



## **ISOLATED AND COMBINED INFLUENCE OF WEIGHT TRAINING AND LADDER TRAINING ON SELECTED PHYSIOLOGICAL VARIABLE AMONG MEN KABADDI PLAYERS**

**L. Karuppiah\* & Dr. A. Palanisamy\*\***

\* Assistant Professor, Department of Physical Education, Arul Anandar College, Karumathur, Madurai, Tamilnadu

\*\* Associate Professor, Department of Physical Education, Bharathidasan University, Tiruchirappalli, Tamilnadu

---

**Cite This Article:** L. Karuppiah & Dr. A. Palanisamy, "Isolated and Combined Influence of Weight Training and Ladder Training on Selected Physiological Variable Among Men Kabaddi Players", International Journal of Scientific Research and Modern Education, Volume 2, Issue 1, Page Number 24-29, 2017.

**Copy Right:** © IJSRME, 2017 (All Rights Reserved). This is an Open Access Article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

---

### **Abstract:**

The purpose of the study was to find out the isolated and combined influence of weight training and ladder training on selected physiological variable among men kabaddi players. To execute the investigation, forty five men kabaddi players studying in various colleges of Madurai Kamaraj University, within 30 kilometers radius of Arul Anandar College, Karumathur, Tamilnadu during the academic year 2014-2016, were selected as subjects at random from the total population of 100 players. The age of the subjects were ranged from 18 to 23 years. The subjects were further classified at random into three equal groups of 15 subjects each in which group – I (n = 15) underwent Ladder training for three days per week for twelve weeks and group – II (n = 15) underwent combined influence of weight training and ladder training programme for three days per week for twelve weeks and group - III (n = 15) acted as control who were not undergo any special training programme. The selected criterion variables such as cardiovascular endurance and vital capacity were assessed before and after the training period. The collected data were statistically analysed by using Analysis of Covariance (ANCOVA). From the results of the study it was found that there was a significant improvement on cardiovascular endurance and vital capacity for Isolated and combined influence of weight training and ladder training when compared with the control group. All students in experimental group, the Isolated and combined influence of weight training and ladder training programme were fixed accordingly. Then the experimental group underwent Isolated and combined influence of weight training and ladder training programme for 6 days per week for 12 weeks. The control group did not participate in any special training programme on strenuous physical activities apart from their day to day activities. The experimental group underwent their Isolated and combined influence of weight training and ladder training under the instruction and supervision of the investigator. The data were collected on selected criterion variables such as cardiovascular endurance was measured by 12 minutes cooper's run/walk test with the seconds and vital capacity was measured by wet spirometer with the cubic centimeter/ liters at before and after the twelve weeks of Isolated and combined influence of weight training and ladder training as pre and post-test. Analysis of covariance (ANCOVA) was applied to find out significant difference if any between the experimental and control group. The Scheffe's test was applied as post-hoc test whenever the 'F' ratio of the adjusted post-test means was found to be significant at 0.05 level of confidence. All the data were analyzed using statistical package (SPSS) in the computer. From the results of this study it was found that there was a significant improvement on cardiovascular endurance and vital capacity for isolated and combined influence weight and ladder training group when compared with the control group.

**Key Words:** Ladder Training, Weight Training, Cardiovascular Endurance, Vital Capacity & Kabaddi

### **Introduction:**

Training has been explained as a programme of exercise designed to improve the skills and increase the energy capacities of an athlete's for particular event. The word 'training' means different things in different fields. In sports, the word training is generally understood to be synonyms doing physical exercises. In a narrow sense, training is doing physical exercise for the improvement of performance. This concept is reflected in words for terms which are gives to a separate component of training or separate methods of procedures of doing physical exercises, sports, medicine and exercise physiologists also understand training to be doing physical exercise for improvement of performance or of separate performance factors (Hardial Singh, 1984).The total personality of sportsman has to be improved in order to improve his performance. Sports training, therefore, directly and indirectly aims at improving the personality of the sports man. High sports performance through sports training can be achieved by a scientific and systematic use of training means. Training means are various physical exercises and other objects, methods and procedure which are used for the improvement maintenance and recovery of performance capacity and performance readiness (Hardial singh, 1991).

