International Journal of Current Research and Modern Education (IJCRME)
Impact Factor: 6.925, ISSN (Online): 2455 - 5428
(www.rdmodernresearch.com) Volume 7, Issue 2, 2022

EFFECT OF STRENGTH TRAINING ON PHYSICAL FITNESS VARIABLES OF UNIVERSITY VOLLEYBALL PLAYERS

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Cite This Article: Dr. M. Rajkumar & S. Suryaraj, "Effect of Strength Training on Physical Fitness Variables of University Volleyball Players", International Journal of Current Research and Modern Education, Volume 7, Issue 2, Page Number 41-44, 2022.

Abstract:
Objective: The motive of this study was to investigate effect of strength training on physical fitness variables of university volleyball players.
Study design: Experimental research.
Background: The fact-finding on the effect of strength training on university male volleyball players only. The studies on the effect of strength training on shoulder strength and core strength have been limited.
Method & Measures: To investigate the study, thirty university volleyball players were randomly selected from various affiliated colleges of Bharathiar University, Coimbatore and their age were ranged between 18 and 25years.The subjects were randomly assigned to two equal groups (n=15) namely experimental group and control group. Experimental group underwent strength training for a period of twelve weeks and control group who did not participate in any special training other than the regular routine. The physical fitness variables such as shoulder strength and core strength were selected as dependent variables. Pre and post-test random group design was used for this study. The dependent't' test was applied to determine the difference between the means of two groups. To find out whether there was any significant difference between the experimental and control groups. To test the level of significant of difference between the means 0.05 level of confidence was fixed.
Results: The result of the study shows that, there was a significant improvement takes place on shoulder strength and core strength of Bharathiar university volleyball players due to the effect of twelve weeks strength training and also concluded that, there was a significant difference exists between experimental and control group in shoulder strength and core strength.
Conclusions: Strength training may be suitable exercise program to the Bharathiar university volleyball players for improving their physical fitness variable namely shoulder strength and core strength.

1. Introduction:

Strength training (also known as resistance exercise) increases muscle strength by making muscles work against a weight or force. Resistance exercise is an anaerobic exercise. Strength training is a type of exercise that improves muscular fitness through the use of resistance to the muscle. It involves activities that make your muscles do more work than they usually do. An exercise counts as strength training if it involves a medium- to high-level effort and if it works major muscle groups of the body. (Raquel Garzon 2017). Strength training has proven to be an effective method of conditioning for the young athlete. Strength training is designed to improve health, fitness, strength, flexibility, endurance and athletic performance.

The study was conducted to the effect of plyometric training and circuit training on selected physical and physiological variables among male volleyball players. Twenty four male volleyball players aged between 18 to 25 years subjected found a significant improvement in speed, muscular endurance, flexibility, agility, explosive strength, vital capacity and anaerobic capacity. (Dr. J. Anitha and Dr. P. Kumaravelu et al., 2018). The effect of plyometric training and combination of weight and plyometric training on selected physical fitness variables of college men volleyball players. The result of the study shows that there was significant improvement for plyometric training and combination of weight and plyometric training of men college volleyball players on selected criterion variables Muscular strength, explosive power and strength endurance. (Babar Bashir et al., 2018). The effect of plyometric training on development of the vertical jump of volleyball players. The result of the study reveals that there was significant difference in 0.05 levels. Based on the findings of the research and the discussion, one could conclude that the exercise model for the development of the vertical jump that had been used, as the fundamental factor of the experimental group, has contributed to the statistically significant difference in the increase of the vertical jump in comparison to the control group, which had used technically tactical contents to develop the vertical jump. (Soundara rajan, R.; Pushparajan 2010). The effects of plyometric jump training (PJT) on measures of physical fitness in amateur and professional volleyball players. A systematic electronic literature search was carried out in the databases pubmed, medline, web of science, and SCOPUS (Rodrigo Ramirez and Campillo 2021) Physical fitness qualities of professional volleyball players:

Determination of positional differences. (Marques, Mário C 2009). The aim of this study is to examine the effect of different strength training on the static and dynamic balance ability of volleyball players. A total of 20 male volleyball players, aged between 18 and 25, are participated in the study who has been playing in national volleyball competition in Gaziantep. The subjects were divided into two groups according to the randomized method as experimental group (n=10, age: 21.60±2.06) and control group (n=10, age:20.50±1.77). The experimental group was given a different strength training program for 3 days a week for 8 weeks. As a result, it is considered that the different strength training applied to the volleyball players has a positive effect on the static and dynamic balance ability. It can be said that static and dynamic balance abilities of regular strength training may increase. (Mehmet Ali Eylen 2017) Effects of different resistance training volumes on strength and power in team sport athletes. The aim of this study was to compare the effects of 3 different volume of resistance training (RT) on maximum strength and average power in college team sport athletes with no previous RT experience. As a result, the initial adaptation period, a HV RT program seems to be a better strategy for improving strength, whereas during the season, an LV RT could be a reasonable option for maintaining strength and enhancing lower-body AP in team sport athletes. (Naclerio, Fernando et al., 2013)

