

WOLKITE UNIVERSITY



COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

DEPARTMENT OF SPORT SCIENCE

**EFFECTS OF ANAEROBIC TRAINING ON IMPROVING REACTION TIME AND
COORDINATION IN CASE OF WOLKITE TOWN UNDER 17 YOUTH FOOT BALL
PROJECT**

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APPROVAL SHEET

This is to certify that the research entitled: ***EFFECTS OF ANAEROBIC TRAINING ON IMPROVING REACTION TIME AND COORDINATION IN CASE OF WOLKITE TOWN UNDER 17 YOUTH FOOT BALL PROJECT*** ,submitted in partial fulfillment of the requirements for the Bachelor degree in Department of sport science and has been carried out **1: Mekdes Worku and 2:Lemma Belay**. Under my /our supervision.

Therefore recommend that the student has fulfilled the requirements and hence here by can submit the thesis to the department.

ADVISOR:- Mr.BUZUNEH SHAMBEBO

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Date_____

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Abstract

Anaerobic activity may target large or small muscle groups and differs from aerobic activity in that it involves short bursts of strenuous exertion, followed by periods of rest. The purpose of the research was investigating effects of anaerobic training on improving reaction time and coordination of Wolkite town u17 youth foot ball project. For conduct of this research, purposive sampling technique was employed to take all Wolkite towns under 17 youth project. In this study both primary and secondary source of data were used. The data collected was analyzed and interpreted through statistical method; mean, std. deviation, maximum and minimum were calculated. According to result of the study the difference between two tests was found that related to the more significance difference found on anaerobic training (rope jump and reaction time) training. Finally, researcher regarding anaerobic training recommended different points

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CHAPTER ONE

1. INTRODUCTION

1.1 Background of the study

Life was not life without the presence of physical activities. Regular exercise is necessary to develop and maintain an optimal level of health, performance and appearance. It makes us to feel good both physically and mentally (Michaud and Narring, 1996). In the 21st century, it has become necessary to think about the ways to increase the physical fitness capacities of human beings and to sustain those potentialities.

Physical fitness is the biggest potentiality of human being. It cannot be bought, but can only be achieved through day-to-day physical activity (Bharath and Mukesh, 2011).

Anaerobic activity may target large or small muscle groups and differs from aerobic activity in that it involves short bursts of strenuous exertion, followed by periods of rest. Aerobic activity generally has a low to moderate-intensity and long duration, while anaerobic activity is highly intense and short-lasting (Suzanne, 2011).

The greatest benefits of regular aerobic and anaerobic exercises are probably well known theoretically for students of Sport Science. Since aerobic exercise can be sustained for long periods of time, it increases the strength and size of the heart and the efficiency of the lungs, increases the body's endurance and lowers blood pressure. Anaerobic training is beneficial in building muscle mass, which results in faster calorie burning during exercise and a heightened metabolism. This allows the body to burn fat more quickly, and it can allow an athlete to eat larger portions of food without gaining weight (Gregory, 2010).

Many of our sports activities in our daily lives are carried out through our hands. In basketball game, which is one of them, the technical movements like rebounding, shot, block, ball handling, dribbling, and passing largely depend on the strength of the fingers, wrists, and particularly on the strength of the arms (Sevim, 2006). This importance of our hands is due to the movements that our hand muscles give our hands. The ability of hand skill is the ability

hand- eye coordination, which is important for works especially requiring fine and rough muscle control. Hand eye coordination especially comes to the fore in the individual sports games, particularly in handball, basketball, volleyball, racquet sports, which require especially a motor hand skill (Menevşe, 2011).

1.2 Statement of the Problem

In modern world sport, there are various types of training applied for various purposes like health, fitness, performance etc. aerobic and anaerobic training is the major type of exercise. Anaerobic exercise is a good type of exercise for health related physical fitness. Universities and colleges have a great responsibility in producing educated and physical fit human power. The main issue raised under this is the physical fitness level of educated persons from those institutions. The same thing in Wolkite town under 17 youth foot ball project. The physical fitness problem observed.

The researcher is initiated to do his research on effects of anaerobic training on improving reaction time and coordination of Wolkite town U/ 17 youth project, due to many reasons, the first is that due to, lack of physical fitness seen on some of sport management U/17 youth in Wolkite town. Foot ball project

1.3 Research questions

Therefore the study was answer following questions

1. How to conduct physical qualities fitness test for an aerobic training and improving coordination of Youth?
2. How to improve physical qualities of the youth in selected exercise?
3. What types of program and procedures should be followed and favorable to the Youth?
4. What improvement remedy should be taken to overcome the problem exist in physical fitness of the Youth

1.3 Objectives of the study

1.3.1 General objective

The general objective of this study is to investigate effects of anaerobic training on improving reaction time and coordination of Wolkite town u 17 youth foot ball project

1.3.2 Specific objectives

- To assess the effect of anaerobic training on improving reaction time of Wolkite town U/17 youth foot ball project
- To assess the effect of anaerobic training on improving coordination of Wolkite town-U/17 youth foot ball project

1.4 Significance of the study

- After this study conducted, it provides great Significance for Wolkite town U/17 youth to improve and work hard on their physical fitness level, plus to examine their progress and to take measure on the future.
- It helps Wolkite town to assess their goal effectiveness.
- It helps Wolkite town to assess male Youth fitness progress and serve us input for their next work plan.
- Play a great contribution for different town to examine how much they are bringing change on their under 17 youth' physical fitness level and servers as database for different researcher those who want to study further on this area.

