

JIMMA UNIVERSITY
COLLEGE NATURAL SCIENCE
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EFFECTS OF 10 WEEKS SOME SELECTED STRETCHING EXERCISES ON MALE
AND FEMALE SPRINTERS PERFORMANCE INCASE OF ATHLETE TIRUNESH
DIBABA ATHLETICS TRAINING CENTER.

ATHESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES
OF JIMMA UNIVERSITY DEPARTMENT OF SPORT SCIENCE
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
MASTER DEGREE OF IN ATHLETICS COACHING SPECIALIZATION

JUNE, 2020
JIMMA, ETHIOPIA

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DECLARATION

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

Name: _____

Signature; _____

Date; _____

Department; _____

Acknowledgment

Above all, I praise GOD for his uncountable compassions and for everything he did for me. Everything is possible with him. Without his will, I can do nothing. I would like to thank my Advisor for Samson Wonderad, (Ass.professor).

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Last, but not least, I would like to thank Athlete Tirunesh Dibaba Athletics Training Center and athletes respondents who participated in the study for their cooperation and kindness in sharing their experiences.

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List of Abbreviations and Acronyms

ATDATC	Athlete Tirunesh Dibaba Athletics Training Center
ANOVA	Analysis of Variance
DS	Dynamic Stretching
PNF	Proprioceptive Neuromuscular Facilitation
ROM	Range of Motion
PARQ	Physical Activity Readiness Questionnaire
PWU	Proper Warm-Up
SPSS	Statistical Package for Social Science

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Abstracts

The primary objective of this study was to assess the effect ten weeks different warm-up and stretching types on sprinters performance in the case of Athlete Tirunesh Dibaba Athletics Training center. Quasi-experimental research design was used to assess the study variables. There were three experimental groups which did not have control group. Purposive sampling technique was used to select athletes. Three type of training protocol such as proper warm-up group (n = 10), proper warm-up and dynamics stretching group (n = 10) and proper warm-up, dynamic and static stretching (n = 10) were included in this study. Dependent variable includes speed, flexibility, power and athlete's personal best. Standardized instrument of data collection like 30m speed test, sit and reach test, broad jump test and athlete's personal best was used. Mean, standard deviation, line graphs and Freidman rank test was used to analyze the data level of significance set at $P < 0.05$. The result of this reveals that proper warm-up did not show significant difference across pretest, during and posttest on sprinters' performance $P > 0.05$. proper warm-up and static stretching training as well as proper warm-up, dynamic and static stretching training shows significant difference across pretest, during and posttest of sprinters' performance $P < 0.05$. In conclusion, proper warm-up and static stretching training as well as proper warm-up, dynamic and static stretching training were effective training types which improves the performance of sprinters.

Keywords: Flexibility, power, speed, sprinters and stretch

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the study

The human body is like the engine of a car. An engine works better when it is properly maintained and warmed up. The same is true of the human machine. Maintenance and warm-up will lead to better performance. The warm-up, better known as “warming”, aims to prepare the athletes, both physically and mentally, taking their muscles to the point of work specific area to make it more efficient (Shellock, 1985).

Although warm up will be shown to result in number of physiological changes, it is possible that psychological mechanisms also contribute to the reported improvements in performance (Bishop, 2001). Prior to vigorous physical exertion, athletes should perform warm-up which benefits performance through thermal, neuromuscular, and psychological effects (Bracko, 2002). Proper warm-up activities mobilize metabolic resources and increase tissue temperature (Bishop, 2001).

Much of the benefit of warm-up comes from the increased body temperature. Another reason for proper warm-up is to prepare the tissues for the greater stresses of vigorous physical activity and thus to lower the risk of muscle-tendon injury. The majority of the effects of warm up have been attributed to temperature-related mechanisms (Bishop, 2001). Warm-up consists of active or passive warming of body tissues in preparation for physical activity.

Active warm-up consists of low-intensity movements that are effective in elevating body temperature, warming tissue, and producing a variety of improvements in physiological function (Gleam, 1997). Passive warm-up includes external heat sources like heating pads, whirlpools, or ultrasound (Bishop, 2001). A Warm-up believed to enhance performance by overcoming viscous resistance to movement of the joint and muscle (McNair and Stanley, 1996).

Proper warm-up and stretching (dynamic and static) can provide several benefits to the body more specifically and the activities are necessary to prepare the body for vigorous physical activity because they increase performance of sprinting time and decrease the risk of muscular injury. Stretching is believed to enhance performance and prevent injuries by increasing flexibility (Smith, 1994). Warm up and Stretching exercises have probably been part of sporting preparation for as long as sport has been performed (Nelson, 2001).

It is important to realize that warm-up and stretching are two different activities. Warm-up is designed to elevate core body temperature and stretching is primarily performed to increase the range of motion (ROM) at a joint or group of joints. It is well accepted that generalized warm-up movements are important to maximize sport performance and reducing the risk of injury in physical activity (Shellock, 1985).

Different types of stretching include static stretching (SS), dynamic stretching (DS), proprioceptive neuromuscular facilitation (PNF), and ballistic stretching (Little and Williams, 2006). These styles can either benefit the athlete or diminish the intended sport outcome, reinforcing the need for evidence as to the appropriate timing and type of stretching activity. Most individuals use static stretching based on prior experience and the ease of performing the task, and some even believe that it will improve performance (Nelson and Kekkonen, 2001). Findings from different studies are somewhat conflicted regarding static stretching and its usefulness in the warm-up.

To this end, there is a lack of consensus on the length of time that the stretches should be held for, although periods of between 20 and 60 seconds are commonly used. The stretch sensation should not be painful and should be localized to the area being stretched. When performed correctly, these types of stretches do not require the assistance of another person and have little chance of causing injury or pain (Power, 2005). Because of these situations, it is possible to provide solutions for the problems that are stated above.

Evidence must be gathered regarding how much proper warm –up (PWU) and stretching are needed to enhance the performance of sprint runners.

The Training Center trains athletes for only four years and then transfer to different clubs,

The earliest record of formal international athletic competition in Ethiopia dates from 1956 in Melbourne Olympic. The first amateur athletics clubs in Ethiopia was formed in 1950's. Over the past 50 years Ethiopia has produced many athletics champions. At the first in 1960 Rome Olympic, others.

Historically Athletics in Ethiopia has relied on a club system to support and develop athletes from secondary school ages upwards. Athletics, like most activities involving groups of people, requires an organizational structure to function smoothly. To meet this need Athlete Tirunesh Dibaba Athletics Training Center exist on national, levels.

The study of Athlete Tirunesh Dibaba Athletics Training Center their similarities, their structure and their relationships – can provide understanding of how they operate and ideas as to how they can make a contribution. Ethiopia Athletics aims to provide better facilities and training environment for the athlete's, by providing the best coaching staff, facilities and resources in psychology, physical therapy, nutrition, performance analysis, skill Acquisition, strength and conditioning and athlete career education support. However all athletics training clubs in Ethiopia will not offer all the mentioned facilities.

In Athlete Tirunesh Dibaba Athletics Training Center currently the first top Academy by contributing number of athletes to the federal team and their athlete's achievement on international and national competitions. These academies have different organizational structure, for Athletics club have a camp where their athletes are living. This academy provides better facilities and training environment for the athlete's. The facility Features include: dormitory, food, sport wear and equipment's, controlled training, meeting rooms, and Administration facilities.

1.2. Statement of the Problem

It is common place for athletes and coaches to use of warm-up and stretching exercises (Dynamics) as a part of pre-activity. Long seen as a means of maintaining range of motion (ACSM, 2009), improving performance and preventing injury (Woods and Jones, 2007), stretching has been suggested as a necessary activity with minimal scientific backing to support its use. Warming up before exercise is important because it prepares you mentally and physically for the training.

In the past there was a strong focus on stretching, but over the last twenty years there have been mixed reviews and research regarding the benefits of warm-up and stretching exercise

on muscles. Warm-up is usually performed before participating in technical sports or exercising. A warm-up generally consists of a gradual increase in intensity in physical activity (pulse raiser), a joint mobility exercise, stretching and a sport related activity.

Warming up is a process by which human machine is brought to a condition at which it safely responds to the nerve impulses of the person for a quick and efficient action. In line with this issue, it is true that most sprinters do not stretch prior to training or competition. Similar to many other sports it is difficult to implement a change in training strategy, however, new information can sway those who direct the future decisions and trends that trickle down to the athletes. In addition to this the researcher has been working for a longer time as a full time coach in the academy so that the researcher motivated to conduct this research.

Given the uniqueness of this current line of research it is warranted that new findings deserve a second look from coaches and sprinters in their application to current training sessions. The Athlete Tirunesh Dibaba Athletics Training Centre and particular attention was directed to the problem on sprinting athletes that the athletes were injured in many cases and their performance were not consistent.

1.3. Research Question

The study was answered the following research questions

- Did ten weeks proper warm-up training affects sprinters' performance across pretest, during and post-test?
- Did ten weeks proper warm-up and dynamic stretching training affects sprinters performance across pretest, during and post-test?
- Did ten weeks proper warm-up, dynamic and static stretching training affects sprinters' performance across pretest, during and posttest

1.4. Objective of the Study

1.4.1 General Objective

The General objective of the study was to assess effects of 10 Weeks Some Selected Stretching Exercises on Male and Female Sprinters Performance In case of Athlete Tirunesh Dibaba Athletics Training Center

1. 4. 2. Specific Objective

- To evaluate the effect of ten weeks proper warm-up training across pretest, during and posttest on sprinters' performance
- To assess the effect of ten weeks proper warm-up and static stretching training across pretest, during and posttest of sprinters' performance
- To assess the effect of ten weeks proper warm-up, dynamic and static stretching training across pretest, during and posttest of sprinters' performance

1.5. Significance of Study

This study may lead to a better understanding of the contributions of proper warm-up Exercise, dynamic and static stretching exercise for enhancing the performance efficiencies of sprinters.

Moreover, the results of the study would help to provide analysis on benefits of performing proper warm-up, dynamic and static stretching exercises brought about. The recommendations could also, be used by athletes, coach and other sports practitioners.

The application of knowledge gained help to improve flexibility, decrease the risk of activity based injuries and rehabilitation. This study will be a ground work for other researchers to conduct further studies in the importance of warm up dynamic and static stretching in sport science.

Athlete Tirunesh Dibaba Athletics Training Center will benefit from 10 Weeks Some Selected Stretching Exercises

1.6. Delimitations of the study

The study was delimited to effects of 10 weeks warm-up and different stretching types on sprinters performance in case of Athlete Tirunesh Dibaba Athletics Training Center. The study also delimited to all sprinters in Athlete Tirunesh Dibaba Athletics Training Center. This study was conducted during 2019/20.

1.7. Limitation of the study

It was well known that this study was quasi-experimental in nature so that the researcher was troublesome in motivating and supervising experimental group athletes from the very beginning from and to the end data collection. In addition to this, there was mostly covid 19 that affected the mobility of the research in order to get transportation and different activity internet connection in order to download necessary literatures from the internet.

1.8. Definitions of Terms

Proper – behaving things in correct and suitable way Warm-up the process of preparing the body for physical activity, resulting in increased body temperature, heart rate, muscle viscosity, metabolic rate and oxygen-hemoglobin disassociation (Sherlock and Prentice, 1985; ACSM, 2009).

Dynamic stretching – movements that take joints and muscles through the full range of motion and are not held but performed in a controlled manner, gradually progressing in speed and intensity until optimal force can be generated without injury.

Static stretching – Slow, sustained muscle lengthening to increase range of motion (Heyward, 2006). Ballistic stretching- which makes use of repetitive bouncing movements Proprioceptive neuromuscular facilitation (PNF) - which uses alternating contractions and stretching of muscle.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

This chapter will discuss current research on the topic of proper warm-up and stretching exercise and its physiological effects to enhancing sports performance for athletes and specifically for sprinters.

