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Impact of Resistance Training upon Strength and Speed of Universities Volleyball Players by Using Scientific Training Method

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Abstract

The aim of this experimental design study was to evaluate the impact of 8 week resistance training upon speed and strength of the Volleyball two different universities including The University of Okara and The University of Sahiwal. The random sampling technique was employed. Total number of 80 (age M= 22.0+/-2.5 SD years, Height M=178.5+/-3.5 SD in centimeter, Weight M=68.88+/-6.39 SD in kg, BMI, M=23.94+/-1.58 SD) Volleyball players were randomly selected to participate in study and the players were randomly divided into two groups, experimental group (n=40) and control group (n=40). In the initial phase for experiment the researcher's randomly collected the data for pretest of both groups. In the next stage, 8 week training plan was implemented for the experimental group and the participants of the control group were allowed to follow their previous routine of activities. After completion of the 8 week of training, once again data were collected for post-test in respect of both groups. To classify and summarize the data, descriptive statistics were used and the collected data were tabulated and analyzed with SPSS (version 22.0). Paired sample T-Test was used to infer the difference between pre and post-test. Results demonstrate significant difference between pretest and post test data of the 40M Sprint category of the Respondents. The pretest data (Mean = 5.3700, SD= .29717) and post – test data which is (Mean = 5.1075, SD = .26736) which indicates post data is less than as compared to pre data which clearly shows that training effect on 40M Sprint. The achieved value of sigma is .000 which is less than the cutoff value of .05. So, the hypothesis H_1 accepted and H_0 rejected. On the other hand results show that there is significant difference between the pre of the 1RM Squat (M = 137.3500, SD = 4.96423, n=40) and post 1RM Squat (M = 146.8250, SD = 4.99686, n=40) of the sampled respondents. The attained value of sigma is .000 which is less than the cutoff value of .05. So, the hypothesis H_1 accepted and H_o rejected.

Keywords: Resistance Training, Speed, Strength, Volleyball, Universities Players

Introduction

The sports movement has recently experienced remarkable growth. These modifications came about as a result of fundamental adjustments made to most games, whether at the legal level or in terms of the conditions (physical, skill, planning, psychological, and mental skills) that players should find enjoyable. Which, then, had an impact on excelling in numerous sporting endeavors? The exercise is a useful tool for the trainer to meet the necessary learning and training objectives.

For this, the training unit should include a series of exercises that can be used to accomplish the intended objectives.

The physical, technical, tactical, and cerebral components of this team sport manifest as an assault by kicking the ball into the opposing team's area. Volleyball players can succeed even with superb technique, tactics, and physical condition if they work diligently to strengthen their fundamental motor skills, such as strength (ASSEFA, B. 2020). Strength determines effectiveness in the field of sports sciences as a bio-motor capacity. It is typically defined as the capacity to withstand resistance or the capacity to persevere in the face of specific levels of resistance. Strength becomes even more specialized by developing groupings of the most often used muscles in a particular athletic discipline (Lloyd R. S et al., 2016).. In response to scientific study on increasing MS, a variety of training techniques were created. One of those involves techniques performing the one-repetition maximum (1- RM) exercise multiple times over a period of time (Motl, R. W., & Gosney, J. L. 2008). Volleyball is one of the most dynamic and invigorating games. Now days, it has an extraordinary type of sports among any remaining ones. In this game, the presence of aerobic and anaerobic energy and furthermore unexpected vacillations of biological requirements are totally perceptible (Maughan, R. J., & Shirreffs, S. M. 2017). In the advanced world, athletic specialists are struggling to use new logical strategies to get ready the professional players at various public and global challenges. In this way, use of the best suitable strategies for preparing is the main premise which should be performed by the accomplished in proficient fields (Launder, A. G., & Piltz, W. 2013). RT is also called strength, or weight training and it has become one of the most well-known types of activity both for improving a person's wellness and for conditioning players (Fernandez-Fernandez, J., & Kovacs, M. 2019).. The terms strength, weight and obstruction training have all been utilized to represent a kind of activity that requires the body's muscular building to move against a restricting power. Typically presented by some kind of apparatus. The terms RT and strength training envelop a wide scope of training modalities, including plyometric and indicate just too ordinary RT utilizing free loads or weight machines (Zhao, X. 2021). The expanding number of gym, universities, colleges, and schools RT facilities attest to popularity of this form of physical fitness.

