ESSAY

THE EFFECT OF AEROBIC EXERCISE ON CARDIOVASCULAR ENDURANCE IN CLUB PB KARSA BADMINTON PLAYERS INDEPENDENTLY

AINUN FITRI

STUDY PROGRAM OF SPORTS SCIENCE
FACULTY OF SPORTS SCIENCES
UNIVERSITAS NEGERI MAKASSAR
2021

ESSAY APPROVAL

PENGESAHAN SKRIPSI

Skripsi ini diajukan oleh

Nama/Nim	:	Ainun Fitri/1733142010
Judul	:	Pengaruh Latihan Aerobik Terhadap Daya Tahan Kardiovaskuler Pada Pemain Bulutangkis Klub PB Karsa Mandiri
Nomor SK	:	**0553/UN.36.11/EP/2021**

telah dipertahankan di hadapan Dewan Penguji pada hari Jum'at, 26 Maret 2021 dan dinyatakan dapat diterima sebagai bagian persyaratan memperoleh gelar **Sarjana Olahraga** pada Program Studi Ilmu Keolahragaan, Jurusan Ilmu Keolahragaan, Fakultas Ilmu Keolahragaan, Universitas Negeri Makassar.

Disahkan oleh
Dekan Fakultas Ilmu Keolahragaan
Universitas Negeri Makassar

Prof. Dr. Hj.Hasmyati, M.Kes
NIP. 19680905 199303 2 001

Panitia Ujian

Ketua Penguji	: Drs. La Kamadi, M.Pd.	(.....)
Sekretaris Penguji	: Dra. Ichsani Basith, M.Kes	(.....)
Pembimbing I	: Dr. Arimbi, S.Or., M.Pd	(.....)
Pembimbing II	: Sarifin G, S.Or, M.Kes	(.....)
Penguji I	: Andi Atssam Mappanyukki, S.Or, M.Kes	(.....)
Penguji II	: Abdul Rahman, S.Or, M.Pd	(.....)

STATEMENT OF AUTHENTICITY

I, the undersigned, certify that this thesis is my own work and that all sources quoted and referenced have been stated correctly. If in the future it turns out that my statement is proven to be untrue, then I am willing to accept the sanctions that have been set by the Faculty of Sports Science, Makassar State University.

Who make the statement,

Name : AINUN FITRI

NIM : 1733142010

Date : March 22, 2021

PUBLICATION APPROVAL FOR ACADEMIC INTEREST

PERSETUJUAN PUBLIKASI UNTUK KEPENTINGAN AKADEMIK

Sebagai sivitas akademika Universitas Negeri Makassar, saya yang bertanda tangan di bawah ini

Nama	: AINUN FITRI
NIM	: 1733142010
Jurusan	: Ilmu Keolahragaan
Fakultas	: Ilmu Keolahragaan

Demi pengembangan ilmu pengetahuan, saya menyetujui untuk memberikan kepada Universitas Negeri Makassar Hak Bebas Royalti Noneksklusif (*Non-exclusive Royalty-Free Right*) atas skripsi saya yang berjudul:

"Pengaruh Latihan Aerobik Terhadap Daya Tahan Kardiovaskuler Pada Pemain Bulutangkis Klub PB Karsa Mandiri"

Beserta perangkat yang ada (jika diperlukan). Dengan Hak Bebas Royalti Non eksklusif ini Universitas Negeri Makassar berhak menyimpan, mengalih-media/format-kan, mengelola dalam bentuk pangkalan data (*database*), merawat, dan mempublikasikan skripsi saya selama tetap mencantumkan nama saya sebagai penulis/pencipta dan sebagai pemilik Hak Cipta, serta tidak dikomersialkan.

Demikian pernyataan ini saya buat dengan sebenarnya.

Dibuat di	: Makassar
Pada tanggal	: 22 Maret 2021

Yang Menyatakan,

AINUN FITRI
1733142010

Menyetujui,

Pembimbing I	Pembimbing II
Dr. Arimbi, S.Or., M.Pd	**Sarifin G, S.Or., M.Kes**
NIP. 198405142008122003	**NIP. 198010272005011001**

MOTTO

"Being knowledgeable is important. But being civilized is much more important.

There is no knowledge that can be obtained without prior adab."

"When I involve Allah in all my affairs, I believe that nothing is impossible to achieve."

"Don't be too concerned with someone's words, sometimes humans have a mouth but don't necessarily have a mind. (Albert Einstein)".

ABSTRACT

Ainun Fitri. 2021. The Effect of Aerobic Exercise on Cardiovascular Endurance in Klub PB Karsa Mandiri Thesis Players. Sport Science Study Program, Faculty of Sport Science, Makassar State University, (supervised by Arimbi. And Sarifin).

This study aims to determine aerobic exercise on cardiovascular endurance and to determine whether there is an effect of aerobic exercise on cardiovascular endurance in Club PB Karsa Mandiri players. This type of research is a quasi-experimental design with one group pre-test and post-test. The population in this study were badminton players Club PB Karsa Mandiri who have the same age level, namely 16-19 years with a sample size of 10 players and the sampling used is simple random sampling. Furthermore, the research data were analyzed using the SPSS 16.00 statistical test. Based on the hypothesis test in this study, the results showed that the effect of aerobic exercise on cardiovascular endurance in badminton players Club PB Karsa Mandiri. From the data of the initial test and the final test of cardiovascular endurance on badminton players Klub PB Karsa Mandiri, the mean / average difference is 4.5400, the value of T contar is -84.67 and the value of P-value is 0.000 ($P < 0.05$), the initial test of cardiovascular endurance and the final test. Cardiovascular endurance in badminton players Club PB Karsa Mandiri has the effect of a 20-minute jogging training program for 16 meetings with an increase of 4.5400.

Keywords: Aerobic Exercise, Endurance, Cardiovascular.

FOREWORD

Assalamualaikum warahmatullahi wabarakatu.

Praise and gratitude the authors pray to the presence of Allah SWT who has given His grace and guidance so that the writer is able to complete the thesis entitled "*The Effect of Aerobic Exercise on Cardiovascular Endurance in Badminton Players at PB Karsa Mandiri Club*" This thesis was submitted in order to complete the Strata I study to achieve a Bachelor of Sports degree from the Faculty of Sports Science, Makassar State University.

During the process of preparing this thesis, it was not possible without the help of various parties, either directly or indirectly. Therefore, in this paper, the writer would like to express his highest appreciation and gratitude to:

1. Mr. Prof. Dr. H. Husain Syam, M.TP, as Chancellor of UNM
2. Mrs. Prof. Dr. Hj. Hasmyati, M.Kes, Dean of FIK UNM who has given permission and opportunity for me to complete this thesis.
3. Mr. Abdul Rahman, S.Or, M.Pd as the Head of the Department of Sports Science at FIK Makassar State University and Dra. Ichsani Basith, M.Kes as Secretary of the Department of IKOR, FIK Makassar State University who always provides direction and input in this thesis.
4. Supervisor I Dr. Arimbi, S.Or., M.Pd and Mr Sarifin G, S.or, M.Kes supervisor II at FIK Makassar State University who has provided direction, knowledge and advice in completing this thesis.

5. Mr. Andi Atssam Mappanyukki, S.Or, M.Kes as examiner 1 and Abdul Rahman, S.Or, M.Pd as examiner II who always provide input, knowledge and always provide direction, knowledge and advice in completing this thesis.
6. Lecturers and Lecturer Assistants, Administrative staff and equipment in the Makassar State University FIK environment.
7. The Board of Trustees of the PB KARSA MANDIRI MAKASSAR Club who helped the author so much in this research.
8. To my beloved parents, Father, Milli dan Nillang's mother and family who has given a lot of moral support and prayers to the author, so that this thesis can be completed properly.
9. Thank you to all IKOR 17 friends, especially Warfahmi Arif and Nursamsi. Thank you for being the best friend and giving color to life. Thank you for always being there to pray for, share stories, and motivate each other for future dreams.
10. All my beloved family and friends who cannot be mentioned one by one, who have given so much support and prayers, so that the writing of this thesis can be completed.

May Allah SWT always repay the kindness that has been given. Hopefully this research can be useful for researchers in general to readers

Makassar, March 22, 2021
Writer

Ainun Fitri
1733142010

TABLE OF CONTENTS

LIST OF TABLES

LIST OF PICTURE

APPENDIX LIST

CHAPTER I

INTRODUCTION

A. Background of the problem

Sport has an important and strategic role in the life of a global era that is full of change, competition, and complexity. This concerns the formation of character and personality as well as efforts to develop and improve the quality of sustainable human resources. Sports can be done as an exercise, education, entertainment, recreation, achievement, profession, politics, business, industry, and other aspects of human life.

In the world of sports, it is divided into 2 main characters, namely aerobic and anaerobic exercise. Aerobic exercise is a low to moderate intensity sports activity that is carried out continuously, such as walking, running, cycling and jogging. Aerobic exercise is an activity that depends on the availability of oxygen to help the process of burning energy sources, so it also depends on the optimal work of the organs of the body, such as the heart, lungs and blood vessels to transport oxygen so that the process of burning energy sources can run smoothly. perfect.

While anaerobic exercise is a high-intensity activity that requires energy quickly in a short time, but cannot be done continuously for a long duration. Anaerobic exercise training requires rest intervals so that adenosine triphosphate can be regenerated, so that you can resume activities again. Aerobic exercise is an exercise that requires oxygen for energy formation that is carried out continuously, rhythmically, by involving large muscle groups, especially in the

leg muscles at an exercise intensity of 60-90% of the maximal heart rate (MHR) and 50-85% of use. maximum oxygen for 20-50 minutes with a frequency of exercise three times a week.