2.1 Proper Warm-Up (PWU)

The warm-up has long been a part of preparing an individual before activity (Nelson, 2001). Prior beliefs indicated that stretching before a sport or exercise will help to decrease injury, but research cannot confirm the prophylaxis of injury, regardless of the activities nature (Bracko, 2002).

Proper warm-up, however, is essential to a few key components before starting an event, namely physiological processes in the body that are temperature-dependent (Shellock and Prentice, 1985). The focus of warming up should be to gradually increase your heart rate and circulation to deliver oxygen to muscles, to increase core body temperature, and to prepare your joints and muscles for participation in your sport. Several lines of research have supported the beneficial effects of warm-up on improving performance and reducing injury risk.

Typical warm-up should consist of general movements of gradually increasing intensity. The intensity of warm-up should be moderate (up to 40% to 60% of aerobic capacity) and sustained (5 to 10 minutes) to increase the tissue temperature. There are various types of stretching techniques that are used, often depending on athlete choice, training program me, and the type of sport. An earlier review of stretching (shellock and prentice, 1985) indicated that four different methods are commonly used for sport activities: static, ballistics, proprioceptive neuromuscular facilitation (PNF), and dynamic. But these studies mainly focus on static and dynamic stretching.

Subject matter to be addressed will include the basic physiology of a warm-up, types of stretching techniques, Effects of Stretching on Muscle Performance, mechanisms of each stretching techniques and their effects regarding to improving flexibility, decrease risk of activity based injuries and rehabilitation purpose.

In addition to the physiological effects, the warm up has the effect of preparing the athletes psychologically by encouraging them to focus on the physical activity to follow (Bishop, 2001).

Specifically, pre-exercise stretching and its effects on sprinters and related variables will also be addressed. Pre-exercise warm up routines are common practice, despite limited scientific evidence supporting one protocol over another. For this reason, warm up protocols tend to reflect the experience of individual coaches, trainers, and athletes.

Traditionally, static-stretching exercises have been a prominent feature of warm up routines. Support for a more dynamic warm up (DWU) has grown in recent years, because several investigations have shown the potential for acute, static stretching to degrade performance on vertical jumps, short sprints, tasks requiring maximal voluntary contractions, muscle strength-endurance performance, balance challenges, and reaction time. Additionally, several studies now indicate that pre-exercise static stretching does not offer the presumed benefit of injury risk reduction (McMillian *et al*, 2006).

In muscular therapy, exercises to improve the flexibility of the muscle are applied to treat hyper tensed and short muscles or myogelosis. Moreover stretching exercises are applied after strength training programs in order to prevent muscle contractures supposed to be a consequence of resistance training (Ibid, 2006).

In general the following effects are attributed to stretching: precaution against developing short muscles; lowering of muscular resting tension; prevention of muscle tightness; increase of joint's range of motion ; prophylaxis against injuries, and due to these stretching effects a general increase of muscular performance. The ability of an individual to move smoothly depends on his flexibility, an attribute that enhances both safety and optimal physical activities. The hamstrings are example of muscle groups that have a tendency to shorten.

A tight hamstring causes increased patella and femoral compressive force, which may eventually lead to patella and femoral syndrome. Flexibility can be enhanced by simple, non-surgical procedures like stretching the shortened muscles. One of the factors that may likely affect the outcome of the non-surgical intervention is the duration for which any of the techniques is applied (Bandy, Irion and Wriggler, 1998).

A proper warm-up routine is very important to the health and performance of an athlete. If the body is not adequately prepared for the demands of the upcoming sport or activity, injury is more likely to occur. In addition, it is impossible for the body to perform to the peak of its ability without warm, flexible muscles. In the past, static stretching was the preferred method of pre-activity warm-up, and is still used to a large extent (Cornwell, 2002).

A static stretch is a stretch performed with a prolonged hold and is used to increase the length of soft tissue or the flexibility of a specific muscle (Therapeutic associates). Static stretching still is an important aspect of an athlete's overall health. Static stretches help to reduce injury by maximizing flexibility and improving biomechanics. Static stretching is very useful and beneficial to be done not only after activity, but also to be continued regularly in between athletic activities to increase and maintain muscle length and flexibility .Flexibility is an important attribute of a healthy as well as of a physically fit muscle(Bracko, 2002).

Dynamic warm-ups increase muscular flexibility for the short-term through the neuromuscular system and potentially reduce injury through decreasing reflexive muscle contractions. The reasons listed above point to dynamic activities being ideal components for pre-activity and sport warm-up Pictured below are some dynamic flexibility exercises that can be added to any pre-activity warm-up program. These exercises will improve the performance of all the main muscle groups and significantly decrease the chance of injury. Also pictured below are some static stretching exercises that can be utilized after athletic activities and regularly during the week to further decrease chance of injury (Therapeutic associates) (Bracko, 2002).

Stretching is physical activity that elongates the muscles being used. According to Professor Davis from Lehigh University, what actually happens during a stretch is very complex. He said, "Each muscle contains stretch receptors which attach themselves to the working part of the muscle called, muscle fibers (Cornwell, 2002).

The stretch receptors measure the degree of the stretch, sending a message through the spinal cord to the nerves that control the contraction of the muscle where the receptors are.” There are several benefits and reasons we stretch before and after exercise. Firstly, we stretch to increase flexibility, which carries over to everyday life; tasks such as bending down or reaching up to move an object(Bracko, 2002).

The more flexible we are, the easier it is to move around and work on different planes. We also stretch to improve blood circulation to our entire body, especially the muscles being used while exercising. Another benefit to stretching is to improve and increase our range of motion, especially to our joints.

Specifically, stretching gives us better balance as our range of motion becomes greater. Finally, we stretch to relieve tension and relax the muscles in our body. Therefore stretching exercises are an essential part of preparation for subsequent sporting activities.

2.2. Dynamic stretching

In an extensive review of warm-up and stretching (Shellock and Prentice, 1985), it was stated that “dynamic stretching is important in athletic performance because it is essential for an extremity to be capable of moving through a non-restricted range of motion”. Unfortunately, there has no published research cited for any aspects of dynamic stretching. Dynamic stretching is the most important part of warming up(Bracko, 2002).

It prepares your joints and muscles for the movements required in your sport while increasing heart rate, circulation, and core body temperature. In Ultimate, dynamic stretching means preparing your body for just about everything including lunging, bending, reaching, jumping, landing, running, twisting, pivoting, and shuffling(Cornwell, 2002).

2.3. Static stretching

Static stretching is the most widely used techniques by athletes due to its simplicity. Static stretching was found to affect mechanical aspects (Cornwell, 2002).Traditionally, static stretching has been an integral part of warm-up routines. However, recent studies and reviews in sports medicine research suggest that static stretching before exercise does not prevent injury and does not improve performance. After a workout is the ideal time to use static stretching.

2.4. General Concepts of Sprinters

Sprinting performance is impacted by a number of anatomical and physiological characteristics. Perhaps the two most readily and generally identified characteristics of sprint performance are height and fast-twitch fiber type. However, based on the various phase requirements of sprint performance and the multitude of skills required of sport performers, there are many factors that contribute to and detract from running speed (William and Brechue, 2011).

General concepts of sprinter according to IAAF Literature categorized each discipline of 100 meter, 200 meter, and 400 meters are sprint running events. One of the target goals of the sprinter is speed. Speed is the capacity to travel or move very quickly. Like all the components of fitness, speed can be broken down into different types. It may mean the whole body moving at maximal running speed, as in the sprinter. Speed training involves development of a skill so that the technique is performed at a faster rate.

To develop speed the skill must be practiced on a regular basis at a maximum or close to maximum rate of movement. Maximal running speed, for example, is developed by runs over short distances at maximum effort. Perhaps the foundation exercise for developing maximal speed is the 'Flying 30s' which are maximal sprints over 10m, 20m, 30m or even 40 meters. The most common distance for senior athletes is 30 meters which is why the exercise is known as 'Flying 30s' It may involve optimal speed, such as the controlled speed in the approach run of the jumping events. Or, it may include the speed of a limb, such as the throwing arm in the shot or discus, or the takeoff leg in the jumps. Speed includes the following types (Bracko, 2002).

2.5. Sprinters Mechanics

For sprinters, muscle power, neurological innervations, and length of limbs are the most important factors to consider. These factors affect the two main components that determine running velocity: stride length and stride frequency (William, 2011).

2.5.1. Reaction time,

When considering speed it is important to include reaction time. Reaction time is the time between a stimulus and the first movement by the athlete, such as the firing of the starter's pistol and the athlete's movement from the blocks.

Includes the reaction to the gun in the crouch start but also to how quickly an athlete responds to something in an event. There are many factors both physiological and psychological which influence reaction time and the initiation of movement. It also includes the athlete's response to what happens during a competition.

How long does it take the athlete to react. Simple reaction time games can be great fun for young athletes and in the Kids' Athletics stage of athlete development these games ensure that the first window of opportunity for speed is optimized.

Reaction time for athletes of all chronological ages and training ages can be improved with practice, provided the practice situation is realistic (Walsh, 2017).

2.6. Force Development & Sprinting

To increase running speed an athlete must increase force to the ground in the appropriate direction and do so over increasingly shorter periods of time, Minimize horizontal braking forces and Increase propulsive forces (O'Sullivan, 2009).

Stride Length

Stride frequency depends on the functioning of the central nervous system (the firing ability of the nerves stimulating the muscles), the muscle fiber type, and the length of the limbs. The more FT fibers a sprinter has, the greater stride frequency he or she can attain. Shorter limbs can move with greater frequency. Longer limbs have a lower frequency. Short sprinters therefore typically run with a very powerful stride and on average run short races faster. Most tall sprinters run faster. The benefit of greater force application is two-fold. Increased stride length Increased stride frequency Sprinting is an extremely complex motor task involving repeated rapid 'switching on and off' of practically every muscle in the body (Little and Williams, 2006).

Stride Frequency

Stride frequency depends on the functioning of the central nervous system (the firing ability of the nerves stimulating the muscles), the muscle fiber type, and the length of the limbs. The more FT fibers a sprinter has, the greater stride frequency he or she can attain. Shorter limbs can move with greater frequency.

Longer limbs have a lower frequency. Short sprinters therefore typically run with a very powerful stride and on average run short races faster. Most tall sprinters run faster in the longer sprint races, in which both speed and endurance are needed (Bracko, 2002).

CHAPTER THREE

3. RESEARCH METHODS AND MATERIALS

3.1. Study Design

In this study quasi-experimental research design was employed to assess the effects of 10 weeks warm-up and different stretching types on sprinters performance in case of Athlete Tirunesh Dibaba Athletics Training Center. This study used pretest, during and post test without control group to determine the effects of proper warm up Dynamics and static stretching exercise to enhance the performance efficiency of sprint runners. In this study the three different groups was assigned independently for experimental purpose. The three groups includes: 'A' proper warm-up group (PWU) 'B' proper warm-up and dynamic stretch group (PWU + DS) and 'C' proper warm-up, dynamic stretch and static stretching groups (PWU+DS+SS).

The training was conducted three times per week for 15 minutes, 30 minutes, 45 minutes. Monday, Wednesday and Friday in the morning from 7:00-9:00a.m.

The training exercise was carried out with proper instructions and supervisions.

The training program was carried out for 15 minute proper warm up, for 30 minute (PWU and DS), and 45 minute (PWU+DS+SS).

All athletes' performance was evaluated three times.

Times over 30 meter flight test, Broad jump test and sit and reach test were recorded in pre-during and post-test.

3.2. Study Area

The training center is found at Arsi high lands at an altitude of 2600m above sea level. The area is globally known for its best quality elite athletes, which dominates on different international athletic competitions. Since its establishments October 2002 E.C. The study will conducted in oromia regional state, Arsi zone, Asela town in Athlete Tirunesh Dibaba Athletics Training center. ATDATC is one of governmental Sport training center in the country and is located about 175 KMs south east of the capital Addis Ababa. A training center have a total population of 478 of this 265 are athletes, 20 are coaches and 193 are supportive staff workers. There are 5 events in athletics i.e. Long distance, Middle distance, Short distance, Throwing and Jumping in the training center and in all of the departments scientific training has been carried out (ATDATC, 2019).

