



Effect of Speed Resistance and Rubber Cord Resistance Exercises on Maximum Strength Performance of Women Team Sports Athletes

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ABSTRACT

The study was to examine the isolated and combined speed resistance and rubber cord resistance exercises on maximum strength performance of women team sports athletes. Total recruited randomly N=80 (eighty) healthy women team athletes their age period ranged from 18 years to 25 years as per subject's secondary board of education certificate and, who at least participated inter collegiate level games in any one discipline namely basketball, hockey, football, cricket, volleyball, handball, kabaddi and kho kho. The chosen women players was randomly recruited into four groups each group n=20 women players i.e. empirical groups I women players underwent: speed resistance training program group (SRTW), empirical group II women players underwent: rubber cord resistance exercises training program (RRTW), empirical group III underwent: combined speed resistance and rubber cord resistance exercises training program (CSRW), and control women players group (CGW). CGP was practiced only their respective specialization game. The training period was for 12- week's duration and four sessions in a week. The measurement of maximum strength performance was done by conducting deep squat test in weight (kilogram) before and after the completion of training. The collected score's were analyzed through ANCOVA and level of significant was restricted at 0.05 levels. The study found that isolated, combined speed resistance and rubber cord resistance exercises training program had positive significant impact to increase the maximum strength performances of three empirical group's women players comparative to control group.

Keywords: – speed, resistance, rubber, exercises, squat and maximum strength

Introduction:

Million of girls now participate in a rapidly expanding variety of physical activities, and female athletes perform feats that once were deemed physiologically impossible. Female have become prime mover in the fitness realm. A recent nationwide survey conducted by the national sporting goods association indicated that more women than men participate in several leading fitness activities-aerobic exercising, bicycling, exercising with equipment exercise walking, running and swimming.

Women athletes' ability to act against maximum resistance in a single maximal voluntary contraction during sporting activity situations. Maximum strength is foundation for explosive strength, which is beneficial for sprinting, jumping, and change of direction tasks in football players and others. Resistance rubber cord is exercise

equipment made of rubber that is useful for adding weight load to the workout movement. Strength training is applied for the physical conditioning of women athletes in all sports, as it can generate improvements in strength, muscles hypertrophy, motor performance, and body composition.

Statement of the Research Problem:

To analyze the “isolated and combined speed resistance and rubber cord resistance exercises on maximum strength performance of women team sports athletes”.

Research Hypothesis:

- There will be a significant increase in maximum strength performance of empirical group’s women players after the twelve weeks impact of isolated and combined speed resistance and rubber cord resistance exercises when compared with control group women players.
- The combined speed resistance and rubber cord resistance exercises will be more effective than the isolated training in increasing maximum strength.

Methodology:

The study was to measure the isolated, combined speed resistance and rubber cord resistance exercises on maximum strength performance of women team sports athletes. Total recruited randomly N=80 (eighty) healthy women team athletes their age period ranged from 18 years to 25 years as per subject’s secondary board of education certificate and, who at least participated inter collegiate level games in any one discipline namely basketball, hockey, football, cricket, volleyball, handball, kabaddi and kho kho. The chosen women players was randomly recruited into four groups each group n=20 women players i.e. empirical groups I women players underwent: speed resistance training program group (SRTW), empirical group II women players underwent: rubber cord resistance exercises training program (RRTW), empirical group III underwent: combined speed resistance and rubber cord resistance exercises training program (CSRW), and control women players group (CGW). CGP was practiced only their respective specialization game. The training period was for 12- week’s duration and four sessions in a week. The measurement of maximum strength performance was done by conducting deep squat test in weight (kilograms) before and after the completion of training. The collected score’s were analyzed through ANCOVA and level of significant was restricted at 0.05 levels.

