



## Effect of band resistance training on selected muscle group and kicking ability of Inter Collegiate male soccer players

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### Abstract

The purpose of this study was to investigate the effect of band resistance training on selected muscle group and kicking ability of Inter-collegiate male soccer players. To achieve the purpose of the study thirty (N=30) male soccer players were randomly selected. The age group of the subject was 18 to 22 years. The data were collected for selected three variables (Quadriceps strength, Hamstring strength & Kicking ability). Selected subjects were equally divided into two groups an experimental group and a control group. Control group was not given any type of training. Experimental group was given Band resistance training for a period of six weeks. The pre-test and post-test data on Quadriceps strength, Hamstring strength & Kicking ability was collected on both the groups before and after the experimental training collected data and the scores were meticulously recorded. Statistical analysis was performed with a predetermined level of significance set at 0.05 confidences. It was concluded that experimental group Band resistance training group significantly ( $p \leq 0.05$ ) improved the Quadriceps strength, Hamstring strength & Kicking ability when compared to control group of the soccer players.

**Keywords:** Band resistance training, quadriceps strength, hamstring strength, kicking ability and soccer players

### Introduction

Performance in sports and games depends on both physical and mental abilities. Body and minds have an equal contribution in human success. Aristotle and John Locke the world's greatest thinkers have said that "the body is the temple of soul, to reach harmony of the body, mind and spirit the body must be physically fit".

The first recorded patent that looked similar to a resistance band was a stretchy, handled rope type thing invented in Switzerland by Gustav Gossweiler. Mr. Gossweiler patented his invention on May 28, 1895 in Switzerland and on June 26, 1896 in The United States. In his patent he describes his exercise bands as "a gymnastic apparatus". With its clips and handles, which Mr. Gossweiler cautions should be "wide enough to not injury the hand", it is a mirror image of certain resistance band today.

Resistance band exercise training was first created in early 1900s, the first resistance Bands were made from surgical tubing. Later in the 1900s these exercise bands were mostly used for body and muscle rehabilitation purposes. Resistance bands made a big come back to the fitness market in the mid 1990s and were mostly used by physiotherapists with their clients. During the last four years resistance bands have become global fitness tools.

Today the resistance bands have come a long way in the development of resistance Band training. Not only have they change in style, but also there are so many different strengths, sizes and shapes. Resistance bands are used for rehab, kinetic and plyometric Training, also helping fitness, strength, power and flexibility increase.

A resistance band is an elastic band used for strength training. They are also commonly used in physical therapy,

specifically by convalescents of muscular injuries. Elastic band training is a type of physical exercise specializing in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles. Band resistance training should be implemented in the conditioning program of all sports, not just strength sports. The increase in speed, strength, agility and muscular endurance will benefit athletes of every sport. Band resistance training is moving the joints through a range of motion against resistance, requiring the muscles to expend energy and contract forcefully to move the bones.

Band resistance training is used to strengthen the muscles, tendons, bones and ligaments and to increase muscle mass.

### Objectives

The main objective of the study is to find out the effect of band resistance training on selected muscle group and kicking ability of Inter-collegiate male soccer players.

### Methodology

The researcher employed a randomized design, which included both pre-tests and post-tests. A total of 30 male soccer players (N=30) were assigned into two equal groups, each consisting of 15 participants ( $n = 15$ ). These groups were designated as the experimental group ( $n = 15$ ) and the control group ( $n = 15$ ). Before the commencement of any training, a pre-test was administered to assess selected physical fitness variables, specifically Quadriceps strength, Hamstring strength & kicking ability for all 30 soccer players. Subsequently, the experimental group underwent a six-week regimen involving Band resistance training. While the control group did not partake in any training activities.

After the completion of the six-week training period, post-tests were conducted to measure the same dependent variables. The data obtained from these tests were subjected to statistical analysis using the dependent t-test to determine if any statistically significant improvements were observed.

It is noteworthy that a level of significance was set at 0.05, ensuring a 95% confidence level for all analyses. Pre-test and post test data was collected on control group and experimental group before and after the six weeks of experimental training by using following authenticated tests.

**Table 1**

S.no	Variable	Test items	Unit of Measurement
1	Quadriceps strength	Leg extension 1RM	In Kilogram
2	Hamstring strength	Leg curl 1RM	In Kilogram
3	Kicking ability	Warner soccer test	In Meters

**Table 2: Training Schedule**

Weeks	Exercises	Repetition's	Set's	Rest
Week I-II	Band Leg Extension Band Squat Band Stationary Lunge Band Stationary Lunge Band Hip Abduction Band Ankle Eversion Band Calf Raise	15	4	30 seconds
Week III-IV	Band Leg Extension Band Squat Band Stationary Lunge Band Stationary Lunge Band Hip Abduction Band Ankle Eversion Band Calf Raise	20	4	30 seconds
Week V-VI	Band Leg Extension Band Squat Band Stationary Lunge Band Stationary Lunge Band Hip Abduction Band Ankle Eversio Band Calf Raise	25	5	30 seconds
Total duration 45 minutes				