Technical skills (TS) and a high level of physical fitness (PF) are prerequisites for playing Volleyball. It is crucial to remember that PF refers to a player's ability to play the game without experiencing excessive tiredness, as well as their capacity to leap very high and move all of their joints fully (Mujika, I., Halson, S., Burke, L. M., Balagué, G., & Farrow, D. 2018). As a result, PF is a physical feature that helps the body respond to demands and adjust to the strain of physical exertion. Moreover PF has health related and TS connected parts. The term "health related components" refers to those factors that are connected to an individual's health, such as muscular endurance, MS, physical and flexibility composition. Speed, balance, agility, power, reaction time and coordination, are the six skill-related PF components, whereas these fitness-related elements are necessary for the best job or athletic performance. Numerous studies have been conducted on certain PF traits such flexibility, explosive power, and muscular endurance. Muscular endurance (ME) is the players' ability to resist early fatigue (ABDI, T. E. 2017). Volleyball requires endurance capacity as the game lasts for long duration. Importantly, endurance capacities are known to be vital to exhibit performance. Power is a role of mutually the strength of players' muscle and the rate at which the muscle contracts. In order to put on a vigorous performance, a player's power, which is a byproduct of their speed and strength, is essential because it determines how hard they can hit, jump, and smash (Paul, D. J., & Nassis, G. P. 2015). At present Volleyball is known to be a speedy and powerful game in which the players are required to perform complex movements in each plane of movement. The game of Volleyball

particularly requires strength and conditioning exercise plan to enhance power while developing explosive strength (Martinez, D. B. 2017).. For Volleyball players, emphasis is given on speed, hitting power, and hopping and landing mechanics. While spiking the ball focuses more on lower body and upper body strength and speed; this mix requires power through the whole active chain for good performance, particularly at the world class level. In the absence of the fundamental factors (distance, strength, and time), movement efficacy is not compromised (Awad, S. D., Mukhlif, A. K., & Rahman, M. A. Q. A. (2021). The player's performance in the sport of volleyball can therefore be predicted by looking at the player's fitness components. The coach can improve the player's physical and skill performance by using such training regimens. Unfortunately, most coaches only employ one-third of the preparation time for the skill element while neglecting to include the special physical skills in the training unit. The present study looked at the "impact of resistance trainings upon speed and strength of universities male Volleyball players" to further enhance the existing knowledge and understanding regarding the role of RT in the game of Volleyball.

Limitations of Study

All consented Volleyball players from both the universities among the age ranges of 19 to 24 years were incorporated in the study. Non-consented and players representing other games and beyond the prescribed age limit were excluded.

Problem Statement

The problem of the study was "To evaluate impact of Resistance training upon speed and strength of the Universities Volleyball players".

Hypotheses

The researcher formulated the following hypotheses

1. H_1: Resistance training will have significant effects upon strength of the universities Volleyball players.

   H_0: Resistance training will have no significant effects upon strength of the universities Volleyball players.

2. H_1: Resistance training will have significant effects upon speed of the universities Volleyball players.

   H_0: Resistance training will have no significant effects upon speed of the universities Volleyball players.

Objectives

This study comprised of the following objectives:

1. To investigate the effects of Resistance training upon strength of the universities level Volleyball players.
2. To investigate the effects of Resistance training upon speed of the universities level Volleyball players.

Methods and Material

Study Design

The experimental research design was used to determine the impact of 8 week resistance training upon speed and strength of Universities Volleyball players by using scientific training method.

Settings
This study was conducted in two different universities including The University of Okara and The University of Sahiwal. The population for this study comprised of all the players who were playing Volleyball in their university teams. There were 80 Volleyball players (N=80) in both the universities.

Population
The population for this study comprised of all the players of Volleyball either they are selected in the universities team or otherwise. At the most, they comprised around eighty Volleyball players in the both Universities.

Sample Size
Total population was taken as sample population for the study. No formula was used to calculate the sample size because the population of interest was not large (N=80).

Equipment
Stop-watch, measuring tape, Cone markers, Gym, 1RM Squat test of strength and 40M Sprint test were used to measure the speed of the respondents.

Data collection procedure:
Before recruiting the participants, informed consent was obtained from all the players. All the details about the study were explained to them regarding "effects of 8 weeks resistance training upon speed and strength of the universities players". Then the participants were divided into two groups, experimental and control. Prior to the experiment of 8 week training, pre-test data in respect of both groups were collected and recorded. In the next stage, 8 week training plan was implemented to the experimental group. While the participants of the control group were allowed to follow their previous routine of activities. After completion of the 8 week of training, once again data was collected for post-test in respect of both groups.

Outcome measures:

Independent variable.

Resistance Training (RT)
Dependent variables.
Speed
Strength

Post Test of Control and Experimental Group
The post test of both groups was conducted after the completion of eight weeks resistance training program for Speed and Strength variable. The average score of Speed and Strength in their three attempts of both groups were taken and calculated as procedure adopted for pretest.

Data analysis procedure
To classify and summarize the data, descriptive statistics were used and the collected data were tabulated and analyzed with SPSS (version 22.0). Paired sample T-Test was used to infer the difference between pre and post-test.

Analysis

Table 4.1: Frequency Distribution of Control and Experimental Group.

Frequency	Percent	Valid Percent
40	50.0	50.0
40	50.0	50.0
80	100.0	100.0

Table 4.1 indicates there were 80 athletes in my study 40 (50%) are in Control group and 40 (50%) were belong to Experimental group.