Ladder training is the multi-directional training, because the elements of strength, power, balance, agility, co-ordination, proprioception, core and joint stability, foot speed, hand eye coordination, reaction time and mobility. Each component should be integrated in to daily training session. Ladder skills are fun and functional ways to teach movement skills. By training, the mind and body to understand a verity of foot combinations. There are 4 basic skills is used when training with ladder. Runs, skips, shuffles and jump/hops. Ladder drills are fun and functional ways to teach movement skills. Although linear and lateral movements are biomechanical simple, their combination can be complex and many times overwhelming for the athlete. Buy teaching the mind and body to understand a variety of foot combinations, the chance for confusion and subsequent error decreases. Ladder drills should be learned in a slow controlled environment. Introducing movement skills too rapidly can ingrain poor motor patterns that may be difficult to override. Skilled movement should be optimized before the drill is advanced. I try to incorporate 3 different types of drills. The first type of drills are steady state drills. These drills focus on quickness endurance and utilize a constant rhythm throughout the ladder. The second types of drills are burst drills. These drills focus on the ability to turn on rapid burst of foot movement. The third types of drills are elastic response drills. These drills focus on improving there active speed components of the lower leg. Ladder drills are also called as speed ladder drills are very important for any sport where agility, leg explosive strength, aerobic capacity and speed are important such as soccer, basketball or Football. It will greatly improve the player's footwork which will improve player's quickness, cardiovascular endurance and coordination after constantly performing different speed ladder training. Drills for cardiovascular endurance ladder training should be done right after warming up so that your muscles are fresh and ready to give 100% under correct form ("Ladder training is the", 2013).

Ladder cardiovascular endurance drills are an excellent way to improve foot speed, agility, coordination and overall quickness. They are an integral part of many SAQ programs and compliment many different sports and events. Speed ladder drills are about quality and form rather than producing overload. The drills are not meant to leave you fatigued or breathless in the way that shuttle runs might ("Ladder cardiovascular endurance drills", 2014). A ladder is excellent training equipment and is useful to enhance body control, cardiovascular endurance and increase the foot speed. For this training player need not to go out and purchase a own Ladder, it is just as easy to use throw-down lines and as far as juniors are concerned, they may be found to be better as there is no chance of their getting tangled up in the ladder. The added advantage of lines is that the distance between them can be changed to suit various exercise patterns. Using a building block system of skill development is very important to achieve success in training with a ladder. The training can start with general development and go on up to the advanced skill development, from a full range of motion to smaller and quicker movements. Keeping in mind the principle of working from slow and controlled movements and moving onto fast, explosive movements as teaching and learning progression will have a greater amount of success. (Suresh kumar, 2012).

Kabaddi is one of the popular team sports which require a high standard of preparation in order to complete 40 minutes of competitive play and to achieve success. In this game movement patterns are characterised as intermittent and change continuously in response to different offensive and defensive situations. Anthropometric factors and morphological characteristics can influence the effectiveness of such responses, as has been observed in other sports (Deng, 1990). Physiological characteristics which contribute to the success of sports persons, in that particular sports discipline. The measurement of player's physiological characteristics has high lightened position specific attributes. The physiological efficiency of various organs is helpful in doing the activity with vigor and more enthusiasm. Physiological efficiency of various organs plays a vital role in the performance of Kabaddi in Kabaddi players are to continue the raid with uttering an approved word of "Kabaddi" repeatedly without break within the course of one respiration shall be called a cant. It is based on their capacity to hold the breath in longer duration. Two teams occupy opposite halves of a field and take turns sending a "raider" into the other half, in order to win points by tagging or wrestling members of the opposing team; the raider then tries to return to his own half, holding his breath and chanting "Kabaddi, Kabaddi, Kabaddi" during the whole raid. The name often chanted during a game derives from a Tamil word Kabaddi meaning "holding of breath", which is indeed the crucial aspect of play. More and more time keeping the respiration helpful to extend the raiding time and it is possible through the ability of a player in having better breath holding time. (Jeyaraj & Gopinathan, 2014).

