



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

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Abstract:

The purpose of the study was to find out the isolated and combined influence of weight training and ladder training on selected physical, physiological variable among men kabaddi players. To execute the investigation, sixty (N=60) College Kabaddi players studying various Arts & Science Colleges affiliated to Madurai Kamaraj University, Madurai, District, Tamilnadu India were randomly selected as subjects. They were divided randomly into four groups of fifteen each i.e., (n=15) Group-I underwent Weight Training, Group-II underwent Ladder Training, Group-III underwent Combined Weight Training and Ladder Training and Group-IV was act as Control. The Experimental groups underwent respective training period for three days per week for twelve weeks. For combined Weight Training and Ladder Training the training period was restricted to twelve alternative weeks and the number of sessions per week was also confined to three. The dependent variables selected for this study were Speed and Resting Pulse Rate. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variables. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post-test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases. The result of the study also revealed that there was a significant improvement on Speed and Resting Pulse Rate after the isolated and combination of weight and ladder training and significant difference was found between the training groups on Speed and Resting Pulse Rate in favour of combination of weight and ladder training.

Key Words: Ladder Training, Weight Training, Speed & Resting Pulse Rate and Kabaddi.

Introduction:

Sports are the highest products of civilization and the most accessible, lived experimental sources of the civilizing spirit; Sport is as old as human society itself. It has been a part of civilized societies throughout history. It is an institution, which has its own traditions and values. Being an institutionalized and competitive activity, it involves vigorous physical exertion or the use of relatively complex physical skills by individuals. Their participation is motivated by a combination of intrinsic satisfaction associated with the activity itself and external rewards earned through participation. With the increasing competitiveness and rising standard in sports, the talent search has become important, as young talent needs to be spotted out at an early age and nurtured with the right kind of scientific training in order to get excellent performance if he has not been chosen for the sport at the right time.

Weight training is doing exercise, using resistance (normally weights) to build muscle strength and endurance. In weight training, one can use weight like dumbbells, barbells, pulley machines, or simply one's own body weight as resistance. General weight training is to increase the strength and the power through general exercises. Specific weight training is to develop specific strength of an event or a specific game. According to the season, the volume and intensity of weight training also change. Weight training is the most widely used and popular method of increasing strength and power.

Ladder drills are an important part of many team sport workouts. They require athletes to move their feet quickly in a precise and specified motion. Athletes must pay attention to perform the agility ladder drills accurately and quickly. Agility ladder drills benefit an athlete by teaching him to move in a swift yet deliberate fashion. This is important for athletes of every shape and size. 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.

Independent Variables:

- ✓ Weight Training
- ✓ Ladder Training
- ✓ Combined Weight Training and Ladder Training

Dependent Variables:

- ✓ Speed
- ✓ Resting Pulse Rate

Methodology:

The purpose of the study was to find out the isolated and combined influence of weight training and ladder training on selected physical, physiological variable among men Kabaddi players. To execute the investigation, sixty (N=60) College Kabaddi players studying various Arts & Science Colleges affiliated to Madurai Kamaraj University, Madurai, District, Tamilnadu India were randomly selected as subjects. They were divided randomly into four groups of fifteen each i.e., (n=15) Group-I underwent Weight Training, Group-II underwent Ladder Training, Group-III underwent Combined Weight Training and Ladder Training and Group-IV was act as Control. The Experimental groups underwent respective training period for three days per week for twelve weeks. For combined Weight Training and Ladder Training the training period was restricted to twelve alternative weeks and the number of sessions per week was also confined to three. The dependent variables selected for this study were Speed and Resting Pulse Rate. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variables. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent ‘t’-test and Analysis of covariance (ANCOVA). Whenever the ‘F’ ratio for adjusted post-test means was found to be significant, the Scheffe’s Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases.

Speed:

The analysis of dependent ‘t’-test on the data obtained Speed of the subjects in the Pre-test and Post-test of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group have been presented in Table-1.

Table 1: The Summary of Mean and Dependent ‘t’ Test for the Pre And Post Tests on Speed of Experimental Groups and Control Group

Mean	Weight Training Group – (I)	Ladder Training Group – (II)	Combined Weight Training and Ladder Training Group – (III)	Control Group – (IV)
Pre- Test Mean	7.73	7.74	7.77	7.67
Post-Test Mean	7.19	6.99	6.83	7.64
‘t’-test	2.18*	2.52*	2.98*	0.08

* Significant at 0.05 level.