Table 4.2: Data Normality Test of Variables

Tests of Normality	Shapiro-Wilk		
	Statistic	df	Sig.
Forty M Sprint	.963	80	.216
One RM Squat	.986	80	.565

*. This is a lower bound of the true significance. a.Lilliefors Significance Correction

Table 4.2 showing that the data of Forty M Sprint (p=.216), One RM Squat (p=.565), was suitable for the parametric test. The Sig. values were greater than the alpha value 0.05 which indicates that the data was normal. Shapiro-Wilk test was performed to test the normality of Forty M Sprint and One RM Squat of Experimental Group and Control Group.

Table no: 4.3 Frequency distribution age of Player control and experimental group

Control group			Experimental group		
Age	Frequency	Percent	Age	Frequency	Percent
20.00	5	12.5	19	1	2.5
21.00	2	5.0	20	5	12.5
22.00	11	27.5	21	6	15.0
23.00	11	27.5	22	6	15.0
24.00	11	27.5	23	9	22.5
Total	40	100.0	24	13	32.5
				40	100.0

Above table no:4.3 is showing the 40 randomly selected age of control respondents of both universities from Sahiwal &Okara volleyball players the frequency distribution of respondents' age, 20 years was 5% 21 years was 2% 22 years was 11% 23 years 11% 24 years was 11%. And showing 40 the randomly selected age of experimental respondents of both universities from Sahiwal & Okara volleyball players the frequency distribution of respondents' age, 19 years was 1% 20 years was 5% 21 years was 6% 22 years 6% 23 years was 9% 24 years was 13%.

Table no 4.4 frequency distribution Height in CM of control and experimental group

Control group			Experimental group		
Height	Frequency	Percent	Height	Frequency	Percent
175.26	7	17.5	175.26	13	32.5
177.80	10	25.0	177.80	9	22.5
180.34	13	32.5	180.34	8	20.0
182.88	10	25.0	182.88	10	25.0
Total	40	100.0	Total	40	100.0

Above table no:4.4 is indicates the 40 randomly selected respondents of both universities from Sahiwal &Okara volleyball players the frequency distribution of respondents' Height, 175.26 CM was 7% 177.80 CM was 10% 180.34 was 13% 182.88 was 10%. And is indicates the 40 randomly selected respondents of both universities from Sahiwal &Okara volleyball players the frequency distribution of respondents' Height, 175.26 CM was 13% 177.80 CM was 9% 180.34 was 8% 182.88 was 10%.

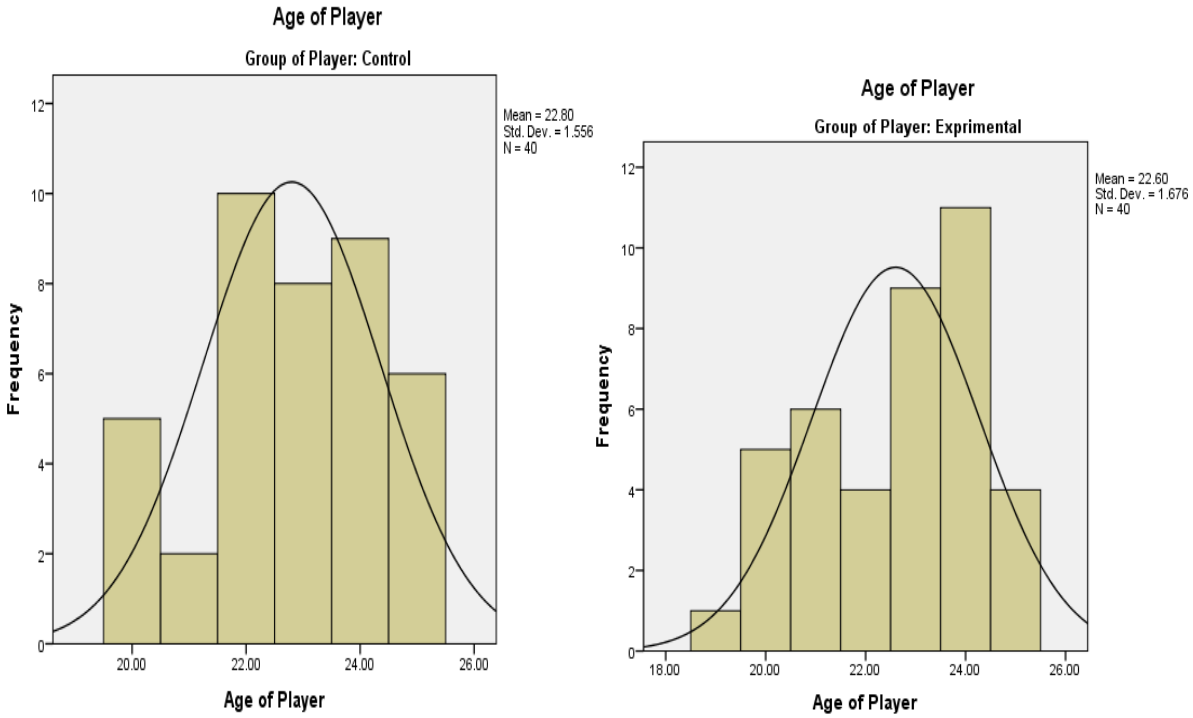

Figure 4.1: Showing the Bar Graph of age control and Experiment group.