1.5 Delimitation of the Study

- The exercise was delimited the only u 17 youth male foot ball project there age 12-17 ye
- To only 8 sample
- To reaction time and coordination variables

1.6 Limitation of the study

- Shortage of the financial problem
- Time

1.7. Definition of key terms

Anaerobic exercise; refers to high intensity exercise like all-out sprinting or very heavy weight lifting.

Cardio-respiratory endurance: ability of heart and lung to supply oxygen to working muscle.

Coordination: the ability to use your senses together with your body parts; ability to use Two or more body parts at the same time (hitting a tennis ball, hand-eye coordination/timing)

Reaction Time: also referred to as quickness, the period from when a stimulus is perceived to when movement begins. (Starting a race, tennis ball drop)

1.8. Organization of the stud

This research was consisting of five chapters. The first chapter deals with back ground of the study, statement of the problem, significance of the study, basic research questions, objective of the study limitation of the study and operational definition, chapter two states about related review literature of an aerobic training on improving reaction time and coordination skill and chapter three focus description of the study area sources of data, research design, sample and sampling techniques. Chapter was deal about data collection discussion and interpretation. The last chapter was deal about summery recommendation and conclusion depending on data collected

CHAPTER TWO

2. Review of literature

2.1. An aerobic exercise

Anaerobic exercise is exercise intense enough to trigger anaerobic metabolism (without oxygen to muscles used). It is used in non-endurance sports to promote strength, speed and power and by body builders to build muscle mass. Muscles trained using anaerobic exercise develops differently when compared to aerobic exercise. This leads to greater performance in short duration, high intensity activities, which last from mere seconds to a maximum of about 2 minutes. Examples of anaerobic exercise would include sprinting, lifting, and jumping. Initial recommendations for anaerobic training: start with a 1:2 work/rest ratio and after a few months progress to a 1:1 work/rest ratio. An example of a 1:2 work/rest ratio is an interval workout of sprinting 30 seconds and then jogging or walking for 1 minute (repeat 5-10 times) (Edward et al., 2003).

2.2. Reaction time

Measurement of the reaction time in determining the hand-eye co-ordination plays an important role. The period passing between the beginning time of the action and the time when reaction starts, is being defined as the reaction time (Tamer, 2000). The reaction

time is an inherited characteristic of a person that determines the time between the realization of the first muscular reaction or action (Bompa, 1998).

2.2.1 Exercise to improve reaction time

Trainings with rope jumping used as a warm up or the method of co-ordination in the exercises have an important role in the development of body coordination and strengthen the general athletic position. Rope jumping which can be done everywhere and which is an activity, the severity of which can be changed with the number and the type of skipping, it looks as a remarkable application in the development and the maintaining of the muscle strength and cardiovascular system and it helps in preparation for the sports disciplines and develops the feet movements. Rope skipping trainings have a positive effect on heart circulation alignment, muscle strength, endurance, mobility, flexibility, balance, coordination, vertical jumping, timing, rhythm, speed, lean body mass, bone density and the development of skills (Orhan et al, 2008). In the rope trainings applied by the repeat method in the literature, it was observed that the repeat numbers vary between 25-150 for each exercise, and it was reported that it varied between the 500- 2000 repeated numbers in a daily training. (Kim et al, 2001; Lee, 2006; Sigmon, 2003; Town et al, 1980).

For years, people have studied exercise and the differing effects it has on the human body. Exercise has been known to control weight management, improve mood, motor function, and cognitive processing (Mayo Clinic, 2014). From a cellular perspective, when an individual engages in intense physical activity, the skeletal muscles utilized consume an increased amount of ATP (energy). The elevated demand of aerobic respiration leads in an increase in the body's requirement for oxygen, therefore explaining the increase in respiration and heart rate effect of exercise. These responses allow more oxygenated blood to flow to the many muscles of the body and help to maintain adequate motor functioning. Increased blood flow also makes its way to the brain and has been shown to have similar benefits for cognitive processing (Poelset al., 2008). Several papers have been published focusing on the study of these post-exercise cognitive improvements by testing short-term and working memory (Brisswalteretal., 1997 and Keen et al., 1993).