In the PB Karsa Mandiri Club, the level of cardiovascular endurance in badminton is very necessary because it can affect the quality of an athlete. Cardiovascular endurance is the ability of the heart and lungs to supply oxygen throughout the body for a long time. Cardiovascular endurance is a major component in physical fitness. Cardiovascular endurance is one of the main elements of physical fitness. Good endurance possessed by an athlete will affect the development of the athlete's own skills, because it will help an athlete in training and competition. For example, with good endurance, an athlete will be able to train for a longer time than an athlete with low physical fitness.

Cardiorespiratory endurance or in other terms cardiovascular fitness is considered the most basic component of physical fitness. Good cardiovascular fitness is the capital to show its appearance when in a match. Based on observations at the PB Karsa Mandiri Club, lack of aerobic exercise can cause a decrease in cardiovascular endurance in the PB Karsa Mandiri Club badminton players, while having good cardiovascular endurance greatly supports the performance of the badminton players themselves. With good performance, PB Karsa Mandiri Club players in the badminton game can also maintain their achievements, apart from having to practice techniques, they also have to keep practicing regularly and measurably. Therefore, researchers wish to conduct

research on "the effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club".

B. Research question

Based on the above background, the formulation of the problem that will be studied is "is there an effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club"

C. Research purposes

Based on the research problem, the research objective to be achieved is to determine the effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club.

D. Benefits of research

1. Theoretically

Provide empirical evidence regarding differences in cardiovascular endurance after doing aerobic exercise.

2. Practically

This research is expected to provide input regarding the importance of doing aerobic exercise to increase cardiovascular endurance.

CHAPTER II

LITERATURE REVIEW, THEORETICIAL FRAMEWORK AND HYPOTHESES

A. Literature review

Literature review is a frame of reference or as a theoretical basis that is closely related to the problems in a research. The theories put forward are expected to support the preparation of a framework of thinking which is the basis for formulating hypotheses as a temporary answer to the problems in this study

1. Aerobics Exercise

a. Definition of Aerobic Exercise

Aerobic exercise is a systematic exercise activity with a gradual and continuous increase in load that uses energy derived from combustion using oxygen, and requires oxygen without causing fatigue (Palar, 2015). In addition, regular aerobic exercise is needed by the body to maintain a person's fitness (including VO2 max) at any age, including children and the elderly. Some aerobic exercises that are safe to do, especially by individuals who have physiological problems are light to moderate intensity exercises such as walking, jogging or swimming, swimming, cycling and aerobic exercise (Kukuh, 2017).

Aerobic physical exercise can increase the value of VO2 max. However, the increase is only limited to about 10-20%, if the time used is not optimal (Intan, 2013). VO2 max is the maximum oxygen uptake or the maximum volume of oxygen that can be utilized in one minute during maximal exercise. The value of VO2 max in light activities is between 30-40 ml/kg/minute and 80-90

ml/kg/minute in athletes with high levels of exercise (Gunawan, 2015). In doing aerobic exercise, to determine whether there is an effect of increasing VO2 max on the sample being tested, it is necessary to have parameters to test the exercise (Kisner, and Colby 2016). Bleep test is usually used to measure a person's VO2 max and a person's fitness level. Weaknesses of the bleep test, practice and level of motivation can affect the grades achieved. A bad psychological state will affect the results of this test (Zacky, 2014).

Aerobic exercise or conditioning is the addition of energy utilization in muscles by using an exercise program. To get the benefits of doing sports and aerobic exercise, you must use the correct exercise rules, namely FITT (Frequency, Intensity, Type, and Time). Aerobic exercise is a systematic exercise activity with a gradual and continuous increase in load that uses energy derived from combustion using oxygen, and requires oxygen without causing fatigue. With regular aerobic exercise, blood flow becomes smooth and accelerates the disposal of metabolic waste substances so that recovery takes place quickly, and a person will not experience fatigue after carrying out tasks, and can still perform other activities (Palar, 2015).

VO2 max is the maximum oxygen uptake or the maximum volume of oxygen that can be utilized in one minute during maximal exercise. The value of VO2 max at light activity is between 30-40 ml/kg/minute and 80-90 ml/kg/minute in athletes with high levels of exercise (Gunawan, 2015). In doing aerobic exercise, to determine whether there is an effect of increasing VO2 max on the sample being tested, it is necessary to have parameters to test the exercise (Kisner,

and Colby 2016). Bleep test is usually used to measure a person's VO2 max and a person's fitness level. Weaknesses of the bleep test, practice and level of motivation can affect the grades achieved. A bad psychological state will affect the results of this test (Zacky, 2014).

There are two characteristics of aerobic exercise, namely that exercise provides enough body movement that causes your body to function for a period of at least 20 to 30 minutes each time you exercise, this exercise will provide activities that are interesting enough to make you want to repeat it again and again for the future. Garrison, 2007). Aerobic exercise is a type of exercise that can improve heart and lung health. Aerobic sports activities can provide maximum results if done regularly and effectively so as to achieve the goal of not causing injury (Purba, 2006). Aerobic exercise is a sport that is carried out continuously where the body's need for oxygen can still be met. Aerobic exercise is divided into 3 types (Miller, 2006):

1) Type 1: Exercise with a relatively steady rise and fall of the pulse. Examples: walking, cycling, and treadmill.
2) Type 2: Exercise with a gradual rise and fall of the pulse. Example: gymnastics, dancing, and swimming.
3) Type 3: Sports with a sudden rise and fall of the pulse, usually in the form of a game. Examples: football, basketball, volleyball, court tennis, and table tennis.

Aerobic fitness creates a high level of efficiency in the circulatory and respiratory systems in carrying oxygen to working muscles. The more oxygen we

can breathe and use, the longer it will take us to work (exercise) before exhaustion. In exercise an efficient aerobic system will help the body adapt to lactate levels, facilitate its elimination, and speed healing. This will make runners able to run maximally for a longer time (Brittenham, 2008).

b. jogging

Jogging is a sport that has a high aerobic value, immediately after swimming. Because jogging is an aerobic activity, it is especially useful for improving and maintaining the health and fitness of the heart, lungs, blood circulation and the muscles and joints of the legs. Jogging is a moderate-intensity aerobic exercise. This movement is very useful for endurance, health and fitness. This run is more concerned with endurance than speed. Jogging exercises are done with short, steady, and relaxed steps. When running, breathe calmly and simultaneously with footsteps (Wahyu, 2013).

Jogging is an exercise that is easy, inexpensive, and can be done by anyone. Jogging exercises are done by jogging or running slowly. The movement or technique in jogging can be said to be simple, but the benefits for physical condition and maintenance of fitness and health are extraordinary. Based on the energy supply system, jogging can be categorized into aerobic exercise (Irianto, 2009).

2. Cardiovascular Endurance

a. Understanding Cardiovascular Endurance

Cardiovascular endurance or lung and heart endurance is one component of physical fitness. Physical fitness is very important to support muscle work by

taking oxygen and distributing it throughout active muscle tissue, so it is used in metabolic processes. According to Ni Luh Putu Spyanawati (2013: 17) endurance is translated from English endurance which means endurance or endurance. Endurance is the organism's capacity to fight fatigue in any activity that requires a long time. This means the ability of the organism related to the function of the heart, lungs and blood circulation. According to Nurhasan and Choiril Hasanudin (2014: 125) that cardiovascular endurance is one of the main elements of physical fitness. Cardiovascular endurance is the ability of the heart, lungs, blood vessels, and large muscle groups to exercise for a long time (Len Kravitz, 1997: 5). Cardiovascular endurance is also known as aerobic endurance. Aerobic endurance is the ability to consume the highest oxygen during maximal work expressed in liters/minute or ml/kg/minute (Suharjana, 2013: 51).

From the various definitions above, it can be concluded that cardiovascular endurance (aerobic endurance) is the ability of the heart and lungs to supply oxygen throughout the body for a long time and cardiovascular endurance is a major component in physical fitness.

b. Functional Capacity of the Cardiovascular System

The main factors limiting most forms of exercise lasting more than three or four minutes are the capacity of the heart, lungs, and circulation to deliver oxygen to the working muscles (Junusul Hairy, 1989: 186). So to measure a person's capacity to perform aerobic activities, one must try to assess the maximum capacity of heart and lung function.

The maximum oxygen consumption value is abbreviated as VO2max. This means that VO2 shows the volume of oxygen consumed, usually expressed in liters or milliliters and the V sign is a sign that states that volume is expressed in units of time, usually per minute. So to measure the maximum oxygen consumption, one must know how much oxygen is inhaled and the amount of oxygen exhaled. The difference between the two is the amount of oxygen consumed to produce energy for active tissues. The factors that determine maximum oxygen consumption (VO2max) according to Junusul Hairy (1989: 188) are as follows:

1) The heart, lungs and blood vessels must function properly. Because the oxygen that is inhaled and enters the lungs reaches the red blood then the blood will be pumped by the heart to be distributed throughout the body.
2) The process of delivering oxygen to the tissues by red blood cells must be normal, namely normal heart function, normal blood volume, normal number of red blood cells and normal blood vessel tissue so as to be able to circulate oxygen throughout the body.
3) Tissues, especially muscles, must have a normal capacity to use the oxygen delivered to them. This is useful in order to be able to consume oxygen to the maximum.