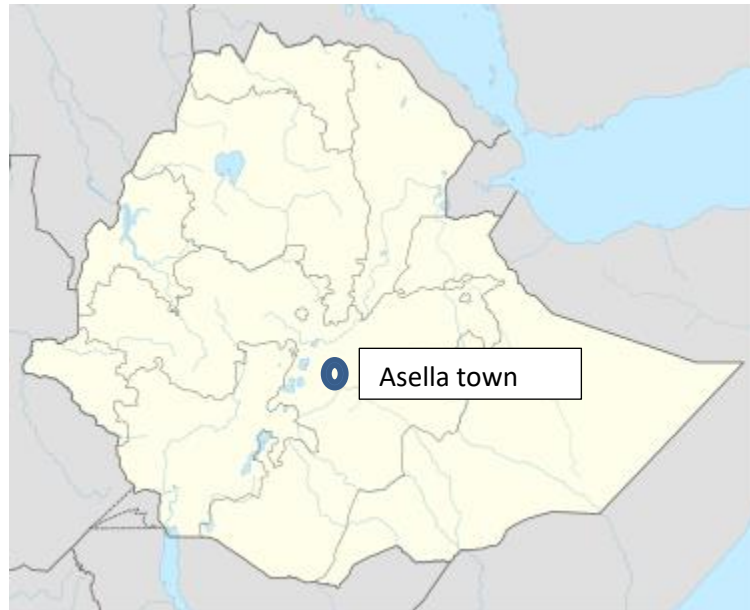


Figure 3.1. Study area, Asella town, Ethiopia

3.3. Inclusion and Exclusion Criteria

Subjects who were filled the health history questionnaires and free from any chronic disease and whose age is 17 - 18 were included in the study. In addition the subjects shouldn't have any recent physical injury and medical condition restricted by physician. The subjects who were unable to fulfill the criteria were excluded from the study.

3.4. Population of Study

The source of population was Athlete Tirunesh Dibaba Athletics Training Center all male (n= 15) and female (n= 15) sprinter athletes. The subjects were from different family background and athletes trained together at the same campus. All the participants were physically active on regular basis. The selection criteria were depending on the interest to participate in performance program. The total population of sprinter were (N = 40), target population as well as sampled subject (n = 30) were selected using simple random sampling. Those samples are classified into three groups each (n = 10).

3.5. Sampling Size and Sampling Techniques

For this study simple random sampling technique was used. The sample was composed of 30 (10 for each group with 5 males and 5 females), aged between 17 and 18 years with equal numbers. Then athletes were selected randomly from each discipline of 100 meter, 200 meter, and 400 meter running events. Because the number of sprinters were very few in

nature so that almost all of sprinters in Tirunesh Dibaba Athletics training center was taken as sample of study.

3.6. Source of the Data

All sprinters including male and female athlete Tirunesh Dibaba athletics training center were considered as the primary source of data. Accordingly the data were collected from athletes using standardized field test

3.6.1. Primary source

The study has used primary source of data including flying 30 meter test, sit and reach test, broad jump test and personal best time of athletes.

3.7. Procedure of data collection

The data were recorded with the help of two assistances. Data collectors were received training regard to data and information which were collected from the participants.

3.7.1. Flying 30 meter Test

This test was used for evaluating the speed performance efficiencies of sprint runners in the study. To undertake this test you will required to: - Track, Cones, and Stop watch, Meter, Flag, Score Sheet, Whistle and Assistant.

Analysis

Analysis of the result is by comparing it with the results of previous tests. It is expected that, with appropriate training between each test, the analysis would indicate an improvement.

3.7. 2. Sit and Reach Test

The objective of this test is to monitor the development of the player's lower back and hamstring flexibility. Required resources are to undertake this test you will require: Sit & reach' table or a bench with a ruler and assistant.

Analysis

Analysis of the result is by comparing it with the results of previous tests. It is expected that, with appropriate training between each test, the analysis would indicate an improvement.

3.7.3. Broad Jump Test

Broad jump is started test of fitness; the jumps provides on Extent way to measure your explosive leg strength. This test will provide on Extent way to measure your explosive leg strength. (According to study published in the July 2010 journal of strength and conditioning research) To perform Broad Jump Test the following procedures will be followed:- For Australian team sport athletes.

3.8. Method of data Analysis

Data were entered into SPSS version 25. Mean and standard deviation was used to analyze demographic characteristics of sprinters. Friedman rank test was used to analyze the effect of ten weeks proper warm-up training across pretest, during and posttest on sprinters' performance, assess the effect of ten weeks proper warm-up and static stretching training across pretest, during and posttest of sprinters' performance and assess the effect of ten proper warm-up, dynamic and static stretching training across pretest, during and posttest of sprinters' performance.

Because of there is on control group The level of significance was set at $p \leq 0.05$.

CHAPTER FOUR

4. RESULTS AND DISCUSSIONS

4.1. Demographic characteristics of Athlete Tirunesh Dibaba Training Center sprinters

Table 4. 1. Demographic characteristics of Athlete Tirunesh Dibaba Athletics Training center sprinters

S.n	Variables	Statistic	PWU	PWU + DS	PWU + DS + SS
1.	Age	Mean	17.2	17.40	17.3
		Std	0.42	0.69	0.48
2.	Height	Mean	1.73	1.69	1.69
		Std	0.05	0.02	0.02
3.	Weight	Mean	54.2	55.7	55.2
		Std	5.1	2.9	3.7
4.	BMI	Mean	18.12	19.47	19.23
		Std	1.3	0.75	1.11

The above descriptive statistics of sprinters demographic characteristics of each experimental group were as discussed below. The proper warm up group age was (17.2 ± 0.42), proper warm up and dynamic group age was (17.3 ± 0.69), and proper warm up dynamic stretching and static stretching group was (17.3 ± 0.48) respectively.

In addition to this the height of proper warm up group was (1.73 ± 0.05), proper warm up and dynamic stretching was (1.69 ± 0.02) and proper warm up and dynamic stretching and static stretching (1.69 ± 0.02) respectively.

Similarly, the weight of proper warm up group was (54.2 ± 5.1) proper warm up and dynamic stretching (55.7 ± 2.9) and proper warm up dynamic stretching and static stretching was (55.2 ± 3.7) respectively.

Correspondingly body mass index (BMI) of proper warm up was (18.21 ± 1.3) proper warm up and dynamic stretching was (19.47 ± 0.75) and proper warm up dynamic and static stretching was (19.23 ± 1.11) respectively.

The above analysis implies that the age of sprinters were almost similar that their range from 17-18 year old. Sprinter height swing from 1.16-1.73m high. Sprinters weight ranges from 51-58kg. The body mass index of sprinters were from 17-18 BMI. Hence sprinters demographic characteristics were almost similar.

4.2. Effect of Ten weeks proper warm-up training across pretest, during and posttest on sprinters' performance

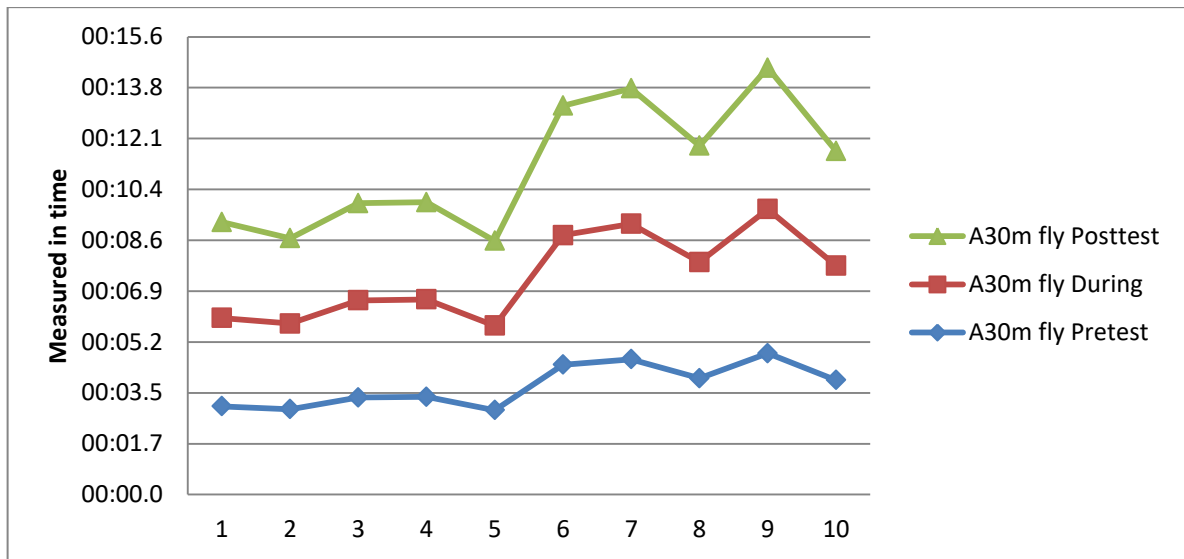


Figure 4. 1 Ten weeks proper warm-up training across fly 30m pretest, during and posttest

The above figure reveals that proper warming up of sprinters shows an improvement of speed fly 30m pretest greater than during and during intervention result was greater than posttest result. This implies that there was an improvement sprinter of Athlete Tirunesh Dibaba Athletics training center.

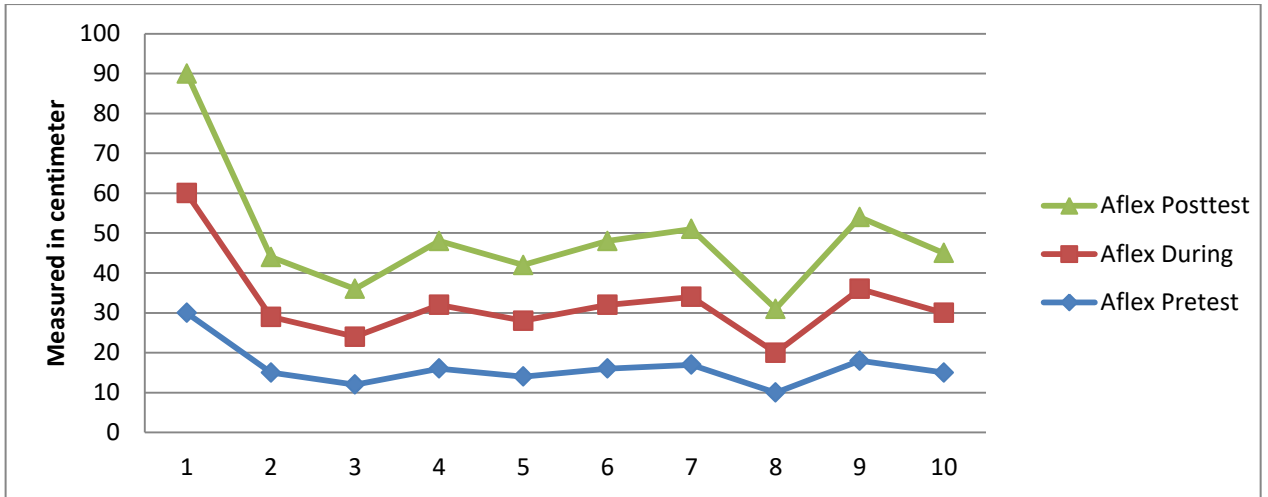


Figure 4. 2 Ten weeks proper warm-up training across sit and reach pretest, during and posttest

The above figure reveals that proper warming up of sprinters shows an improvement of sit and reach pretest lower than during and during intervention result was lower than posttest result. This shows that there was flexibility an improvement of Athlete Athlete Tirunesh Dibaba Athletics training center. Tirunesh Dibaba sprinters.