In another study, Yilmaz et al (2009) did a research in order to investigate the effects of water exercises and swimming on physical fitness of children with mental retardation. The age range of the male subjects was 12 to 14 years old. The results showed that these

exercises, significantly improves the balance in the male subjects. Also, Smith et al (2005) used the training intervals for improving the balance in the people.

2.2.2 Measurement of coordination and reaction time

The results of their research, conducted for determining the effect of balance exercise on their performance like balance, showed that the balance exercises (3 times a week , for 12 weeks) , significantly improves the static balance in the people. In general , the results of these studies is compatible with the results of the present study , but the point one should consider most , is that in the said studies , the gender of the subjects is ignored , while in the present study , the balance was investigated in both male and female subjects. Also, in case of comparing the groups, the male subjects had more progress.

Considering the fact that the literature of field of balance is not broad enough, we should resort to the studies done on the healthy people, which indicate that the male subjects , are in a better position in case of balance , compared to the female ones (Edwards , 2011). In this respect, the results of the present study, also confirmed these results and one can observe that the weaker performance of the female subjects in case of the balance in people with mental retardation , was also confirmed which is of course a possibility. More details indicated that with omitting the sight data , or in other words with manipulating the sight , the male subjects' performance was more deteriorated , which shows the dependence of the male subjects on the sight data , but this issue was not observed in the female subjects. Also, it seems that the jump rope workout, as of using the important muscular pattern, that is the anti-gravity muscles (the muscles which play important roles in keeping the static balance), has a great role in keeping the balance. On the other hand, considering the hormone secretion and the muscular differences between the male and the female, it seems that in case of these jump rope exercises, the male subjects' better performance, be due to the gender differences. Another important point is the subject's skill in doing the balance test. Although these subjects are the healthy ones, the conducted studies in case of validating the subjects' age range are limited. In any case, Lahtinen , in a research done in 1986 , has confirmed the stork test in the mental retarded patients , while it may be the lack of the required skill in the female subjects , which has led to the insignificance of the results.

According to the results of the present study, Smith et al (2005), used the training intervals for improving the balance in the people. The results of their research, conducted for determining the effect of balance exercise on their performance like balance, showed that the balance exercises (3 times a week , for 12 weeks) , significantly improves the static balance in the people. Also, it seems that the jump rope work-out, as of using the important muscular pattern, that is the anti-gravity muscles (the muscles which play important roles in keeping the static balance), has a great role in keeping the balance. On the other hand, considering the hormone secretion and the

Muscular differences between the male and the female, it seems that in case of these jump rope exercises, the male subjects' better performance, be due to the gender differences.

The results of the present study showed that one can suggest these exercises in order to improve the (static) balance. However, the researchers believe that the jump rope workout, have specific advantage, since these exercises are of the dynamic activities, which causes vigor in the people, while strengthening the pivotal muscles.

Assessment of static balance of participants was carried out as follows using the Sharpened Romberg Test. The participant was asked to stand straight with naked feet, putting one foot in front of the other and his or her arms crossed upon the chest; the score given to each individual was the time he could maintain a stable state with open and then with closed eyes(Paula &YimChiplis Laura, 2000). Because the participants were unaware of the scoring, they were asked to repeat the task three times (in order to control for the plateau effect) before the main test; next, in

a separate trial, they performed the task for another three times, for which an average score was calculated and considered as an index for their ability to maintain balance.

The vast us medial is contraction had shorter duration in the group of trained rope skippers than in the other. The shorter duration of the EMG signal reflects the fact that the working time of the muscle is shorter. When compared with the same intensity of exercise, shorter muscle working time may result in lower energy expenditure.

2.3 Coordination

Co-ordination of different muscles in contraction to execute an exercise is of vital importance. The better the muscle co-ordination, the better the exercise performance. At the beginning of landing, the tibia is anterior starts to contract eccentrically. When jumping-up

begins, the gastrocnemius and quadriceps (vastusmedialis, rectus femoris and vastuslateralis) undergo a concentric contraction (John et al. 1986). With the same frequency of skipping, significant differences were found in muscle contraction timing between trained and untrained rope skippers. The trained rope skippers demonstrated greater time periods in muscle contractions between the quadriceps (vastusmedialis, rectus femoris and vastuslateralis) and tibialis anterior

When jumping up. The contraction timing between the tibialis anterior at landing and the gastrocnemius at jumping showed greater time periods in the trained group. It is well known that the shorter muscle contraction durations and greater time periods between different muscle contractions in performing an exercise task can provide more resting time to the involved muscles, resulting in less energy expenditure. This advantage was found in the subject group of trained rope skippers. It indicated that the trained rope skipper possessed better co-ordination capacity in muscle contraction and higher working efficiency in performing rope skipping

Good Reaction time allows us to be agile and efficient when it comes to responding to stimuli and situations like driving, having a conversation, playing sport etc

Reaction in a sport is also dependent upon coordination

CHAPTER THREE

3. Research Methodology and materials

3.1 description of study area

This study was conducted in Wolkite town, which is located in south nation nationality regional state Gurage zone Wolkite town, which is 168 km far from the capital city of Addis Ababa Ethiopia.

