P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2023; 10(1): 409-416

www.kheljournal.com
Received: 23-12-2022
Accepted: 22-01-2023

PC Thotawaththa
Department of Sports Sciences and Physical Education, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, P. O. Box 02, Belihuloya, 70140, Sri Lanka

AWS Chandana
Department of Sports Sciences and Physical Education, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, P. O. Box 02, Belihuloya, 70140, Sri Lanka

Corresponding Author:
PC Thotawaththa
Department of Sports Sciences and Physical Education, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, P. O. Box 02, Belihuloya, 70140, Sri Lanka

The effects of the basic meso-cycle of the general preparation period on the improvement of long jump performance and fitness level

PC Thotawaththa and AWS Chandana

DOI: https://doi.org/10.22271/kheljournal.2023.v10.i1f.2815

Abstract
One of the most competitive sports events is long jump event. Most of the athletes prioritize performance over fitness level. The aim of the study was to increase an athlete's long jump performance and overall fitness. This article describes how to determine and implement training loads for the athlete. An athlete who had stopped participating in sport was selected and his fitness components were assessed at baseline performance. Utilizing baseline data, an annual plan was created, and the training load was thoroughly evaluated. The athlete received the first meso-cycle for eight weeks. The same test was again given following the eight-week training course in order to assess his current performance and compare it to his baseline performance. Performance on the pretest and posttest was compared. The subject was an amateur athlete at the Sabaragamuwa University in Sri Lanka. Through this training program, the participants' initial performance was improved by 1.6%, 2.9%, 1.8%, 12.5%, 14.2%, 17.3%, 20%, and 8.6%, respectively, in the 30m acceleration test, leg elastic strength, standing board jump, upper body strength test, lower body strength test, sit up test, sit and reach test, and vertical jump test. The results indicate that the introduced approach should be utilized to determine the training load, and this mesocycle can be used by beginner and intermediate athletes throughout their initial period of preparation.

Keywords: Fitness component, long jump, periodization, training load

1. Introduction
Athletics is an exclusive collection of sporting events that involve competitive running, jumping, throwing, and walking. The most common types of athletics competitions are track and field, road running, cross country running, and race walking. The simplicity of the competitions, and the lack of a need for expensive equipment, makes athletics one of the most competed sports in the world. Track and field events are divided into three broad categories: track events, field events, and combined events. The majority of athletes tend to specialize in just one event (or event type) with the aim of perfecting their performances, although the aim of combined events athletes is to become proficient in a number of disciplines. There are two types of field events: jumps and throws. In jumping competitions, athletes are judged on either the length or height of their jumps. The performances of jumping events for distance are measured from a board or marker, and any athlete overstepping this mark is judged to have fouled. In the jumps for height, an athlete must clear his or her body over a crossbar without knocking the bar off the supporting standards.
The long jump can just as easily be named the “run and jump” or “sprint and jump” because the actual jump is only part of the process. Yes, there are techniques for pushing off the board, for flying over the pit, and for landing. But these techniques, while important, can only maximize your distance, based on your take-off speed. Once you’re in the air, there’s only a certain distance you can travel, based on the momentum you gained during the approach run, no matter how good your flight or landing techniques. That’s why there’s a history of great sprinters, from Jesse Owens through Carl Lewis, who’ve excelled at the long jump. Successful jumpers understand that every truly long jump begins with a fast, efficient approach run [10, 12, 13].

Therefore, the Annual training plan for an intermediate long jumper was designed to improve his jump performance. The first eight-week training program of the annual plan was introduced to the athlete. The first eight-week training programs consist of one meso-cycle (basic meso-cycle); and eight micro-cycles which include starting, introduction, preparatory, and regeneration micro-cycles [3, 4].

The purpose of this annual training plan was to train an intermediate long jump athlete who withdrew from his sport. This report provides all the necessary details of the annual training plan, session plans, how training load was applied, how performance was analyzed, and how the evaluation was made. The following evaluation tests can be used to monitor the long jump athlete's development.

Stride test

The objective of this test is to monitor the athlete's ability to accelerate from a sanding staff efficiently. Analysis of the test result is by comparing it with the athlete's previous results for this test. It is expected that, with appropriate training between each test, the analysis would indicate an improvement in the athlete's acceleration [5, 6].

Flying 30 m speed test

To monitor the development of the athlete's maximum sprint speed [6].

Jump Decathlon

The Jumps Decathlon [2] is easy to carry out and is an excellent way to test an athlete's elastic strength. The Jumps Decathlon comprises of the following ten events: Standing long jump, 5 spring jumps (Bunny hops), Standing triple jump, standing 4 hops and jump, 2 hops, step and jump, running 4 hops and jump, 2 hops, 2 steps and jump, 25 m hop for time, 2 hops, 2 steps and jumps, 5 stride long jump.