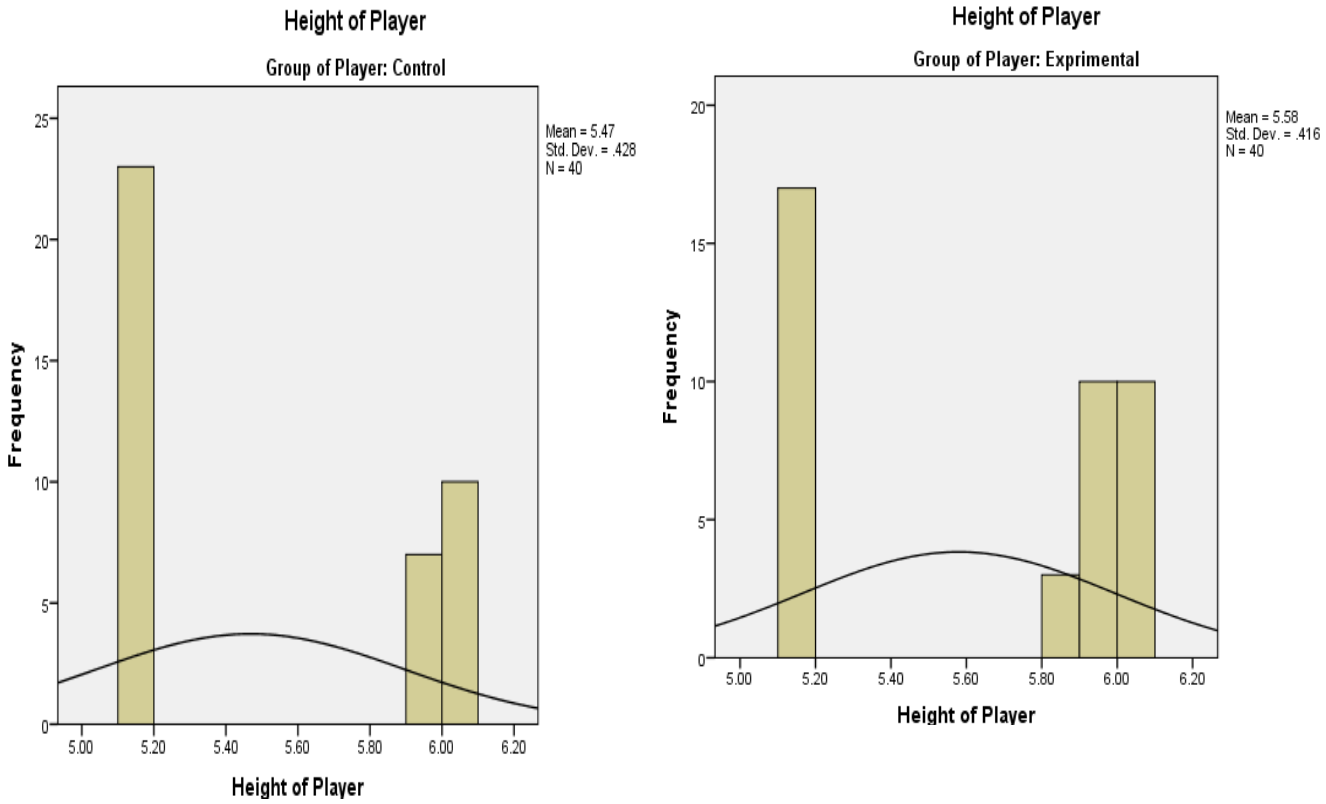

Figure 4.2: Showing the Bar Graph of Height of control and Experiment group.