According to Lamb, DR in Junusal Hairry (1989: 188-189) that the lungs of healthy people are able to consume unlimited oxygen. In addition, factors that need to be considered in determining maximum oxygen consumption are data on special tests regarding body posture, muscle mass used in exercise, exercise

duration, mechanical efficiency and motivation (Nagle, FJ and Rowell in Junusal Hairy, 1989: 191). Exercise is one of the influential factors in increasing cardiovascular endurance, according to Brian J Sharkey (2003: 80) exercise can increase the function and capacity of the respiratory and cardiovascular systems and blood volume, but the most important changes occur in muscle fibers used in exercise.

c. Exercise For Cardiovascular Endurance

To train cardiopulmonary endurance (VO2 Max) there are several things that must be considered, including movements that involve the large muscles of the body, the type of continuous-rhythmic motion, and the nature of aerobic motion. A good exercise to increase VO2 Max is a type of cardio or aerobic exercise, because it triggers the heart rate, lungs, blood vessels, and muscular system. Exercise targets for a large VO2 Max so that athletes have better endurance and are able to carry out high-intensity activities for longer (Sukadiyanto & Dangsina Muluk, 2011: 80)

Exercises that use the large muscles of the body, anatomically large muscles are located in the lower part or legs. One form of exercise for large muscles in the legs is aerobic exercise. Aerobic gymnastics is a sport that can provide continuous movement, according to the tone, namely moderate to high intensity. Movement in aerobic exercise at moderate intensity as measured by an increase in exercise heart rate. Aerobic gymnastics is a type of exercise that is predominantly aerobic.

d. Cardiovascular Endurance Exercise Method

Cardiopulmonary endurance training (VO2 Max) has several training models with the aim of increasing cardiopulmonary endurance. The training methods for VO2 Max include continuous, fartlek, and interval models. Rushall and Pyke (1990: 201) state that to develop aerobic endurance there are three training methods, namely Continuous Training, Fartlek Training, and Interval Training.

1) *Continuous Training*or continuous exercise, exercise that usually takes a long time, continues without stopping, and is done without rest breaks. The time used for continuous exercise is relatively long, 30 minutes or more. Competitive sports that are included in continuous training are bicycle racing, marathon running, and triathlon. While in the sport of games, such as in football. Continuous training method has an intensity which is divided into two, low intensity and high intensity.
2) *Fartlek Training*designed not only to develop the cardiorespiratory system, but also to develop muscle strength. The Fartlek Training method is often called a speed-playing exercise method. The Fartlek Training method also has two training intensities, high intensity and low intensity.
3) *Interval Training*or intermittent exercise, is an exercise that has work intervals and interspersed with rest intervals (recovery). Interval training usually uses high intensity, which is 80-85% of HR.max. The time (duration) used is between 2-5 minutes. Rest time between 2-8 minutes. The ratio of exercise to rest is 1:1 or 1:2. Repetitions (repetitions) 3-12

times. Interval training methods are divided into long, medium and short intervals.

In determining the right training model or method for the right purpose, it is necessary to pay attention to the level of training and a person's physical condition.

e. Benefits of Cardiovascular Endurance Exercise

Cardiovascular endurance is very beneficial for an athlete. A person's cardiovascular endurance determines the extent to which an athlete is able to run. The higher the level of a person's cardiovascular endurance, the farther the distance that can be traveled (Suharjana, 2013: 53). Cardiovascular endurance training encourages the work of the heart, blood, and lungs for a period of time long enough to produce organ repair. Based on research presented by Rusli Lutan, et al (2002: 46) the benefits of developing cardiovascular endurance can reduce the risk of: (1) high blood pressure, (2) coronary heart disease, (3) obesity, (4) diabetes, (5) cancer.

3. Sports Games Badminton

Badminton is a skill game that consists of several basic techniques or strokes in play. According to James Poole (2006: 6), that: "Basic skills of badminton can be divided into four parts, consisting of; racket grips, serve hits, over the head strokes, and low swings”. To be able to carry out all forms of basic techniques, one must have good skills.

Badminton playing skills are the ability to use the knowledge of players effectively and readily in implementation, as well as to achieve stability from a

success in achieving a goal. This is in line with what was stated by Siregar (1981: 36), that: "Technique as the implementation of an activity effectively and rationally that allows the achievement of better results in matches". This means that by knowing all the basic techniques of badminton strokes, players will be able to play badminton well and will be able to return all the results of the opponent's strokes in all directions.

According to Johnson (2009: 997), suggests that: a player's skills will improve his choice of strokes, accuracy and strength to play, as well as his ability to deceive opponents. Furthermore, Agus Salim (2007: 60) stated that: "The technique of hitting the shuttlecock to cross the net is called a stroke". As for the basic techniques of badminton, Feri Kurniawan (2012: 51) explains, as follows:

- How to hold a racket.
- *Footwork.*
- *Service* (short/tall).
- Service returns.
- *Underhand.*
- *Overhead Clear.*
- *Round the head.*
- *netting.*
- *Drive.*
- *smash.*

Badminton is a game that uses the help of a racket. So to be able to play correctly, it is necessary to pay attention to how to hold the racket. This greatly determines the quality of a badminton player's stroke.

Therefore, if the racket grip technique is wrong from the start, it is very difficult to improve the quality of the game. Correct grip of the racket is the basis

for developing and improving all types of strokes in the game of badminton. In addition, to support the ability to play badminton, players must master various basic stroke techniques in the game of badminton correctly.

1). Racket Holding Technique (Grips)

Basically, in the game of badminton, there are several ways to grip the racket. The correct way to grip a racket according to Hermawan Aksan (2012: 53), the racket must be held using the fingers in a flexible and relaxed manner. James Poole (2006: 18), suggests that: “there are three ways to hold a badminton racket; forehand, backhand, and frying pan”. However, the handle most often used by badminton players according to Hermawan Aksan (2012: 53), is "forehand and backhand". Correct grip of the racket, and utilize wrist force when hitting the shuttlecock.

How to grip the forehand, according to Mikadan Rahmani (134: 73), that: "The forehand grip technique is done in a way like shaking hands". While the backhand grip, is done by placing the thumb on the racket rod to form the letter "T", the pressure from the thumb should press lightly on the grip.held in an oblique position, thumb and forefinger attached to the narrow handle of the racket. When holding the racket, it should not be changed. While the backhand grip, the racket is held in an oblique position and when holding the racket the thumb is on the back of the racket handle, while the fingers placed at the front.

B. Theoretical framework

The framework of thinking is a temporary explanation of the symptoms that are the object of the problem and is an introduction to the arguments put forward.

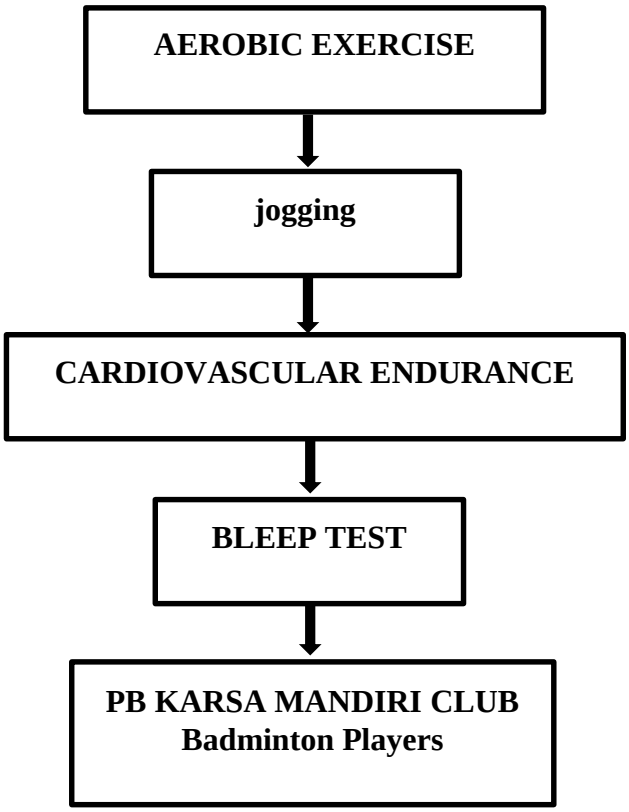


Figure 2.1 : frame of mind

From the pattern or flow of thought that is arranged in the framework of the scheme shown in the figure, it can be seen that:

If badminton players are given a regular form of exercise, namely jogging, it will affect cardiovascular endurance by conducting a bleep test on badminton players at PB Karsa Mandiri Club. Researchers will do exercises, namely jogging for 16 meetings to see an increase in cardiovascular endurance by means of a bleep test on badminton players at the PB Karsa Mandiri Club.

C. Hypothesis

The hypothesis is a presumption or assumption that must be tested through data or facts obtained through research (Dantes, 2012). In addition, the proposed hypothesis is also an indication of the extent to which the researcher has mastered the concepts and theories in relation to the problem posed.

H0 :μ xy = 0

Ha:μ xy 0

Information :

H0: H0 is accepted and Ha is rejected if there is no effect of aerobic exercise on cardiovascular endurance in badminton players at PB Karsa Mandiri Club.

Ha : Ha is accepted and H0 is rejected if there is an effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club

CHAPTER III

METHODS

A. Types of research

This type of research is a quasi-experimental design with one group pre-test and post-test by looking at the effect of aerobic exercise.

B. Location and time of research

1. Research Place

   This research will be carried outat Gor Badminton Borong, Makassar.

2. Research time

   This research will be conducted in October - November 2020.