Leg Elastic Strength test

To monitor the development of the athlete's elastic leg strength [3, 5].

Strength test - upper body (Bench Press)

This is a specific repetition maximum (RM) test for the upper body, using the bench press exercise. The one repetition maximum test (1-RM) is a popular method of measuring isotonic muscle strength. It is a measure of the maximal weight a subject can lift with one repetition. You might want to pair this test with the squat or deadlift lower body max test. See the general description of 1 RM fitness test.

Strength test - lower body (Back Squat)

This is a specific repetition maximum (RM) test for the lower body (see the general description of 1RM fitness tests) using the squat exercise [5]. Another max strength exercise for the lower body is the max deadlift test. You might want to pair this test with the bench press upper body max test.

Sit and Reach test - lower back and hamstring test

The objective of this test is to monitor the development of the athlete's lower back and hamstring flexibility.

Vertical Jump test/ Sargent Jump Test

The Sargent Jump Test [11], also known as the vertical jump test, was developed by Dr Dudley Allen Sargent (1849-1924) [9, 11].

2. Materials and Methods

Table 1: Preparatory Model of the Annual Plan

Factors	Units	Percentage
Periodization		
Annual plan (weeks)	52	100%
Preparation period	34	65%
Competition period	15	30%
Transition period (T)	3	5%
Sub Phases		% to its' period
General preparation (GP)	20	60%
Specific preparation (SP)	14	40%
Pre-competition (PC)	9	60%
Competition (C)	6	40%
Number of Meso-cycles		
Total	11	-
GP	4	-
SP	2	-
PC	2	-
C	2	-
T	1	-
Number of Micro-cycles		
Total	49	-
GP	20	-
SP	14	-
PC	9	-
C	6	-
T	1	-
No of Tests	7	
No of Competition	1	

A student from the University of Sri Lanka Sabaragamuwa who has been away from sports for almost a year was selected to train and improve his fitness level during the early preparation period of the annual plan. The pre-test was conducted to identify his performance level and prepare the annual plan, and the training load was determined according to the player's pre-test results. The athlete was allowed to warm up according to his preference. 30 m Speed Test (sec), Leg Flexural Strength Test (sec), Standing Long Jump (m), Strength Test - Upper Body (Kg), Strength Test - Lower Body (Kg), Sit Up Test (Count), Sit Up Reach Test (cm), Vertical Jump Test (m), Full Approach Jump Test (m) and Jump Decathlon Tests [2] were conducted before and after the presence and eight (08) week training program. The simplest type of training plan "Monocycle" is built for a year, based on the previous test performance for the sprinter.

The duration of this year's plan was approximately fifty-two (52) weeks. General theory of periodicity was used to prepare the annual plan. The training year is divided into three periods (preparation period, competition period and transition period), and the periods are then divided into sub-phases. General preparation and specific preparation come under the preparation period and pre-competition and competition come under the competition period. The ratio of weeks allocated to the periods of this training plan was 65:30:05 for preparation, competition, and transition respectively. Table 01 shows the format of preparation of annual plan. Then the preparation time and the competition time are divided in the ratio of 6:4 in their allotted weeks.

2.1 Preparation Period

Thirty-four (34) weeks were allotted for the preparation period of this annual plan, which was then divided into two sub-phases (General Preparation - 20 weeks and Specific Preparation - 14 weeks) as shown in Table 01. Preparation

time is built in. With the seven (07) Meso-cycles (Primary Meso-cycle, Preparatory Meso-cycle, Developmental Meso-cycle, 2-Traumatic Mesocycles, and 2-Regeneration/Recovery Meso-cycles). Each of those meso-cycles has different goals. The basic mesocycle was constructed from eight micro cycles (08). A relatively low training load was applied during this mesocycle, and the training load only increased with volume rather than changing intensity and a 3:1 step loading method was used to increase the load for this mesocycle.

2.2 Training Load

In this annual plan, training weights were calculated separately for speed, strength and endurance [3, 4]. To measure training load for speed training, volume was measured as the total distance covered during the training session, intensity was measured as how fast the athlete reached 100 m, and strength training volume was calculated as the total amount of weight lifted during the training session and intensity. as one-repetition maximum was calculated as a percentage, training volume for endurance was calculated as the total distance covered during training, and intensity was measured based on heart rate. Meso-cycle volume was measured using the following equation [3].

$$MC\,VL = \frac{Total\ VL}{SV\%\ of\ Each\ MC} \times Volume\ \%\ of\ MC$$

Where, MC, VL, and SV are some of the Meso-Cycle, Volume Load, and Volume, respectively. Total volume load was set for goals for this meso-cycle, mainly increasing aerobic capacity, strength endurance, and work with technique and general speed. Table 02 shows the training load constructed for each micro cycle for endurance, strength and speed [. To increase the training load in this mesocycle, flat loading methods were used for endurance and speed. Step loading method (3:1) was used for the strong component.

