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Effect Of Eccentric Muscle Strength Training On Selected Physical Fitness Components Of Women Volleyball Players

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Abstract:

Background: Eccentric muscle strength trainingimproves women volleyball players body's ability to work efficiently as one unitby training multiple muscle groups at the same time which was help to avoid unnecessary injuries research have investigated the advantages of eccentric muscle strength trainingdeveloping reaction time and flexibility in women volleyball players.

Method: Therefore the purpose of the study was to investigate the effect of eccentric muscle strength training on reaction time and flexibility of women volleyball players. In this study thirty (30) subjects, of women volleyball players studying in SRM Institute of Science and Technology, Kattankulathurwere randomly selected in eccentric muscle strength training group and in non eccentric muscle strength training group, fifteen (15) in each group. The age of the subject were ranged between 18 to 21 years.

Timeline: The eccentric muscle strength training consisted of 45-60 min/day, 3days in a week till twelve weeks from the SRM Institute of Science and Technology, Kattankulathur, Tamilnadu. Physical fitness componentscompleted of the bothgroups at zero time and after twelve weeks of eccentric muscle strength training in experimental group and excepteccentric muscle strength trainingintervention in non eccentric muscle strength traininggroup.

Results: In present study, reaction time (15.10) and flexibility (18.71) were changed significantly.

Conclusion: The result of the study showed that there was a significant difference between experimental group and control group on reaction time and flexibility among women volleyball players.

Keywords: WOMEN VOLLEYBALL PLAYERS, Paired 't' test, PHYSICAL FITNESS, ECCENTRIC MUSCLE STRENGTH TRAINING.

Introduction:

Research has demonstrated that an accentuated eccentric load can increase the maximumload lifted in the concentric phase of the movement in comparison to a more typical trainingcondition where the load lifted in the eccentric and concentric phases are equal. Werecently published research demonstrating that vertical jumps that involve an accentuated(additional) eccentric load produce

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higher jump heights, power output, velocity, and forcegeneration than vertical jumps that do not use an extra load. To simplify, utilizing anextra load during the lowering phase of a counter-movement vertical jump, and releasing thisload just prior to initiating the upward phase of the jump, produced superior kinetic andkinematic values compared to a typical counter-movement jump movement where load isequal in the eccentric and concentric phase.Eccentric muscle strength training is becoming increasingly popular within the fitness industry and has been considered to be a better alternative and traditional resistance training for improving various measures of muscular fitness including strength, endurance, coordination, balance. Definitions describing what eccentric muscle strength training is or what a functional exercise program should entail vary considerably in the literature. Furthermore, experimental research conducted to ascertain the muscular fitness benefits of Eccentric muscle strength training is limited and focused specifically on improving athletes (Milton et al, 2008). As modern, evidence suggest that eccentric muscle strength training developing leg explosive power as well as flexibility of the women volleyball players.

Methodology:

The purpose of this study was to find out the effect ofeccentric muscle strength training on physical fitness components of women volleyball players. Thirtywomen volleyball players were randomly selected and they were assigned into two equal groups. Each group consisted of fifteen subjects. Pre test was conducted for all the thirty subjects on physical fitness components of reaction time, andflexibility. This initial test scores formed as pre test scores of the subjects.Experimental group I was exposed to eccentric muscle strength training, and group II was control. The control group was not exposed to any experimental training other than their regular daily activities. The experimental period was 12 weeks.After the experimental treatment, all the subjects were measured on thephysical fitnessvariables. This final test scores formed as post test scores of the subjects. The data collected from the experimental and control groups on selected dependent variable was analyzed statistically by paired 't'test to analyze the significant difference if any between the pre and post test.

Statistical analysis:

The data were analysed using statistical package for social sciences (SPSS) for windows version 16.1. Paired t-testwas carried out between eccentric muscle strength trainingand control groups. To find out significance difference between the means of pre and post test of the groups and are presented in table I & II.

Table-I: TABLE SHOWING COMPARISON OF DIFFERENCE IN PRE TREATMENT AND POST TREATMENT SCORES AMONG ECCENTRIC MUSCLE STRENGTH TRAINING.