(Table value required for significance at .05 level for ‘t’-test with df 14 is 2.15)

Table - 1 shows that the pre-test mean on Speed of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 7.73, 7.74, 7.77 and 7.67 respectively. The post-test mean are 7.19, 6.99, 6.83 and 7.64 respectively. The obtained dependent t-ratio values between the pre and post-test means on Speed of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 2.18, 2.52, 2.98 and 0.08 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. It was concluded that Experimental groups such as Weight Training group, Ladder Training group and Combined Weight Training and Ladder Training group had registered significant improvement in Speed.

The results of the Analysis of Covariance on Speed of the pre, post, and adjusted test scores of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are presented in Table – 2.

Table 2: Analysis of Covariance on Speed of Experimental Groups and Control Group

Test	Weight Training Group – (I)	Ladder Training Group – (II)	Combined Weight Training and Ladder Training Group – (III)	Control Group-(IV)	Source of Variance	Sum of Squares	df	Mean Squares	F ratio
Pre-Test Mean	7.73	7.74	7.77	7.67	Between	0.08	3	0.02	1.00
					Within	1.33	56	0.02	
Post-Test Mean	7.19	6.97	6.68	7.64	Between	7.22	3	2.41	60.25*
					Within	2.44	56	0.04	
Adjusted Post-Test Mean	7.19	6.98	6.65	7.68	Between	7.86	3	2.62	87.33*
					Within	1.77	55	0.03	

* Significant at 0.05 level of confidence (Speed Scores in Seconds)

Table value for df (3, 56) at 0.05 level = 2.76 Table value for df (3, 55) at 0.05 level = 2.78

The above table-2 shows that the pre-test mean values on Speed of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 7.73, 7.74, 7.77 and 7.67 respectively. The obtained 'F' ratio of 1.00 for pre-test scores was lesser than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed.

The post-test mean values on Speed of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 7.19, 6.97, 6.68 and 7.64 respectively. The obtained 'F' ratio of 60.25 for post-test scores was higher than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed.

The adjusted post-test means on Speed of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 7.19, 6.98, 6.65 and 7.68 respectively. The obtained 'F' ratio of 87.33 for adjusted post-test scores was higher than the table value of 2.78 for degrees of freedom 3 and 55 required for significance at 0.05 level of confidence on Speed.

The results of the study indicate that there are significant differences among the adjusted post-test means of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group in Speed performance.

To determine which of the paired means have a significant difference, the Scheffe's test is applied as Post-hoc test and the results are presented in Table 3.

Table 3: The Scheffe's Test for the Differences between the Adjusted Post-Test Paired Means on Speed

Adjusted Post-Test Means				Mean Difference	Confidence Interval
Weight Training Group – (I)	Ladder Training Group – (II)	Combined Weight Training and Ladder Training Group – (III)	Control Group – (IV)		
7.19	6.98			0.21*	0.19
7.19		6.65		0.54*	0.19
7.19			7.68	0.49*	0.19
	6.98	6.65		0.33*	0.19
	6.98		7.68	0.70*	0.19
		6.65	7.68	1.03*	0.19

* Significant at 0.05 level of confidence

Table 3 shows that the adjusted post-test mean differences on Speed between Weight Training group and Ladder Training group, Weight Training group and Combined Weight Training and Ladder Training Group, Weight Training group and Control group, Ladder Training group and Combined Weight Training group and Ladder Training group, Ladder Training group and Control group, and Combined Weight Training and Ladder Training group and Control group are 0.21, 0.54, 0.49, 0.33, 0.70, and 1.03 respectively, which are greater than the confidence interval value of 0.19 on Speed at 0.05 level of confidence. The results of the study showed that there was a significant difference between Weight Training group and Ladder Training group, Weight Training group and Combined Weight Training and Ladder Training Group, Weight Training group and Control group, Ladder Training group and Combined Weight Training group and Ladder Training group, Ladder Training group and Control group, and Combined Weight Training and Ladder Training group and Control group on Speed.