2.3 Micro-cycle and Session Plan

The first meso-cycle of the annual plan included eight (08) micro cycles. Each micro cycle consists of the same training methods with different training loads (weights vary in volume and intensity). Each micro cycle consists of five training sessions. The micro cycle was designed with two high loads, two low loads, one medium load and two rest days. Athletes' training session typically included various activities such as endurance training, strength training, power training, skill lesson and technique sessions between warm-up and cool-down sessions. For each session, goals were set to achieve and evaluate training effects. The total volume load for endurance training in this mesocycle was 123.6 km (Table 02). The built-in volume for continuous running and fartlek training was 50:50 of its micro cycle training load.

Table 2: Training Loads for endurance, strength, and speed

Micro-cycles	Endurance		Strength		Speed	
	Volume %	Micro-cycle load (km)	Volume %	Micro-cycle load (kg)	Volume %	Micro-cycle load (m)
1	40	12.50	30	7,102.28	40	1,270.88
2	40	12.50	35	8,285.98	40	1,270.88
3	40	12.50	40	9,469.70	40	1,270.88
4	30	9.38	30	7,102.27	30	953.16
5	45	14.06	45	10,653.41	50	1,588.60
6	45	14.06	50	11,837.12	50	1,588.60
7	45	14.06	55	13,020.83	50	1,588.60
8	35	10.94	45	10,653.41	40	1,270.88

Table 03 shows the training volume and intensity of each session in all eight micro cycles to improve cardiovascular endurance. The training was conducted on a 400 m track. To maintain the phase of the training, the lap time was calculated, and the athlete was asked to maintain the phase. The fourth and eighth micro cycles were regenerative micro cycles, so the intensity and volume decreased. Throughout the meso-cycle, training load was varied by varying volume rather than varying intensity. Endurance training was set at 1,100 km, strength training at 1,100,000 kg and speed training volume at 175,000 m. They are then divided into fair percentages for each meso-cycle as shown in Table 02. The volume percentage shown in the table was estimated based on training theory and athlete ability. Each mesocycle volume was then divided into its micro cycles. Volume load was calculated as the product of repetitions, sets, number of exercises and weightlifting for strength training.

Table 3: Training Load for First Eight Micro-cycles

Micro-cycles	Endurance		Strength		Speed	
	Volume %	Micro-cycle load (km)	Volume %	Micro-cycle load (kg)	Volume %	Micro-cycle load (m)
1	60	123.6	30	52380.9	50	10,802.47
2	80	164.8	40	69841.2	60	12,962.96
3	90	185.4	50	87301.5	70	15,123.46
4	80	164.8	60	104761.8	80	17,283.95
5	55	113.3	70	122222.1	95	20,524.69
6	40	82.4	80	139682.4	90	19,444.44
7	30	61.8	85	148412.6	85	18,364.20
8	25	51.5	70	122222.1	80	17,283.95
9	20	41.2	55	96031.65	75	16,203.70
10	15	30.9	40	69841.2	75	16,203.70
11	10	20.6	30	52380.9	50	10,802.47
Total	535	1,100 km	630	1,100,000 kg	810	175,000 m

Such values are then completed by the corresponding session of the micro cycle. Later, a session plan was prepared. The super compensation cycle was used to balance the micro cycle. Furthermore, the load was divided according to the adequate training and recovery period and training. Each day's session plan and training protocol are displayed in Table 04 and 05. The training regimen will be the same on the same day, but the training load will be changed as the volume and intensity are changed throughout the initial mesocycle. Therefore, training volume and intensity are specified in a single session plan on a given day. For example, The Monday session plan covers the other Monday session plans, as the training volume and intensity of the main section is displayed with the training session dates.

Table 4: Long jump general preparation period (2020-11-25 to 2020 -12-16)