**Table 3:** computation of 't'-ratio between pre and post test means of experimental group on quadriceps strength

Group	Mean	Standard deviation	Mean difference	Standard error mean	T-ratio
Pre-test	108.28	9.15	14.64	1.05	13.92*
Post test	122.92	6.08			

\*Significant at 0.05 level of confidence (2.48)

Table -3 reveals that the computation of 't' ratio between mean of pre and post test on quadriceps strength of inter-collegiate male Soccer players. The mean values of pre and post test of experimental group were 108.28 and 122.92 respectively. Since, the obtained 't' ratio 13.92\*was higher than the required table value 2.145, it was found to be

statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the quadriceps strength has been improved from the basic line to post treatment due to selected band resistance training.

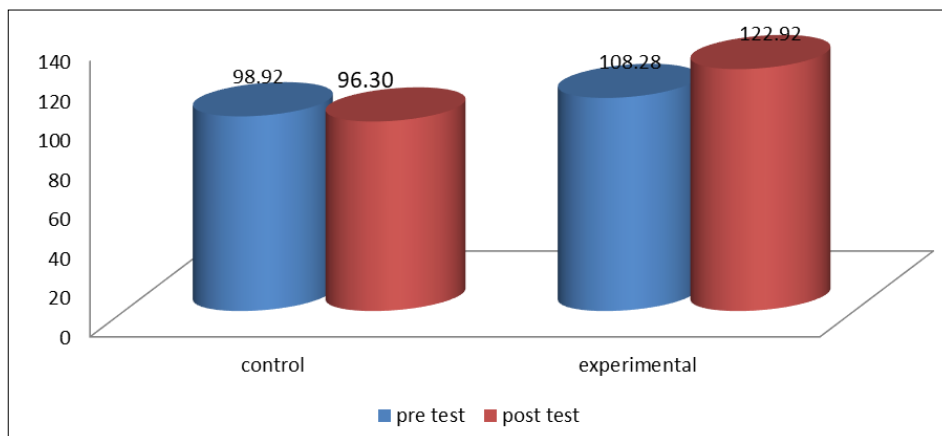
**Table 4:** computation of 't'-ratio between pre and post test means of control group on quadriceps strength

Group	Mean	Standard deviation	Mean difference	Standard error mean	t-ratio
Pre-test	98.92	7.69	0.34	0.78	1.92
Post test	96.30	7.22			

\*Significant at 0.05 level of confidence (2.48)

Table -4 reveals that the computation of 't' ratio between mean of pre and post test on quadriceps strength of inter-collegiate male Soccer players. The mean values of pre and post test of control group were 98.92 and 96.30 respectively. Since, the obtained 't' ratio 1.92 was less than the required

table value 2.145, it was found to be statistically not significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the quadriceps strength of the control group had not been improved.



**Fig 1:** Bar Diagram Shows the Mean Values of Pre and Post Test on Quadriceps Strength of Control and Experimental Groups

**Table 5:** Computation of ‘t’-ratio between pre and post test means of experimental group on hamstring strength

Group	Mean	Standard deviation	Mean difference	Standard error mean	t-ratio
Pre-test	48.66	4.98	8.13	0.94	8.60*
Post test	59.80	5.11			

\*Significant at 0.05 level of confidence (2.48)

Table -5 reveals that the computation of ‘t’ ratio between mean of pre and post test on strength hamstring of intercollegiate male Soccer players. The mean values of pre and post test of experimental group were 48.66 and 59.80 respectively. Since, the obtained ‘t’ ratio 8.60 was highethan

the required table value 2.48 it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the hamstring strength has been improved from the basic line to post treatment due to selected band resistance training.

**Table 6:** Computation Of ‘T’-Ratio Between Pre And Post Test Means of Control Group on Hamstring Strength

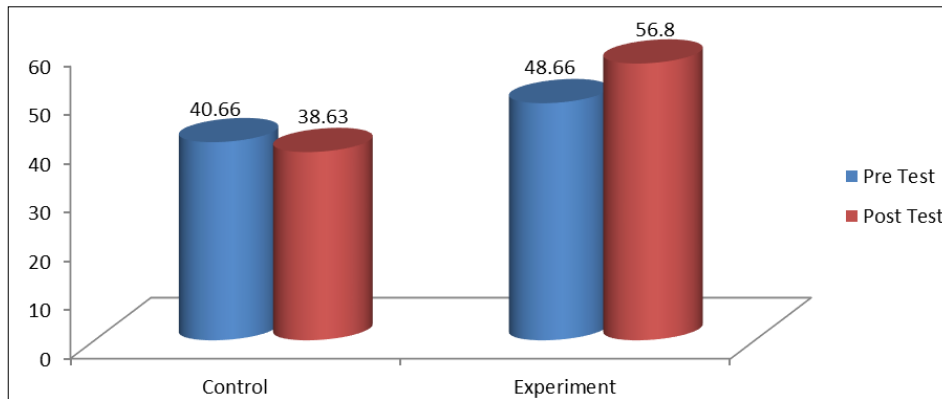
Group	Mean	Standard deviation	Mean difference	Standard error mean	t-ratio
Pre-test	40.66	3.28	0.14	0.40	1.21
Post test	38.66	2.76			

\*Significant at 0.05 level of confidence (2.48)

Table -6 reveals that the computation of ‘t’ ratio between mean of pre and post test on hamstring strength of inter-collegiate male Soccer players.