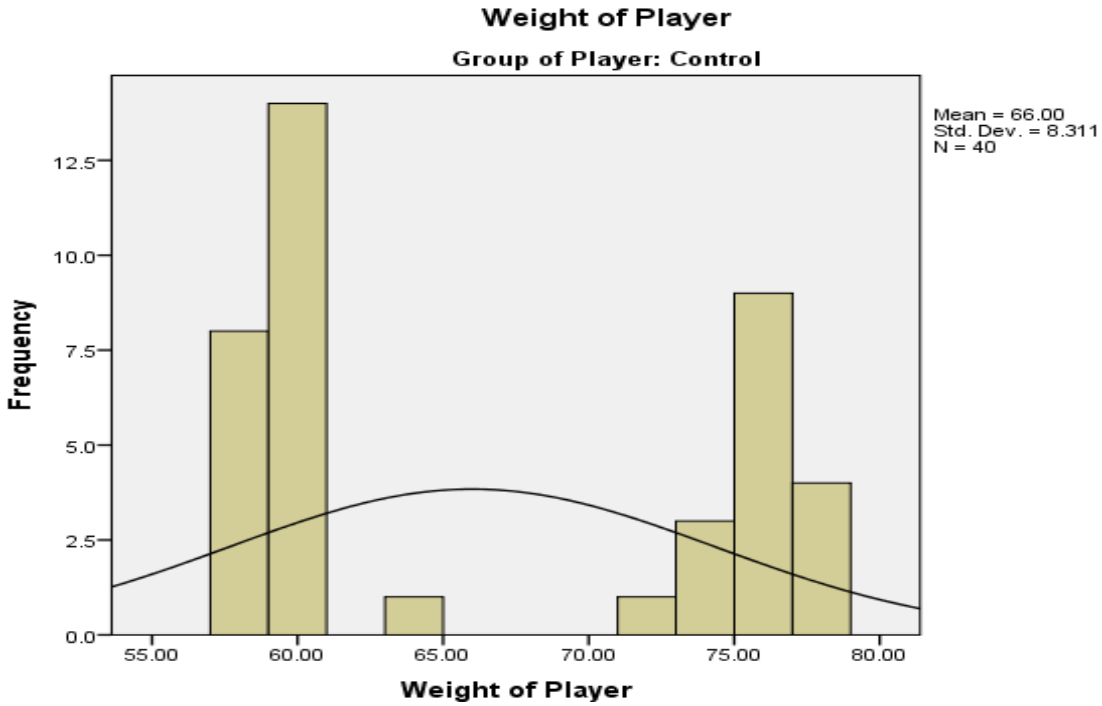

Figure 4.3: Showing the Bar Graph of weight of Control group.

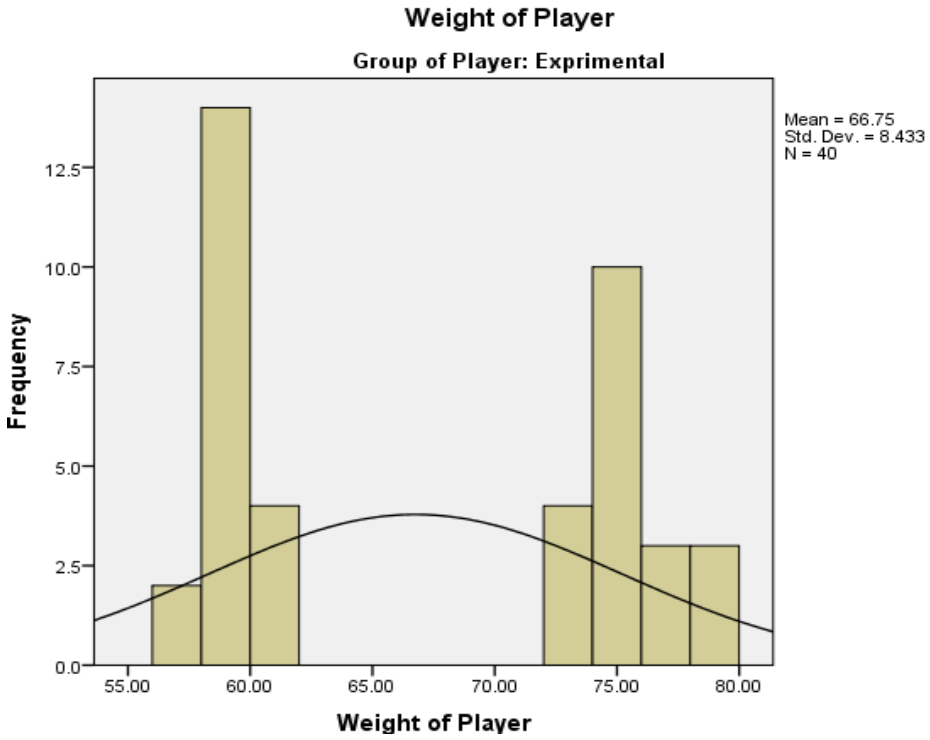

Figure 4.4: Showing the Bar Graph of weight of experimental group.

