |
| Intercept | 186.156 | 1 | 186.156 | 162.244 | .000 | .768 |
| Gzpre | 29.335 | 1 | 29.335 | 25.567 | .000 | .343 |
| Group | 8.100 | 1 | 8.100 | 7.059 | .011 | .126 |
| Error | 56.222 | 49 | 1.147 | | | |
| Total | 8590.148 | 52 | | | | |
| Corrected Total | 96.560 | 51 | | | | |

a. R Squared = .418 (Adjusted R Squared = .394)

As indicated in the above Table , the results of ANCOVA statistics indicated that in both groups that means football and aerobic dance groups showed significant difference between post-test compared to pre-test. However, when we compare between group results there is a significant differences between football trained and aerobic dance trained groups at the end of the training in the capacity of answering the correct answer with ($P < 0.01$) and 12.6% effect size table 4. Moreover the pairwise comparison result shows that the highest score were recorded by football trainees with mean differences (0.792) Table 5. This result indicates that even though, both training have significant effect on attention span or cognitive development, football training showed better improvement in attention span than aerobic dance. Therefore, we reject the null hypothesis there might have no significant differences between football and aerobic dance training on students attention span hypothesized at the beginning of the study.

Studies have shown that children performed folk dances for two days a week for 15 weeks and found that folk dances had a positive effect on children with attention deficit (Topcu , Yıldız, 2007). And (Shephard, 1996), also noted that physical activity improves classroom behaviour and increases AS and the ability to increase attention span, concentration and self-esteem by reducing children's annoyance. Although in another study, (Oh , Kim , Jang , Won , Lee, 2003) and (Tremblay , Inman, 2000)found that students had a positive but weak relationship between physical activity and AS. The differences of these conflicting might be the age of participants, method of training and type of exercises.

Table 4. Correct answers Differences between groups in the post test

| | Sum of Squares | Df | Mean Square | F | Sig. | Partial Eta Squared |
|----------|----------------|----|-------------|-------|------|---------------------|
| Contrast | 8.100 | 1 | 8.100 | 7.059 | .011 | .126 |
| Error | 56.222 | 49 | 1.147 | | | |

The F tests the effect of group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Table 5. Comparison of Correct answers between groups in the post test

| (I) group | (J) group | Mean Difference (I-J) | Std. Error | Sig. ^b | 95% Confidence Interval for Difference ^b | |
|---------------|---------------|--------------------------|------------|-------------------|--|-------------|
| | | | | | Lower Bound | Upper Bound |
| Football | aerobic dance | .792* | .298 | .011 | .193 | 1.391 |
| aerobic dance | Football | -.792* | .298 | .011 | -1.391 | -.193 |

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

The study also tried to observe the trainees percent error making pre and post training. Based on the analysis both the football and aerobic dance training groups showed significantly reduced error making in the post test as compared to pre training results at ($P < 0.001$) with 61% effect size Table 6. This indicates that both football training and aerobic dance trainings are significantly effective in improving attention span and reduction of error making capacity after 12 week training. Therefore, we reject the null hypothesis of participation in football training and aerobic dance training might have no significant effect on students attention span hypothesized at the beginning of the study. Different studies like (Hillman , Pontifex , Raine , Castelli , HalleE, 2009) found that moderately-intense aerobic exercises (walking) could increase the cognitive control of attention among pre-adolescent children. Similarly, in a comparative cross-sectional study conducted by (Tompsonowski , Davis , Miller, 2007), it was found that physically fit children performed cognitive tasks better and had better neurophysiological activity indicators, compared to the children who are less fit. As stated on the above study result indicates simply stands with my finding directly related due to different reasons like they may use aerobic exercise to determine student’s cognitive skill, time duration of training and age of the participants.

Table 6. Percentage of total errors in the post test as compared to pre-test

| Source | Type III Sum of Squares | Df | Mean Square | F | Sig. | Partial Eta Squared |
|-----------------|-------------------------|----|-------------|---------|------|---------------------|
| Corrected Model | 379.045 ^a | 2 | 189.523 | 52.925 | .000 | .684 |
| Intercept | 419.968 | 1 | 419.968 | 117.279 | .000 | .705 |
| Percenterrorpre | 282.048 | 1 | 282.048 | 78.764 | .000 | .616 |
| Group | 71.521 | 1 | 71.521 | 19.973 | .000 | .290 |
| Error | 175.466 | 49 | 3.581 | | | |
| Total | 20073.273 | 52 | | | | |
| Corrected Total | 554.511 | 51 | | | | |

a. R Squared = .684 (Adjusted R Squared = .671)

Even though the above result showed that both training groups are effective in improving attention and reducing error making in the post test as compared to pre-test, the between group comparison showed that the presence of significant differences between the responses of the two trainings at ($P < 0.001$) with 29% effect size Table 7. Moreover, the comparisons of percentage of total errors between groups in the post test showed that football training showed better improvement than aerobic training groups with mean differences of (-2.353) Table 8. This indicates that even though both training showed a significant improvement in developing attention span, we confirmed that football training has better attention span development and reduced error making than the aerobic training after 12 weeks training. As usual results on exercise and attention (Chinapaw, 2012) found that there was a positive relationship between physical activity and the AS in a study conducted on children. So based on the most studies findings has implies we can simply conclude that exercise can a positive effect on students' attention span, academic success and level of interest to do something their daily life style .