Days	**Monday**	**Tuesday**	**Wednesday**	
Venue	Gym and Outdoor track	Outdoor track	Outdoor track	
Warmup	20 Min Easy runs	20 Min Easy runs	20 Min Easy runs	
Main Part	▪ Strength Training ○ Squat (40%, 12reps, 3sets) ○ Lunges (40%, 10reps each leg, 3 sets) ○ Bench Press (40%, 12reps, 3 sets) ○ Leg curl (40%, 12reps, 3 sets) ○ Leg Extension (40%, 20rep, 3sets) ○ Heel raise (40%, 30 reps, 3sets) ▪ Medicine Ball each 10reps ▪ {Overhead front, over head Back, Frontal, Upward, Hit the ground}	▪ Speed Drills 20m (3 reps) ▪ Jumping drills (20min) ▪ 4*300m/3 (60%) ▪ Abs workout ▪ (100 sit-ups, 100 Leg raise, 100 Chin Knees, 100 Back Extension, 100 Side bend, 100 Bars)	▪ Speed Drills 30m (3 reps) ▪ General Fitness conditioning ▪ 5*120/Jogging (60%) ▪ Abs workout ▪ (100 sit-ups, 100 Leg raise, 100 Chin Knees, 100 Back Extension, 100 Side bend, 100 Bars)	
Warm down	▪ 20min jogging ▪ Static Stretching	▪ 20min jogging ▪ Static Stretching	▪ 20min jogging ▪ Static Stretching	
Objectives	▪ General Strength ▪ Aerobic Endurance ▪ Flexibility ▪ Coordination	▪ Strength Endurance ▪ Techniques ▪ Flexibility ▪ Coordination	▪ Strength Endurance ▪ Techniques ▪ Flexibility ▪ Coordination	
Days	**Thursday**	**Friday**	**Saturday**	**Sunday**
Venue	Gym and Outdoor track	Outdoor track	Outdoor track	
Warm up	20 Min Easy runs	20 Min Easy runs		
Main Part	▪ Strength Training ▪ Squat (40%, 12reps, 3sets) ▪ Lunges (40%, 10 reps each leg, 3 sets) ▪ Bench Press (40%, 12reps, 3 sets) ▪ Leg curl (40%, 12reps, 3 sets) ▪ Leg Extension (40%, 20rep, 3sets) ▪ Heel raise (40%, 30 reps, 3sets) ▪ Medicine Ball each 10reps ▪ {Overhead front, over head Back, Frontal, Upward, Hit the ground}	▪ Jumping Garden (3 sets/ 3min rest) ▪ 15*13 Stride LJ 2min rest ▪ 3*300m/3 (60%) ▪ Abs workout ▪ (100 sit-ups, 100 Leg raise, 100 Chin Knees, 100 Back Extension, 100 Side bend, 100 Bars)	30 Min Easy runs	Rest
Warm Down	▪ 20 min jogging ▪ Static Stretching	▪ 20min jogging ▪ Static Stretching		
Objectives	▪ General Strength ▪ Aerobic Endurance ▪ Flexibility ▪ Coordination	▪ Strength Endurance ▪ Techniques ▪ Flexibility ▪ Coordination		

Table 5: Long jump general preparation period (2020-12-16 to 2021 -01-26)

Days	**Monday**	**Tuesday**	**Wednesday**
Venue	Gym and Outdoor track	Outdoor track	Outdoor track
Warm up	30 Min Easy runs	30 Min Easy runs	30 Min Easy runs
Main Part	▪ Speed Drills 20m (3 reps) ▪ Jumping drills (20min) ▪ Circuit Training 3Set 30”/ No Rest, 3min set rest ▪ {Squat (40%), Bench Press (40%), Clean (40%), Arm press (40%), Leg curl (40%), Leg Extension (40%), High Knee (40%), Leg Alteration (40%)}	▪ 20 SLJ, 10 STJ, 10* 2H Step J, 10*2H 2S J ▪ 25*50m (60%) Sprint, 20” rest ▪ Abs workout ▪ (100 sit-ups, 100 Leg raise, 100 Chin Knees, 100 Back Extension, 100 Side bend, 100 Bars)	▪ 10*30m Hill run (high knee) 2 min ▪ Speed Drills 30m (3 reps) ▪ General Fitness conditioning ▪ Medicine Ball each 10reps ▪ {Overhead front, over head Back, Frontal, Upward, Hit the ground} ▪ 5*150/ 6min (60%)
Warm down	▪ 20min jogging ▪ Static Stretching	▪ 20min jogging ▪ Static Stretching	▪ 20min jogging ▪ Static Stretching
Objectives	▪ General Strength ▪ Aerobic Endurance ▪ Flexibility ▪ Coordination	▪ Strength Endurance ▪ Techniques ▪ Flexibility ▪ Coordination	▪ Strength Endurance ▪ Techniques ▪ Flexibility ▪ Coordination

Days	Thursday	Friday	Saturday	Sunday
Venue	Gym	Outdoor track	Outdoor track	
Warm up	30 Min Easy runs	30 Min Easy runs		
Main Part	▪ Circuit Training 3Set 30"/ No Rest, 3min set rest ▪ {Squat (40%), Bench Press (40%), ▪ Clean (40%), Arm press (40%), ▪ Leg curl (40%), ▪ Leg Extension (40%), High Knee (40%), Leg Alteration (40%)}	▪ Jumping drills (20min) ▪ 10*3 stride long jump ▪ 10*7 stride long jump ▪ General Fitness conditioning ▪ Abs workout ▪ (100 sit-ups, 100 Leg raise, 100 Chin Knees, 100 Back Extension, 100 Side bend, 100 Bars)	30 Min Easy runs	Rest
Warm Down	▪ 10 min jogging ▪ Static Stretching	▪ 10min jogging ▪ Static Stretching		
Objectives	▪ General Strength ▪ Aerobic Endurance ▪ Flexibility ▪ Coordination	▪ Strength Endurance ▪ Techniques ▪ Flexibility ▪ Coordination		

Number of hours: 2 hours per day
Places: University playground and University Gym
Time: Evening 5.00 pm -7.00 pm
Breakdown of the planned activities: After 4 weeks change the activities for each objective in that period.