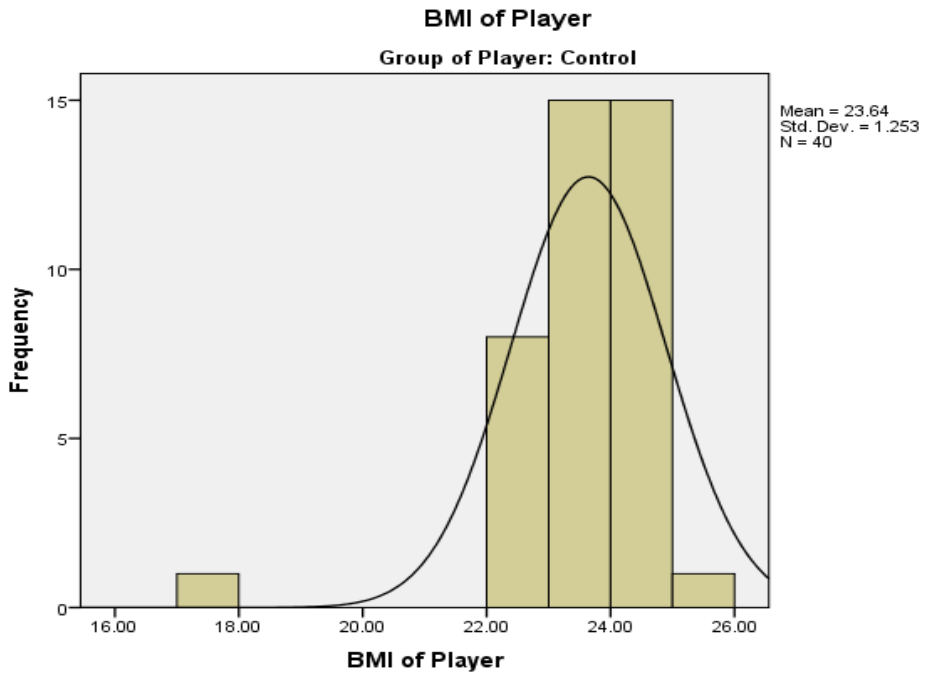

Figure 4.5: Showing the Bar Graph of BMI of players of control group.

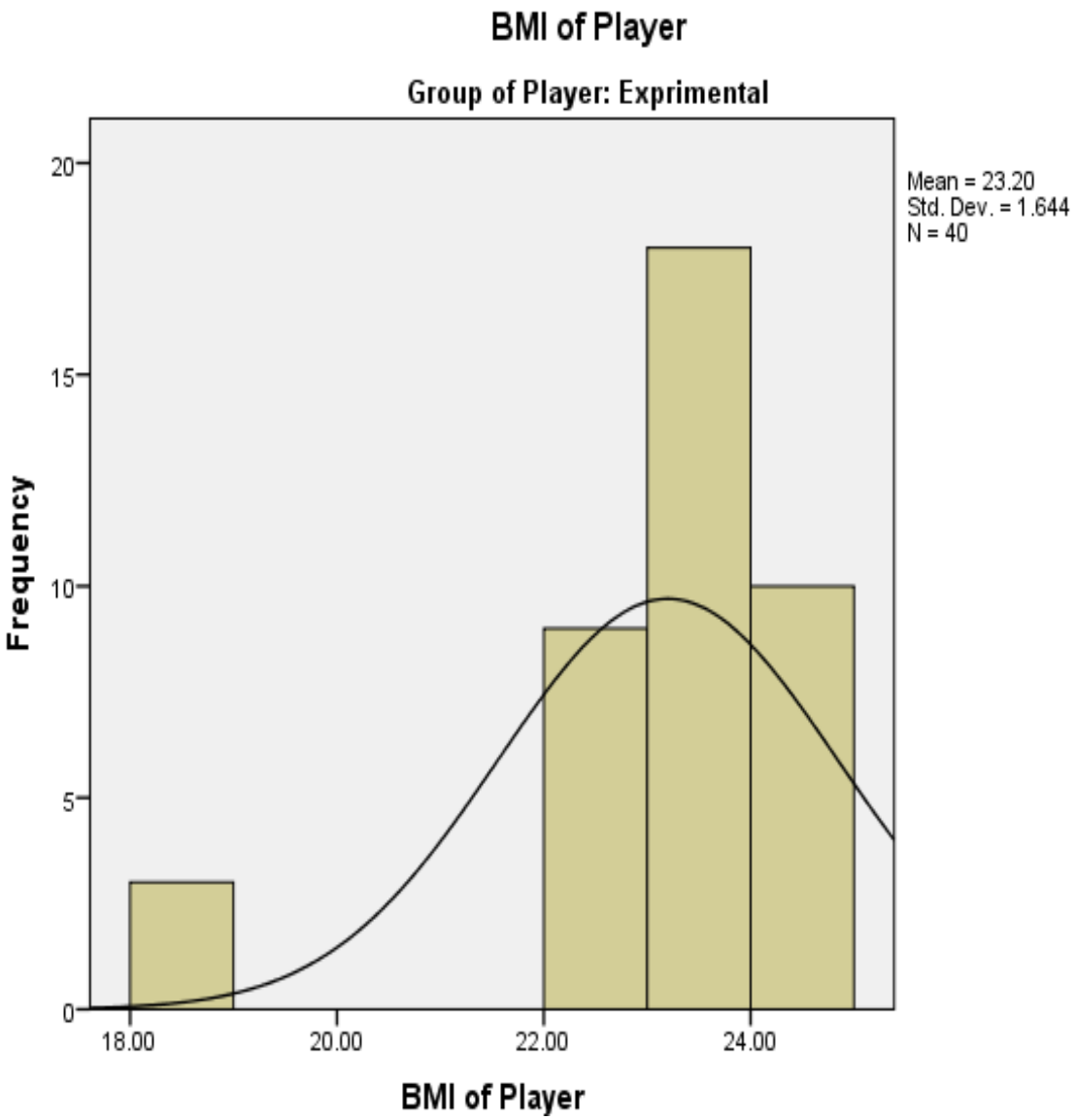

Figure 4.6: Showing the Bar Graph of BMI of players of Experimental Group.