Table 7. Differences between groups on Percentage of total errors in the post test

| | Sum of Squares | Df | Mean Square | F | Sig. | Partial Eta Squared |
|----------|----------------|----|-------------|--------|------|---------------------|
| Contrast | 71.521 | 1 | 71.521 | 19.973 | .000 | .290 |
| Error | 175.466 | 49 | 3.581 | | | |

The F tests the effect of group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Table 8. Comparison of percentage of total errors between groups in the post test

| (I) group | (J) group | Mean Difference (I-J) | Std. Error | Sig. ^b | 95% Confidence Interval for Difference ^b | |
|---------------|---------------|-----------------------|------------|-------------------|---|-------------|
| | | | | | Lower Bound | Upper Bound |
| Football | aerobic dance | -2.353* | .527 | .000 | -3.411 | -1.295 |
| aerobic dance | Football | 2.353* | .527 | .000 | 1.295 | 3.411 |

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

In this chapter the main points of the study were summarized, concluded and given based on the result of the study, and recommendations for researchers, coaches, and concerned bodies had given based on results of the study.

The purpose of this study was to investigate the comparative effect football and aerobic dance training on student's attention span .In this study, pre-test and post-test comparison of football trainee group and aerobic dance trainee showed statistical significant difference in students attention span. The finding of this study in each variable was discussed as follows:

The first objective of the study was to identify the effects of football training participation on student's attention span. To analyse this, Before the intervention of 12 weeks designed 30 minute training for both experimental groups pre-test standard d2 attention test was recorded between the group as a base line. Similarly, after the intervention post-test d2 attention test was prepared between the groups to compute the data. Yet, the result was compute by an ANCOVA. Similarly to identify the effects of intervention training on student's attention span was also computed within the group. The findings of the study show that there were significant differences between pre and post d2 attention test on student's attention span.

5.1. CONCLUSION OF THE STUDY

Based on the analysed data, the researcher could reach the following conclusions: The main conclusion to be drawn from the results of two comparative experimental statistics is that there was a significant difference between the pre-test and the post-test result of both football and aerobic dance training on students attention spans. Similarly, based on the major findings of the study, it was concluded that there is highly significant difference on football training pre-test and post-test compared to aerobic dance training.

Therefore, based on the result of this study, the following points were reached as a conclusion.

- Participating in football training had significant effect on student's attention span in the post test compared to pre-test during the d2 standard attention test within the group.

- Participating in aerobic dance training had significant effect on student's attention span in the post test compared to pre-test during the d2 standard attention test within the group.
- Participating in football training had an a positive effect on the improvement of students attention span of grade four Birhu tesfa elementary male students rather than participating in aerobic dance training students participating.

In general, the main finding of this study was football and aerobic dance training had showed highly significant difference measuring by d2 standard attention test in the post test as compared pre-test within and between the groups. But when we compared two experimental groups that means students participated on football training had relatively showed high significant difference rather than students participated in aerobic dance training.

In the other sense the attention levels of the children who participated in football training and those who were participated aerobic dance training, were measured and analysed using the d2 attention test. The findings of this study show that the children who were engaging in football training had higher attention levels than participating in aerobic dance training .Inconformity with our hypothesis, a significant relationship was found between the attention levels of the football training active children and the aerobic dance training children ($p < 0.05$).

5.2. Recommendations

The purpose of this study was to determine the comparative effects of football and aerobic dance training on student's attention span grade four male students in Birhu tesfa elementary school. Based on the conclusions drawn in light of the research findings, the following recommendations have been forwarded.

- It is necessary to develop an awareness of different stake holders about the importance of participating on football training and aerobic dance training to improve student's attention span.

- Parents should advice and push their children participating on football training rather than participating in aerobic dance training to attention levels. Hence, in this study the football trainee groups showed a significant difference in attention span when compared with student participating on aerobic dance training groups.
- We recommend researchers to do further research on female students and males above 10-11 ages football players.
- Finally, we recommended that school principals, students' families and different stakeholders should give attention to students sport participation especially in football training to improve their attention span for learning capacity.