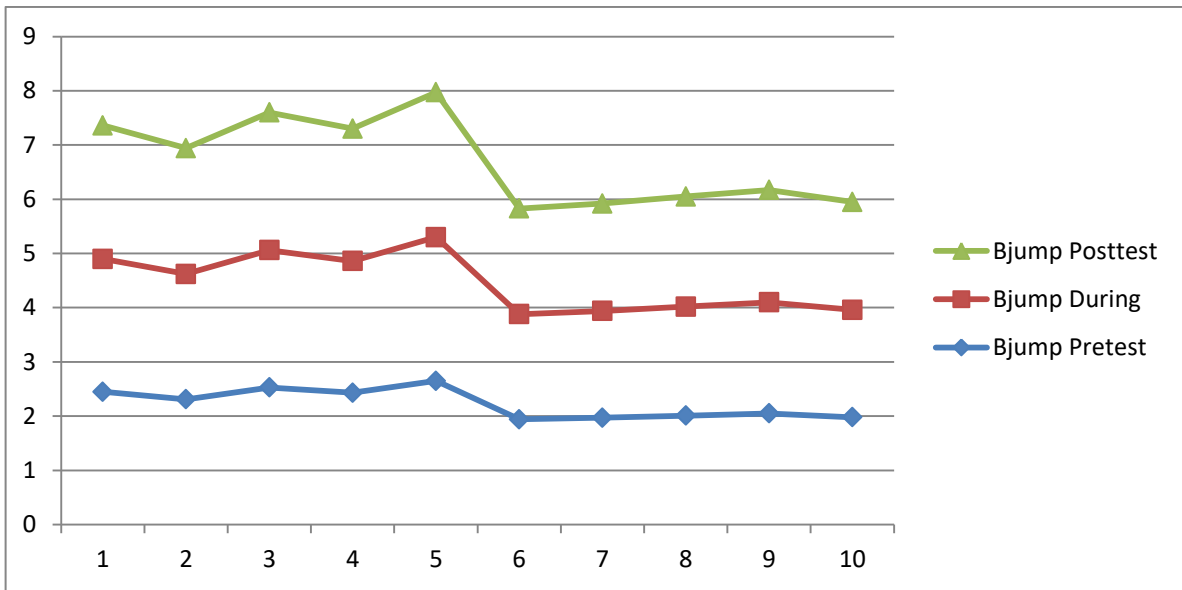


Figure 4. 3 Ten weeks proper warm-up training across broad jump pretest, during and posttest

The above figure reveals that proper warming up of sprinters shows an improvement of broad jump performance of pretest lower than during and during intervention result was lower than posttest result. This shows that there was jumping performance an improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

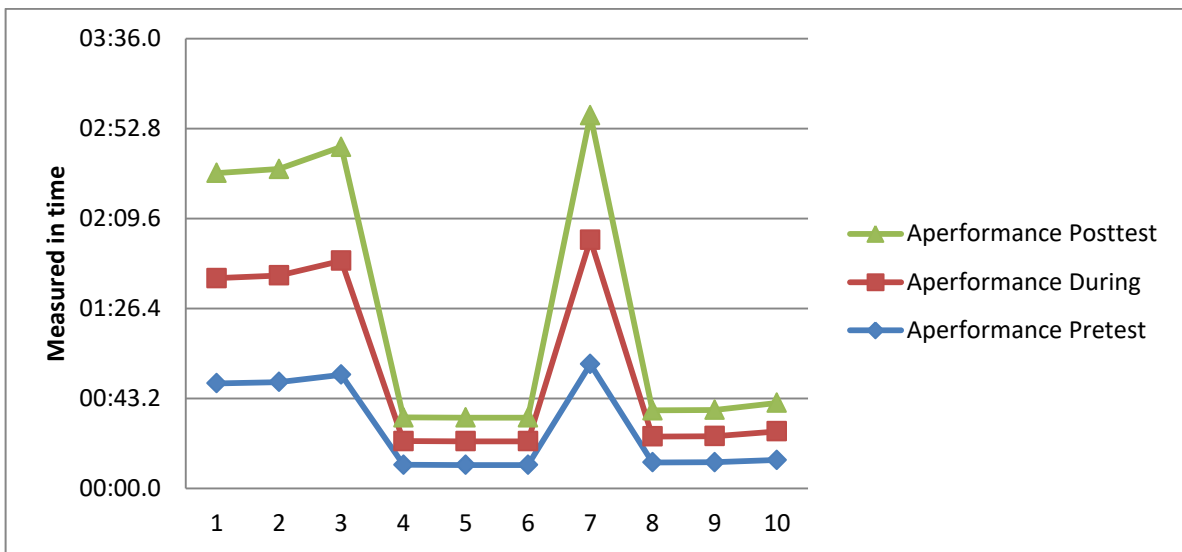


Figure 4. 4 Ten weeks proper warm-up training across seasonal performance pretest, during and posttest result.

The above figure reveals that proper warming up of sprinters shows an improvement of trial time performance of pretest less than during and during intervention result was less than posttest result. This shows that there was trial time performance an improvement of Athlete Tirunesh Dibaba Athlete Tirunesh Dibaba Athletics training center sprinters.

Table 4. 2. Effect of Ten weeks proper warm-up training across pretest, during and posttest of sprinters' performance

S.n	Variables	Mean Rank	df	X ²	Sign
1	PWU Fly 30m Pretest	2.05	9	.875	.646
2	PWU Fly 30m During	2.10			
3	PWU Fly 30m Posttest	1.85			
4	PWU Sit & Reach Pretest	2.00	9	3.00	.223
5	PWU Sit & Reach During	1.85			
6	PWU Sit & Reach Posttest	2.15			
7	PWU Broad jump Pretest	1.85	9	3.00	.223
8	PWU Broad jump Test jump During	2.15			
9	PWU Broad jump Test jump Posttest	2.00			
10	PWU performance pretest	1.95	9	1.07	.58
11	PWU performance during	2.15			
12	PWU performance posttest	1.90			

Friedman Rank test reveals that proper warm-up posttest was not statistically higher than during intervention in the same way during intervention result was also not statistically significantly higher than pretest speed fly 30m test at $X^2 = .875$, $P > 0.05$. Thus, the null hypothesis was accepted that there was no statistically significant difference among speed fly 30m test pretest, during and posttest due to 10 weeks proper warm-up intervention. From this one can understand that effective 10 weeks proper warm-up intervention does not show statistically significant difference on speed of fly 30m Athlete Tirunesh Dibaba Athletics training center. Sprinters.

Correspondingly, proper warm-up posttest was not statistically higher than during intervention in the same way during intervention result was also not statistically significantly higher than pretest Sit & Reach test at $X^2 = 3.00$, $P > 0.05$. Thus, the null hypothesis was accepted that there was no statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up intervention. From this one can understand that effective 10 weeks proper warm-up intervention does not show statistically significant difference on Sit & Reach performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

Interestingly, proper warm-up posttest was not statistically higher than during intervention in the same way during intervention result was also not statistically significantly higher

than pretest broad jump test at $X^2 = 3.00$, $P > 0.05$. Thus, the null hypothesis was accepted that there was no statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up intervention. From this one can understand that effective 10 weeks proper warm-up intervention does not show statistically significant difference on broad jump performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

Similarly, proper warm-up posttest was not statistically higher than during intervention in the same way during intervention result was also not statistically significantly higher than pretest seasonal performance test at $X^2 = 1.07$, $P > 0.05$. Thus, the null hypothesis was accepted that there was no statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up intervention. From this one can understand that effective 10 weeks proper warm-up intervention does not show statistically significant difference on seasonal performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

4.3. Effect of Ten weeks proper warm-up and static stretching training across pretest, during and posttest of sprinters' performance

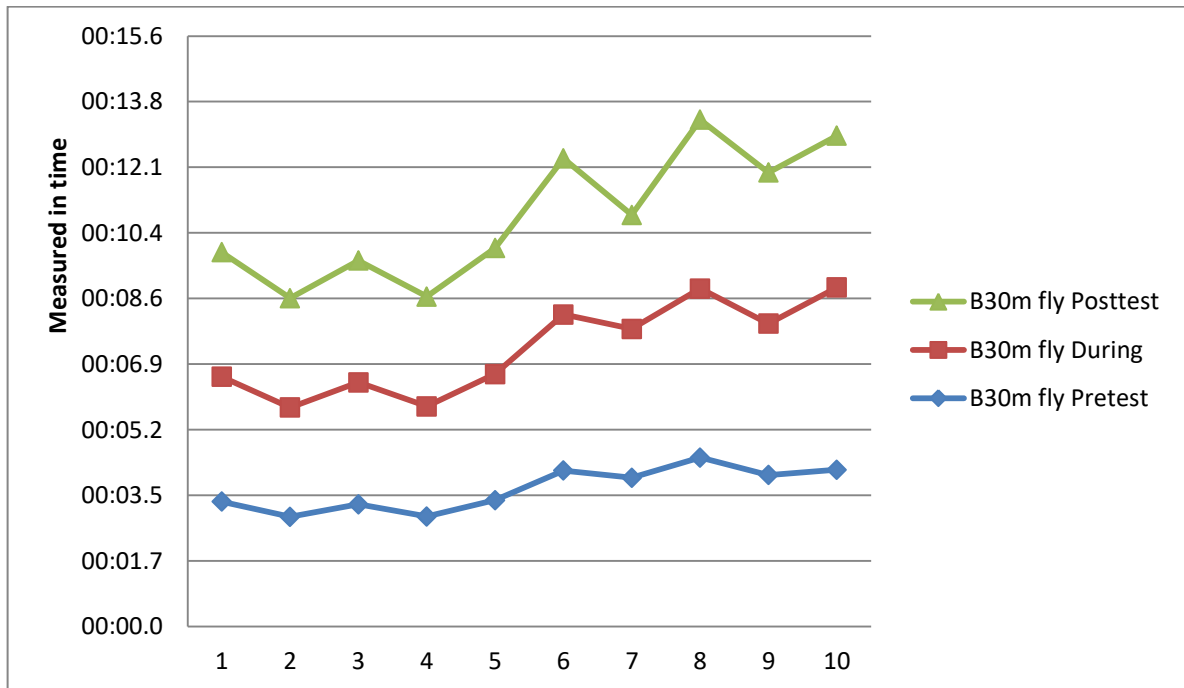


Figure 4. 5 Ten weeks proper warm-up and dynamic stretching training across fly 30m pretest, during and posttest

The above figure reveals that proper warming up and dynamic stretching training of sprinters shows an improvement of fly 30m performance of pretest greater than during and during intervention result was greater than posttest result. This shows that there was fly 30m performance same improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

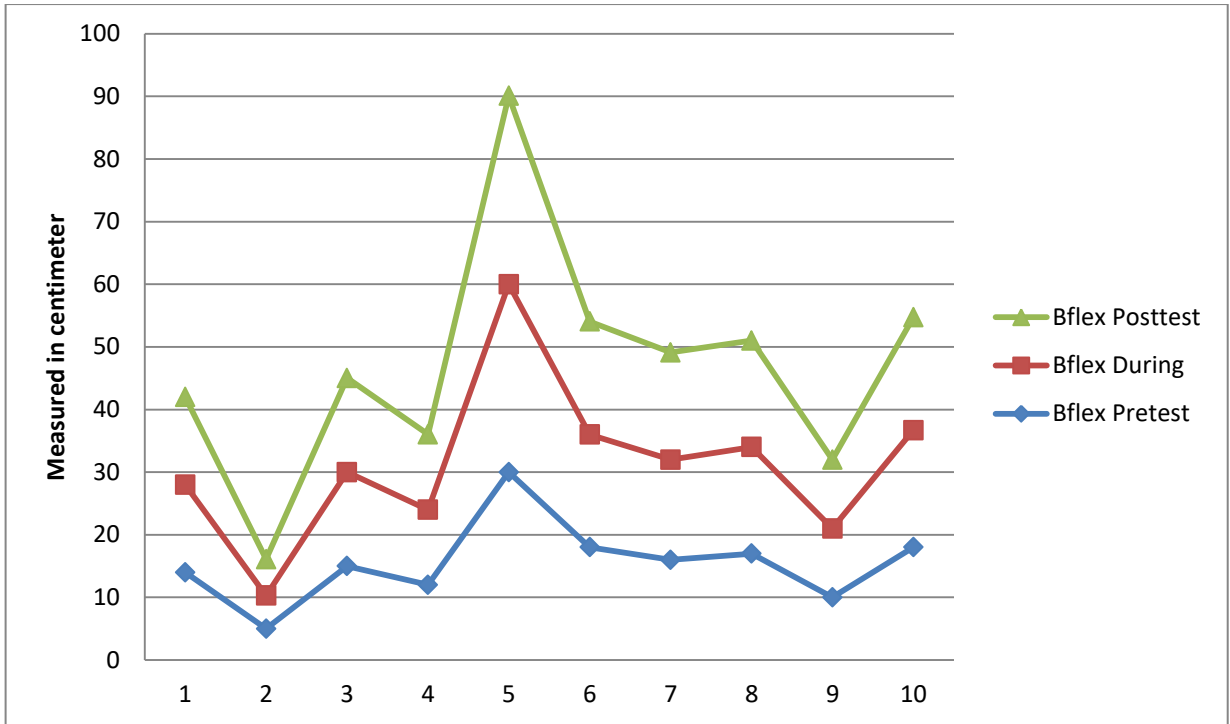


Figure 4. 6 Ten weeks proper warm-up and dynamic stretching training across sit and reach pretest, during and posttest