C. Variables and Research Design

1. Research variable .

In this research, the research variables are the factors that play a role in an event that will affect the results of the study. To understand clearly about the variables involved, it is identified as follows:

a. The independent variable (independent variable) is a variable that affects the dependent variable. The independent variable in this study is Aerobic Exercise.
b. The dependent variable is the variable that is influenced by the independent variable. As for the dependent variable in this study, namely:Cardiovascular Endurance.

2. Research design

The method used in this study is an experimental method with a pre-experimental design. With regard to experiments (Sugiyono, 2015: 107) revealed that "in experimental research there is treatment (treatment), experimental research methods can be interpreted as research methods used to find the effect of certain treatments on others under controlled conditions".

Furthermore, Sugiyono, (2015: 109) explains that it is said to be pre-experimental design "because this design is not yet a real experiment. Because there are still external variables that also influence the formation of the dependent variable. The design used in this study is the One Group Pretest-Posttest, which means that a group of samples is taken from the results of aerobic endurance before and after being given treatment, so that it can be compared with the situation before being given treatment. For more details, this design is described as follows:

O1---------->X---------->O2

Figure 3.1. One Group Pretest-Posttest

Source: Sugiyono (2015)

Information:

O1 : Cardiovascular Endurance Pretest/ Pretest
X : Jogging Aerobic Exercise Treatment
O2 : Cardiovascular Endurance final test/posttest

D. Population and Sample

1. Population

The population is a generalization area consisting of objects/subjects that have certain qualities and characteristics, determined by researchers to be studied and then drawn conclusions (Sugiyono, 2016). The population in this study is allPB Karsa Mandiri Club Badminton Players totaling 10 people.

2. Sample

According to Suharsimi Arikunto (2010: 177) the sample is "a part or representative of the population". The number of samples to be used considers the following:

a. Researcher ability
b. The breadth of the research subject is narrow.
c. The size of the research risk

So that the desired number of samples is 10 badminton players of the PB Karsa Mandiri Club. Sampling using a total sampling technique, the technique of determining the sample by taking all members of the population as respondents or samples. So the sample in this study were all 10 players of the PB Karsa Mandiri Club badminton.

E. Variable Operational Definition

In order to prevent wide interpretation of the variables involved in this research, it is necessary to define as follows:

1. The aerobic exercise referred to in this study was jogging for 20 minutes which was carried out 3 times a week for 16 meetings.
2. Cardiovascular endurance referred to in this study is a person's ability to run or do work continuously for a long time. To test cardiovascular endurance is done by using the Bleep Test.

F. Research procedure

This research will be conducted in the afternoon at 16.00 WIB until it is finished, this activity includes three main parts, namely:

1. Warming up

   The purpose of a warm-up is to stretch, stretch, and prepare the muscles for use in core training. In addition to avoiding the possibility of injury.

2. Core workout

   The core exercise here is to do aerobic exercise, namely jogging for 20 minutes.

3. Cooling

   The purpose of cooling is to restore / restore the condition of the body to its pre-exercise state so that the heart rate and breathing gradually recover.

Table 3.1. Aerobic Exercise Schedule

NO	DATE	MATERIAL EXERCISE	DURATION	AIM EXERCISE	THE PLACE EXERCISE
1.	First Sunday 26,28,30 October 2020	The first day of the Pre-test was the Bleep Test. Then the next day was the			

		jogging exercise. Always start with a warm-up.	20 minutes	To increase cardiovascular endurance	Badminton Court, MAKASSAR WHOLESALE
2.	Second Sunday 2,4,6 November 2020	Warm up. Then do jogging exercises			
3.	Third Sunday 9,11,13 November 2020	Warm up. Then do jogging exercises			
4.	The fifth week 23,25,27 November 2020	Warm up. Then do jogging exercises.			
5.	The sixth week of November 30, 2020				

G. Data collection technique

The data collection technique used in this study is a test and measurement technique, which is a way of collecting data for analysis. Before taking measurements, the sample of this study was given an explanation of the measurement procedure.

The steps taken in collecting research data are as follows:

1. Work procedures or jogging procedures.

a. Aerobic exercise

Jogging steps.

1) Body posture should be leaning slightly forward.
2) Head straight with gaze always directed forward.
3) Casual running (jogging) with foot movements when stepping does not need to be 30-40 cm long enough.
4) The position of the feet should always be relaxed.
5) Arms swinging naturally with fingers do not need to be clenched, just open them slightly.
6) The rhythm of running criss-crossed between the hands and feet.

2. Cardiovascular endurance data was collected before and after being given jogging treatment three times a week for six weeks.

H. Research Instruments

The research instrument according to Arikunto (2006: 149) is a tool at the time of research using a method.

The tools and equipment used in this study are as follows:

1. *Stopwatch*
2. bleep test form
3. Stationery
4. test officer

The test instruments in this study are as follows:

1. Measurement of cardiovascular endurance using the bleep test, before (pretest) was given treatment and after (posttest) was given treatment.
2. The following is the procedure for performing the bleep test:
    1. Measure the distance of 20 meters and mark the line using chalk.
    2. Instruct the test taker to warm up sufficiently.
    3. Start is done by standing and the position of the feet behind the line on one side. With the signal "ready-yes" (according to the rhythm on the cassette), the athlete runs according to the rhythm of the cassette to the opposite side.
    4. The test taker must try to get to the opposite side to coincide with the first “tut” sound from the cassette.
    5. The end of each run is signaled by a single “tut” signal, while the end of each level is signaled by three “tut” signals.
    6. If the "tut" sound signal has not been heard when the athlete arrives on the opposite side (the athlete is faster than the tempo), then to run back must wait for the "tut" sound signal. On the other hand, if the athlete has not arrived on the opposite side but the "tut" sound signal has been heard (the athlete is slower than the tempo), the athlete must increase his speed.
    7. If two consecutive "tut" sounds, the athlete is unable to follow the rhythm of the run, it means that the athlete has reached the maximum limit and the test is considered to have ended.

8. The test results in the form of levels and feedback are then matched with the test norm in the form of VO2max predictions.

I. Data analysis technique

The analysis used in this research is quantitative descriptive analysis, namely analyzing quantitative data by describing or describing the data that has been collected as it is without intending to make conclusions that apply to the public or generalizations. This analysis is only in the form of accumulation of basic data in the form of mere descriptions in the sense of not seeking or explaining interrelationships, testing hypotheses, making predictions, or drawing conclusions (Sugiyono, 2015).

In this case, quantitative data analysis will focus on the average value of respondents' answers (mean) or percentage (percentage). This data is needed to provide an overview of the quantitative data of research results for further interpretation based on the principles of quantitative data analysis.

The analysis technique obtained in this study is the level of playing skills. Badminton Club PB Karsa Mandiri From the data obtained from this study, it was continued by analyzing the data and then drawing conclusions using parametric statistics.

1. Prerequisite Test and Data Analysis

a. Normality test

The normality test is nothing but actually testing the normal distribution of the data to be analyzed. Tests are carried out depending on the variables to be processed. Testing the normality of the data using the Kolmogorov-Smirnov

Test with the help of SPSS if the p value > of 0.05 then the data is normal, but on the contrary if the analysis results show the p value < of 0.05 then the data is not normal.

b. Homogeneity Test

In addition to testing the distribution of values to be analyzed, it is necessary to test homogeneity to ensure that the groups that make up the sample come from a homogeneous population. Homogeneity was searched with the F test from the pretest and posttest data using the SPSS program. The homogeneity test was carried out using the ANOVA test, if the results of the analysis showed a p value > of 0.05, then the data was homogeneous, but if the results of the data analysis showed a p value < of 0.05, then the data was not homogeneous.

2. Hypothesis test

Testing the hypothesis using the t-test using the SPSS 25 program, namely by comparing the mean between group one and group two. The level of significance used is 5%. According to Sutrisno Hadi (1991: 34) the formula for the percentage increase is as follows:

Percentage increase = Mean difference / pretest x 100%

CHAPTER IV

RESULTS AND DISCUSSION

This chapter describes the results of data analysis to present the findings or research results, namely the effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club. To answer the problems and to achieve the objectives and to test the hypotheses of this study, all the data were processed using the SPSS 16.00 statistical test with descriptive and normality tests, and hypothesis testing.

A. Descriptive analysis

Descriptive data analysis is intended to obtain an overview of research data. Data descriptions are intended to be able to interpret and give meaning to the data.

Table IV-1 Summary of the results of descriptive analysis of the data on the effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club

Variable	N	Range	Minimum	Maximum	Sum	mean	SD	Variance
Initial cardiovascular endurance test	10	7.50	34.70	42.20	375.20	37.5200	2.44122	5.960
Cardiovascular endurance final test	10	2.70	40.20	42.90	420.60	42.0600	.99800	.996
Athlete age 16-19 PB Karsa Mandiri Club	10	3.00	16.00	19.00	175.00	17.5000	1.26930	1,611

Table IV-1 above is explained as follows:

1. Data Initial cardiovascular endurance testThe obtained value of N or 10 samples is 7.50, the minimum value is 34.70, the maximum is 42.20, the

sum or total value is 375.20, the mean (average) is 37.52000, the standard deviation is 2.44122 and the variance is 5.960.

