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Effect of Resistance Training Programme on Selected Physical and Physiological Variables among under 18-19 Basketball Women Players

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Abstract

A sport is an activity that is governed by a set of rules or customs and often engaged competitively. Sports commonly refers to activities where, the physical capability of the competitor are the sole or primary determinant of the outcome (winning or losing), but the term is also used to include activities such as mind sports (a common name for some card games and board games with little to no element of chance) and motor sports where mental acuity or equipment quality are major factors. Sports are commonly defined as an organized, competitive and skillfull physical activity requiring commitment fair play. Some view sports as differing from games based on the fact that there are usually higher levels of organization and profit (not always monetary) involved in sports. Accurate records are kept and update for most sports at the highest levels, while failures and accomplishments are widely announced in sport news. The term sports are sometimes extended to encompass all competitive activities in which offense and defence are played, regardless of the level of physical activity. Both games of skill and motor sport exhibit many of the characteristics of physical sports, such as skill, sportsmanship, and at the highest levels, even professional sponsorship associated with physical sports.

Introduction

There are records of handball-like games in medieval France, and among the Inuit in Greenland, in the Middle Ages. By the 19th century, there existed similar games of handbold from Denmark, hazená in the Czech Republic, hádzaná in Slovakia, gandbol in Ukraine, torball in Germany, as well as versions in Uruguay. The team handball game of today was formed by the end of the 19th century in northern Europe, primarily Denmark, Germany, Norway and Sweden. Holger Nielsen, a Danish gym teacher, drew up the rules for modern handball (handbold) in 1898 and published them in 1906, and Rasmus Nicolai Ernst, another Danish teacher, did something similar in 1897. Modern Handball is therefore widely considered a game of Danish origins.

Statement of the Problem

The purpose of this study was to find out the effect of resistance training programme on selected physical and physiological variables among under 18-19 basketball women players.

Hypothesis

It is hypothesized that the resistance training programme may improve the selected physical and physiological variables among under 18-19 basketball women players.

Significance of the Study

Physical educationists and scientists have been constantly examining sports performance in relation to the individual skills and fitness standards. They try to discover those factors that contribute to high performance so that finding could utilize in the practical of coaching and training.

1. The finding of the study will prove guidance to physical education teachers and coaches to prepare training schedules for handball on the basis of the handball players.
2. This study will reveal the extent to which the resistance training will influence beneficially on the different variable.
3. The finding of the study will add to the quantum of knowledge is the area of training methods.

Delimitations

1. The study was delimited to 30 basketball players from Boiler Plant Girl Higher Secondary School, Trichy.
2. The age groups of the subjects were 18 to 19.
3. Training period was delimited to six weeks only.

Limitations

1. Height, Weight and nutrition of the subjects were not taken into consideration for this study.
2. Diet, atmosphere and temperature were not taken into consideration.
3. No special motivational techniques were used to influence.

Methodology

In this chapter the selection of subjects, selection of variables, criterion measures, Selection of variables and tests, orientation of subjects, reliability of data, tester reliability, instrument reliability, test administration and statistical technique were described.

Selection of the Subjects

1. To achieve the purpose of this study thirty basketball players were selected at random, from the Boiler plant Girls Higher Secondary School, Trichy.
2. The age of the subjects ranged from 18 to 19 years. The selected subjects were divided in to one experimental group and one control group at random.

Selection of Variables

Independent Variables

1. Resistance training

Dependent Variables

1. Physical variables
2. Physiological variables

Physical variables

1. Leg Explosive power
2. Agility
3. Abdominal Strength

Physiological Variables

1. Resting Pulse rate
2. Breath holding time

Experimental Design

The subject were formed a random group design consisting of Resistance training given to Experimental group and Control group, of 15 subject each, the control group not given any kind of Resistance training. After the exprimental period of six weeks in progression, post test scores were obtained from the two groups. The differences between initial and final scores on physical and physiological variables considered as the effect of Resistance training on subjects. The mean differences were tested for significance using't' ratio.

Having the expert consultation in the field of physical education, sports sciences and scanning various literatures related to modern training method, the investigator has selected the following test items as criterion measures. The chosen tests are highly standardized, appropriate and ideal for assessing the criterion variables and briefly explained here.

Criterion Measures

The following criterion measure was used to measure the variables.

1. Physical variables will be measured by using leg explosive power, agility, abdominal strength test and the score is recorded
2. Physiological variables will be measure by was using Resting pulse rate and Breath holding time test and the score is recorded

Table 3.1

S.No	Variables	Test Items	Units
1	Leg Explosive power	Standing broad jump	Meters
2	Agility	T-Test	Seconds
3	Abdominal strength	Sit-ups	Counts
4	Resting pulse rate	Pulse monitor	Counts
5	Breath holding time	Stop watch	Minutes

Orientation of Subjects

The subjects were assembled and oriented to requirement of the studies. The method of taking measurement was demonstrated. The students were motivated during the testing period.

Reliability of Data

The reliability of data was ensured by establishing the instrument reliability, tester reliability and subject reliability.

Tester Reliability

To ensure the tester competency on conducting the tests, the investigator has to available number of practice sessions in testing procedure. The reliability of the data will be established through the test method.

Instrument Reliability

Medicine ball, Stop watches, measuring tape, whistle, score sheet and other equipment were used to collect the data for this. They were obtained from standard firms. On all occasions, the measurements showed the same reading and therefore the instruments were obtained reliable.