The above figure reveals that proper warming up and dynamic stretching training of sprinters shows an improvement of sit and reach performance of pretest less than during and posttest intervention result was less than posttest result. This shows that there was sit and reaches performance same improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

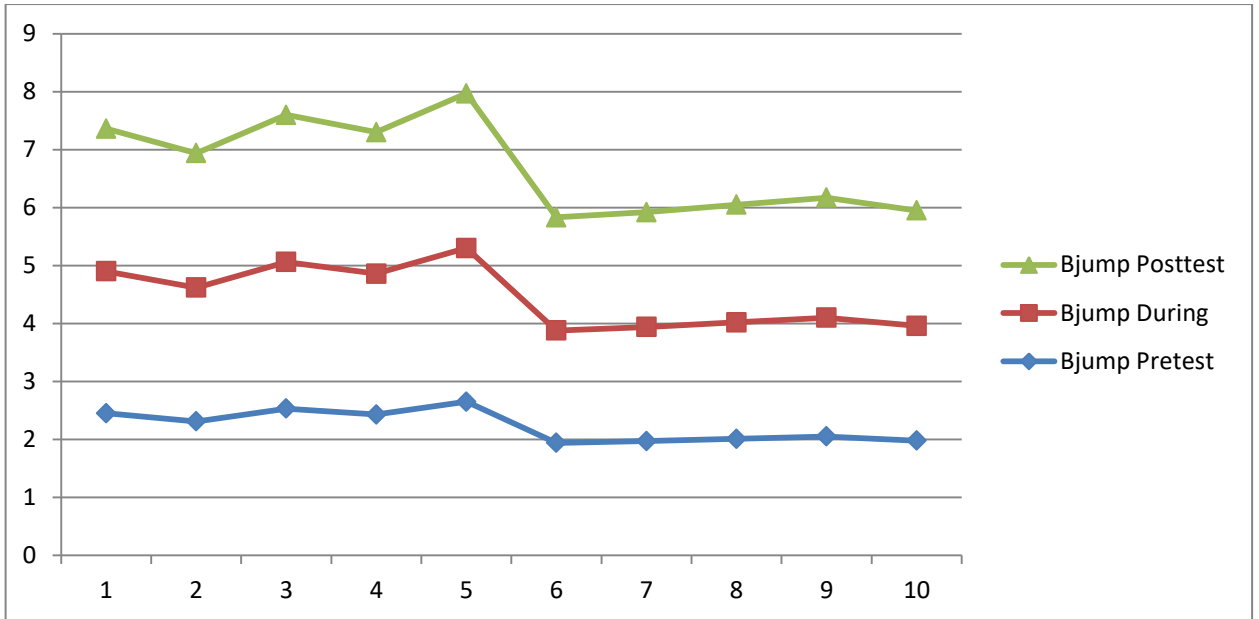


Figure 4. 7 Ten weeks proper warm-up and dynamic stretching training across broad jump pretest, during and posttest

The above figure reveals that proper warming up and dynamic stretching training of sprinters shows same improvement of broad jump performance of pretest less than during and post intervention result was greater than pre during result. This shows that there was broad jump performance same improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

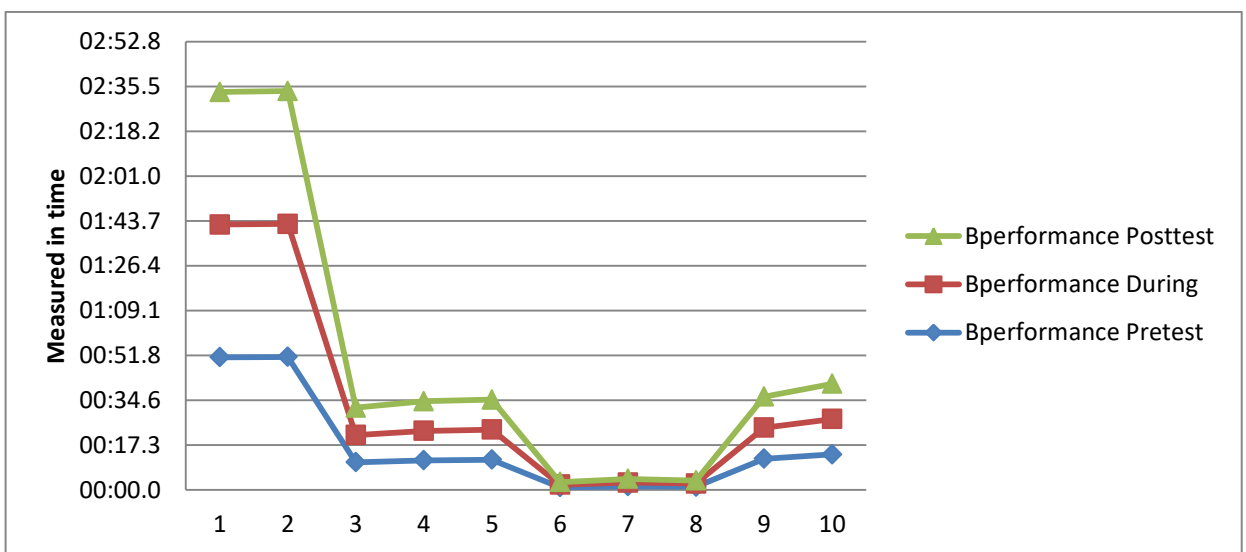


Figure 4. 8 Ten weeks proper warm-up and dynamic stretching training across seasonal performance pretest, during and posttest

The above figure reveals that proper warming up and dynamic stretching training of sprinters shows an improvement of trial time performance of pretest greater than during and post intervention result was less than post and during result. This shows that there was trial time performance an improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

Table 4. 3. Effect of Ten weeks proper warm-up and static stretching across pretest, during and posttest of sprinters' performance

S.n	Variables	Mean Rank	Df	X ²	Sign
1	PWU + DS Fly 30m Pretest	2.50	9	11.12	.004
2	PWU + DS Fly 30m During	2.15			
3	PWU + DS Fly 30m Posttest	1.35			
4	PWU + DS Sit & Reach Pretest	1.45	9	11.64	.003
5	PWU + DS Sit & Reach During	1.85			
6	PWU + DS Sit & Reach Posttest	2.70			
7	PWU + DS Broad jump Pretest	1.50	9	20.00	.000
8	PWU + DS Broad jump Test During	1.50			
9	PWU + DS Broad jump Test Posttest	3.00			
10	PWU + DS performance pretest	2.55	9	10.57	.005
11	PWU + DS performance during	1.95			
12	PWU + DS performance posttest	1.50			

The above table of Friedman Rank test reveals that proper warm-up and dynamic stretching posttest was statistically significantly higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest speed fly 30m test at $X^2 = 11.12$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among speed fly 30m test pretest, during and posttest due to 10 weeks proper warm-up and dynamic stretching intervention. This shows that effective 10 weeks proper warm-up and dynamic stretching intervention show statistically significant difference on speed of fly 30m Athlete Tirunesh Dibaba Athletics training center sprinters.

Proper warm-up and dynamic stretching posttest was statistically higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest Sit & Reach test at $X^2 = 11.64$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up and dynamic stretching intervention.

From this one can understand that effective 10 weeks proper warm-up intervention and dynamic stretching intervention shows statistically significant difference on Sit & Reach performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

Interestingly, proper warm-up and dynamic stretching posttest was statistically higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest broad jump test at $X^2 = 20.00$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up intervention. From this one can understand that effective 10 weeks proper warm-up and dynamic stretching intervention show statistically significant difference on broad jump performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

Similarly, proper warm-up and dynamic stretching posttest was statistically higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest seasonal performance test at $X^2 = 10.57$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up and dynamic stretching intervention. From this one can understand that effective 10 weeks proper warm-up intervention show statistically significant difference on seasonal performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

4.4. Effect of Ten weeks proper warm-up, dynamic and static stretching training across pretest, during and posttest of sprinters' performance

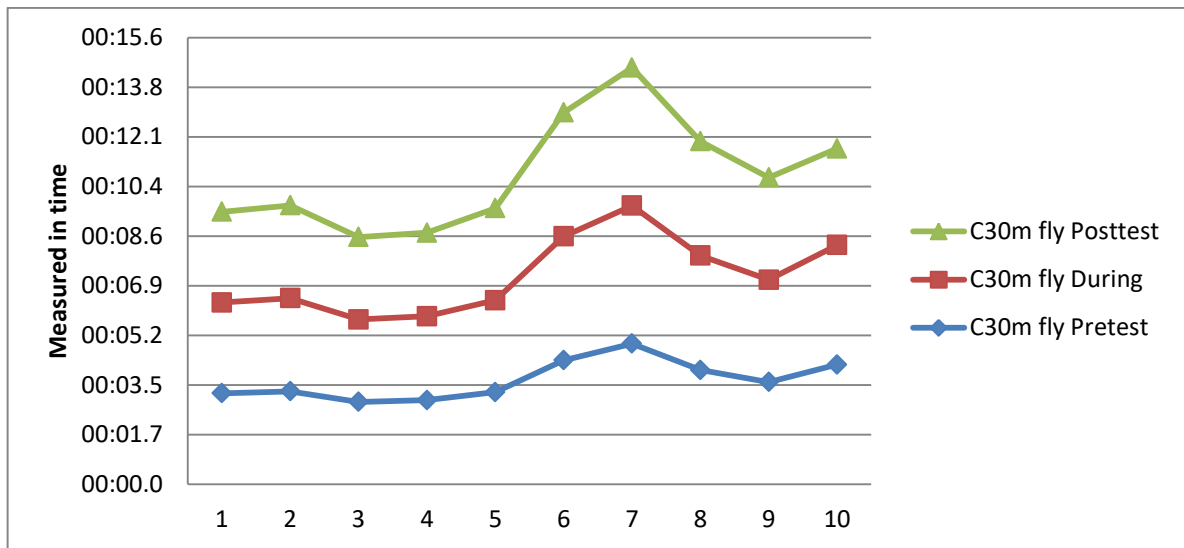


Figure 4. 9 Ten weeks proper warm-up, dynamic and static stretching training across fly 30m pretest, during and posttest

The above figure reveals that proper warming up, dynamic and static stretching training of sprinters shows an improvement of fly 30m performance of pretest less than during and during intervention result was less than post test result. This shows that there was fly 30m performance improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