**Dependent Variables:**

- ✓ Cardiovascular Endurance
- ✓ Vital Capacity

**Independent Variables:**

- ✓ Ladder Training
- ✓ Weight Training

**Methodology:**

The purpose of the study was to find out the isolated and combined influence of weight training and ladder training on selected physiological variable among men kabaddi players. To execute the investigation,

forty five men kabaddi players studying in various colleges of Madurai Kamaraj University, within 30 kilometers radius of Arul Anandar College, Karumathur, Tamilnadu during the academic year 2014-2016, were selected as subjects at random from the total population of 100 players. The age of the subjects were ranged from 18 to 23 years. The subjects were further classified at random into three equal groups of 15 subjects each in which group – I (n = 15) underwent Ladder training for three days per week for twelve weeks and group – II (n = 15) underwent combined influence of weight training and ladder training programme for three days per week for twelve weeks and group - III (n = 15) acted as control who were not undergo any special training programme. The selected criterion variables such as cardiovascular endurance and vital capacity were assessed before and after the training period. The collected data were statistically analysed by using Analysis of Covariance (ANCOVA). From the results of the study it was found that there was a significant improvement on cardiovascular endurance and vital capacity for isolated and combined influence of weight training and ladder training when compared with the control group. All students in experimental group, the isolated and combined influence of weight training and ladder training programme were fixed accordingly. Then the experimental group underwent Isolated and combined influence of weight training and ladder training programme for 6 days per week for 12 weeks. The control group did not participate in any special training programme on strenuous physical activities apart from their day to day activities. The experimental group underwent their Isolated and combined influence of weight training and ladder training under the instruction and supervision of the investigator. The data were collected on selected criterion variables such as cardiovascular endurance was measured by 12 minutes cooper’s run/walk test with the seconds and vital capacity was measured by wet spirometer with the cubic centimeter/liters at before and after the twelve weeks of Isolated and combined influence of weight training and ladder training as pre and post-test. Analysis of covariance (ANCOVA) was applied to find out significant difference if any between the experimental and control group.

**Cardiovascular Endurance:**

The data collected prior to and after the experimental period on cardiovascular endurance of ladder group, combination of weight and ladder training group and control group were analyzed and presented in Table I.

Table I: Analysis of Covariance on Cardiovascular Endurance of Ladder Training Group, Combination of Weight and Ladder Training Group and Control Group

	Ladder Training Group	Combination of Weight and Ladder Training Group	Control Group	SOV	Sum of Square	df	Mean Square	‘F’ ratio
<b>Pre- test Means</b>	2228.67	2250.13	2147.33	B: W:	88053.33 863316.67	2 42	44026.67 20555.16	2.14
<b>Post-test Means</b>	2391.67	2448.33	2121.67	B: W:	914111.11 587500.00	2 42	457055.56 13988.10	32.68*
<b>Adjusted Post-test Means</b>	2378.84	2421.83	2160.99	B: W:	532504.14 232537.22	2 41	266252.07 5671.64	46.94*

\* Significant at .05 level of confidence.