2. Data Cardiovascular endurance final testThe obtained value of N or 10 samples is 2.70, the minimum value is 40.20, the maximum is 42.90, the sum value or total is 420.60, the mean (average) is 42.06000, the standard deviation is 998000 and the variance is 996.
3. Data athlete PB Karsa Mandiri Club badminton from 16-19 years old obtained the value of N or sample 10 range 3.00, minimum value 16.00, maximum 19.00, sum value or total number 175.00, mean value (average) 17.5000, standard deviation1.26930 and variance 1.611

B. Data Normality Test

One of the assumptions that must be met so that parametric statistics can be used is that the data follows a normal distribution. If the test turns out to be normally distributed, it means that the parametric statistical analysis has been fulfilled. To find out the data for the two groups are normally distributed, from the research titlethe effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club, then tested using the Kolmogorov Smirnov test. The results of the data normality test can be seen in the following table:

Table IV-2. Summary of data normality test resultsthe effect of aerobic exercise on cardiovascular endurance in badminton players at PB Karsa Mandiri Club.

Variable	Absolute	Positive	Negative	KS-Z	Asymp	Note:
Initial cardiovascular endurance test	0.172	0.172	-0.156	0.544	0.929	Normal
Cardiovascular endurance final test	0.306	0.200	-0.306	0.967	0.307	Normal

Table IV-2 above shows that the results of testing the normality of the data using the Kolmogorov Smirnov test show the following results:

1. Data from the initial cardiovascular endurance test obtained absolute value 0.172, positive 0.172, negative -0.156, Kolmogorov-Smirnov 0.544, Asymptote. Sig 0.929 (P>0.05), it can be said that the data follows a normal distribution or is normally distributed.
2. Cardiovascular endurance final test data obtained absolute value 0.306, positive 0.200, negative -0.306, Kolmogorov-Smirnov 0.967, Asymptote. Sig 0.307 (P>0.05), it can be said that the data follows a normal distribution or is normally distributed.

C. Hypothesis Testing Results

The hypotheses carried out in this study need to be tested and proven through empirical data obtained in the field through tests and measurements of the variables studied with research variables.the effect of aerobic exercise on cardiovascular endurance in badminton players at PB Karsa Mandiri Club. Furthermore, the data will be processed statistically. The hypothesis testing of this research is used is the T-Test

Table IV-3. Analysis test results the effect of aerobic exercise on cardiovascular endurance in badminton players at PB Karsa Mandiri Club.

Variable	N	mean	Tcount	Sig
Initial cardiovascular endurance test	10	37.5200	48,602	0.00
Cardiovascular endurance final test	10	42.0600	133,272	0.00
	Difference	4.5400	-84.67	

Based on the table above, it can be stated as follows:

1. From data Initial cardiovascular endurance testPB Karsa Mandiri Club badminton player obtained the value of N or sample 10 mean/average 37.5200. Tcount 48.602 and the P value is 0.00 (P < 0.05).
2. From data Cardiovascular endurance final test onPB Karsa Mandiri Club badminton player obtained the value of N or sample 10 mean/average 42.0600. Tcount value is 133,272 and P value is 0.00 (P<0.05).
3. From data Initial cardiovascular endurance test and cardiovascular endurance final test onPB Karsa Mandiri Club badminton player obtained the value of the difference in the mean / average 4.5400, Tcount value -84.67 and the P value of 0.000 (P <0.05) the initial test cardiovascular endurance and cardiovascular endurance final test onPB Karsa Mandiri Club badminton players have the effect of a 20 minute jogging training program for 16 meetings with an increase of 4,5400.

D. Discussion

The results of the analysis of the effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club on the dependent variable. To test the hypothesis, it is necessary to study further by providing an interpretation of the relationship between the results of the analysis achieved and the theories that underlie the research.

This explanation is needed in order to know the suitability of the theories put forward with the research results obtained. Where there is an effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club. The results obtained when associated with the framework of thinking and the underlying theories, basically the results of this study support the underlying theory.

In this study, the variables used were aerobic exercise as the independent variable and cardiovascular endurance the dependent variable. This study aims to determine the effect of aerobic exercise on cardiovascular endurance in badminton players at PB Karsa Mandiri Club with 10 samples requiring aerobic exercise. With the criteria of age 16-19 years, with the first treatment measuring cardiovascular endurance with a test, namely the bleep test, then given 20 minutes of jogging aerobic exercise for 16 meetings then measuring cardiovascular endurance again with the bleep test.

Based on the hypothesis test in this study, it was found that the effect of aerobic exercise on cardiovascular endurance in badminton players at the PB

Karsa Mandiri Club was very significant. This can be seen from the value of the SPSS test results, namely From the results of calculations on the data above,From data Initial cardiovascular endurance test and cardiovascular endurance final test onPB Karsa Mandiri Club badminton player obtained the value of the difference in the mean / average 4.5400. from the results of 20 minutes of jogging for 16 meetings with an increase of 4.5400

From the results of this test, researchers were able to assess good and bad cardiovascular endurance in children PB Karsa Mandiri Club badminton player thatThe good cardiovascular endurance of this club is that the average age of those who move into the adult category is 17-19 years, and the less good is the age category of 16 years.

As in previous studies, it was shown that "after using the aerobic exercise method, the ability of students' cardiovascular endurance who took part in basketball extracurriculars increased significantly, because with the results of this study, it is hoped that this aerobic exercise model can be applied to a cardiovascular endurance training model, from the application of this method. aerobic exercise on the ability of students' cardiovascular endurance who take part in the men's basketball extracurricular at SMAN 3 Sukabum City".

From the results of this study, aerobic exercise becomes a comparison from previous studies, namely; Aerobic exercise is a systematic exercise activity with a gradual and continuous increase in load that uses energy derived from

combustion using oxygen, and requires oxygen without causing fatigue (Palar, 2015).

Aerobic exercise or conditioning is the addition of energy utilization in muscles by using an exercise program. To get the benefits of doing sports and aerobic exercise, you must use the correct exercise rules, namely FITT (Frequency, Intensity, Type, and Time). Aerobic exercise is a systematic exercise activity with a gradual and continuous increase in load that uses energy derived from combustion using oxygen, and requires oxygen without causing fatigue. With regular aerobic exercise, blood flow becomes smooth and accelerates the disposal of metabolic waste substances so that recovery takes place quickly, and a person will not experience fatigue after carrying out tasks, and can still perform other activities (Palar, 2015).Aerobic exercise is a type of exercise that can improve heart and lung health. Aerobic sports activities can provide maximum results if done regularly and effectively so as to achieve the goal of not causing injury (Purba, 2006).

Cardiovascular endurance or lung and heart endurance is one component of physical fitness. Physical fitness is very important to support muscle work by taking oxygen and distributing it throughout active muscle tissue, so it is used in metabolic processes. According to Ni Luh Putu Spyanawati (2013: 17) endurance is translated from English endurance which means endurance or endurance. Endurance is the organism's capacity to fight fatigue in any activity that requires a long time. This means the ability of the organism related to the function of the heart, lungs and blood circulation. According to Nurhasan and Choiril Hasanudin

(2014: 125) that cardiovascular endurance is one of the main elements of physical fitness. Cardiovascular endurance is the ability of the heart, lungs,

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

In this chapter, the conclusions of the research as the ultimate goal of a study are presented based on the results of data analysis and discussion. From the results of this conclusion will be put forward some suggestions as recommendations for the implementation and development of research results.

5.1. Conclusion

Based on the data analysis and discussion, it is found that the effect of aerobic exercise on cardiovascular endurance in badminton players at the PB Karsa Mandiri Club after giving 20 minutes of jogging aerobic exercise for 16 meetings. It can be concluded that from the data above, it is explained that there is an effect of aerobic exercise on cardiovascular endurance in badminton athletes at the PB Karsa Mandiri Club..

5.2. Recommendations

Based on the results of data analysis and the conclusions of this study, it can be recommended or suggested several things:

1. It is hoped that all levels of society, students or badminton athletes and also other athletes to increase knowledge about aerobic exercise.
2. The results of this study can be input for teachers or coaches to provide information to their players/athletes that increasing cardiovascular endurance can use jogging exercises.

3. To increase the ability to exercise endurance, it is necessary to pay attention to the form of exercise performed.

REFERENCES

*Aksan. Hermawan. Skilled Badminton.*Bandung: Scholarly nuances. 2012.

Deed of Setyo Pambudi (2016). Cardiovascular Endurance Level of Football Extracurricular Participants at SMA Negeri 2 Wonosobo for the 2015/2016 academic year. Essay. Faculty of Sports Science, Yogyakarta State University.

Andhi Suwardana (2007). The Level of Aerobic Freshness of SMA N 2 Sleman following the volleyball extracurricular. Essay. Faculty of Sports Science, Yogyakarta State University.

Arikunto. (2010). Research Procedure: A Practical Approach. Jakarta: Rineka Cipta.

Bahfirman BH. (2013). Contribution of Sports Physiology to Overcome Risk Towards Optima Achievement : Semarang: Semarang State University.

Ministry of National Education.(2000). Sports Health Training Guidelines and Modules for Coaches of Student Athletes. Jakarta: Center for Physical Quality Development.

Endang Mulyatiningsih, 2011. Evaluation of a Program Process, Bumi Aksara. Jakarta

Junusul Hairy (1989). Physiology and Sport. Jakarta: Debdikbud.

Ministry of National Education. (2010). Government Regulation Number 17 of 2010 concerning Management and Implementation of Education. Jakarta: Ministry of National Education

Kravitz, Len. (1997). Complete Guide to Total Fitness. Jakarta : PT Raja Gravindo
Homeland.