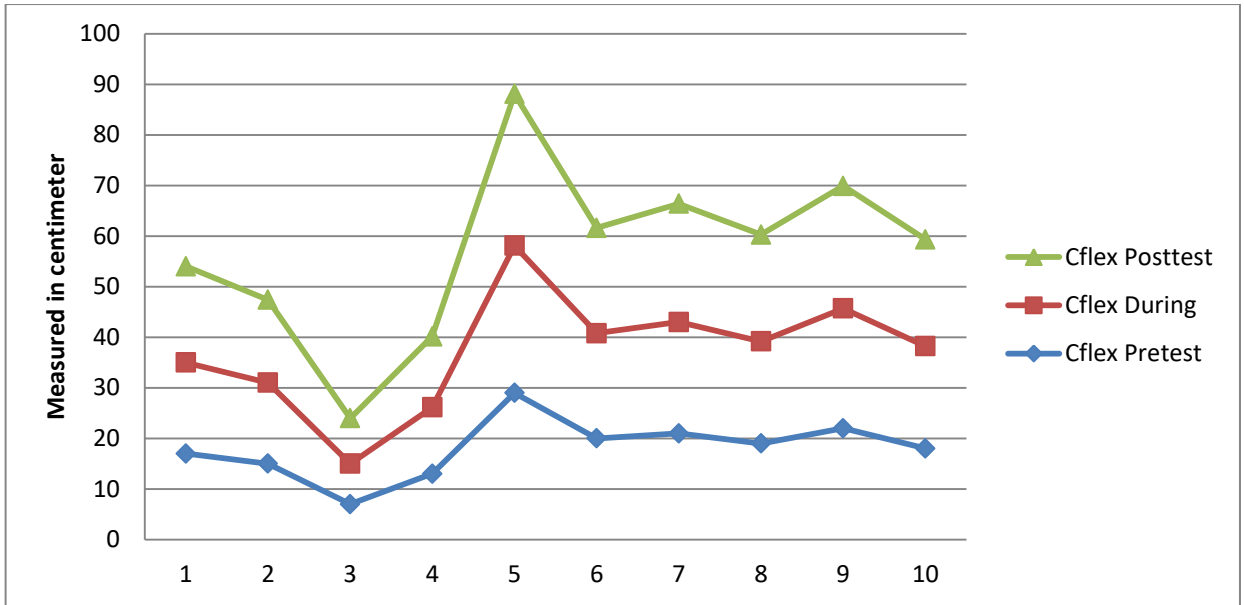


Figure 4. 10 Ten weeks proper warm-up, dynamic and static stretching training across sit and reach pretest, during and posttest

The above figure reveals that proper warming up, dynamic and static stretching training of sprinters shows an improvement of sit and reaches performance of pretest less than during and during intervention result was less than posttest result. This shows that there was sit and reaches performance improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

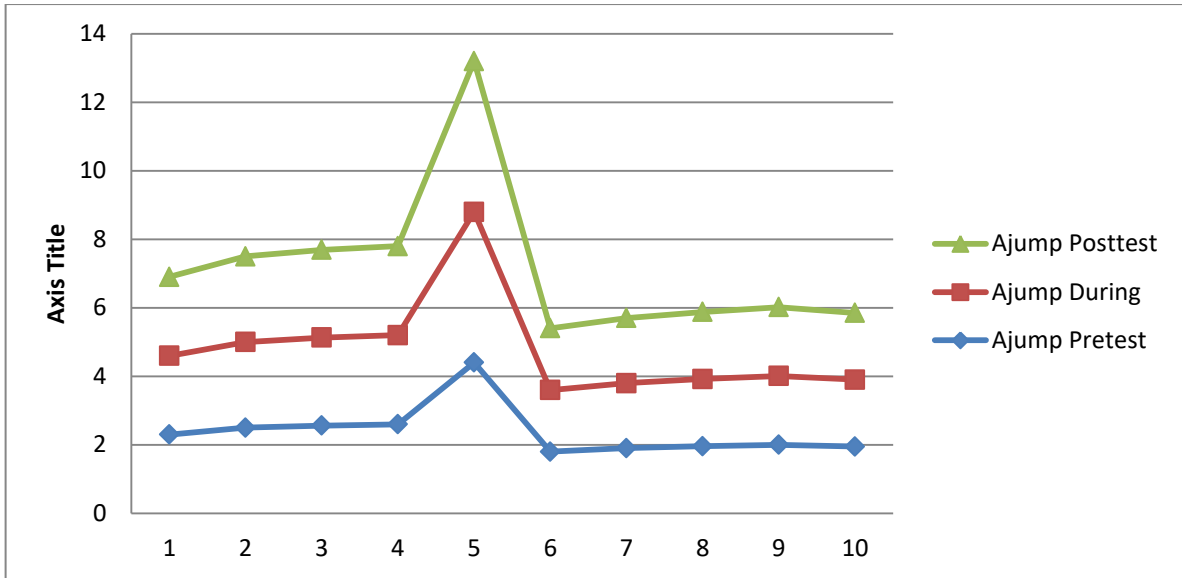


Figure 4. 11 Ten weeks proper warm-up, dynamic and static stretching training across broad jump pretest, during and posttest

The above figure reveals that proper warming up, dynamic and static stretching training of sprinters shows an improvement of broad jump performance of pretest less than during and during intervention result was less than posttest result. This shows that there was broad jump performance improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

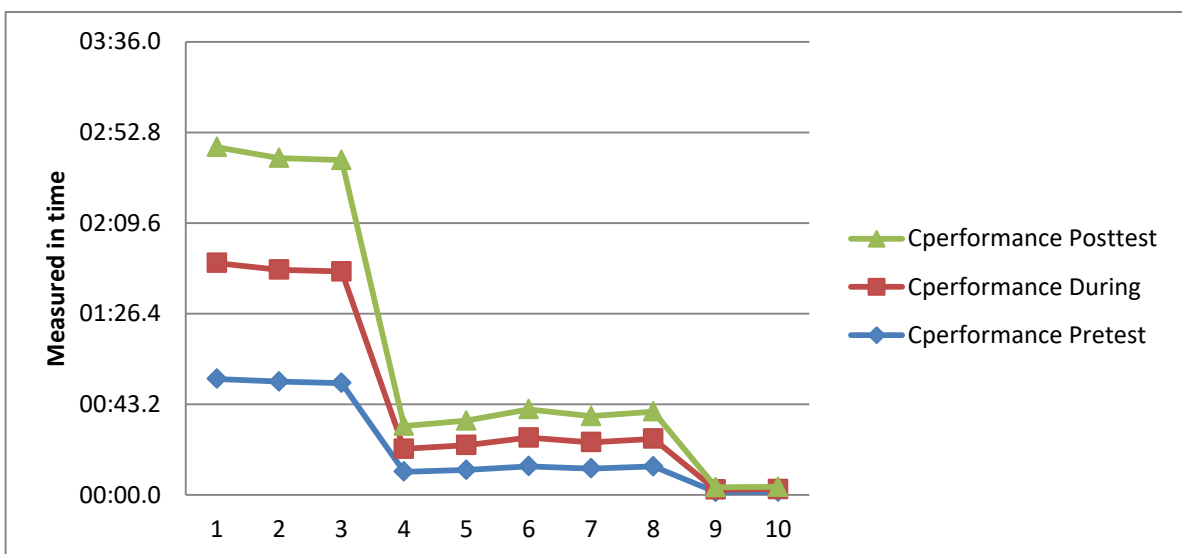


Figure 4. 12 Ten weeks proper warm-up, dynamic and static stretching training across performance pretest, during and posttest

The above figure reveals that proper warming up, dynamic and static stretching training of sprinters shows an improvement of trial time performance of pretest less than during and during intervention result was less than posttest result. This shows that there was trial time performance improvement of Athlete Tirunesh Dibaba Athletics training center sprinters.

Table 4. 4. Effect of Ten weeks proper warm-up, dynamic and static stretching training across pretest, during and posttest of sprinters' performance.

S.n	Variables	Mean Rank	df	X ²	Sign
1	PWU + DS + SS Fly 30m Pretest	2.65	9	12.08	.002
2	PWU + DS + SS Fly 30m During	1.85			
3	PWU + DS + SS Fly 30m Posttest	1.50			
4	PWU + DS + SS Sit & Reach Pretest	1.00	9	19.53	.000
5	PWU + DS + SS Sit & Reach During	2.05			
6	PWU + DS + SS Sit & Reach Posttest	2.95			
7	PWU + DS + SS Broad jump Pretest	1.10	9	18.20	.000
8	PWU + DS + SS Broad jump Test During	1.90			
9	PWU + DS + SS Broad jump Posttest	3.00			
10	PWU + DS + SS performance pretest	3.00	9	20.00	.000
11	PWU + DS + SS performance during	2.00			
12	PWU + DS + SS performance posttest	1.00			

The above table of Friedman Rank test reveals that proper warm-up, dynamic and static stretching posttest was statistically significantly higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest speed fly 30m test at $X^2 = 12.08$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among speed fly 30m test pretest, during and posttest due to 10 weeks proper warm-up, dynamic and static stretching intervention. This shows that effective 10 weeks proper warm-up, dynamic and static stretching intervention show statistically significant difference on speed of fly 30m Athlete Tirunesh Dibaba Athletics training center sprinters.

proper warm-up, dynamic and static stretching posttest was statistically higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest Sit & Reach test at $X^2 = 19.53$, $P < 0.05$. Thus, the null hypothesis was

rejected that there was statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up, dynamic and static stretching intervention. From this one can understand that effective 10 weeks proper warm-up intervention and dynamic stretching intervention shows statistically significant difference on Sit & Reach performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

Interestingly, proper warm-up, dynamic and static stretching posttest was statistically higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest broad jump test at $X^2 = 18.20$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up, dynamic and static stretching intervention. From this one can understand that effective 10 weeks proper warm-up, dynamic and static stretching intervention show statistically significant difference on broad jump performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

Similarly, proper warm-up, dynamic and static stretching posttest was statistically higher than during intervention in the same way during intervention result was also statistically significantly higher than pretest seasonal performance test at $X^2 = 20.00$, $P < 0.05$. Thus, the null hypothesis was rejected that there was statistically significant difference among Sit & Reach test pretest, during and posttest due to 10 weeks proper warm-up, dynamic and static stretching intervention. From this one can understand that effective 10 weeks proper warm-up, dynamic and static stretching intervention show statistically significant difference on seasonal performance of Athlete Tirunesh Dibaba Athletics training center sprinters.

4.5. Discussions

The finding of this study shows that 10 weeks proper warm-up and dynamic stretching intervention show statistically significant difference on sprinters speed, flexibility, jumping

distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters.

Ten weeks proper warm-up, dynamic and static stretching training brought statistically significant difference on sprinters speed, flexibility, jumping distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters.

Supporting with this study suggested that the first unit of every training session or preparation for competition should make warm up, well planned and executed it will result in improved performance (Thompson, 2009). Trained individuals who wish to implement static stretching should include an adequate warm-up and dynamic sport-specific activities with at least 5 or more minutes of recovery before their sport activity (Anis *et al.*, 2001).

The other finding would like to support that the use of static stretching within an activity specific warm-up to ensure maximal range of motion along with an enhancement in sprint performance (Michael, 2012). Warm-up significantly increased hamstring flexibility. Static stretching also increased hamstring flexibility, whereas dynamic did not, in agreement with previous findings on uninjured controls. The effect of warm-up and static stretching on flexibility was greater in those with reduced (O'Sullivan, 2009).

In the United States, pre exercise static stretching seems to have become common practice and routine. However, research suggests that it is time for a paradigm shift--that pre-exercise static stretching be replaced with dynamic warm-up exercises. Research indicates that a dynamic warm-up elevates body temperature; decreases muscle and joint (Young, 2010). In contrary other finding reveals that the negative impact of static stretching on muscle strength limits the utility of static stretching before athletic performance. If stretching is to be performed as part of a warm up, dynamic stretching should be favored over static stretching (Walsh, 2017).

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of major findings

The primary objective of this study was to assess the effect of different stretching types on sprinters performance in the case of Athlete Tirunesh Dibaba Athletics training center. The study developed the following research questions to be answered. This includes: Do ten weeks proper warm-up training affects sprinters' performance across pretest, during and posttest; was ten weeks proper warm-up and static stretching training sprinters' performance across pretest, during and posttest and do ten weeks proper warm-up, dynamic and static stretching training affects sprinters' performance across pretest, during and posttest. Quasi-experimental research design was used to assess the study variables. There were three experimental groups divided consists of ten ($n = 10$) population. The study variables like fly 30m speed test, sit and reach test, Broad jump test and seasonal field test was used. Mean, standard deviation, line graphs and Freidman rank test was used to analyze the data.