(The table value required for significance at 0.05 level of confidence with df 2 and 42 was 3.23, and 2 and 41 was 3.23). Table – I shows that the pre-test means on cardiovascular endurance of ladder training, combination of weight and ladder training and control groups were 2228.67, 2250.13 and 2147.33 respectively. The obtained ‘F’ ratio value of 2.14 for pre-test scores of ladder training, combination of weight and Ladder training and control groups on cardiovascular endurance was less than the required table value of 3.23 for insignificance with df 2 and 42 at 0.05 level of confidence. The post-test mean values of cardiovascular endurance for ladder training, combination of weight and ladder training and control groups were 2391.67, 2448.33 and 2121.67 respectively. The obtained ‘F’ ratio value of 32.68 for post-test scores of ladder training, combination of weight and ladder training and control groups was greater than the required table value of 3.23 for significance with df 2 and 42 at 0.05 level of confidence. The adjusted post-test mean values of ladder training, combination of weight and Ladder training and control groups were 2378.84, 2421.83 and 2160.99 respectively. The obtained ‘F’ ratio value of 46.94 for adjusted post-test scores of ladder training, combination of weight and ladder training and control groups was higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence. The above statistical analysis indicates that there was a significant improvement on cardiovascular endurance after the training. Further, to determine which of the paired means had a significant difference, the Scheffe’s test was applied. The result of the test is presented in Table - I (a).

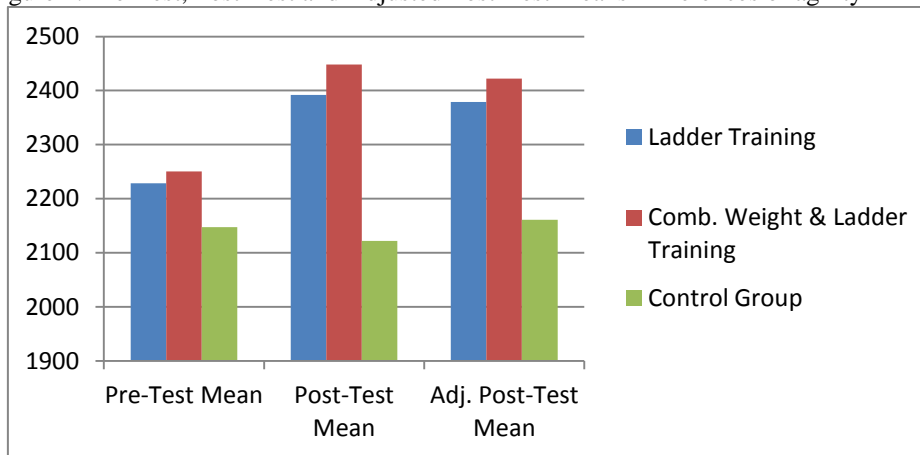
Table I (a): Scheffe’s Test for the Difference between the Adjusted Post-Test Means of Cardiovascular Endurance

Adjusted Post-Test Means				
Ladder Training Group	Combination of Weight and Ladder Training Group	Control Group	Mean Difference	Confidence interval at .05 level
2378.84		2160.99	217.85*	3.98
2378.84	2421.83		42.49*	
	2421.83	2160.99	260.84*	

\*Significant at 0.05 level of Confidence

Table – I (a) shows that the adjusted post-test means differences on cardiovascular endurance between ladder training group and control group, between ladder training group and combination of weight and ladder training group and between combination of weight and ladder training group and control group were 217.85, 42.49 and 260.84 respectively, which were significant at 0.05 level of confidence. The adjusted post-test means difference on cardiovascular endurance between ladder training group and combination of weight and ladder training group was 42.49, which was significant at 0.05 level of confidence. It was concluded from the results of the study that ladder training and combination of weight and ladder training groups have increased the cardiovascular endurance significantly. The result of the study also showed that significant difference was found between the training groups in favour of the combination of weight and ladder training group. The mean values on cardiovascular endurance of ladder training, combination of weight and ladder training and control groups are graphically represented in figure – 1.

Figure 1: Pre-Test, Post-Test and Adjusted Post-Test Means Differences of agility in Meter



**Vital Capacity:**

The data collected prior to and after the experimental period on vital capacity of ladder group, combination of weight and ladder training group and control group were analyzed and presented in Table - II.