Kurniawan. ferry. Sports Knowledge Smart Book. Jakarta : Lakskar Aksara, 2012,

Kusumaningtyas, DN 2011. The effect of light and moderate intensity aerobic exercise on decreasing body fat percentage. Thesis, Muhammadiyah University

Kusumah, Wijaya and Dedi Dwitagama. 2011. Knowing Classroom Action Research. Edition: 2. Jakarta: PT Index.

Nurhasan, and Choiril Hasanudin, (2014). Sports Tests and Measurements,. Bandung: UPI

Noegroho, Hadi. 1998. Fundamentals of Sports Management. Surabaya. Teacher Training and Education Institutions

Palar, Chrisly M. 2015. The benefits of aerobic exercise on human physical fitness. Journal of e-Biomedicine (eBm)

Purba, A. 2006. KarJiovaskulcir and Sports Physiology. Bandung. Department of Physiology, Faculty of Medicine, University of Padjadjaran.

Poole James. Learn Badminton. Bandung: Publisher Pioner Jaya, 2006.

Salim, Agus. Badminton Smart Book. Bandung : Jembar, 2007.

Singer, Robert N. Motor Learning And Performance Application To Motor Skill And Movement Behavior. In Sudiadharma, the relationship between arm explosive power and flexibility with smash ability in badminton games for students of FIK Sports Science, FIK UNM Makassar. 2009. (Scientific Journal: Ikhtiyar ISSN 14128535.Vol.7 No.3. Year 2099) hh. 997-1132.

Sugiyono. (2016). Quantitative, Qualitative and R&D Research Methods. Bandung: PT Alphabet.

Stoner, J. A., R. Edward Freeman., Daniel A. Gilbert, Jr.. 1995. Management. Issue 6. Prentice-Hall International, Inc. Englewood Cliffs, New Jersey.

Terry, Georgia R. & Leslie W. Rue. 2011. Fundamentals of Management. Jakarta: Bumi Aksara.

Wiradi, Gunawan. 2002. Social Analysis. Jakarta. Rineka Cpt

Lampiran 1 : Persuratan

1. **Surat Keterangan Lulus Seminar**

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI MAKASSAR
FAKULTAS ILMU KEOLAHRAGAAN
Alamat : Wijaya Kusuma Raya No. 14 Telpon (0411) 872602
Kampus Banta - bantaeng Kode Pos 90222 Makassar
Laman : www.unm.ac.id

SURAT KETERANGAN LULUS SEMINAR
Nomor : 6798/UN36.3.7/PP/2020

Yang bertanda tangan di bawah ini Ketua Jurusan Ilmu Keolahragaan Universitas Negeri Makassar menerangkan:

Nama : **AINUN FITRI**
NIM : 1733142010

Benar telah Lulus Seminar Proposal Penelitian yang dilakukan pada hari Selasa, 11 Agustus 2020

Pembimbing
1. Dr. Arimbi, M.Pd.
2. Sarifin G, S.Or, M.Kes

Pembahas
1. Andi Atssam Mappanyukki, S.Or, M.Kes
2. Abdul Rahman, S.Or, M.Pd

Dengan Judul Penelitian :

PENGARUH LATIHAN AEROBIK TERHADAP DAYA TAHAN KARDIOVASKULER PADA PEMAIN CLUB PB KARSA MANDIRI"

Demikian surat keterangan ini diberikan kepada yang bersangkutan untuk dipergunakan sebagaimana mestinya.

Makassar, 30 November 2020
Ketua Jurusan,

Abdul Rahman, S.Or, M.Pd
NIP 19801231 200604 1 003

2. Surat Pembimbingan Skripsi

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI MAKASSAR
FAKULTAS ILMU KEOLAHRAGAAN
Alamat : Wijaya Kusuma Raya No. 14 Telpon (0411) 872602
Kampus Banta - bantaeng Kode Pos 90222 Makassar
Laman : www.unm.ac.id

Nomor : 6758 /UN36.3/PP/2020 Makassar, 27 November 2020
Lamp : -
H a l : **Pembimbingan Skripsi**

Kepada Yth,
1. Dr. Arimbi, M.Pd.
2. Sarifin G, S.Or, M.Kes

Dosen Pada FIK Universitas Negeri Makassar
Di Makassar

Dengan hormat,

Untuk penyelesaian studi Program Strata Satu (S1) maka Dekan, atas usul ketua Jurusan **Ilmu Keolahragaan** menunjuk saudara menjadi Pembimbing Mahasiswa :

N a m a : **AINUN FITRI**
N I M : 1733142010

Judul skripsi Mahasiswa tersebut adalah :
"PENGARUH LATIHAN AEROBIK TERHADAP DAYA TAHAN KARDIOVASKULER PADA PEMAIN CLUB PB KARSA MANDIRI"

Penunjukan ini berlaku tanggal **27 November 2020 s/d 27 Februari 2021**
Demikian disampaikan untuk dapat dilaksanakan sebagaimana mestinya.

Dekan,

Prof. Dr. Hj. Hasmyati, M.Kes.
NIP. 19680905 199303 2 001

Tembusan Yth.
1. Wakil Dekan I FIK UNM
2. Mahasiswa yang bersangkutan
3. Arsip

3. Surat Penelitian Tugas Akhir

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI MAKASSAR
FAKULTAS ILMU KEOLAHRAGAAN
Alamat : Wijaya Kusuma Raya No. 14 Telpon (0411) 872602
Kampus Banta - bantaeng Kode Pos 90222 Makassar
Laman : www.unm.ac.id

Nomor 6861 /UN36.3/PL/2020 Makassar, 1 Desember 2020
Lamp. : 1 (satu) Eks.
Hal : **Penelitian Tugas Akhir**

Yang Terhormat,
Ketua Pengurus Club PB KARSA Mandiri
Jl. Borong Raya Baru, Batua, Kec. Manggala
Makassar - Sulawesi Selatan

Akhir dari proses belajar mengajar bagi mahasiswa adalah penulisan atau penyusunan Karya Tulis Ilmiah yang wajib diprogramkan bagi mahasiswa di lingkungan Fakultas Ilmu Keolahragaan Universitas Negeri Makassar.

Sehubungan dengan hal tersebut di atas, perkenankan dengan ini kami memohon bantuan bagi mahasiswa kami dari Jurusan Ilmu Keolahragaan Fakultas Ilmu Keolahragaan Universitas Negeri Makassar, yang bernama :

AINUN FITRI – NIM : 1733142010

Untuk mengadakan penelitian di **Club** yang Bapak/Ibu pimpin, dengan mengambil tema/judul **"PENGARUH LATIHAN AEROBIK TERHADAP DAYA TAHAN KARDIOVASKULER PADA PEMAIN CLUB PB KARSA MANDIRI"** guna memperoleh informasi, data pendukung maupun penjelasan secara langsung berkaitan dengan penyusunan tugas akhir dan akan dilaksanakan pada 1 Desember 2020 s/d 1 Maret 2021 yang dibimbing oleh **Dr. Arimbi, M.Pd. (Pembimbing I) Sarifin G, S.Or, M.Kes (Pembimbing II)**

Atas Perhatian dan bantuan yang diberikan kami ucapkan terima kasih.

Dekan,

Prof. Dr. Hj. Hasmyati, M.Kes.
NIP. 19680905 199303 2 001

Tembusan :
1. Wakil Dekan I FIK UNM.
2. Mahasiswa yang bersangkutan.
3. Arsip

4. Surat Balasan Izin Penelitian

PB KARSA MANDIRI MAKASSAR
GOR MAKASSAR BADMINTON CENTER
Sekretariat : GOR MBC Borong Jln Borong Raya/Infeksi Kanal No 1 Makassar TLP 081355503768

Makassar, 2 Desember 2020

No Surat : 010 / KM-Mksr /*XII*/ 2020
Lampiran : 1 Berkas
Perihal : Memberikan Izin Penelitian

Kepada YTH

DEKAN FAKULTAS ILMU KEOLAHRAGAAN

UNIVERSITAS NEGERI MAKASSAR (UNM)

Di

Tempat

Assalamu"alaiukum Wr.Wb

Puji Syukur kita panjatkan kehadiran Allah SWT ,Shalawat serta salam atas junjungan Nabi Muhammad SAW

Sehubungan dengan adanya Surat Fakultas Ilmu Keolahrgaaan Universitas Negeri Makassar , ***Nomor 6861/UN36.3/PL/2020*** dengan bermaksud untuk penyelesain tugas akhir.

Maka Kami dari Pengurus / Pembina PB Karsa Mandiri Makassar memberikan izin kepada mahasiswa yang akan melaksanakan penelitian ,adapun mahasiswa akan melaksanakan penelitian

Nama : AINUN FITRI

N I M : 173 314 2010

JURUSAN : ILMU KEOLAHRAGAAN

TEMA : PENGARUH LATIHAN AEROBIK TERHADAP DAYA TAHAN KARDIOVASKULER PADA PEMAIN CLUB KARSA MANDIRI MAKASSAR

Demikian surat keterangan ini kami berikan untuk dipergunakan sebagaimana mestinya.