3. Results & Discussion

3.1 Pre and post test results analysis

In here got player total attempts and average were made from the successful attempts. The data between 25th November 2020 to 20th January 2021 period observational result showed that skill and fitness components of long jump has improvement in Sabaragamuwa university long jump athlete. The results were observed by the coaches and noted skill performance vice and subject vice. The following Table 6 shows the pre-test, post-test results, and percentage of performance change in the selected physical fitness component [7] of the athlete and table 07 shows the pre-test, post-test and percentage of performance change in the Jump Decathlon.

Table 6: Pre-test and post-test best results for selected fitness components

Test	Pretest	Post test	Δ %
30 m Speed test (sec)	4.3	4.25	1.6
Leg Elastic Strength test (sec)	7.9	7.67	2.9
Standing Long Jump (m)	2.64	2.69	1.8
Strength test- Upper Body (kg)	40	45	12.5
Strength test- lower Body (kg)	70	80	14.2
Sit Ups test (count)	23	27	17.3
Sit and reach test (cm)	5	6	20
Vertical Jump test (m)	0.23	0.25	8.69
Full Approach Jump (m)	5.3	5.47	3.2

Table 7: Jump Decathlon pre-test and post-test results

Test	Pretest	Post test	Δ %
Standing long jump (m)	2.58	2.66	3.1
Standing Triple jump (m)	5.52	5.89	6.7
2 hops, step and jump (m)	8.15	8.31	1.9
2 hops, 2 steps and jump (m)	11.83	11.91	0.6
2 hops, 2 steps and 2 jumps (m)	14.06	14.25	1.3
5 spring jumps (Bunny hops) (m)	10.01	10.29	2.7
Standing 4 hops and jump (m)	9.89	10.03	1.4
Running 4 hops and jump (m)	11.02	11.14	1.1
5 strides long jump (m)	4.49	4.62	2.8
25-meter hop for time (sec)	5.15	5.01	2.7

Figure 01 to figure 07 show, 30 m acceleration performance, leg elastic strength, standing board jump, upper body strength test, lower body strength test, sit up test, sit and reach test, vertical jump tests were increased by 1.6%, 2.9%, 1.8%, 12.5%, 14.2%, 17.3%, 20% and 8.6% than initial performance respectively. It ensures that the athlete's fitness levels were slightly increased through the eight-week training program. And normative data of both tests also ensure that enhancement. One of the major objectives of this training plan was achieved. The training load was mostly concentrated on strength endurance [1, 6, 7, 8].