Table - I

Analysis of Covariance for maximum strength performance on Pre Test and Post Test Data of SRTW, RRTW, CSRW and CGW Groups women Players

Groups	SRTW	RRTW	CSRW	CGW	SOV	Sum of squares	df	Mean Square	F' Ratio
Pre test mean	39.450	39.050	39.350	39.750	B	5.00	3	1.667	0.63 ^{NS}
SD	5.880	4.795	4.826	5.066	W	2024.20	76	26.634	
Post test mean	45.700	50.550	56.150	39.550	B	2992.33	3	997.44	41.40*
SD	5.876	4.605	4.579	4.430	W	1830.65	76	24.08	
Adjusted mean	45.65	50.85	56.19	39.24	B	3146.73	3	1048.91	317.18*
					W	248.01	75	3.30	
Mean difference	+6.25	+11.50	+16.80	-0.20	-	-	-	-	-

Note: Table F-ratio value at 0.05 level of confidence for 3 and 76 (df) =2.68, 3 and 75 (df) =2.68 *Significant & NS: Not significant.

SRTW : Speed resistance training program group.

RRTW: Rubber cord resistance exercises training program group

CSRW : Combined speed resistance and rubber cord resistance exercises training program

CGW : Control group women team athletes

The above table-I shows that there is a significant difference on maximum strength performance among the four groups such [SRTW] Speed resistance training program group, [RRTW] Rubber cord resistance exercises training program group, [CSRW] Combined speed resistance and rubber cord resistance exercises training program and [CGW] Control group women team athletes. Since the 'F' value required being significant at 0.05 level for 3, 76 d/f and 3, 75 are 2.68, but the computation values of maximum strength performance of post and adjusted posttest 'F' values are 41.40 and 317.18 respectively. Which are greater than the tabulated value, it shows that training is effective for positive changes in maximum strength performance. Since the obtained 'F' ratio is found significant.

TABLE: 2

THE MAXIMUM STRENGTH PERFORMANCE [IN KILOGRAMS] RESULTS OF SCHEFFE'S METHOD TEST MEAN DIFFERENCES BETWEEN SRTW, RRTW, CSRW AND CGW GROUPS OF WOMEN TEAM ATHLETES

SRTW	RRTW	CSRW	CGW	MD	CI
45.65	50.85	-	-	5.20*	1.625
45.65	-	56.19	-	10.54*	
45.65	-	-	39.24	6.41*	
-	50.85	56.19	-	5.34*	
-	50.85	-	39.24	11.61*	
-	-	56.19	39.24	16.95*	

Note: * Significant & NS: No significant

SRTW : Speed resistance training program group.

RRTW: Rubber cord resistance exercises training program group

CSRW : Combined speed resistance and rubber cord resistance exercises training program