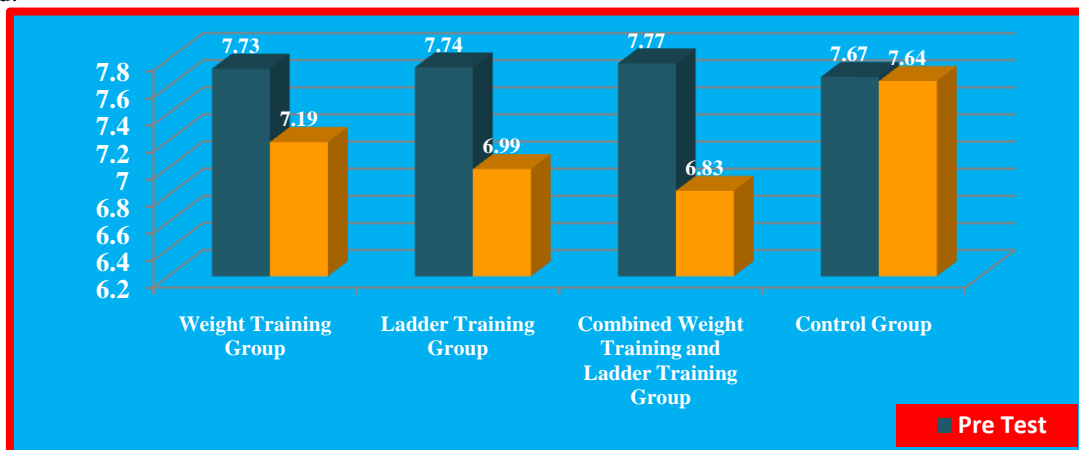


Figure 1: The Pre and Post-test Mean values of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group on Speed

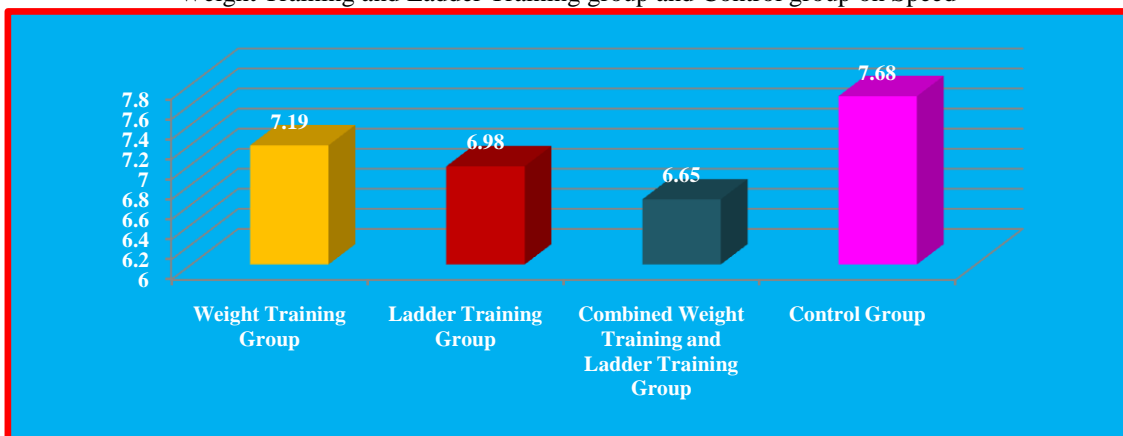


Figure 2: The Adjusted Post Mean Values of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group on Speed

The above data also reveal that Combined Weight Training and Ladder Training group had shown better performance than Weight Training group, Ladder Training group and Control group in Speed.

The pre and post mean values of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group on Speed are graphically represented in the Figure 1.

The adjusted post mean values of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group on Speed are graphically represented in the Figure 2.

Resting Pulse Rate:

The analysis of dependent ‘t’-test on the data obtained Resting Pulse Rate of the subjects in the Pre-test and Post-test of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group have been presented in Table-4.

Table 4: The Summary of Mean and Dependent ‘T’ Test for the Pre and Post Tests on Resting Pulse Rate of Experimental Groups and Control Group

Mean	Weight Training Group – (I)	Ladder Training Group – (II)	Combined Weight Training and Ladder Training Group – (III)	Control Group – (IV)
Pre- Test Mean	74.40	74.67	74.73	74.07
Post-Test Mean	72.33	72.32	72..27	74.20
‘t’-test	4.06*	4.51*	4.85*	0.16

* Significant at 0.05 level.