Table 4.5: Paired sample t-test showing the mean difference between pre-test and post-test score of subjects in 40M Sprint.

40M Sprint	Mean	N	Std. Deviation	t	Df	Sig. (2-tailed)
Pre	5.3700	40	.29717	16.959	39	.000
Post	5.1075	40	.26736			

p = .05

The above table 4.15 indicates a significant difference between pre and post – test data of the 40M Sprint category of the Respondents. The pre – test data (Mean = 5.3700, SD= .29717) and post – test data which is (Mean = 5.1075, SD = .26736) which indicates post data is less than as compared to pre data which is clearly shows that training effect on 40M Sprint. The achieved value of sigma is .000 which is less than the cutoff value of .05. So, the hypothesis H_1 accepted and H_O rejected.

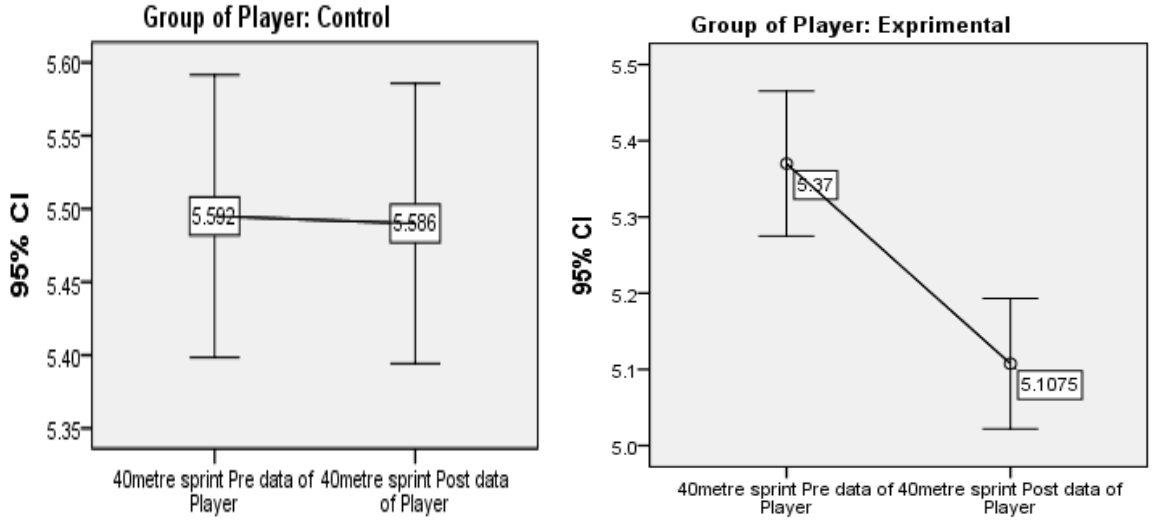

Figure no 4.7 indicates the Graph of Control and Experimental Group of 40M Sprint.

Table no 4.6: Paired sample t-test indicates the mean difference between pre-test and post-test score of subjects in 1RM Squat.

1RM Squat	Mean	N	Std. Deviation	t	Df	Sig. (2-tailed)
Pre	137.3500	40	4.96423			
Post	146.8250	40	4.99686	-12.761	39	.000

The above table no 4.17 indicates that there is significant difference between the pre of the 1RM Squat (M = 137.3500, SD = 4.96423, n=40) and post 1RM Squat (M = 146.8250, SD = 4.99686, n=40) of the sampled respondents. The attained value of sigma is .000 which is less than the cutoff value of .05. So, the hypothesis H_1 accepted and Ho rejected.