3.2 Study design

The research design was a comparative survey study.

The objective of this research is to investigate effects of an aerobic training on improving reaction time and coordination in Wolkite town U/ 17 youth project foot ball project.

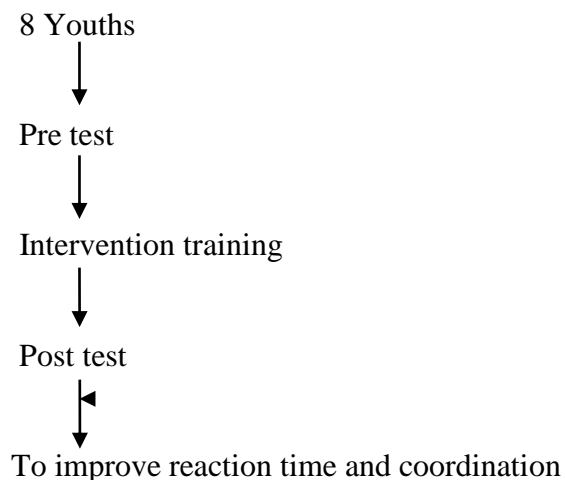


Fig. 3.1 Flow chart of methodology

3.3 Source of data

- ✓ Primary source of data and secondary source of data was used. Primary data was the data obtained from test score of the subject and secondary data was taken from different review and journal.

3.4 Total population of the study

The research is focus on Wokite town U/ 17 youth project. There are totally 25 youth. There are 25 male youth foot ball project and in Wolkite town u 17 youth project

3.5 sample and sampling techniques of the study

In the study, purposive sampling technique was used.

Subjects: 8 youths was selected, male under 17 in Wolkite town foot ball project volunteer to participate in the study. A written consent was obtained from the subjects.

Table: 3.1 Sample and sampling technique of the study

No	Total population	Sample
1	25	8

3.6 Criterion measures

Table: 3.2 Criteria

Variables	Tests	Unit
Reaction time	Ruler catch test	Inch
Coordination	Rope jump	Second

3.7 Data collection instruments

- ✓ Rope jump test (Orhan et al, 2008) was an activity, the severity of which can be changed with the number and the type of skipping. The time taken to rope jump was recorded in second.
- ✓ Reaction time test (Tamer, 2000) was the period passing between the beginning time of the action and the time when reaction starts. The time taken to reaction time was recorded also in inch

3.7.1 Reliability

- ✓ Reliability of instruments, which are use in this study like rope, ruler, stopwatch are standardized instruments.

3.7.2 Administration of the Test

- ✓ Firstly, the researcher informed the nature and purpose of the study and creates awareness. Then, written consent was obtained prior to the start of the study.
- ✓ After they become aware of the study and volunteer to participate then after test was administered.

3.7.3 Training Protocol

Table: 3.3 Training Protocol

week	Type of exercise	Frequency	Intensity	time	Warm up and cool down
1	Anaerobic exercise(sprint)	3 day per week	Moderate	40 min	Five, five minute
2	Anaerobic exercise(sprint)	3 day per week	High	4o min	Five, five minute
3	Anaerobic exercise(sprint)	3 day per week	Very high	40 min	Five, five minute

4	Anaerobic exercise(sprint)	3 day per week	Very high	40 min	Five, five minute
5	Anaerobic exercise(sprint)	3 day per week	Very high	40min	Five, five minute

3.8 methods and procedures of data collection

Quantitative and qualitative data was collected through the select appropriate physical fitness test with the appropriate measure of selected variable.

3.8.1 Plotting

The researcher was plot the data collection instrument to overview weather the data collection instrument was collect an exact and understandable procedure of data collection

3.9 Data Analysis

The data collected on the selected physical fitness variables was analyzed, interpreted and tabulated in to meaningful way by using computerized in order to compare variables between subjects. In this study, a statistical technique was used to analyze and summarize the data. The significance level for all data was set at $p < 0.05$.