3.2 Speed test

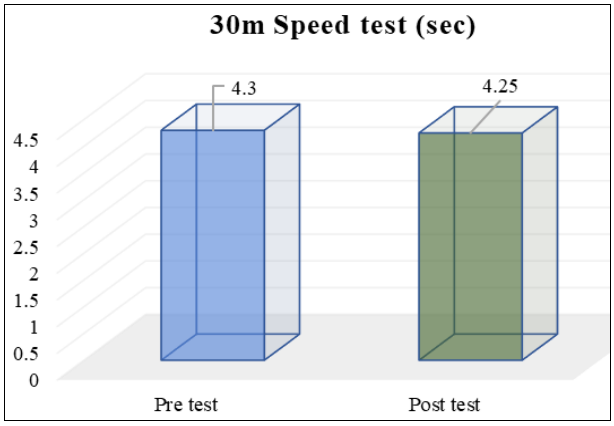

Fig 1: 30 m speed test

3.3 Leg Elastic Strength test

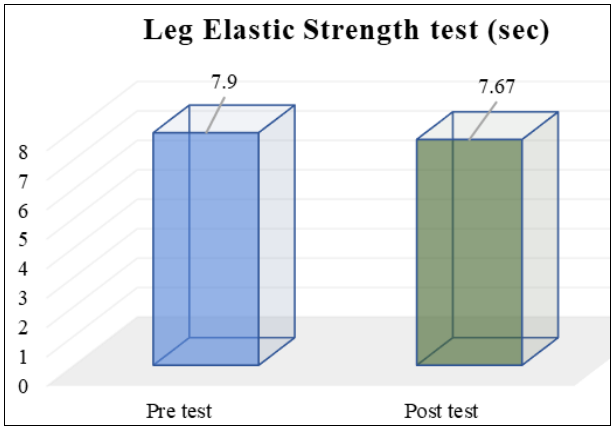

Fig 2: Leg elastic strength test

3.4 Standing long jump

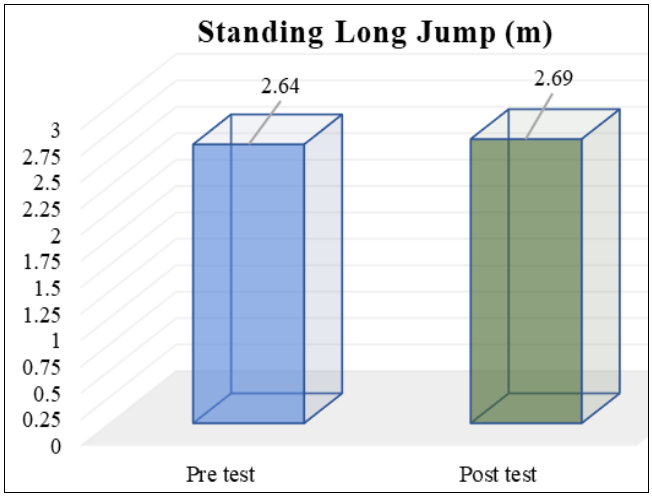

Fig 3: Standing long jump test

3.5 Strength test

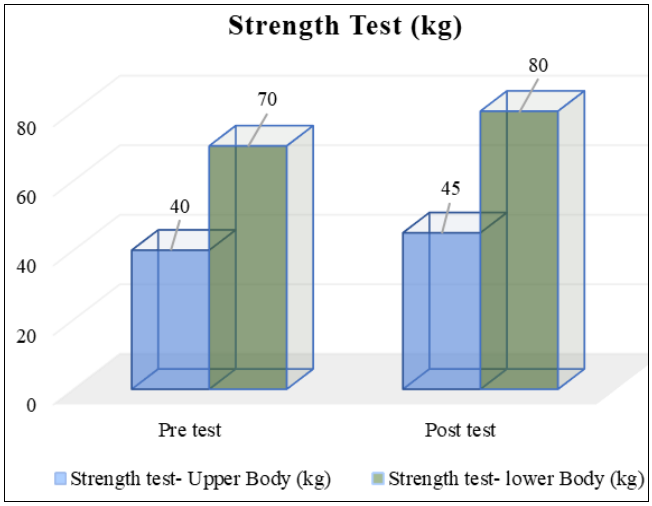

Fig 4: Strength test

3.6 Sit Ups test

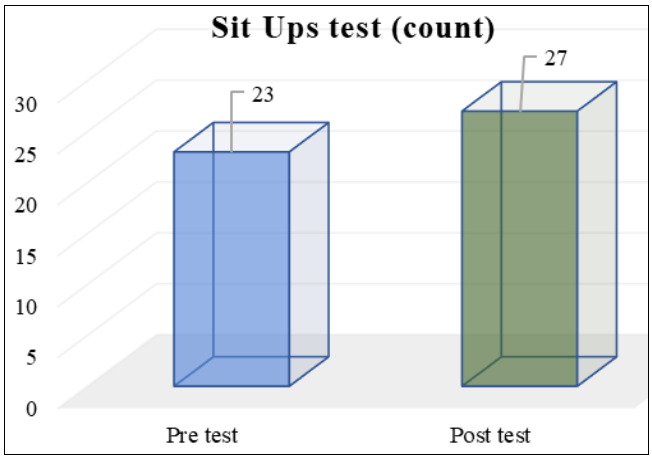

Fig 5: Sit up test

3.7 Sit and reach test

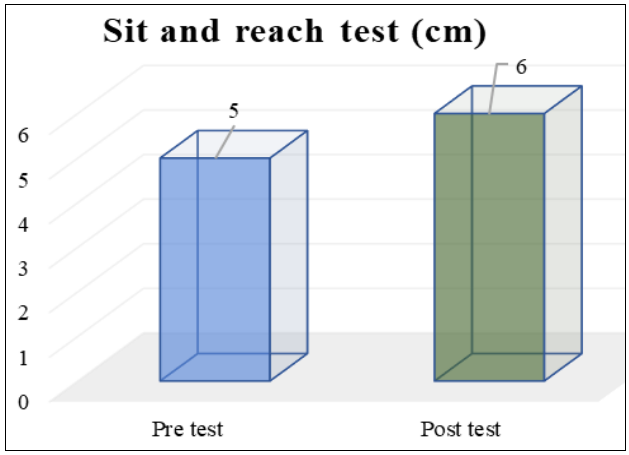

Fig 6: Sit and reach test

3.8 Vertical Jump test

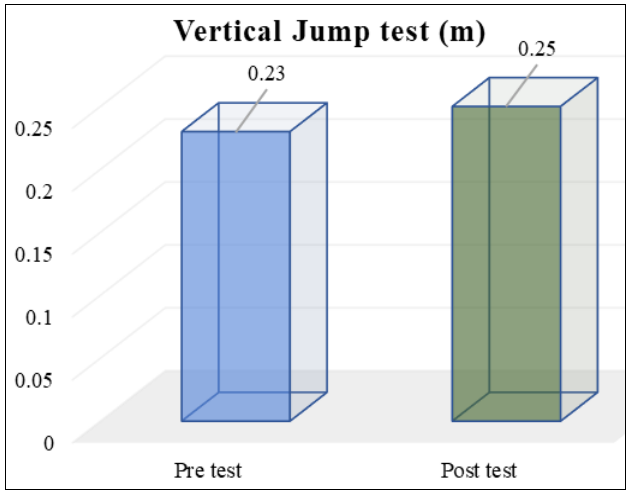

Fig 7: Vertical Jump test

3.9 Full Approach Jump

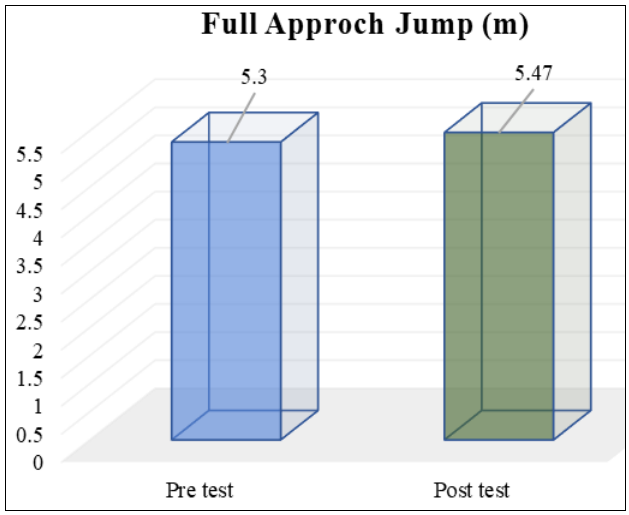

Fig 8: Full approach long jump

The figure 8 shows the significant different between pre-test & post-test results of full approach jump of athlete. But full approach was slightly increased than pre-test. Which means there is slightly overall performance improvement through this eight-week training program. The figure 9 shows the significant different between pre-test & post-test results of Jump Decathlon results of athlete.