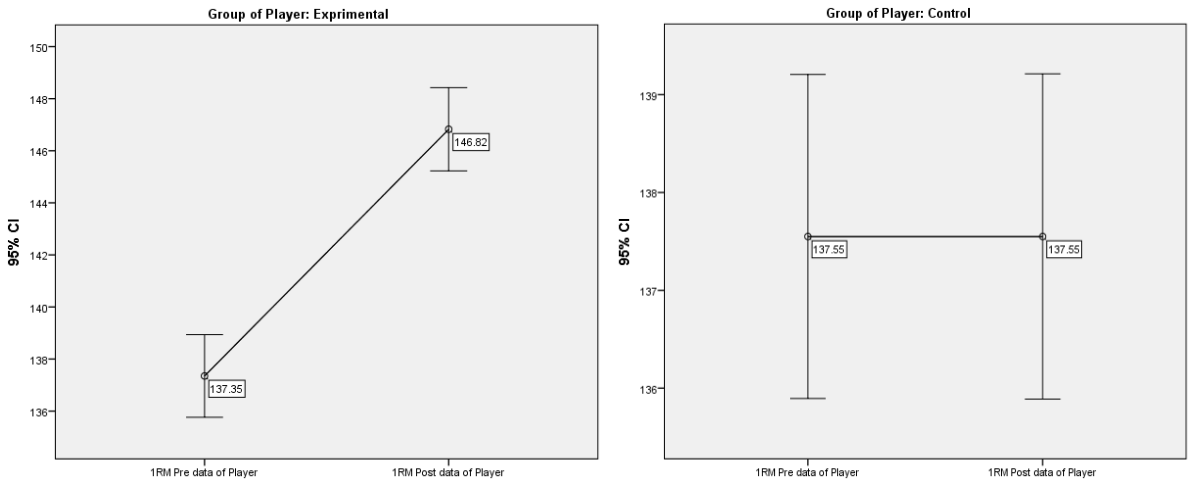

Figure no 4:8 indicates the Graph of Control and Experimental Group of 1RM Squat.

Summary

Resistance training plays an important role in improving the speed and strength which is necessary for obtaining good results in agility and force related activities. The major objective of this study was to investigate the effects of eight week resistance training on speed and strength university volleyball players. Various studies of the same kind have been conducted worldwide. Taking into consideration, the studies world over formulated the basis of research design for this experimental study. The students of university of Okara and university of Sahiwal formulated population of the study. The age limit of the subjects was between 19 to 24 years. Pre-test score recorded using the 40M Sprint test for speed and 1RM Squat test for strength for respondent. All the score of randomly selected (n=80) respondents were written in ascending order on basis of tests. The odd numbers formed Experimental group (n=40) and the even numbers formed Control Group (n=40).Tools for tests used Stop-watch, measuring tape, Cone markers and Gym, for data collection.The eight week resistance training treatment was designed for study. The treatment was given to the Experimental Group while the Control Group was allowed to carry on their routine life activities. The treatment comprised of resistance training activities that included upper body strength, lower body strength, sprints, foot works, warm up and cool down activities. The duration of each session was 1 hour including the time of warm up and cool down. The intensity of training the training was 70%-to 85% of the MHR Dr.Karvonen. After the treatment given to the Experimental Group, the post test of speed and strength of each respondent of both groups was taken and recorded. The tabulated data were analyzed by SPSS version 22 and used paired sample T-test for determining the significance between the mean values of pre-test and post-test.

Conclusion

On the basis of data findings it was concluded that resistance training improves the speed and strength components. In mostly sports speed is required to move all or part of the body quickly for good performance. Resistance training can improve your speed of movement, or your rate and agility component. The calculation of Speed of person plays important role in to judge for performance, it is also helpful in determining fitness level of player which can assist the coaches or trainers to design the training program for athletes.

The component of strength also plays important role in designing the sports training program. In many Sports Muscular strength is required to exert force in order to overcome

resistance. The component of Strength have capability to produce force, reducing the risk of injury and increasing bone density and muscle density and increased strength is crucial in developing stability. There are a few games that depend on strength only for success. While the weight-lifting workouts like dead lift or bench press and require maximum force at a low speed and all Olympic competitions depends on the combination of strength, technique and speed to deliver lifts such as the Jerk and Clean or Snatch.

In this study, the pretest mean value of 1RM Squat 137.35kg and 40M Sprint was 5.37s before treatment of Experimental Group, where as in control group the pretest mean value of 1RM Squat was 137.55kg, the pretest mean value of 40M Sprint was 5.49s.The intensity of training fluctuated between 70% to 85% for Experimental Group. While the Control Group was allowed to take part in their daily routine life activities.

After eight weeks treatment to the Experimental group, the data were analyzed. In Experimental group the posttest mean value of 1RM Squat was 146.82kg and 40M Sprint was 5.10s.While in the Control group, the posttest mean value of 1RM Squat was 137.55kg and 40M Sprint was 5.49s.According to the above stated facts, the study concluded the resistance improves speed and strength components which is essential for a player to show good performance in agility and force related sports activities. Moreover study proves the resistance training is necessary for optimal performance.

Recommendations

The following recommendations are hereby being proposed on the basis of findings of the study.

- As the results show that Resistance training improves the speed and strength components therefore, it is suggested that awareness should be created among the people about the importance of resistance exercises for improving their physical efficiency.
- In youth level the concerned coaches and physical education teachers are suggested to prepare sports activities and motivate the students for resistance exercises.
- As noted during the study, most of the students were not aware of the benefits of Resistance exercises, therefore it is suggested that Resistance training program should be made part of the curriculum at college and university levels.
- In light of the study the trainers and coaches and trainers put the Resistance exercise protocol in routine activities.
- It is further proposed that more in depth studies should be conducted to verify the findings of the study in order to adopt at national level.
- The views of the findings reflected that study less participation and lack of awareness is the cause of appropriate facilities. The researcher suggested that proper Resistance activities may be ensured at club levels.
- Sports federations and Sports clubs must should provide the facilities for Resistance exercises, and provide awareness, importance of Resistance exercises and motivate the athletes for Resistance training for compete National and international levels.

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