2. Methods and Measurement:

Subject: The purpose of the study was to find out the effect of strength training on physical fitness variables of university volleyball players. To achieve the purpose of the study thirty volleyball players were selected from various affiliated colleges of Bharathiar University, Coimbatore. Their age ranged between 18 and 25 years and they were divided into two equal group's experimental group and control group consists of 15 each. Experimental group underwent the strength training and the control group was not given any sort of training except their routine work. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The selected variables namely, shoulder strength was measured by Pull up test and Core strength was measured by sit up test. The data were collected from the subjects was statistically analysed with dependent 't' test to find out significant improvement if any at 0.05 level of confidence.

Criterion Measures: It is evaluate physical fitness variables where chosen as the criterion measures to this study for testing.

Table 1: Criterion Measures

S.No	Criterion Variables	Test Items	Unit of Measurements
1	Shoulder strength	Pull up test	In counts
2	Core strength	Sit up test	In counts

Statistical Methods: The collected data before and after training period of twelve weeks on the above said variables due to the effect of strength training was statistically analysed with't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. (P<0.05).

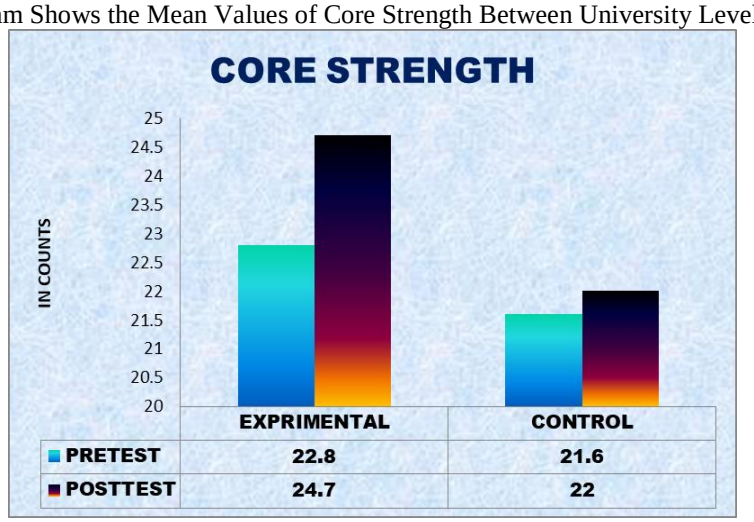
Table 2: The t Ratio for University Level Volleyball Players on Shoulder Strength and Core Strength

Variable	Groups	Pre Mean	Post Mean	Std Deviation	Std Error	t
Shoulder Strength	Experimental	9.46	11.8	0.89	0.23	10.4*
	Control	7.80	8.20	0.73	0.19	2.10
Core Strength	Experimental	22.8	24.7	0.79	0.20	9.3*
	Control	21.6	22.0	0.82	0.21	1.87

(Significance at 0.05 level of confidence for df of 14 is 2.14)

Figure 1: Bar Daigram Shows the Mean Values of Shoulder Strength Between University Level Volleyball Players

Figure 2: Bar Daigram Shows the Mean Values of Core Strength Between University Level Volleyball Players



Mean standard deviation and t-value were calculated for each outcomes measure can be found in Table 2 result shows that the pre-test mean values of experimental group and control group(9.46, 22.8) and (7.80 , 21.6) respectively and the post test mean values are(11.8 , 24.7)and (8.20 , 22.0) respectively. The obtained dependent t-test value on shoulder strength (t=10.4) and core strength (t=9.3) of experimental group respectively. The table value required for significant difference with degrees of freedom 14 at 0.05 level of confidence is 2.14. The obtained 't' test value of experimental group was greater than the table value. The results clearly indicated that the shoulder strength and core strength of the experimental group improved due to effect of strength training on university volleyball players.

3. Discussion:

The result of the study considered that the different strength training applied to the volleyball players has a positive effect on the static and dynamic balance ability. It can be said that static and dynamic balance abilities of regular strength training may increase. (Mehmet Ali Eylen 2017). The result of the present showed the effect of strength training on physical fitness variable of university volleyball players and there was a difference between experimental group and control group. The findings of the present study are in line with investigator referred in this study. Shoulder strength and core strength is developed due to the strength training after 12 week training period.

4. Conclusion:

Strength training trains the ability to overcome resistance where you focus on moving as much weight as possible for the given number of repetition. (Christian Bosse 2020). Based on finding and within the limitation of the study it is concluded that there was a significant improvement in shoulder strength and core strength of university volleyball players because utilizing external resistance, including weight can be an effective way to improve the physical fitness. The current analysis has shown strength training to beneficial for University volleyball players with the age between 18 to 25 years in the period of 12 week training. Further it also concludes the strength training is suitable exercise program to the Bharathiar university volleyball players for improving their physical fitness variable namely shoulder strength and core strength.

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