The result of this study shows that 10 weeks proper warm-up intervention does not show statistically significant difference on sprinters speed, flexibility, jumping distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters.

The result of this study reveals that 10 weeks proper warm-up and dynamic stretching intervention show statistically significant difference on sprinters speed, flexibility, jumping distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters.

The result of this study reveals that 10 weeks proper warm-up, dynamic and static stretching intervention show statistically significant difference on sprinters speed, flexibility, jumping distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters.

5.2. Conclusions

The finding of this study shows that the age, height, weight and BMI of Athlete Tirunesh Dibaba Athletics training center sprinters were almost similar.

The study shows that 10 weeks proper warm-up modality was not effective in order to reveal a significant difference on sprinters speed, flexibility, jumping distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters.

This finding reveals that 10 weeks proper warm-up and dynamic stretching intervention was effective which brought statistically significant difference on sprinters speed, flexibility, jumping distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters.

The finding of this study reveals that 10 weeks proper warm-up, dynamic and static stretching intervention was effective shows statistically significant difference on sprinters speed, flexibility, jumping distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters.

5.3. Recommendations

- ✓ This study contains thirty subjects consists of three groups (N = 10) which shows small sample size. Thus, this study recommends that the incoming researcher can increase the study sample size then generalize the findings of the study.
- ✓ This study used quasi-experimental research design in order to assess the study variables which consists only experimental group not control group. Hence, the researcher recommends that the incoming researcher better to include control group in order to generalize the findings of the study.
- ✓ Athlete Tirunesh Dibaba Athletics training center sprinter were found to be shorter, has less weight and less BMI compared to world class sprinters. So the screening team for sprinters talent identification better to focus on world class standard norm.
- ✓ The study shows that 10 weeks proper warm-up modality was not effective in order to reveal a significant difference on sprinters speed, flexibility, jumping distance and seasonal performance across pretest, during and posttest of Athlete Tirunesh Dibaba Athletics training center sprinters. So the researcher recommends proper warm-up supported by dynamic stretching to enhance the performance of sprinters in Athlete Tirunesh Dibaba Athletics training center.

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Appendix- I

**Jimma University
College Of Natural Science
Department Of Sport Science**

Questionnaire to be filled by sprinter athletes

Dear! Sprinters athletes, at present I am conducting a research towards my fulfilment for the Degree of Master Science in Sport Science in Athletics Coaching specialization at Jimma University. The research is concerned with “the effects of 10 week warm-up and different stretching types training on sprinter on the case of athlete tirunesh dibaba athletics training center.

So you are kindly requested to give appropriate information for the following questions regarding to your current health status. I deeply appreciate your co-operation.

I. Athlete General information

Name ----- Age----- (yrs), Body mass----- (Kg), Height----- (m)
Birth Date-----/-----/-----Sex –M-----Academic Qualification-----
Address----- Telephone Number-----

II. Personal health history (answer yes or no and give description if necessary)

1. Have you taken any performance test especially performance related? _____
2. Do you know your current level of sprinter tes performance? _____
3. Have you injured seriously while you sprinter in the past two month? _____if yes which body part of injury you got?

4. Have you had a major surgery in the last two month? _____

5. Are you currently undergoing any medical treatment? -----

I have read the above and understand its content and have given accurate information. And I agree to participate in this study.

Athletes name _____ signature _____ Date-----/-----/-----

E.c

APPENDIX A

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘A’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test, During Test and Post Test the test Protocol will be filled like the following.



Proper warming up Exercise Sprinters Group ‘A’ respectively (PWU)

Name of Athlete(PWU)	Age	Sex	Height	Weight	BMI	
1 ኢዘዲን ሁስን	17	ጠ	1.80	53	16.35	
2 ጉተማ ኤገታ	17	ጠ	1.77	58	18.53	
3 ሳምሶን አበራ	17	ጠ	1.74	60	19.86	
4 ኤልያስ ኤገታ	18	ጠ	1.76	62	20.06	
5 ዳዊት ከፍያለው	17	ጠ	1.82	59	17.81	
6 ደራርቱ ተፈሪ	17	ሴ	1.69	47	16.49	
7 ሜሮን ታፈሰ	17	ሴ	1.72	50	16.94	
8 ሀይማኖት ሀንቆ	18	ሴ	1.67	53	19.06	
9 ምስጋኔ በቀለ	17	ሴ	1.68	50	17.73	
10 የሺወርቅ ታያቸው	17	ሴ	1.65	50	18.38	



Test protocol for Pre-test, during test and Post test Proper Warming up Exercise group of Sprint performance.

No	Name of athlete	sex	Age	Flying 30 meter Test			Remark
				Pre-Test	During test	Post Test	
1	ኢዘዲን ሁስን	M	17	3.26	3.26	3.26	
2	ጉተማ ኤገታ	M	17	2.90	2.91	2.90	
3	ሳምሶን አበራ	M	17	3.30	3.30	3.30	
4	ኤልያስ ኤገታ	M	18	3.32	3.31	3.30	
5	ዳዊት ከፍያለው	M	17	2.87	2.87	2.88	
6	ደራርቱ ተፈሪ	F	17	04.41	04.40	04.40	
7	ሜሮን ታፈሰ	F	17	04.06	04.06	04.06	
8	ሀይማኖት ሀንቆ	F	18	03.95	03.95	03.95	
9	ምስጋኔ በቀለ	F	17	04.08	04.09	04.08	
10	የሺወርቅ ታያቸው	F	17	03.89	03.89	03.89	

APPENDIX A

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘A’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test, During Test and Post Test the test Protocol will be filled like the following.

Test protocol for Pre-test, During test and Post test Proper Warming up Exercise group of Sprint performance.

No	Name of athlete	Sex	age	Sit and reach test			Remark
				Pre-Test	During test	Post Test	
1	ኢዘዲን ሁስን	M	17	30 cm	31.cm	30.cm	
2	ጉተማ ኤገታ	M	17	15 cm	14.cm	15.cm	
3	ሳምሶን አበራ	M	17	12 cm	12.cm	12.cm	
4	ኤልያስ ኤገታ	M	18	16. cm	16.cm	16.cm	
5	ዳዊት ከፍያለው	M	17	14. cm	14.cm	14.cm	
6	በሻቱ ቶሊና	F	17	16.cm	16.cm	16.cm	
7	ጫሮን ታፈሰ	F	17	17 cm	17.cm	17.cm	
8	ሀይማኖት ሀንቆ	F	18	10 cm	10.cm	11.cm	
9	ምስጋኔ በቀለ	F	17	18 cm	18.cm	18.cm	
10	የሺወርቅ ታያቸው	F	17	15 cm	15.cm	15.cm	

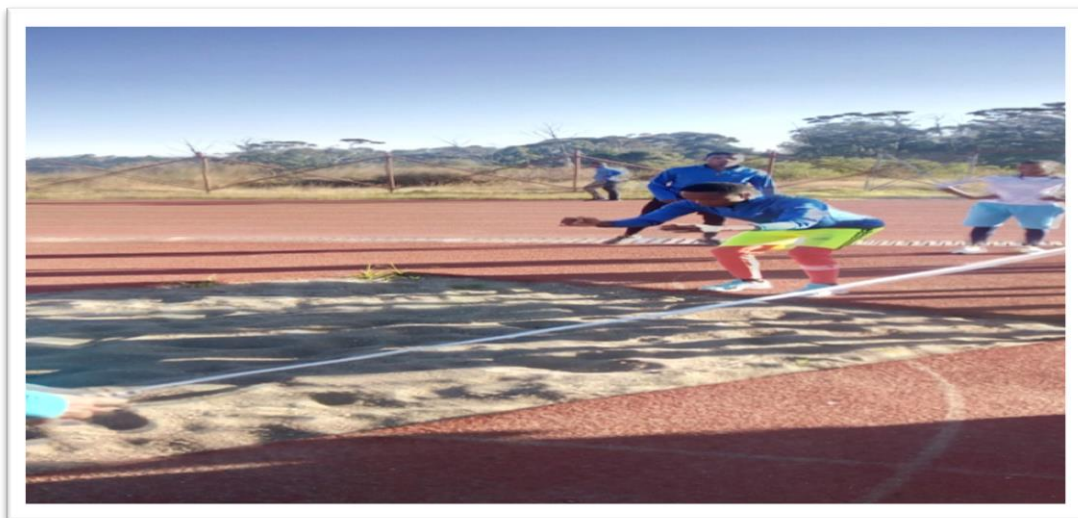
APPENDIX A

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘A’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test the test Protocol will be filled like the following.

Test protocol for Pre-test During test and Post test of Proper Warming up Exercise group Sprint performance.

No	Name of athlete	Sex	age	Broad jump Test			Remark
				Pre-Test	During test	Post Test	
1	ኢዘዲን ሁስን	M	17	2.30 cm	2.30cm	2.30cm	
2	ጉተማ ኤገታ	M	17	2.50 cm	2.50cm	2.50cm	
3	ሳምሶን አበራ	M	17	2.56 cm	2.57cm	2.56cm	
4	ኤልያስ ኤገታ	M	18	2.60 cm	2.60cm	2.61cm	
5	ዳዊት ከፍያለው	M	17	4.40 cm	4.40cm	4.41cm	
6	በሻቱ ቶሊና	F	17	1.80 cm	1.80cm	1.80cm	
7	ሜሮን ታፈሶ	F	17	1.90 cm	1.90cm	1.90.cm	
8	ሀይማኖት ሀንቆ	F	18	1.96 cm	1.96cm	1.96cm	
9	ምስጋኔ በቀለ	F	17	2.00 cm	2.01cm	2.01cm	
10	የሺወርቅ ታያቸው	F	17	1.95 cm	1.95cm	1.95cm	



APPENDIX A

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test the test Protocol will be filled like the following.

Test protocol for Pre-test During test and Post test of Proper Warming up Exercise groups Sprint performance.

No	Name of athlete	Sex	age	Event performance Test			Remark
				Pre-Test	During test	Post Test	
1	ኢዘዲን ሁስን	M	17	50.48.se	50.48.se	50.48.se	
2	ጉተማ ኤገታ	M	17	51.13.se	51.13.se	51.13.se	
3	ሳምሶን አበራ	M	17	54.66.se	54.66.se	54.66.se	
4	ኤልያስ ኤገታ	M	18	11.37.se	11.37.se	11.36.se	
5	ዳዊት ከፍያለው	M	17	11.38.se	11.38.se	11.37.se	
6	በሻቱ ቶሊና	F	17	1.00.se	1.01.se	1.00.se	
7	ሜሮን ታፈሰ	F	17	59.72.se	59.72.se	59.71.se	
8	ሀይማኖት ሀንቆ	F	18	12.05.se	12.05.se	12.05.se	
9	ምስጋኔ በቀለ	F	17	12.58.se	12.58.se	12.58.se	
10	የሺወርቅ ታያቸው	F	17	13.07.se	13.07.se	13.07.se	

APPENDIX B

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘B’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test the test Protocol will be filled like the following.



Parameters Age and sex of participants’ Male and female Athletes proper warming up and Dynamics stretching Exercise Sprinters Group ” B “ respectively (PWU + DS)

Name of Athlete(PWU)	Age	Sex	Height	Weight	BMI	
1 አ/ጀዋድ አ/ጀሊል	18	ጠ	1.71	58	19.86	
2 ናትናኤል ጌትነት	17	ጠ	1.73	56	18.72	
3 ሸርፍ ረዲን	17	ጠ	1.72	60	20.33	
4 አብረሃም ተሾመ	19	ጠ	1.70	58	20.06	
5 አረጋሀኝ ምንዳ	17	ጠ	1.70	59	20.41	
6 ሚልኪቱ ፍቃዱ	17	ሴ	1.67	55	19.78	
7 ምንትዋብ ገ/ዮሃንስ	17	ሴ	1.69	52	18.24	
8 ጊሹ ፈይሳ	17	ሴ	1.68	54	19.14	
9 ሮማን ፀጋዬ	18	ሴ	1.65	53	19.48	
10 ባንቸአምላክ አበጀ	17	ሴ	1.67	52	18.70	

Test protocol for Pre-test, during test and Post test proper warming up + dynamic stretching groups “B “ Sprint performance.