(Table value required for significance at .05 level for ‘t’-test with df 14 is 2.15)

Table 4 shows that the pre-test mean on Resting Pulse Rate of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 74.40, 74.67, 74.73 and 74.07 respectively. The post-test mean are 72.33, 72.32, 72.27 and 74.20 respectively. The obtained dependent t-ratio values between the pre and post-test means on Resting Pulse Rate of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 4.06, 4.51, 4.85, and 0.16 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. It was concluded that Experimental groups such as Weight Training group, Ladder Training group and Combined Weight Training and Ladder Training group had registered significant improvement in Resting Pulse Rate.

The results of the Analysis of Covariance on Resting Pulse Rate of the pre, post, and adjusted test scores of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are presented in Table – 5

Table 5: Analysis of Covariance on Resting Pulse Rate of Experimental Groups and Control Group

Test	Weight Training Group – (I)	Ladder Training Group – (II)	Combined Weight Training and Ladder Training Group – (III)	Control Group- (IV)	Source of Variance	Sum of Squares	df	Mean Squares	F ratio
Pre-Test Mean	74.40	74.67	74.73	74.07	Between	4.13	3	1.38	2.09
					Within	36.80	56	0.66	
Post-Test Mean	72.33	72.32	72.27	74.20	Between	40.18	3	13.39	24.79*
					Within	30.00	56	0.54	
Adjusted Post-Test Mean	72.38	72.21	72.10	74.46	Between	51.68	3	17.23	63.81*
					Within	14.95	55	0.27	

* Significant at 0.05 level of confidence

(Resting Pulse Rate Scores in Beats per Minute)

Table value for df (3, 56) at 0.05 level = 2.76 Table value for df (3, 55) at 0.05 level = 2.78

The above table-5 shows that the pre-test mean values on Resting Pulse Rate of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 74.40, 74.67, 74.73 and 74.07 respectively. The obtained 'F' ratio of 2.09 for pre-test scores was lesser than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Resting Pulse Rate.

The post-test mean values on Resting Pulse Rate of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 72.33, 72.32, 72.27 and 74.20 respectively. The obtained 'F' ratio of 24.79 for post-test scores was higher than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Resting Pulse Rate.

The adjusted post-test means on Resting Pulse Rate of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group are 72.38, 72.21, 72.10 and 74.46 respectively. The obtained 'F' ratio of 63.81 for adjusted post-test scores was higher than the table value of 2.78 for degrees of freedom 3 and 55 required for significance at 0.05 level of confidence on Resting Pulse Rate.

The results of the study indicate that there are significant differences among the adjusted post-test means of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group in Resting Pulse Rate performance.

To determine which of the paired means have a significant difference, the Scheffe's test is applied as Post hoc test and the results are presented in Table – 6.

Table 6: The Scheffe's Test for the Differences between the Adjusted Post-Test Paired Means on Resting Pulse Rate

Adjusted Post-Test Means				Mean Difference	Confidence Interval
Weight Training Group – (I)	Ladder Training Group – (II)	Combined Weight Training and Ladder Training Group – (III)	Control Group – (IV)		
72.38	72.21			0.17	0.55
72.38		72.10		0.28	0.55
72.38			74.46	2.08*	0.55
	72.21	72.10		0.11	0.55
	72.21		74.46	2.25*	0.55
		72.10	74.46	2.36*	0.55

* Significant at 0.05 level of confidence

Table-6 shows that the adjusted post-test mean differences on Resting Pulse Rate between Weight Training group and Control group, Ladder Training group and Control group, and Combined Weight Training and Ladder Training group and Control group are 2.08, 2.25 and 2.36 respectively, which are greater than the confidence interval value of 0.55 on Resting Pulse Rate at 0.05 level of confidence.

Further the table-6 shows that the adjusted post-test mean differences on Resting Pulse Rate between Weight Training group and Ladder Training group, Weight Training group and Combined Weight Training and Ladder Training Group, Ladder Training group and Combined Weight Training group and Ladder Training group 0.17, 0.28, and 0.11 respectively, which are less than the confidence interval value of 0.55 on Resting Pulse Rate at 0.05 level of confidence.

The results of the study showed that there was a significant difference between Weight Training group and Control group, Ladder Training group and Control group, and Combined Weight Training and Ladder Training group and Control group on Resting Pulse Rate. Further the results of the study showed that there was no significant difference between Weight Training group and Ladder Training group, Weight Training group and Combined Weight Training and Ladder Training Group, Ladder Training group and Combined Weight Training group and Ladder Training group, on Resting Pulse Rate.