CHAPTER FOUR

4. Analysis of Data, Interpretation and Discussion of Results

4.1 Analysis and Interpretation

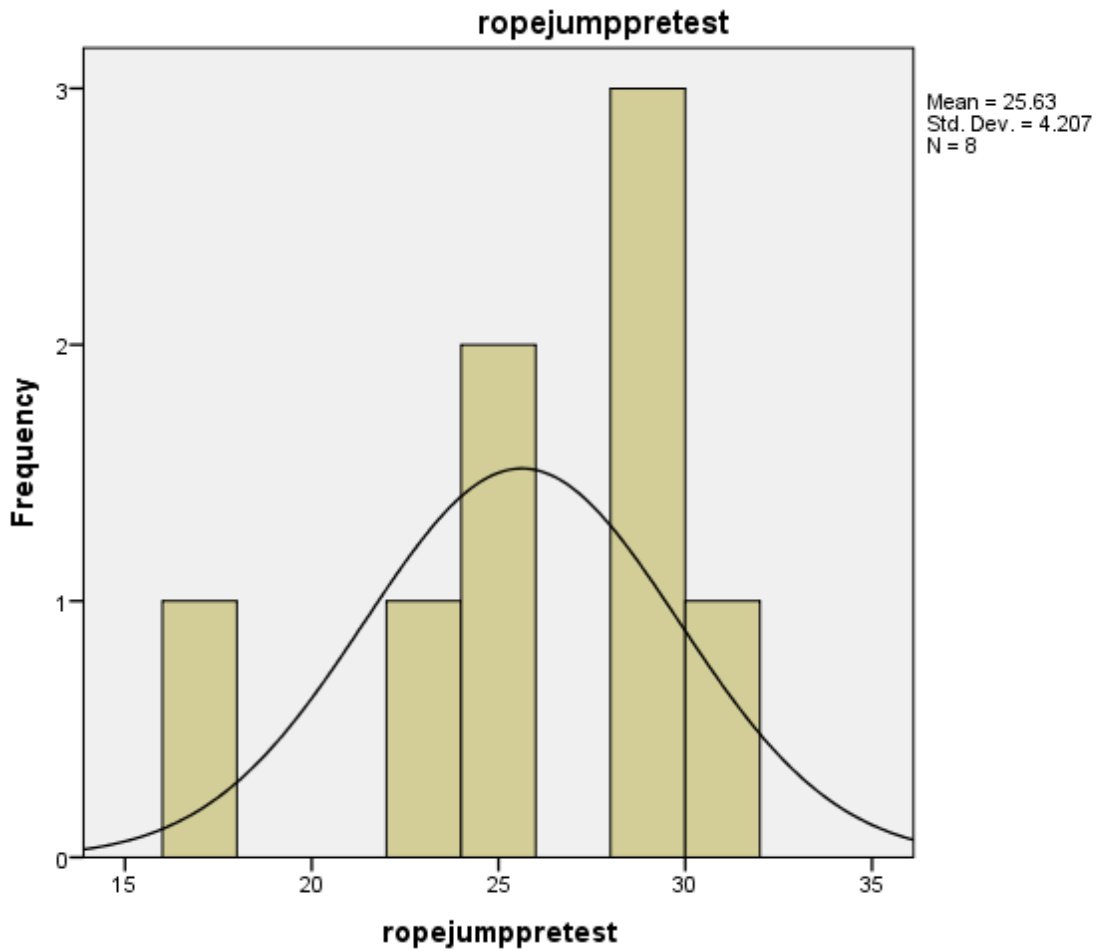
The data collected through experimental was analyzed by statistics software for their descriptive statistics such as mean, std. deviation, minimum, maximum and interpreted

Table: 4.1 Descriptive statistics of rope jump test records in 15 seconds

Rope jump test	Mean	std .Dev	Minimum	Maximum
Pre-test	25.63	4.207	17.	30.
Post-test	28.25	3.770	20.	32.

Table 4.1 shows that the mean, std. deviation, maximum and minimum of before training and after training on rope jump training test of two weeks training among under 17 youth foot ball project. Resulting from above table, the mean value of both before and after training is before 25.63 after 28.25 respectively. Based on the mean value analyzed on the above table, there was

statistically difference between both pre- and post-test indicating increment mean value. Implies of this those male students rope jump repetition was counted and analyzed the difference was found. Their rope jump anaerobic training was improved and the number of rope jump repetition on pre-test was less than post-test.