No	Name of athlete	sex	Age	Flying 30 meter Test			Remark
				Pre-Test	During test	Post Test	
1	አ/ጀዋድ አ/ጀሊል	M	18	03.29.se	03.29.se	03.28.se	
2	ናጉናኤል ጌትነት	M	17	02.89.se	02.88.se	02.88.se	
3	ሸርፍ ረዲን	M	17	3.22.se	03.21.se	03.20..se	
4	አብረሃም ተሾመ	M	19	02.90.se	02.90.se	02.89.se	
5	አረጋሀኝ ምንዳ	M	17	03.33.se	03.32.se	03.32.se	
6	ሚልኪቱ ፍቃዱ	F	17	04.11.se	04.11.se	04.11.se	
7	ምንትዋብ ገ/ዮሃንስ	F	17	03.92.se	03.91.se	03.91.10.se	
8	ጊሹ ፈይሳ	F	17	04.45.se	04.45.se	04.44.90.se	
9	ሮማን ፀጋዬ	F	18	03.99.se	03.99.se	03.98.se	
10	ባንቸአምላክ አበጀ	F	17	04.13.se	04.12.80.se	04.12.70.se	

APPENDIX B

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘B’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test Exercise the test Protocol will be filled like the following.

Test protocol for Pre-test, during test and Post test of proper warming up + Dynamic stretching groups of Sprint performance.

No	Name of athlete	sex	age	Sit and reach Test			Remark
				Pre-Test	During test	Post Test	
1	አ/ጀዋድ አ/ጀሊል	M	18	14.cm	14cm	14.7.cm	
2	ናጉናኤል ጌጉነት	M	17	5.cm	5.3.cm	5.8.cm	
3	ሸርፍ ረዲን	M	17	15.cm	15.cm	15.02.cm	
4	አብረሃም ተሾመ	M	19	12.cm	12.cm	12.02.cm	
5	አሸናፍ ዳኒኤል	M	17	30.cm	30.cm	30.07.cm	
6	ሚልኪቱ ፍቃዱ	F	17	18.cm	18.cm	18.05.cm	
7	ምንጉዋብ ገ/ዮሃንስ	F	17	16.cm	16.cm	16.10.cm	
8	ጊሹ ፈይሳ	F	17	17.cm	17.cm	17.01.cm	
9	ሮማን ፀጋዬ	F	18	10.cm	11.cm	11.cm	
10	ባንቸአምላክ አበጀ	F	17	18.cm	18.7cm	18.cm	

APPENDIX B

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘B’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test the test Protocol will be filled like the following.

Test protocol for Pre-test, During test and Post test of the proper warming up + Dynamic stretching Exercise Groups Sprint performance.

No	Name of athlete	sex	age	Broad jump Test			Remark
				Pre-Test	During test	Post Test	
1	አ/ጀዋድ አ/ጀሊል	M	18	2.45.cm	2.45.cm	2.46.cm	
2	ናትናኤል ጌትነት	M	17	2.31 cm	2.31.cm	2.32.cm	
3	ሸርፍ ረዲን	M	17	2.53.cm	2.53.cm	2.54.cm	
4	አብረሃም ተሾመ	M	19	2.43.cm	2.43.cm	2.44.cm	
5	አረጋሀኝ ምንዳ	M	17	2.65.cm	2.65.cm	2.67.cm	
6	ሚልኪቱ ፍቃዱ	F	17	1.94.cm	1.94.m	1.95.cm	
7	ምንትዋብ ገ/ዮሃንስ	F	17	1.97.cm	1.97.cm	1.98.cm	
8	ጊሹ ፈይሳ	F	17	2.01.cm	2.01.cm	2.03.cm	
9	ሮማን ፀጋዬ	F	18	2.05.cm	2.05.cm	2.07.cm	
10	ባንቸአምላክ አበጀ	F	17	1.98.cm	1.98.cm	1.99.cm	

APPENDIX B

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘B’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test the test Protocol will be filled like the following.

Test protocol for Pre-test, During test and Post test of proper warming up + Dynamic stretching Exercise groups Sprint performance.

No	Name of athlete	Sex	age	Event performance Test			Remark
				Pre-Test	During test	Post Test	
1	አ/ጀቀድ አ/ጀሊል	M	18	51.12.se	51.12.se	51.11.se	
2	ናትናኤል ጌትነት	M	17	51.24.se	51.23.70se	51.23.se	
3	ሸርፍ ረዲን	M	17	10.60.se	10.55.se	10.54.se	
4	አብረሃም ተሾመ	M	19	11.37.se	11.37.se	11.36.50se	
5	አሸናፍ ዳኒኤል	M	17	11.60.se	11.59.se	11.58.70se	
6	ሚልኪቱ ፍቃዱ	F	17	1.00.se	1.00.se	59.55se	
7	ምንትዋብ ገ/ዮሃንስ	F	17	1.04.se	1.04.se	1.03.77se	
8	ጊሹ ፈይሳ	F	17	1.02.se	1.02.se	1.02.se	
9	ሮማን ፀጋዬ	F	18	11.98.se	11.97.se	11.96.90se	
10	ባንቸአምላክ አበጀ	F	17	13.64.se	13.63.se	13.62.20se	

APPENDIX C

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘C’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test the test Protocol will be filled like the following.



Parameters Age and sex of participants’ Male and female Athletes proper warming up and Dynamics starching Exercise sprinters Group ‘C’ respectively (PWU + DS + SS)

Name of Athlete(PWU)	Age	Sex	Height	Weight	BMI	Remark
1 ኢብሳ አብደላ	18	ወ	1.70	60	20.76	
2 በላይ ጌታሁን	17	ወ	1.72	55	18.64	
3 ጌታነህ ምንዳ	17	ወ	1.70	59	20.41	
4 አደም ሙሳ	17	ወ	1.67	57	20.50	
5 አብረሃም አያሌው	18	ወ	1.73	60	20.06	
6 ስኬት ጌታሁን	17	ሴ	1.69	53	18.59	
7 ባህርንሽ ደበበ	17	ሴ	1.70	55	19.03	
8 ሮቤ ኢብሳ	17	ሴ	1.68	50	17.73	
9 አያንቱ አብደላ	18	ሴ	1.69	51	17.89	
10 ሄረሜላ ሲሳይ	17	ሴ	1.67	52	18.70	

Test protocol for Pre-test, During test and Post test of the Proper Warming up + Dynamic stretching + Cooling dawn And static stretching groups of Sprint performance.

No	Name of athlete	Sex	Age	Flying 30 meter Test			Remark
				Pre-Test	During test	Post Test	
1	ኢብሳ አብደላ	M	18	03.17.se	03.16.60se	03.16.30se	
2	በላይ ጌታሁን	M	17	03. 25.se	03.24.30se	03.24.15se	
3	ጌታነህ ምንዳ	M	17	02. 89.se	02.87.52se	02.87.47se	
4	አደም ሙሳ	M	17	02.93.se	02.92.5se	02.92se	
5	አብረሃም አያሌው	M	18	03.21.se	03.20.15se	03.20.07se	
6	ባንቸአምላክ አበጀ	F	17	04.32.se	04.31.40.se	04.31.20se	
7	ባህርንሽ ደበበ	F	17	04.09.se	04.08.44se	04.08.40se	
8	ፎቤ ኢብሳ	F	17	03.99.se	03.98.10se	03.98.05se	
9	አያንቱ አብደሳ	F	18	03. 57.se	03.56.30se	03.56.15se	
10	ሄርሜላ ሲሳይ	F	17	04.17.se	04.16.23se	03.16.17se	

APPENDIX C

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘C’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test the test Protocol will be filled like the following.

Test protocol for Pre-test, During test and Post test of Proper Warming up + Dynamic stretching + Cooling down And static stretching groups Sprint performance.

No	Name of athlete	sex	age	Sit and reach Test			Remark
				Pre-Test	During test	Post Test	
1	ኢብሳ አብደላ	M	18	17. cm	18.cm	19.cm	
2	በላይ ጌታሁን	M	17	15. cm	16.cm	16.40cm	
3	ጌታነህ ምንዳ	M	17	07.cm	08.cm	09.cm	
4	አደም ሙሳ	M	17	13.cm	13.15cm	14.cm	
5	አብረሃም አያሌው	M	18	29.cm	29.10cm	30.cm	
6	ባንቸአምላክ አበጃ	F	17	20. cm	20.80cm	20.cm	
7	ባህርንሽ ደበበ	F	17	21.cm	22.cm	23.40.cm	
8	ኖቤ ኢብሳ	F	17	19.cm	20.17cm	21.10.cm	
9	አደንቱ አብዲሳ	F	17	22.cm	23.70cm	24.20.cm	
10	ሄርሜላ ሲሳይ	F	17	18.cm	20.22.cm	21.10.cm	



APPENDIX C

Jimma University College of Natural Science Department of Sport Science

A data to be collected from sprinters **Group ‘C’** Athlete Turinesh **Dibaba** athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test the test Protocol will be filled like the following.

Test protocol for Pre-test, During test and Post test of Proper Warming up + Dynamic stretching + Cooling dawn And static stretching groups Sprint performance.

No	Name of athlete	sex	age	Broad jump Test			Remark
				Pre-Test	During test	Post Test	
1	ኢብሳ አብደላ	M	18	2.41	2.40.cm	2.50.cm	
2	በላይ ጌታሁን	M	17	2.62	2.65.cm	2.70.cm	
3	ጌታነህ ምንዳ	M	17	2.69	2.72.cm	2.80.cm	
4	አደም ሙሳ	M	17	2.51	2.55.cm	2.65.cm	
5	አብረሃም አያሌው	M	18	2.56	2.70.cm	2.79.cm	
6	ባንቸአምላክ አበጀ	F	17	2.07	2.15.cm	2.25.cm	
7	ባህርንሽ ደበበ	F	17	2.02	2.10.cm	2.15.cm	
8	ፎቤ ኢብሳ	F	17	1.85	1.90.cm	2.90.cm	
9	አያንቱ አብዲሳ	F	18	1.96	1.98.cm	2.00.cm	
10	ሄርሜላ ሲሳይ	F	17	2.00	2.05.cm	2.10.cm	

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A data to be collected from sprinters **Group ‘C’** Athlete Turinesh Dibaba athletics training center before proceeding to the progressive stretching training the Athletes will take pre-test. the test Protocol will be filled like the following.

Test protocol for Pre-test, During test and Post test of Proper Warming up + Dynamic stretching + Cooling dawn And static stretching groups Sprint performance.

No	Name of athlete	sex	age	Event performance Test			Remark
				Pre-Test	During test	Post Test	
1	ኢብሳ አብደላ	M	18	55.28.se	55.27.se	55.20se	
2	በላይ ጌታሁን	M	17	54.00.sd	53.30.se	53.25.se	
3	ጌታነህ ምንዳ	M	17	53.25.se	53.20se	53.15.se	
4	አደም ሙሳ	M	17	10.98.se	10.95se	10.93.se	
5	አብረሃም አያሌው	M	18	11.85.se	11.82se	11.70.se	
6	ባንቸአምላክ አበጃ	F	17	13.64.se	13.60se	13.55.se	
7	ባህርንሽ ደበበ	F	17	12.53.se	12.50se	12.45.se	
8	ሮቤ ኢብሳ	F	17	13.05.se	13.02se	13.00.se	
9	አያንቱ አብዲሳ	F	18	1.03.se	1.02se	1.01.se	
10	ሄርሜላ ሲሳይ	F	17	1.04.se	1.03se	1.01.se	