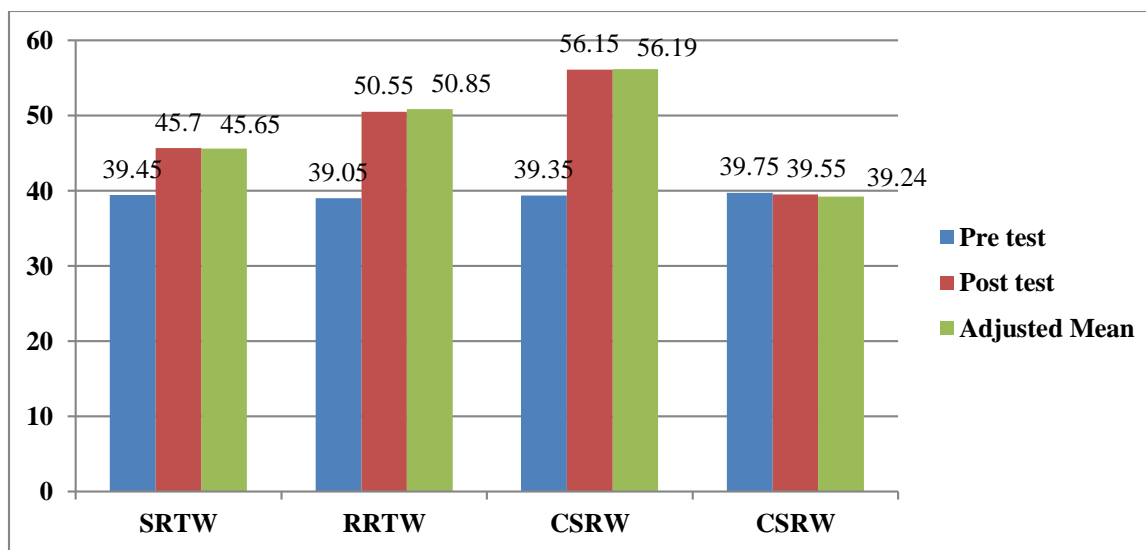
CGW : Control group women team athletes

In above table II displayed the mean differences between the speed resistance training program group (SRTW) and rubber cord resistance exercises training program group (RRTW), speed resistances training program group (SRTW) and combined speed resistance and rubber cord resistance exercises training program (CSRW), speed resistance training program group (SRTW) and Control group women team athletes, rubber cord resistance exercises training program group (RRTW) and combined speed resistance and rubber cord resistance exercises training program (CSRW), rubber cord resistance exercises training program group (RRTW) and control group women team athletes (CGW) & combined speed resistance and rubber cord resistance exercises training program (CSRW) and control group women team athletes (CGW) are 5.20, 10.54, 6.41, 5.34, 11.61 and 16.95, these values are higher than CI value 1.625. Therefore significant differences present between the groups.

The results shows that speed resistance training program, rubber cord resistance exercises training program, combined speed resistance and rubber cord resistance exercises training program are significantly enhance the muscular strength to increase maximum strength performance when compare with control group women team athletes. Further, it reveals that combined speed resistance and rubber cord resistance exercises training program is

more effective than speed resistance training program and rubber cord resistance exercises training program for increasing maximum muscular strength performance. Further, it shows that rubber cord resistance exercises training program is more effective than speed resistance training program for increasing maximum muscular strength performance.

FIGURE: 1 THE MAXIMUM STRENGTH PERFORMANCE [IN KILOGRAMS] PRE POST AND ADJUSTED POST TEST MEAN NUMBERS IN NUMBERS OF SRTW, RRTW, CSRW and CGW GROUPS OF WOMEN TEAM ATHLETES PRESENTED IN BAR GRAPH



Discussion on Hypothesis:

- The first hypotheses stated that there will be significant increase in maximum strength performance of empirical group's women players after the twelve weeks impact of isolated, combined speed resistance and rubber cord resistance exercises training program when compared with control group women players. The statistical analysis proved that isolated, combined speed resistance and rubber cord resistance exercises training program significantly increased the maximum strength performance. Hence research hypothesis accepted.
- The second hypotheses stated that combined speed resistance and rubber cord resistance exercises training program will be superior to the isolated training. The statistical analysis proved combined training is superior to isolated training method. Hence research hypotheses accepted for increasing maximum strength performance.

Discussion and Findings:

The results reveals that speed resistance training program, rubber cord resistance exercises training program, combined speed resistance and rubber cord resistance exercises training program are significantly increased maximum strength performance. The various sports training effect on maximum strength performances results are Mursel et al., (2015) researcher said that 8-week of strength training program with elastic band had positive impact for increment of one repetition maximum (1RM) method for bench press and squad and shoulder press. Kelsey et al., (2020) found that 8-weeks elastic resistance exercise providing positive muscular strength gain in shoulder abduction and external rotation & hip abduction and hip extension strength. Amira et al., (2023) systematic review concluded that resistance combined with other exercises significantly lead to increase in muscle strength and power in female elite athletes. Sercan et al., (2018) results reveals that a significant increase was encountered in leg strength, hand claw strength and back-leg strength with the application of 8-weeks dynamic and static strength training. Jaqueline et al., (2019) study suggested on the bases of literature that elastic resistance training with elastic devices is able to promote similar strength gains on upper limbs and lower limbs muscular strength when compared to resistance training performed from conventional devices. Feuerbacher et al., (2023) indicated that combined

training with upper- and lower-body strength loading resulted in a reduction of squat and bench press explosive strength of menstruating women. Souhail et al., (2011) finally reveals that in-season upper and lower limb heavy resistance training can be recommended to increase the power parameters and handball related performance without adverse impacts upon speed of movement.

Conclusions: Maximum strength (kg's)

It is concluded that speed resistance training program, rubber cord resistance exercises training program, combined speed resistance and rubber cord resistance exercises training program are significantly enhance the muscular strength to increase maximum strength performance when compare with control group women team athletes. Further, it reveals that combined speed resistance and rubber cord resistance exercises training program is more effective than speed resistance training program and rubber cord resistance exercises training program for increasing maximum muscular strength performance. Further, it shows that rubber cord resistance exercises training program is more effective than speed resistance training program for increasing maximum muscular strength performance.

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