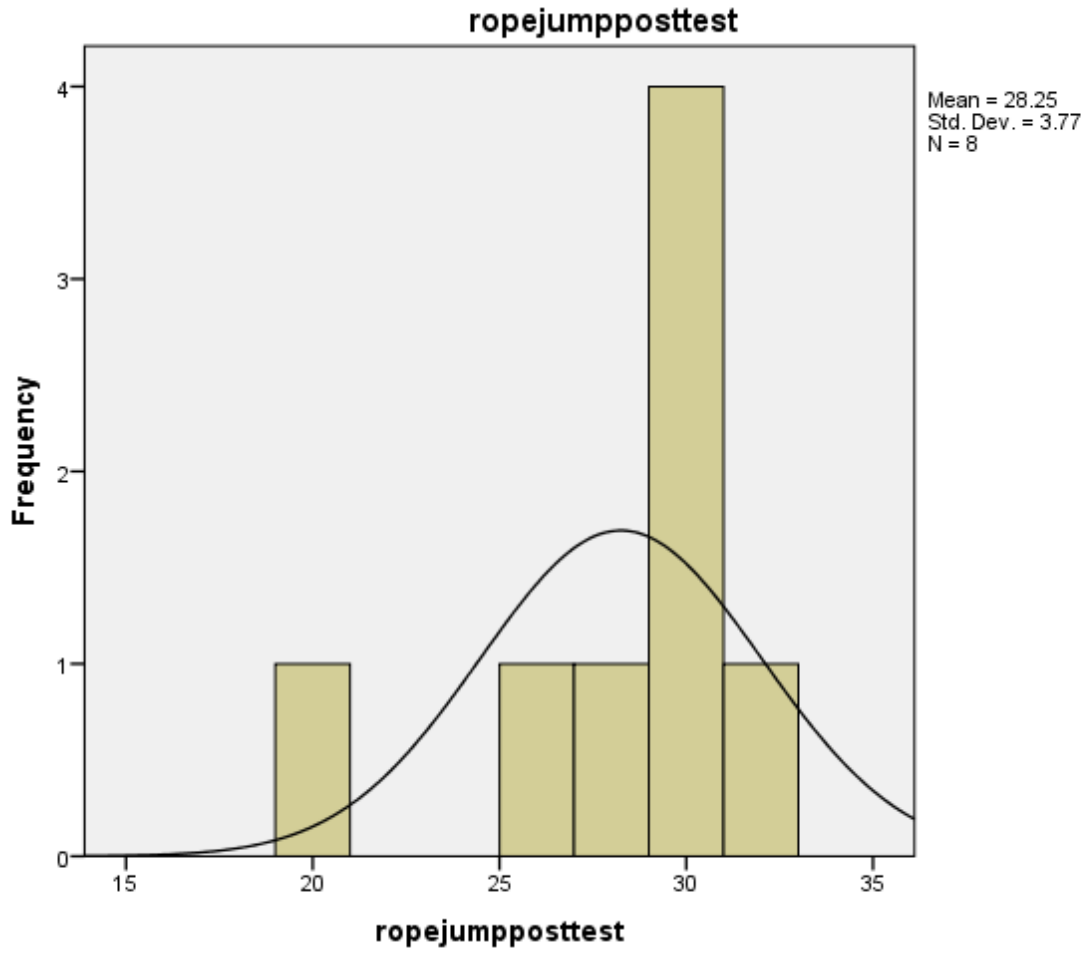
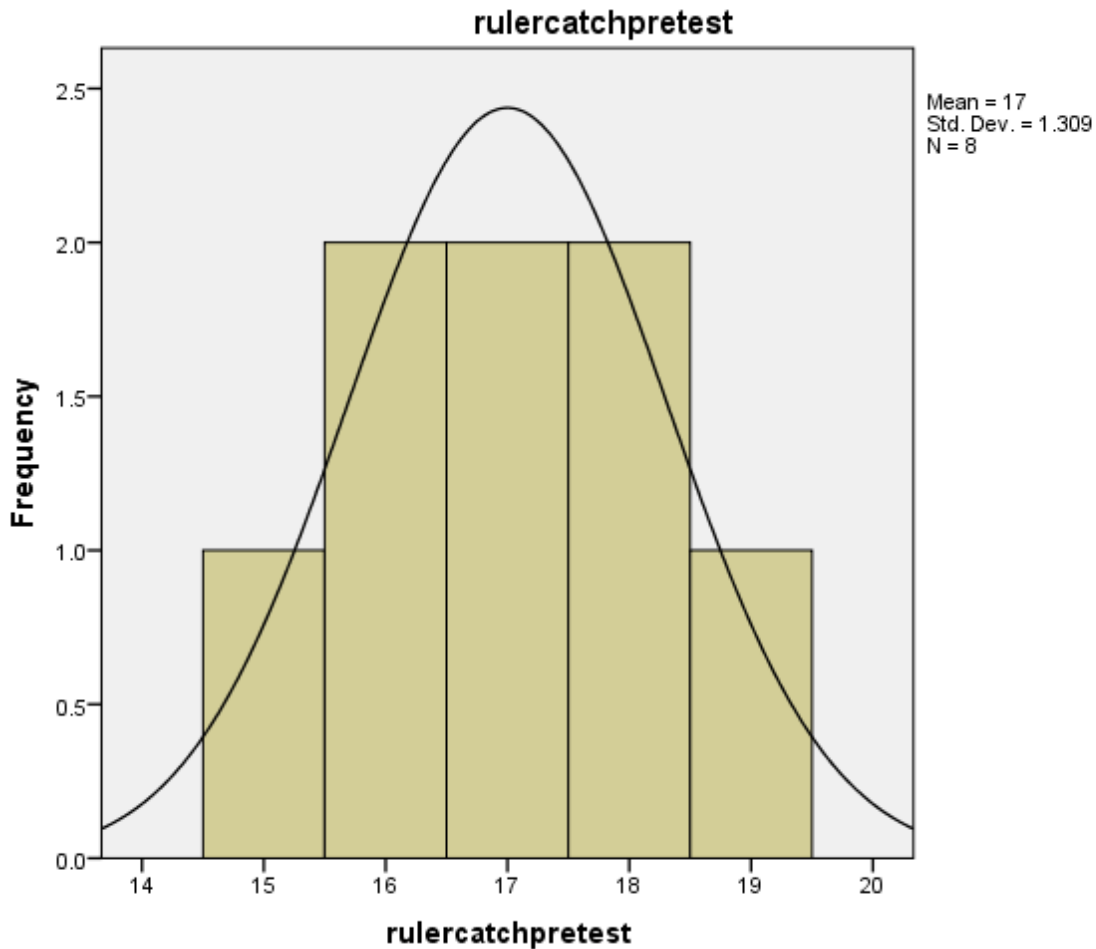