The mean values of pre and post test of control group were 40.66 and 38.63 respectively. Since, the obtained ‘t’ ratio

1.21 was less than the required table value 2.145 it was found to be statistically not significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the hamstring strength of the control group had not been improved.



**Fig 2:** Bar diagram shows the mean values of pre and post test on hamstring strength of control and experimental groups

**Table 7:** Computation of ‘T’-Ratio between Pre and Post Test Means of Experimental Group on Kicking Ability

Group	Mean	Standard deviation	Mean difference	Standard error mean	t-ratio
Pre-test	40.62	1.28	1.72	0.11	15.63*
Post test	42.35	1.45			

\*Significant at 0.05 level of confidence (2.48)

Table-7 reveals that the computation of ‘t’ ratio between mean of pre and post test on kicking ability of inter-collegiate male Soccer players. The mean values of pre and post test of experimental group were 40.62 and 42.35 respectively. Since, the obtained ‘t’ ratio 15.63 was higher

than the required table value 2.48 it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the kicking ability has been improved from the basic line to post treatment due to selected band resistance training.

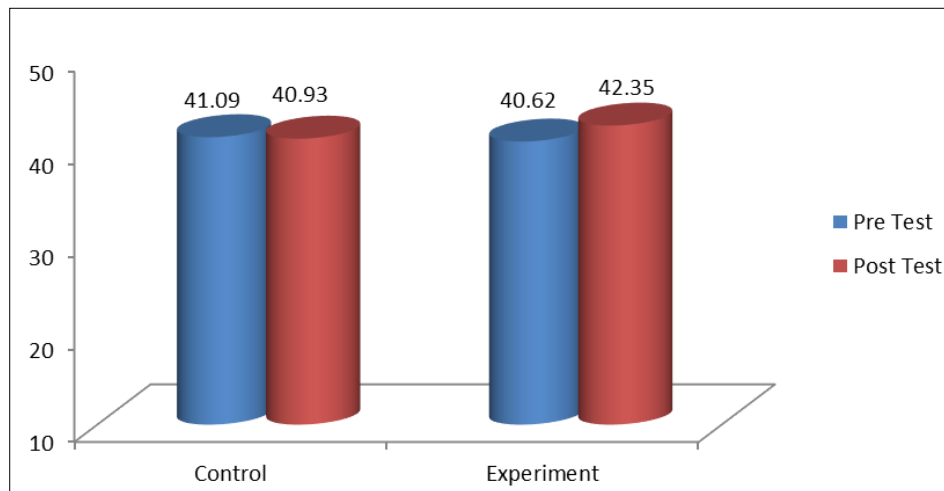
**Table-8:** Computation of ‘t’-ratio between pre and post test means of control group on kicking ability

Group	Mean	Standard deviation	Mean difference	Standard error mean	t-ratio
Pre-test	41.09	2.07	0.16	0.13	1.23
Post test	40.93	2.12			

\*Significant at 0.05 level of confidence (2.48)

Table -8 reveals that the computation of ‘t’ ratio between mean of pre and post test on kicking ability of inter-collegiate male Soccer players. The mean values of pre and post test of control group were 41.09 and 40.93 respectively. Since, the obtained ‘t’ ratio 1.23 was less than the required

Table value 2.145 it was found to be statistically not significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the kicking ability of the control group had not been improved.



**Fig 3:** Bar diagram shows the mean values of pre and post test on kicking ability of control and experimental groups

### Discussion on Finding

The study's findings reveal a significant improvement in the selected variables, namely quadriceps Strength, hamstring Strength, and kicking ability, within the experimental group, which consisted of individuals undergoing Band resistance training in comparison to the control group. Further, the post test analysis shows that there was significant difference between the experimental groups, clearly indicating that Band resistance training group was better result. The Band resistance training was improving the quadriceps Strength, hamstring Strength, and kicking ability of inter- collegiate male soccer players. The band resistance training would be effective in improving on quadriceps Strength, hamstring Strength, and kicking ability of inter- collegiate male soccer players due to 6 weeks of training programme.

### Conclusions

From the statistical analysis, it was found that there was a significant mean difference in the improvement on quadriceps Strength, hamstring Strength, and kicking ability of male soccer players. In the control group on the entire variables there is insignificant result on the data. Because the control group does not undergo any specific training.

### Recommendations

The experience gained from the present study a few suggestions for further study is made.

- This study may be conducted with other sports and games.
- Same kind of study may be conducted for female students.
- A similar study may be conducted for different age groups.
- The findings from the study can be utilized by physical education teachers and coaches.

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