Variable	Test	Mean	Mean Difference	Std. Error of the mean	DF	't'	Table value
Physical Fitness Components							
Reaction Time	Pre test	17.16	2.93	0.96	14	15.10*	**2.145**
	Post	14.23					

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	test						
Flexibility	Pre test	20.33	9.47	0.81	14	18.71*	
	Post test	29.80					

** Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145*

Table I suggests the obtained 't' values on criterion measure of 15.10 (reaction time) and 18.71 (flexibility). The obtained 't' values to be significant at 0.05 level for degree of freedom 1, 14 the required criticalvaluewas once 2.145. Hence the obtained 't' values on the selected criterion variables greater than the required critical value, it was concluded that the eccentric muscle strength training programme produced enormousimprovementmean difference.

Figure 1: Bar diagram showing the pre, post means values of eccentric muscle strength training group onreaction time and flexibility.

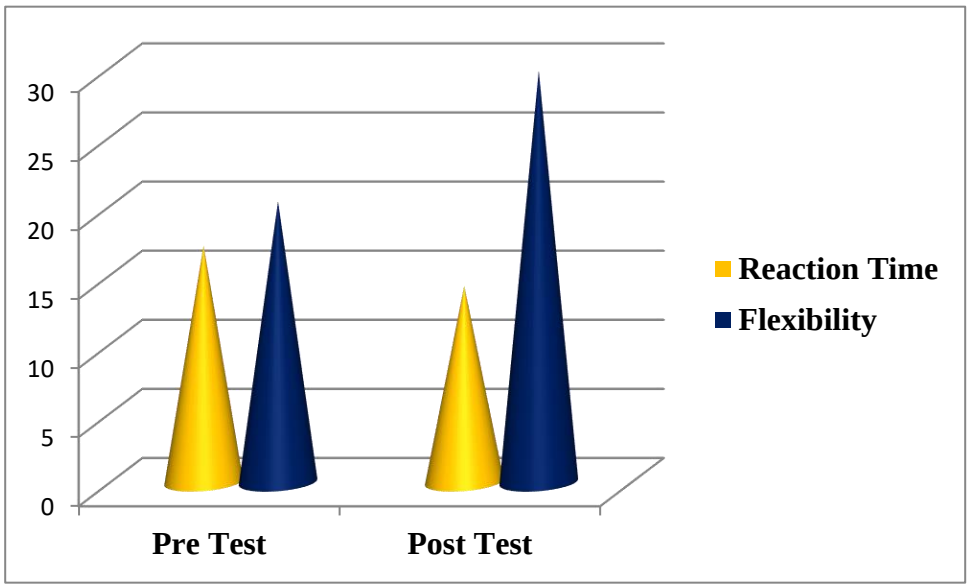

Table-II : TABLE SHOWING COMPARISON OF DIFFERENCE IN PRE TREATMENT AND POST TREATMENT SCORES AMONG CONTROL GROUP.

Variable	Test	Mean	Mean Difference	Std. Error of the mean	DF	't'	Table value
Physical Fitness Components							
Reaction Time	Pre test	16.41	0.04	0.255	14	1.31	**2.145**
	Post test	16.37					
Flexibility	Pre test	19.06	0.14	0.52	14	0.45	

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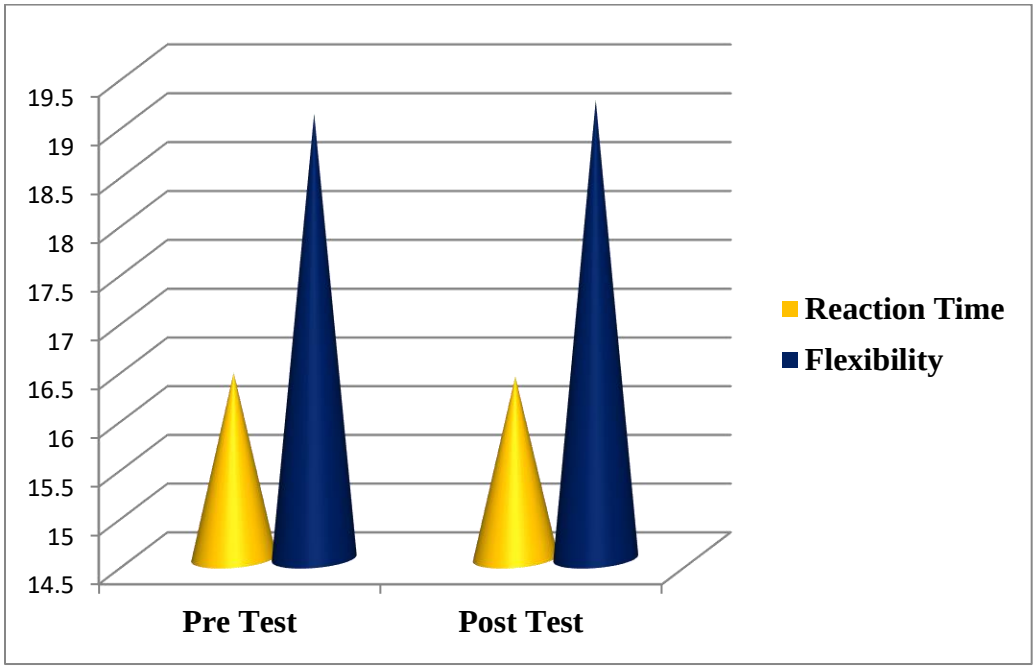
	Post test	19.20					

** Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145*

Table IIsuggests the obtained 't' values of the control group on criterion measure of 1.31(reaction time) and 0.45 (flexibility). The obtained 't' values to be significant at 0.05 level for degree of freedom 1, 14 the required criticalvaluewas once 2.145. Hence the obtained 't' values on the selected criterion variables lessthan the required critical value, it was concluded that the control groupno differences.

Figure 2: Bar diagram showing the pre, post means values of control group (CG) onreaction time and flexibility.



Discussion on findings:

The present study was found statistically significant improvement on reaction time and flexibility, which showed that positive effect of eccentric muscle strength training. The findings of the study were also agreed with the findings of (Udermann B 2008), (Ford A 2005).

Conclusion:

From the results achieved, the following conclusions were drawn.

1. The result of the study showed that there was a significant difference between experimental group and control group on reaction time among womenvolleyball players.
2. The result of the study showed that there was a significant difference between experimental group and control group on flexibility among women volleyball players.

Reference:

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1. Sheppard J, Newton R, McGuigan M. The effect of accentuated eccentric load on jump kinetics in high-performance volleyball players. International Journal of Sports Science & Coaching. 2007 Sep;2(3):267-73.
2. Anitha J, Kumaravelu P, Lakshmanan C, Govindasamy K. Effect of plyometric training and circuit training on selected physical and physiological variables among male Volleyball players. International Journal of Yoga, Physiotherapy and Physical Education. 2018;3(4):26-32.
3. Hadzic V, Sattler T, Markovic G, Veselko M, Dervisevic E. The isokinetic strength profile of quadriceps and hamstrings in elite volleyball players. Isokinetics and Exercise Science. 2010 Jan 1;18(1):31-7.
4. Anitha J. Effect of plyometric training and circuit training on speed muscular endurance among men volleyball players.
5. Kumar PK, Govindasamy K, Kumaresan G, Raj NS. A Critical Review on Traditional Medicines, Ayurvedic Herbs and fruits in Treatment of Cardiovascular Diseases. Research Journal of Pharmacy and Technology. 2020 Jul 1;13(7):3480-4.
6. Sheppard J, Hobson S, Barker M, Taylor K, Chapman D, McGuigan M, Newton R. The effect of training with accentuated eccentric load counter-movement jumps on strength and power characteristics of high-performance volleyball players. International Journal of Sports Science & Coaching. 2008 Sep;3(3):355-63.
7. Alfredson H, Pietilä T, Lorentzon R. Concentric and eccentric shoulder and elbow muscle strength in female volleyball players and non-active females. Scandinavian journal of medicine & science in sports. 1998 Oct;8(5):265-70.
8. Mohanakrishnan R, Murukesan K. Comparative analysis of playing ability in selected offensive skills of intercollegiate men kabaddi players. Elementary Education Online. 2021;20(5):7507-9.
9. Kumaravelu P, Govindasamy K. Impact of circuit resistance training on leg strength among University players from different discipline. International Journal of Yogic, Human Movement and Sports Sciences. 2018; 3(1):158-159.
10. Krishnan RM. Effect of Football Lead up Games on Selected Physical fitness Components among Football Players. Psychology and Education Journal. 2021 May 1;58(5):638-42.
11. Brini S, Abderrahman AB, Clark CC, Zouita S, Hackney AC, Govindasamy K, Granacher U, Zouhal H. Sex-specific effects of small-sided games in basketball on psychometric and physiological markers during Ramadan intermittent fasting: a pilot study. BMC Sports Science, Medicine and Rehabilitation. 2021 Dec;13(1):1-9.