The above data also reveal that Combined Weight Training and Ladder Training group had shown better performance than Weight Training group, Ladder Training group and Control group in Resting Pulse Rate.

The pre and post mean values of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group on Resting Pulse Rate are graphically represented in the Figure 3.

The adjusted post mean values of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group on Resting Pulse Rate are graphically represented in the Figure 4.

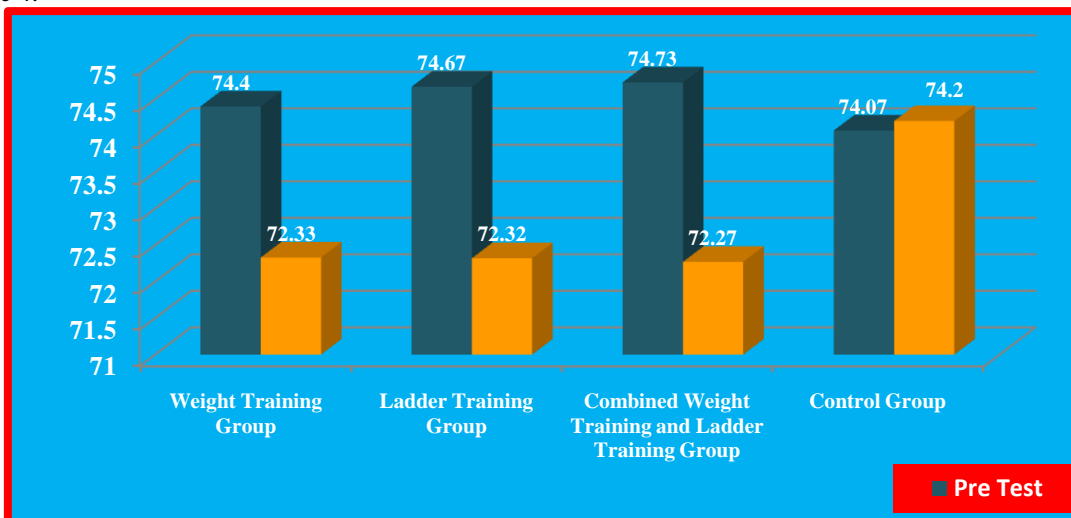


Figure 4: The Pre and Post-test Mean values of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group on Resting Pulse Rate

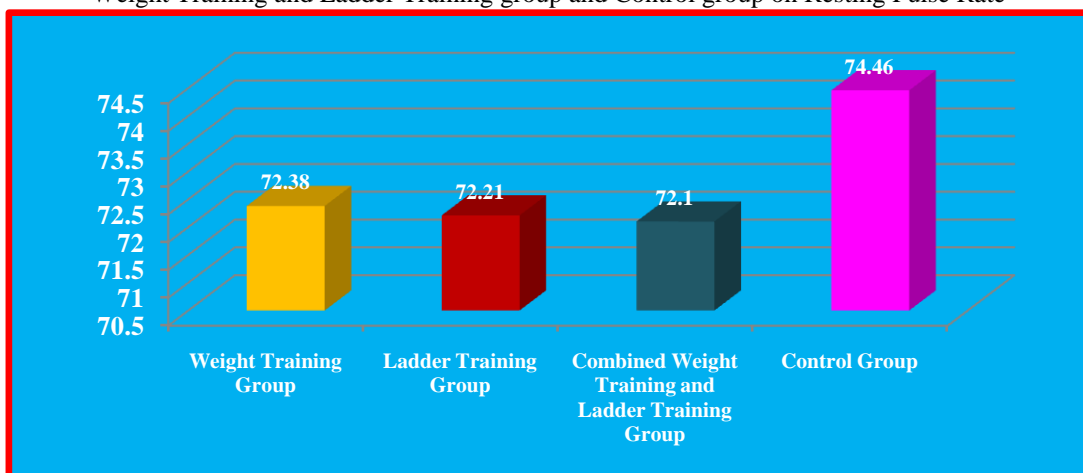


Figure 5: The Adjusted Post Mean Values of Weight Training group, Ladder Training group, Combined Weight Training and Ladder Training group and Control group on Resting Pulse Rate (In Seconds)

Conclusions:

From the analysis of the data, the following conclusions are drawn. The result of the study also revealed that there was a significant improvement on Speed and Resting Pulse Rate after the isolated and combination of weight and ladder training and significant difference was found between the training groups on Speed and Resting Pulse Rate in favour of combination of weight and ladder training.

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