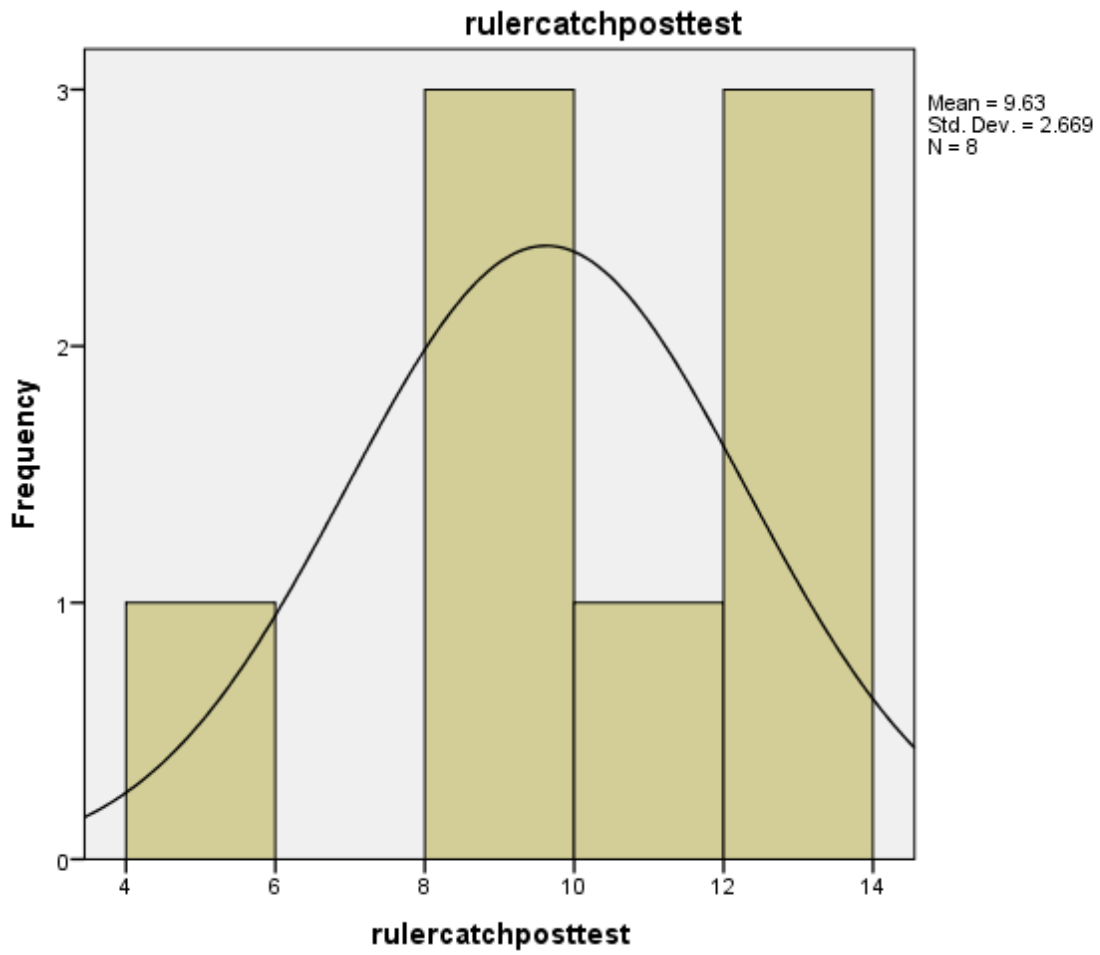