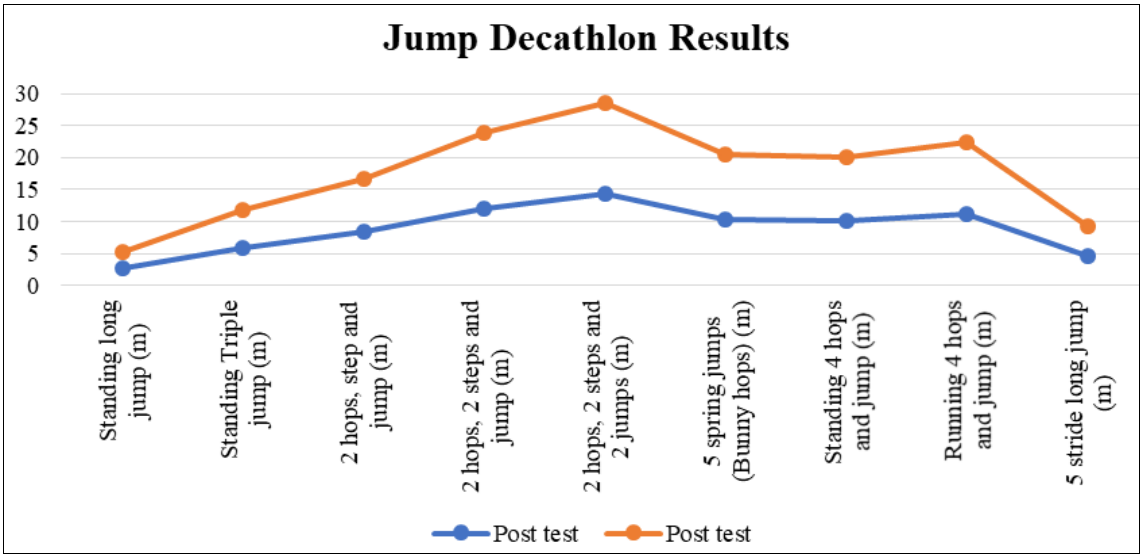

Fig 9: Jump decathlon pre-test and post-test results

Pre- and post-tests allowed coaches to evaluate the impact of their training plans on the players. Additionally, there were competent, intermediate, and poor players. Also, the pretest and posttest aid in determining the player's skill level. Through an eight-week training schedule, coaches are educated on how to enhance physical components connected to general preparation for long jump performance.

These pre- and post-tests were used to evaluate performance levels and assess how training sessions had improved trainees' abilities. According to the coaches' findings, there is a significant difference in the long jump performance while improving general preparation related to the physical components between the pre-test and the post-test [4].