REFERENCES

- Banich. (1997). Attention In Neuropsychology the neural bases of mental function . *Boston: Houghton Mifflin Company*, 234–273.
- Beckett, Ardern, and R. (2015). A meta-analysis of prospective studies on the role of physical activity and the prevention of Alzheimer’s disease in older adults. *BMC Geriatr.*
- Burdette, Laurienti, Espeland, Morgan, Telesford, Vechlekar, et al. (2010). Using network science to evaluate exerciseassociated brain changes in older adults. *Front. Aging Neurosci.*
- Carson, Hunter, Kuzik, Wiebe, Spence, Friedman, E. (2016). Systematicreviewofphysicalactivityandcognitivedevelopment in early childhood. *J. Sci. Med. Sport*, 19, 573–578.
- Chaddock-Heyman, Erickson, Holtrop, Voss, Pontifex, Raine, E. (2014). Aerobicfitnessisassociatedwithgreaterwhitematter integrity in children. *Front. Hum. Neurosc.*
- Chinapaw, S. U. T. van M. (2012). Physical activity and performance at school: a systematic review of the literature including a methodological quality assessment. *Arc. Pediat. Adol. Med*, 166, 49–55.
- Coe , Pivarnik , Womack, R. M. (2006). Effect of physical education and activity levels on academic achievement in children. *Med Sei Sports Exerc*, 38, 1515–1519.
- Colcombe, & K. (2003). Fitness effects on the cognitive function of older adults: A meta-analytic study. *Psychological Sci-Ence*, 14, 125–130.
- Cotman , Berchtold, C. (2007). *Exercise builds brain health: key roles of growth factor cascades and inflammation.*
- Cotman, B. (2002). *Exercise: a behavioral intervention to enhance brain health and plasticity.*
- Fields Diego, S. (2001). *Exercise is positively related to adolescents ’ relationships and academics. Adolescence.* 36, 105–110.
- Foss, K. (1998). Fox’s physiological bases for exercise and sport. *WBCI McGraw Hill.*
- Harvey JW, R. G. (1997). *Motor performance of children with ADHD.* 189–202.
- Hillman , Erickso, and K. (2008). *Science and Society: Be Smart, Exercise Your Heart: Exercise Effects on Brain and Cognition, Nature Reviews Neuroscience.* 9, 58–65.
- Hillman , Pontifex , Raine , Castelli , HallEE, K. (2009a). *The effect of acute treadmill walking*

- on cognitive control and academic achievement in preadolescent children, *Neuroscience*, 159, 1044–1054.
- Hillman , Pontifex , Raine , Castelli , HallEE, K. (2009b). The effect of acute treadmill walking on cognitive control and academic achievement in preadolescent children. *Neuroscience*, 159, 1044–1054.
- HYavuzer. (2001). *Children Psychology*. p:54.
- Janssen , Toussaint , Van Mechelen, V. (2014). *Effects of acute bouts of physical activity on children's attention*.
- Kramer, Erickson, & C. (2006). Exercise, cognition, and the aging brain. *Journal of Applied Physiology*, 101 (4), 1237–1242.
- Moffitt. (1990). *Juvenile delinquency and attention deficit disorder: Boys' developmental trajectories from 3 to age 15*, *Child Development*. 61, 893–910.
- NimetHasilKorkmaz, F. (2021). Measurement of attention based on physical activity levels of secondary school students. *Net Journals*, 9(2).
- Oh , Kim , Jang , Won , Lee, K. (2003). *Academic performance of Korean children is associated with dietary behaviours and physical status*. 186–192.
- Posner, P. (1990). The attention system of the human brain. *Annual Review Of Neuroscience*, 13, 25–42.
- Putnam. (2001). Nature's ritalin for the marathon mind: naturing ADHD child with exercise. *Hinesburg, VT, USA: Upper Access*.
- Reynolds, K. S. (2000). Physical training as a substance abuse prevention intervention for youth. *Journal of Drug Education*, 435–451.
- Shephard. (1996). *Habitual physical activity and academic performance*. 32–36.
- Silah M. (2005). Social Psychology Behavioral Sciences, Turkey. *SeçkinYayinevi Ankara*, 47.
- Stadler. (1995). Role of attention in implicit learning. *J. Exp. Psychol. Learn. Mem. Cognit*, 21, 674–685.
- Tan tillo , Kesick , Hynd, D. (2002). the effects of exercise on children with attention-deficit hyperactivity disorder. *Medicine & Science in Sports & Exercise*, 34, 203–212.
- Thomas, M. (2012). The Effect of Different Movement Exercises on Cognitive and Motor Abilities. *Published Online November in SciRes (Http://Www.SciRP.Org/Journal/Ape)*.
- Tompsonowski , Davis , Miller, N. . (2007). Exercise and Children's Intelligence, Cognition, and

- Academic Achievement. *Educ Psychol*, 20, 111–131.
- Topcu , Yıldız, B. (2007a). *The effects of folklore exercise program in children diagnosed with attention deficit/hyperactivity disorder.*
- Topcu , Yıldız, B. (2007b). *The effects of folklore exercise program in children diagnosed with attention deficit/hyperactivity disorder.* 89–93.
- Tremblay , Inman, W. (2000). The relationship between physical activity self-esteem and academic achievement in 12 old year children. *Pediatr. Exerc. Sci*, 12:3, 12–323.
- Verburgh, Königs, Scherder, and O. (2014). Physical exercise and executive functions in preadolescent children, adolescents and young adults: a meta-analysis. *Br. J. Sports Med*, 48, 973–979.
- Yurdakul , Çamlıyer , Çamlıyer , Karabulut, S. (2012). *The effects of movement education on attention and memory development in the age group of 8 years children.*
- Zametkin , Liotta, L. (1990). *The neurobiology of attention deficit/hyperactivity disorder.*

Appendix 1

Figure 1, d2 attention test administration.