Hormat Kami

KARSA MANDIRI

MULYADI LATIEF
*PENGURUS **Pembina Club***

5. Surat Tugas/Izin Penelitian

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI MAKASSAR
FAKULTAS ILMU KEOLAHRAGAAN
Alamat : Wijaya Kusuma Raya No. 14 Telpon (0411) 872602
Kampus Banta - bantaeng Kode Pos 90222 Makassar
Laman : www.unm.ac.id

SURAT TUGAS / IZIN
Nomor 9061 /UN36.3/KP/2020

Dengan hormat kami menugaskan / mengizinkan Saudara (i) :

Nama/ NIP	**1. Dr. Arimbi, M.Pd./ 19840514 200812 2 003** **2. Sarifin G, S.Or, M.Kes19801027 200501 1 001**
Jabatan	: Dosen
Unit Kerja	: Fakultas Ilmu Keolahragaan UNM
Izin / Tugas	: Membimbing dan mendampingi Mahasiswa dalam pelaksanaan Penelitian an. **AINUN FITRI** NIM.**1733142010** Jurusan **Ilmu Keolahragaan**
Tempat	: GORO Bororng
Waktu	: **Tanggal 12 - 15 Desember 2020**
Lain-lain	: -

Harap dilaksanakan dengan sebaik-baiknya dan menyampaikan laporan setelah selesai melaksanakan tugasnya.

Makassar, 11 Desember 2020
Dekan,

Prof. Dr. Hj. Hasmyati, M.Kes
NIP. 19680905 199303 2 001

Tembusan Yth.
1. Mahasiswa yang bersangkutan
2. Arsip

6. Surat Keterangan Telah Melakukan Penelitian

PB KARSA MANDIRI MAKASSAR
GOR MAKASSAR BADMINTON CENTER
Sekretariat : GOR MBC Borong Jln Borong Raya/Infeksi Kanal No 1 Makassar TLP 081355503768

SURAT KETERANGAN
No Surat : 012 / KM-Mksr / XII / 2020

Yang bertanda tangan dibawah ini ,Pengurus / Pembina PB KARSA MANDIRI MAKASSAR menerangkan bahwa

Nama	: AINUN FITRI
N I M	: 173 314 2010
JURUSAN	: ILMU KEOLAHRAGAAN
PEKERJAAN	: MAHASISWA (S I) UNM MAKASSAR

Telah selesai melaksanakan Penelitian dengan judul **" PENGARUH LATIHAN AEROBIK TERHADAP DAYA TAHAN KARDIOVASKULER PADA PEMAIN CLUB KARSA MANDIRI MAKASSAR**

Demikian surat keterangan ini kami berikan untuk dipergunakan sebagaimana mestinya

Makassar ,
Pengurus / Pembina PB Karsa Mandiri

KARSA MANDIRI
MULYADI LATIEF

7. Surat Keterangan Bebas Perpustakaan Fakultas

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI MAKASSAR (UNM)
FAKULTAS ILMU KEOLAHRAGAAN
Alamat: Jl. WijayaKusuma Raya No. 14 Kampus Banta-Bantaeng
Telepon : (0411) 872602 Kode Pos 90222
Laman : www.fik.unm.ac.id Email : fik@unm.ac.id

SURAT KETERANGAN BEBAS PUSTAKA
Nomor : 390 /UN36.3.11/LK/2020

Pengadministrasi Sarana Pendidikan Fakultas Ilmu Keolahragaan Universitas Negeri Makassar, menerangkan bahwa :

Nama : AINUN FITRI
NIM : 1733142010
Jurusan/Prodi : ILMU KEOLAHRAGAAN
Alamat : BTN INDIRA

Yang bersangkutan di atas benar telah bebas dari peminjaman buku dan hal-hal yang bersangkutan dengan Perpustakaan FIK Universitas Negeri Makassar.

Keterangan diberikan kepada yang bersangkutan untruk dipergunakan seperlunya.
Terimakasih.

Makassar, 15 Desember 2020

Pengelolah Perpustakaan,

Pitter Koro
NIP. 196212081981021001

8. Surat Keterangan Bebas Alat

KEMENTERIAN RISET,TEKNOLOGI, DAN PENDIDIKAN TINGGI
UNIVERSITAS NEGERI MAKASSAR
FAKULTAS ILMU KEOLAHRAGAAN
Alamat : Jl. Wijaya Kusuma Raya No. 14
Kampus Banta-Bantaeng Telp. 872602 Kode Pos 90222 Makassar
Laman : [illegible]

SURAT KETERANGAN BEBAS PERALATAN
Nomor: 2672/UN36.3.11/LK/2020

Bagian Sarana Pendidikan Fakultas Ilmu Keolahragaan Universitas Negeri Makassar menerangkan bahwa,

Nama	: AINUN FITRI
N I M	: 1733142010
Jurusan / Prodi	: ILMU KEOLAHRAGAAN
Alamat	: BTN INDIRA

Yang bersangkutan di atas benar telah bebas dari peminjaman maupun hal-hal yang berkaitan dengan alat-alat olahraga FIK Universitas Negeri Makassar.

Keterangan diberikan kepada yang bersangkutan untuk dipergunakan seperlunya.
Terimakasih.

Makassar, 15 Desember 2020

Bagian Sarana Pendidikan,

Wahyuddin
NIP. 19721014 200501 1 004

9. Surat Keterangan Bebas Labotratorium

KEMENTRIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI MAKASSAR
FAKULTAS ILMU KEOLAHRAGAAN
Alamat Jalan Wijaya Kusuma Raya, No. 14, Telp. 872602
Kampus Banta-Bantaeng, Kode Pos 90222, Makassar
Laman www.unm.ac.id

SURAT KETERANGAN BEBAS LABORATORIUM
Nomor 064 UN36.3.7/PP/2020

Yang bertanda tangan di bawah ini Kepala Laboratorium Jurusan Ilmu Keolahragaan Fakultas Ilmu Keolahragaan Universitas Negeri Makassar, menerangkan:

Nama [illegible]
Nim [illegible]

Benar bebas tidak ada sangkut pautnya dengan peminjaman alat barang pada laboratorium Pendidikan Jasmani Kesehatan dan Rekreasi Fakultas Ilmu Keolahragaan Universitas Negeri Makassar.

Demikian surat keterangan ini diberikan kepada yang bersangkutan untuk dipergunakan sebagamana mestinya.

Makassar, 15 Desember 2020
Kepala Laboratorium
Ilmu Keolahragaan

Dr. Suhrimbol, S.Pd
Nip. 19741207 200404 1 002

10. Surat Keterangan Bebas Perpustakaan Universitas Negeri Makassar

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
UNIVERSITAS NEGERI MAKASSAR
UPT PERPUSTAKAAN
Alamat : Jalan A.P. Pettarani ,Makassar,0411-869834-869854-860468, FAX. 861377
Laman* : *perpustakaan.unm.ac.id

SURAT KETERANGAN BEBAS PUSTAKA
NO: 4627 / UN.16 / TU/ 2020

Yang bertanda tangan di bawah ini menerangkan bahwa :

Nama : AINUN FITRI
Pekerjaan : MAHASISWA
NIM : 1733142010
Fakultas/Jurusan : ILMU KEOLAHRAGAAN
Alamat : BTN INDIRA

Telah terbebas dari tunggakan peminjaman koleksi di UPT. Perpustakaan Universitas Negeri Makassar,

Demikian surat keterangan ini dibuat untuk dipergunakan sebagaimana mestinya.

Makassar, 16 Desember 2020

Prof. Oslan Jumadi, S.Si.,M.Phil., Ph.D
NIP. 19701016 199702 1 001

mutu certification international

*) Berlaku 2(dua) bulan sejak tanggal dikeluarkannya

APPENDIX 2: RESEARCH DATA

No	Name	Bleep Test				
		return	Pre-Test	Final Test	return	Age
1	Bayu	L6/5	34.7	41.8	L8/4	16 Th
2	Irfandi	L6/8	35.7	42.9	L8/10	18 Th
3	Sofyan Maulana	L6/6	35.0	42.6	L8/9	18 Th
4	Moh. Yusuf	L8/8	42.2	42.9	L8/10	17 Th
5	Anzar	L7/2	37.1	42.6	L8/9	19Th
6	Job	L7/7	38.9	40.6	L8/3	16 Th
7	Anto	L7/8	39.2	42.9	L8/10	19 Th
8	Aswar	L7/7	38.9	40.2	L8/1	16 Th
9	Ansir	L7/6	38.5	41.5	L8/4	17 Th
10	Ahmad	L6/6	35.0	42.6	L8/10	19 Th

Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	mean	Std. Deviation	Variance
Initial cardiovascular endurance test	10	7.50	34.70	42.20	375.20	37.5200	2.44122	5.960
Cardiovascular endurance final test	10	2.70	40.20	42.90	420.60	42.0600	.99800	.996
Age	10	3.00	16.00	19.00	175.00	17.5000	1.26930	1,611
Valid N (listwise)	Valid							

Paired Samples Correlations

		N	Correlation	Sig.

Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	mean	Std. Deviation	Variance
Initial cardiovascular endurance test	10	7.50	34.70	42.20	375.20	37.5200	2.44122	5.960
Cardiovascular endurance final test	10	2.70	40.20	42.90	420.60	42.0600	.99800	.996

Pairs 1	Cardiovascular Endurance Initial Test & Cardiovascular Endurance Test	10	-.161	.657

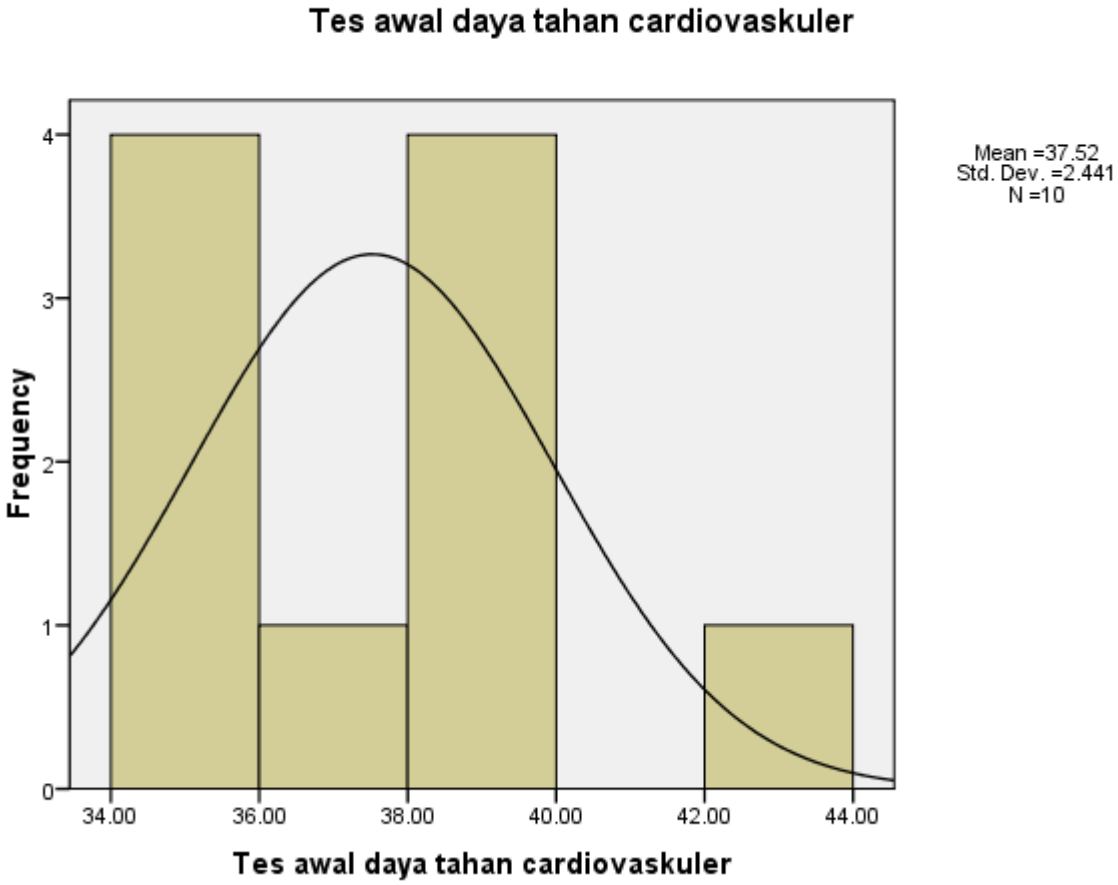
One-Sample Statistics

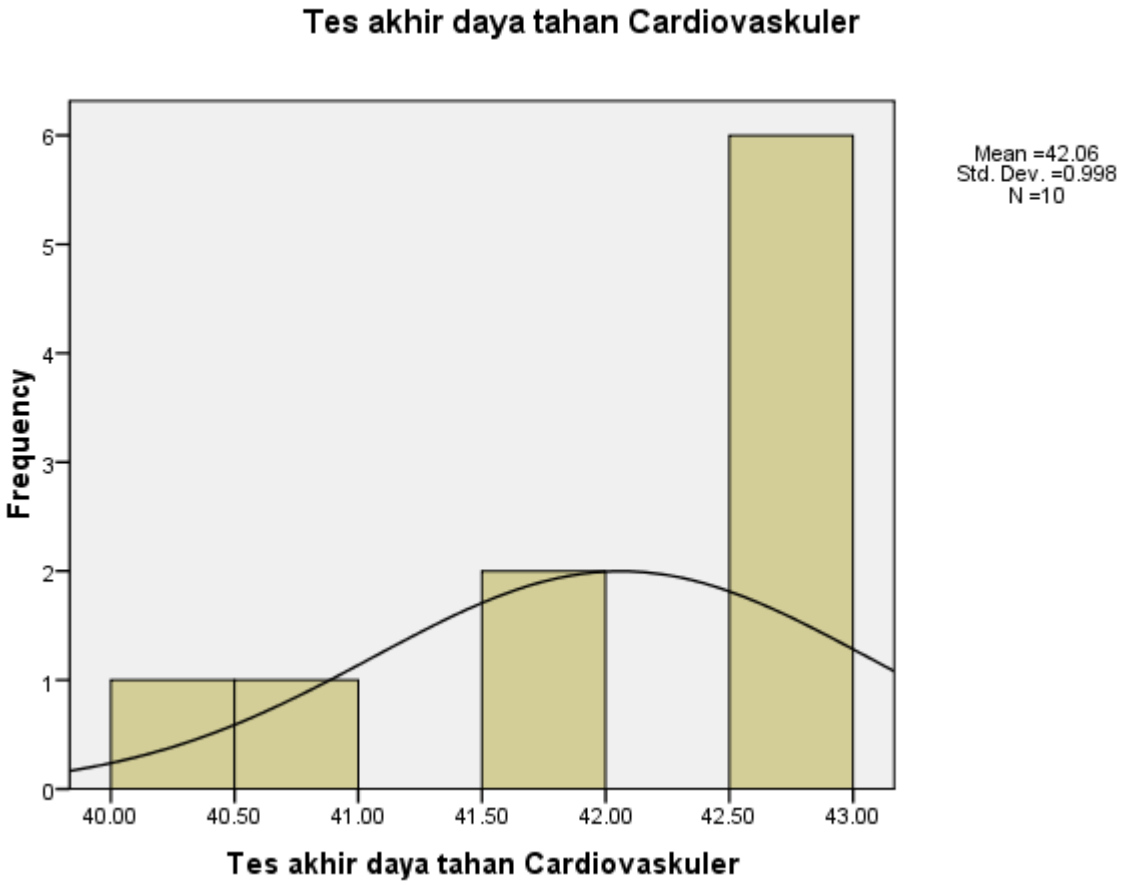
	N	mean	Std. Deviation	Std. Error Mean
Initial cardiovascular endurance test	10	37.5200	2.44122	.77198
Cardiovascular endurance final test	10	42.0600	.99800	.31559

Statistics

		Initial cardiovascular endurance test	Cardiovascular endurance final test
N	Valid	10	10
	Missing	0	0
Mean		37.5200	42.0600
Std. Deviation		2.44122	.99800
Variance		5.960	.996
Range		7.50	2.70
Minimum		34.70	40.20
Maximum		42.20	42.90
Sum		375.20	420.60

histogram


Tes awal daya tahan cardiovaskuler
Frequency
0
1
2
3
4
34.00
36.00
38.00
40.00
42.00
44.00
Tes awal daya tahan cardiovaskuler
Mean =37.52
Std. Dev. =2.441
N =10



Frequency Table

Initial cardiovascular endurance test

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	34.7	1	10.0	10.0	10.0
	35	2	20.0	20.0	30.0
	35.7	1	10.0	10.0	40.0
	37.1	1	10.0	10.0	50.0
	38.5	1	10.0	10.0	60.0
	38.9	2	20.0	20.0	80.0
	39.2	1	10.0	10.0	90.0
	42.2	1	10.0	10.0	100.0

Initial cardiovascular endurance test

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	34.7	1	10.0	10.0	10.0
	35	2	20.0	20.0	30.0
	35.7	1	10.0	10.0	40.0
	37.1	1	10.0	10.0	50.0
	38.5	1	10.0	10.0	60.0
	38.9	2	20.0	20.0	80.0
	39.2	1	10.0	10.0	90.0
	42.2	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Cardiovascular endurance final test

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	40.2	1	10.0	10.0	10.0
	40.6	1	10.0	10.0	20.0
	41.5	1	10.0	10.0	30.0
	41.8	1	10.0	10.0	40.0
	42.6	3	30.0	30.0	70.0
	42.9	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

One-Sample Kolmogorov-Smirnov Test

		Initial cardiovascular endurance test	Cardiovascular endurance final test
N		10	10
Normal Parameters	mean	37.5200	42.0600
	Std. Deviation	2.44122	.99800
Most Extreme Differences	Absolute	.172	.306
	Positive	.172	.200
	negative	-156	-.306
Kolmogorov-Smirnov Z		.544	.967
asymp. Sig. (2-tailed)		.929	.307

a. Test distribution is Normal.

Paired Sample Statistics

		mean	N	Std. Deviation	Std. Error Mean
Pairs 1	Initial cardiovascular endurance test	37.5200	10	2.44122	.77198
	Cardiovascular endurance final test	42.0600	10	.99800	.31559

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Initial cardiovascular endurance test	48,602	9	.000	37.52000	35.7737	39.2663
Cardiovascular endurance final test	133,272	9	.000	42.06000	41.3461	42.7739

Appendix 3: Documentation

Marching with the sample led by the researcher

Researcher-led warm-up and stretch

The sample is given Directions by the supervisor

Samples of doing jogging exercises

Samples do the Bleep Test

Photos of doing the Bleep Test

Photo with researcher and sample

Photo with researcher and sample

APPENDIX D

BIOGRAPHY

Ainun Fitri. Born in Allekang, on June 15, 1996, the second of 3 children, the couple Mr. Mili and Mrs. Nillang. Elementary school education at SD 294 Erecinnong Erecinnong Village, Bontocani District, Bone Regency, in 2004 and graduated in 2009. Continuing education at SMP Negeri 2 Bantaeng Kab. Bantaeng in 2009 and graduated in 2012.

Then continued his education at SMA Negeri 2 Bantaeng and graduated in 2015. Then in 2017 the author continued his studies and graduated from state universities through the MANDIRI route at the Department of Sports Science, Faculty of Sports Science, Makassar State University.