Finally, coaches can claim that by using this type of training, which takes into account the development of General Preparation pertaining to the Physical Components, athletes' long jump performance can be improved in a short amount of time. Maximum strength wasn't emphasized in this first meso-cycle (basic meso-cycle), but rather aerobic endurance, strength endurance, general speed, and skill technique. This yearly strategy was put into practice on an athlete because it was created for athletes. It was therefore unable to do statistical analysis and identify treatment effects. There is some evidence to suggest that the eight-week training program has enhanced flexibility, general speed, strength endurance, and cardiovascular endurance, which are the fundamental training variables that must be trained throughout the preparatory phase. These characteristics must be improved upon in the second meso-cycle.

4. Conclusions

This study can be used to help a long jump beginner increase their performance abilities in as little as eight weeks. Moreover, we must concentrate our attention to the main direction of the intensity and volume most crucial element in the long jump performance of the physical elements and abilities of the related periods. Instead of emphasizing talent development, the majority of long jump coaches and athletes focus on developing fitness components. The training load for the micro cycles and mesocycles needs to be more accurately accounted for in the annual plan. Own experience is the most crucial factor in player performance improvement they would be significantly able to improve their long jump performance skills if they followed this kind of training schedule. The identical training schedule (time duration and training load) can be modified to help the university's long jumpers enhance their skills.

In order to help the athlete and prevent overtraining, the rest of the annual plan will be carried out so that the Sri Lanka University Games can occupying a special place in the near future. Furthermore, keeping track of the athlete's training load for each session is recommended as it will help in determining the effectiveness and faults of the training program. It is advised to change gradually the training load and also to provide a regeneration program if an athlete exhibits any overtraining syndromes. The first meso-cycle was instructed to the athlete for eight (08) weeks as part of the annual plan, which was created with consideration of training concepts and based on the pre-evaluation of specific fitness components of the athlete. The primary objective of the first meso-cycle was to increase flexibility, general speed, strength endurance, and aerobic endurance. When pre-test and post-test results were compared, fitness component performance had improved, and the long jump performance had also slightly improved However, the effectiveness of this eight-week training program did not increase all fitness factors. Training Plan must be applied for the long period of time using the correct loading mechanism and follow the training principles.

5. Recommendations

The training program had a beneficial impact; thus it is recommended to use this technique of training early in the preparation process to improve the health-related fitness components and skill-related fitness. Before creating the annual plan, most of the training-related factors were taken into consideration. Therefore, it is advised that beginner and intermediate athletes use this plan. Statistics were not performed because just one person received training, making it impossible to compare the training effect to other variables.

This approach will be used in the future to determine the effect of a training plan using a control group and more samples. The remainder of the annual plan will be carried out in the future to continue preparing the athlete for competition. Additionally, the annual plan was created to avoid overtraining, and it is recommended to record the athlete's training load for each session in order to assess the effectiveness and faults of the training plan. It is suggested to gradually change the training load as well as by providing a regeneration program if an athlete exhibits any overtraining syndromes.

6. References

1. Arkinstall M, *et al*. VCE Physical Education 2. Malaysia: Macmillian; c2010. p. 248.
2. Arnold M. Long Jump. 4th ed. London: BAAB; c1987. p. 46-47.
3. Bompa TO, Haff GG. Periodization. Theory and methodology of training; c2009. p. 5.
4. Bushman B. Medicine ACoS. ACSM's Complete Guide to Fitness & Health, 2E: Human Kinetics; c2017.
5. Chu DA. Explosive Power and Strength. Champaign: Human Kinetics; c1996.
6. Davis B, *et al*. Physical Education and the study of sport. 4th ed. London: Harcourt Publishers; c2000. p. 123-125.
7. Garrett R, Wrench A. Fitness testing: the pleasure and pain of it. ACHPER Australia Healthy Lifestyles Journal. 2008;55(4).
8. Harman EA, *et al*. Estimation of Human Power Output from Vertical Jump. Journal of Applied Sport Science Research. 1991;5(3):116-120.
9. Hede C, *et al*. PE Senior Physical Education for Queensland. UK: Oxford University Press; c2011. p. 178-179.
10. Jasminan V, Chandana AWS. Two-dimensional analysis of changes in athlete’s center of mass during the long jump flight phase. International Journal of Research in Engineering and Innovation. 2021;5(3):154-158.
11. Sargent DA. The Physical Test of a Man. American Physical Education Review. 1921;26:188-194.
12. Thotawaththa PC, Chandana AWS. Effectiveness of the biomechanical factors related to triple jump performance prediction during COVID 19 period in Sri Lanka. South Florida Journal of Development. 2022;3(1):1351-1359.
13. Thotawaththa P, Chandana A. A Triple Jump Performance Optimization Model Based on Flight Phase Biomechanical Factors. IOSR Journal of Sports and Physical Education (IOSR-JSPE). 2021;8(4):10-17.