



# Effect of Speed Resistance and Rubber Cord Resistance Exercises on Core Strength 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 core strength 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 core strength was done by conducting Plank test in time (seconds) 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 improve the core strength performances of three empirical group's women players comparative to control group.*

**Keywords:** – speed, resistance, rubber, exercises and core strength

## Introduction:

Ironically, where the real and potential health outcomes of physical activity and sports are probably most needed, participation rate and access to resources are most lacking. Physical activity and sport are not simply things young girls do in addition to the rest of their lives, but rather, they comprise an interdependent set of physiological, psychological and social processes that can influence, and in varying degrees, sustain girls growth and development (Shekar 2005).

Younger found that women athletes were significantly faster than women non-athletes in speed of arm movement and reaction time, and that- although tennis players, fencers and field hockey players differed significantly in speed movement-there was not a significant differences in their reaction times. One might assume that the speed of performing, specific movements can be improved through training, but that the initial reaction or reflex times does not differ significantly among trained, skilled players. One could describe speed in running as being due to a combination of reflex time, strength, endurance and flexibility. All these factor give a person a specific response within a given time (Sharad 2009)

Rubber cord exercises introduced as a unique exercise tool and eventually became popular as a rehabilitation device. It is used around the world by elite athletes in all sports—football players, UFC fighters, power lifters, bodybuilders, you name it—to develop muscle strength, allows variable speed of movement, provides progressive resistance, increases muscle size, easy to store, easy to transport, inexpensive, prevents cheating, provide constant tension, provide tension in multiple direction.

### Statement of the Research Problem:

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

### Research Hypothesis:

- There will be a significant increase in score of plank test 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.

### Methodology:

The study was to measure the isolated, combined speed resistance and rubber cord resistance exercises on core strength 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 core strength was done by conducting Plank test in time (seconds) 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 core strength 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	1.5880	1.515	1.735	1.616	B	0.502	3	0.167	0.726 <sup>NS</sup>
SD	0.585	0.397	0.445	0.472	W	17.522	76	0.231	
Post test mean	3.277	3.788	4.122	1.581	B	76.433	3	25.478	80.377*
SD	0.405	0.606	0.685	0.515	W	24.090	76	0.317	
Adjusted mean	3.289	3.836	4.064	1.580	B	75.601	3	25.200	94.057*
					W	20.094	75	0.268	
Mean difference	1.689	2.273	2.387	0.035	-	-	-	-	-

Table F-ratio value at 0.05 level of confidence for 3 and 76 (df) =2.68, 3 and 75 (df) =2.68

**\*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 core 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 core strength post and adjusted posttest 'F' values are 80.377 and 94.057 respectively. Which are greater than the tabulated value, it shows that training is effective for positive changes in core strength. Since the obtained 'F' ratio is found significant.

**TABLE: 2**

**THE CORE STRENGTH [IN SECONDS] 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
3.289	3.836	-	-	0.547*	0.464
3.289	-	4.064	-	0.775*	
3.289	-	-	1.580	1.709*	
-	3.836	4.064	-	0.228	
-	3.836	-	1.580	2.256*	
-	-	4.064	1.580	2.484*	

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

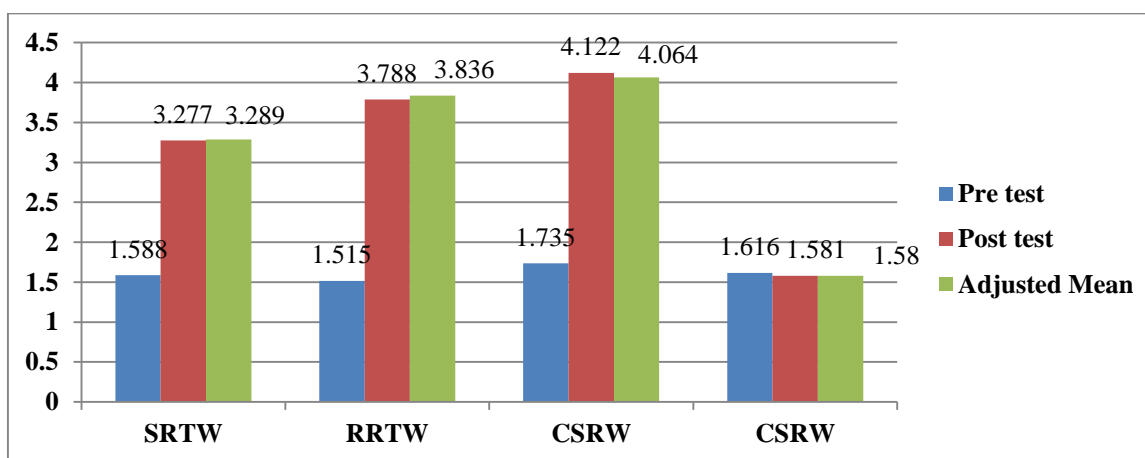
CGW : Control group women team athletes

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 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 0.547, 0.775, 1.709, 2.256 & 2.484, these values are higher than CI value 0.464. Therefore significant differences present between the groups.

Whereas mean differences between rubber cord resistance exercises training program group (RRTW) and combined speed resistance and rubber cord resistance exercises training program (CSRW) is 0.228, this value is lower than CI value 0.497. Hence there is no significant difference present.

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 endurance to increase core strength when compare with control group women team athletes. Further, it reveals that combined speed resistance and rubber cord resistance exercises training program is significantly more effective than speed resistance training program for increasing core strength endurance timing. Finally, rubber cord resistance exercises training program and combined speed resistance and rubber cord resistance exercises training program are equally effective for increasing muscular strength endurance performance.

**FIGURE: 1 THE PLANK TEST [IN SECONDS] 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**



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

### Discussion on Hypothesis:

- The first hypotheses stated that there will be significant increase in score of plank test 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 core 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 not superior to isolated training method. Hence research declared null hypotheses accepted.

### Discussion and Findings:

#### Core strength (minutes)

The influence of 12-weeks treatment of 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 endurance to increase core strength when compare with control group women



team athletes. The researcher referred experimental studies on core strength are as follows Kuan et al., (2023) results implies that core training program design had a large effect on general athletic performance, such as core muscles endurance and balance of athletes, but little effect on sport-specific performance of athletes. Kwang-Sub Lee et al., (2022) finding shows that the progressive Thera-Band exercise had a positive effect to increase the core strength for improving the balance abilities of athletes. Rasika et al., (2020) conclusion on the basis of the result of the study reveals that the BOSU ball exercises and thera band exercises appears to be equally effective for improving core stabilization and balance performance in athletes. Fatemeh et al., (2018) seems that combined (core stability training and total-body resistance exercise) has more significant beneficial effects on improvement of muscles strength and balance in these athletes. Theerawith et al., (2021) stated that the elastic and bodyweight strength training program can significantly increase core muscles strength when compare to a regular routine training of archer athletes. Aagaard and Andersen (2010) reviews describes that concurrent strength and endurance training can lead to enhanced long-term (430 min) and short-term (o15 min) endurance capacity both in well-trained athletes and highly trained top-level endurance athletes, especially (but not exclusively) when high-volume, heavy-resistance strength training protocols are applied in training program.

### Conclusions:

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 endurance to increase core strength when compare with control group women team athletes. Further, it reveals that combined speed resistance and rubber cord resistance exercises training program is significantly more effective than speed resistance training program for increasing core strength endurance timing. Finally, rubber cord resistance exercises training program and combined speed resistance and rubber cord resistance exercises training program are equally effective for increasing muscular strength endurance performance.

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