Table II: Analysis of Covariance on Vital Capacity of Ladder Training Group, Combination of Weight and Ladder Training Group and Control Group

	Ladder Training Group	Combination of Weight and Ladder Training Group	Control Group	SOV	Sum of Square	df	Mean Square	‘F’ ratio
<b>Pre-test Means</b>	3155.60	3141.50	3245.23	<b>B:</b>	141770.00	2	70885.00	0.36
				<b>W:</b>	8231135.10	42	195979.41	
<b>Post-test Means</b>	3415.10	3612.40	3310.00	<b>B:</b>	761520.15	2	380760.08	19.20*
				<b>W:</b>	832965.30	42	19832.51	
<b>Adjusted Post-test Means</b>	3438.14	3605.10	3267.80	<b>B:</b>	1224364.50	2	612182.25	9.93*
				<b>W:</b>	2527927.90	41	61656.78	

\* Significant at .05 level of confidence.

(The table value required for significance at 0.05 level of confidence with df 2 and 42 was 3.23, and 2 and 41 was 3.23). Table – II shows that the pre-test means on vital capacity of ladder training, combination of

weight and ladder training and control groups were 3155.60, 3141.50 and 3245.23 respectively. The obtained 'F' ratio value of 0.36 for pre-test scores vital capacity was less than the required table value of 3.23 for insignificance with df 2 and 42 at 0.05 level of confidence. The post-test mean values of vital capacity for ladder training, combination of weight and ladder training and control groups were 3415.10, 3612.40 and 3310.00 respectively. The obtained 'F' ratio value of 19.20 for post-test scores of ladder training, combination of weight and ladder training and control groups was greater than the required table value of 3.23 for significance with df 2 and 42 at 0.05 level of confidence. The adjusted post-test mean values of vital capacity for ladder training, combination of weight and ladder training and control groups were 3438.14, 3605.10 and 3267.80 respectively. The obtained 'F' ratio value of 9.93 for adjusted post-test scores of ladder training, combination of weight and ladder training and control groups was higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence. The above statistical analysis indicates that there was a significant improvement on vital capacity after the training. Further, to determine which of the paired means had a significant difference, the Scheffe's test was applied. The result of the test is presented in Table - II (a).

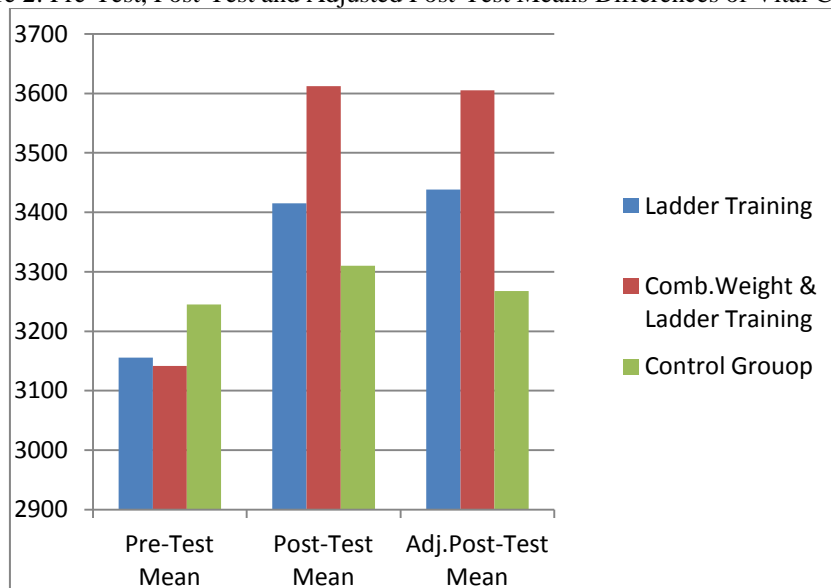
Table II (a): Scheffe's Test for the Difference between the Adjusted Post-Test Means of Vital Capacity