Table 4.2 Descriptive statistics of reaction time test

Reaction time test	Mean	St. Dev	Minimum	Maximum
Pre-test	17	1.309	15	19
Post-test	9.63	2.669	5	13

Table 4.2 indicates that the mean, std. deviation, maximum and minimum of reaction time test before and after training of two weeks duration of time among U 17 youth. According to above table, the mean value of reaction time test before and after training were before 9.63 after 17 respectively. The instrument used for measuring this type of test was Inch. So, based on the analysis of above table the difference were found between pre and post-test, which indicate that during pre-test they take long time on reaction time test and then, they tested after two week training and the reduction of time was found. This shows that, the reaction time were improved.





4.2 Discussion of finding

4.2.1 Measuring anaerobic training

Rope jumping is an activity, the severity of which can be changed with the number and the type of skipping. It is one of outstanding purpose in the development and the maintaining of the muscle strength and cardiovascular system, and applicable in training for the sports disciplines and develops the feet movements. In the rope training, there was the repetition numbers vary for each exercise in a daily training (Kim et al, 2001; Lee, 2006; Sigmon, 2003; Town et al, 1980).

According to the results of the study indicates that there was difference between pre-test and post-test among U 17 youth. This implies that the number of rope jump repetition make difference in through each time training, that is why pre-test value of training is less than post-test values. Throughout the increment value of each test in duration time of training, a rope jump anaerobic training of U17 years youth was improved.

Rule catch test is another part of measuring anaerobic training, which is defined as the period passing between the beginning time of the action and the time when reaction starts (Tamer, 2000). Accordingly, based on the analyzed results of reaction time test before and after training, there were difference between the pre-and post-test value among under 17 year's youth which mean that the pre-test value is greater than the post-test value. This implies that, it was taken long duration of time during the pre-test on reaction time test of indicating greater value than the tested value after two weeks training. This mean that the pre-test of reaction time is greater than the post-test reaction time and showing as the reaction time were improved .

CHAPTER FIVE

5. Summary, conclusion and recommendation

5.1 Summary

The purpose of the research was investigating effects of anaerobic training on improving reaction time and coordination in case of Wolkite city under 17 years youth . The test was taken on rope jump test for improvement of the severity of which can be changed with the number and the type of skipping during anaerobic training and reaction time test for improvement of an inherited characteristic of a person that determines the time between the realizations of the first muscular reaction. For conduct of this research, purposive sampling technique was employed to take all under 17 years youth in Wolkite town. The data obtained from scored result depending on test of instrument. The data collected was analyzed and interpreted through statistical technique by using table and graphs to compare their mean value of pre and post test. According to result of the study the difference between two tests was found in related to this the more significance difference found on anaerobic training (rope jump and reaction time) training.

5.2 Conclusion

Consistent with the result indication, this research is subsequently concluded as follows:

Purposely, the study is going on to investigate effects of anaerobic training on improving reaction time and coordination of Wolkite town under 17 years youth .This program must be causative the improvement of Wolkite town under 17 years youth .

In accordance with the result, the study indicates that there was difference on their mean value on both rope jump and reaction time test of two weeks before and after training. Based on the number of repetition on rope jump test during pre and post-test, they counted large number of repetition on post-test rather than pre test training and indicating the improvement of rope jump anaerobic training test.

In contrast, even though, there was a difference during the reaction time test of two weeks before and after training, based on a given duration time of training which is used in pre-test, greater value is counted in pre-test than post-test training and improving reaction time anaerobic training

Recommendation

Based on the research finding and conclusion the researcher had drawn the following recommendations:

- Every youth should be made practice or do exercise of anaerobic training having a concept of its importance
- Wolkite town u 17 youth should make schedule on health exercise and regular training for who want to perform.
- Each and individual people should do training as his/her special need.
- All people could change and improve his/her health risk and survival through making necessary training and practice as well as special improvement may come from specific training on specific variable or factor.
- Scientific training should be processed by expert as well as department of sport science for special population and students.

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APPENDAX

Wolkite University

College of natural and computational Sciences

Department of Sport science

Participant: Wolkite city under 17 years youth

Rope jump test records in 15 seconds

Roll No	Name	Age in year	Weight (Kg)	Height (m)	Pre-test Jump	Post-test Jump
1	B.A	14	44 (kg)	1.50 m	28	30
2	S.M	14	38 (kg)	1.48 m	25	28
3	T.K	14	42 (kg)	1.57 m	23	26
4	M.t	13	37 (kg)	1.43 m	25	30
5	Z.d	16	50 (kg)	1.65	17	20
6	U.a	15	47	1.60	29	30
7	Z.k	12	37	1.38	30	32
8	A.s	16	46	1.58	28	30b

Reaction time test

Roll No	Name	Age in year	Weight (Kg)	Height (m)	Pre-test Inch	Post-test Inch
1	B.a	14	44 (kg)	1.50 m	18 inch	12 inch
2	S.m	14	38 (kg)	1.48 m	16 inch	10 inch
3	T.k	14	42 (kg)	1.57 m	17 inch	13 inch
4	M.t	13	37 (kg)	1.43 m	19 inch	8 inch
5	Z.d	16	50 (kg)	1,65 m	18 inch	9 inch
6	U.a	15	47 (kg)	1.60 m	15 inch	5 inch
7	Z.k	12	37 (kg)	1.38 m	16 inch	8 inch
8	A.s	16	46 (kg)	1,58 m	17	12 inch