Adjusted Post-Test Means				
Ladder Training Group	Combination of Weight and Ladder Training Group	Control Group	Mean Difference	Confidence interval at .05 level
3438.14		3267.80	170.34*	447.03
3438.14	3605.10		166.96*	
	3605.10	3267.80	337.30*	

\*Significant at 0.05 level of Confidence

Table – II (a) shows that the adjusted post-test means differences on vital capacity between ladder training group and control group, between ladder training group and combination of weight and ladder training group and between combination of weight and ladder training group and control group were 170.34, 166.96 and 337.30 respectively, which were significant at 0.05 level of confidence. The adjusted post-test means difference on vital capacity between ladder training group and combination of weight and ladder training group was 166.96, which was significant at 0.05 level of confidence. It was concluded from the results of the study that ladder training and combination of weight and ladder training groups have increased the vital capacity significantly. The result of the study also showed that significant difference was found between the training groups in favour of the combination of weight and ladder training. The mean values on vital capacity of ladder training, combination of weight and ladder training and control groups are graphically represented in figure – 2.

Figure 2: Pre-Test, Post-Test and Adjusted Post-Test Means Differences of Vital Capacity



**Conclusion:**

- ✓ It was concluded that the isolated training group and combination of weight training and ladder training have significantly improved all the variables under study better than the control group.
- ✓ The result of the study also revealed that there was a significant improvement on cardiovascular endurance after the isolated and combination influence of weight and ladder training and significant difference was found between the training groups on cardiovascular endurance in favour of combination of weight and ladder training.



- ✓ The result of the study also revealed that there was a significant improvement on vital capacity after the isolated and combination influence of weight and ladder training and significant difference was found between the training groups on vital capacity in favour of combination of weight and ladder training.

**References:**

1. Hardayalsingh. (1997). Science of sports training. New Delhi: D.V.S. Publication.
2. Singh, Hardayal, Science of Sports Training. New Delhi: D.V.S. Publications, 1991.
3. Anderson. R. W. (1957). The Effect of Weight Training on Total Body Reaction Time. Unpublished Master Thesis, University of Illinois.
4. Berger. R. (1965). Comparison of the Effect of Various Weight Training Loads on Health. Research Quarterly, 36-141.
5. Manikandan & Sureshkumar. (2012) Effect of ladder training on selected performance factors among volleyball players. Impact of physical education in developing wholesome personality among student community. Sri Ramakrishna Mission Vidyalaya, Maruthi College of Physical Education. Coimbatore.
6. Madsen, Orjan. "A Theoretical Basis of a Development-Related Age Group Program," Coaches' Quarterly [Http://www.usswim.org/coaches/childply.htm](http://www.usswim.org/coaches/childply.htm). September. 1995, On Line Internet 16th December, 2001.
7. Edward, F.L., et.al, (1984). The Physiological Basis of Physical Education and Athletes Dubugues, Iowa.
8. "Ladder cardiovascular endurance drills", (2014) retrieved from <http://www.sportfitness-advisor.com/ladder-agility-drills.html> on 2<sup>nd</sup> January.
9. Deng, P, L, Lin, Z., H., R., Xia, H., Q., & Cheng, Y., H. (1990). A study of somatotypes of Chinese elite Handball players. Journal of China Sports Science Society, 10, 48-53.
10. Jeyaraj, N, & Gopinathan, P. (2014). Relationship of selected anthropometric and physiological variables to kabaddi playing ability. Academic Sports Scholar, 3(6).
11. Jeyaraj, N, & Gopinathan, P. (2014). The relationship of physical fitness and psychological variables to Kabaddi playing ability. Indian Streams Research Journal, 4 (4).
12. Devaraju, K. (2014). Relationship between Kabaddi Playing Ability with Selected Physiological Variables among College Level Players. International Journal of Recent Research and Applied Studies, 5(17)