Table 3.1 Resistance Training Schedule
Resistance Training Programme for1st and 2nd Week

Exercises	Intensity	Repetition	Sets	Rest In Between The Repetition	Rest In Between
Half squat	60%	8	2	15seconds	1min
Leg press	60%	8	2	15seconds	1min
Leg extension	60%	8	2	15seconds	1min
Leg curl	60%	8	2	15seconds	1min
Upright rowing	60%	8	2	15seconds	1min
Bench press	60%	8	2	15seconds	1min
Abdominal curl	60%	8	2	15seconds	1min
Shoulder press	60%	8	2	15seconds	1min
Seated calf rise	60%	8	2	15seconds	1min

Table 3.2 Resistance Training Programme for 3th and 4th Week

Exercises	Intensity	Repetition	Sets	Rest in Between the Repetition	Rest in Between
Half squat	65%	6	3	10seconds	30seconds
Leg press	65%	6	3	10seconds	30seconds
Leg extension	65%	6	3	10seconds	30seconds
Leg curl	65%	6	3	10seconds	30seconds
Upright rowing	65%	6	3	10seconds	30seconds
Bench press	65%	6	3	10seconds	30seconds
Abdominal curl	65%	6	3	10seconds	30seconds
Shoulder press	65%	6	3	10seconds	30seconds
Seated calf rise	65%	6	3	10seconds	30seconds

Table 3.3 Resistance Training Programme for 5th and 6thWeek

Exercises	Intensity	Repetition	Sets	Rest In Between The Repetition	Rest In Between
Half squat	70%	5	4	5seconds	1-2 Min
Leg press	70%	5	4	5seconds	1-2 Min
Leg extension	70%	5	4	5seconds	1-2 Min
Leg curl	70%	5	4	5seconds	1-2 Min
Upright rowing	70%	5	4	5seconds	1-2 Min
Bench press	70%	5	4	5seconds	1-2 Min
Abdominal curl	70%	5	4	5seconds	1-2 Min
Shoulder press	70%	5	4	5seconds	1-2 Min
Seated calf rise	70%	5	4	5seconds	1-2 Min

Analysis of Data and Interpretation of the Study

Analysis of the data pertaining to the study was presented in this chapter. The purpose of the study was to investigate the effect of resistance training programme on selected physical and physiological variables among higher secondary school handball players. For this purpose of the study 30 Handball players were selected from St.Britto higher secondary school Madurai, their age ranged from 14-17 years.

The statistical analysis of data collected from the experimental group is presented in this chapter. All subjects (N= 30) were tested on selected variables prior to and after the training programme to find out the significance difference between the means on the criterion variables correlated `t' ratio was applied. Pertaining to present study it processed with appropriate statistical technique. The obtained `t' values are tested at 0.05 levels.

Level of Significance

To test the significance of `t' values as level of significance 0.05 level was chosen for the required table value for the degrees of freedom. The data collected prior to and after the training period on abdominal strength, leg explosive power and agility for the experimental group have been analyzed.

Table 4.1 Analysis of 't'-Ratio the Pre and Post-test for Control and Experimental Group on Leg Explosive Power

Variable	Groups	Mean		SD		Sd Error	df	't' ratio
		Pre	Post	Pre	Post			
Leg explosive power	Control	2.27	2.27	0.24	0.23	0.002	14	0.62
	Experimental	2.25	2.32	0.17	0.16	0.01		10.73*

*Significance at 0.05 level of confidence

The Table - 4.1 shows that the mean values of pre-test and post-test of control group on leg explosive power were 2.27 and 2.27 respectively. The obtained 't' ratio was 0.62, since the obtained 't' ratio was less than the required table value of 2.15 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental groups on leg explosive power were 2.25 and 2.32 respectively. The obtained 't' ratio was 10.73 since the obtained 't' ratio was greater than the required table value of 2.15 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and experimental group in speed. It may be concluded from the result of the study that experimental group improved in speed due to six weeks of resistance training.

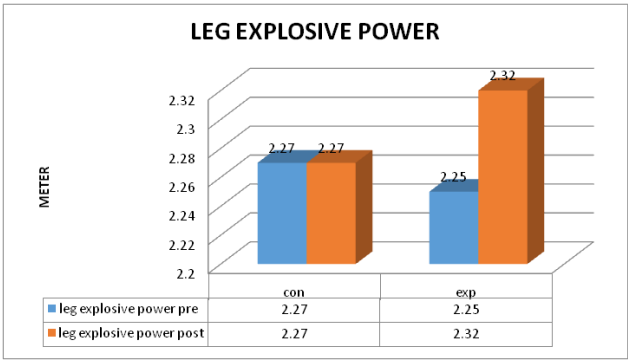

Figure 4.1 Bar Diagram Shows the Pre and Post Test Mean values of Control group and Experimental on Leg Explosive Power

Table 4.2 Analysis of 't'-Ratio the Pre and Post-Test for Control and Experimental Group on Agility

Variable	Group	Mean		SD		Sd Error	df	't' ratio
		Pre	Post	Pre	Post			
Agility	Control	11.45	11.47	0.68	0.64	0.09	14	0.17
	Experimental	11.48	11.04	0.68	0.61	0.77		6.20*

* significance at 0.05 level of confidence

The Table - 4.2 shows that the mean values of pre-test and post-test of control group on agility were 11.45 and 11.47 respectively. The obtained 't' ratio was 0.17 since the obtained 't' ratio was less than the required table value of 2.15 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental groups on agility were 11.48 and 11.04 respectively. The obtained 't' ratio was 6.20 since the obtained 't' ratio was greater than the required table value of 2.15 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and experimental group in explosive power. It may be concluded from the result of the study that experimental group improved in explosive power due to six weeks of resistance training

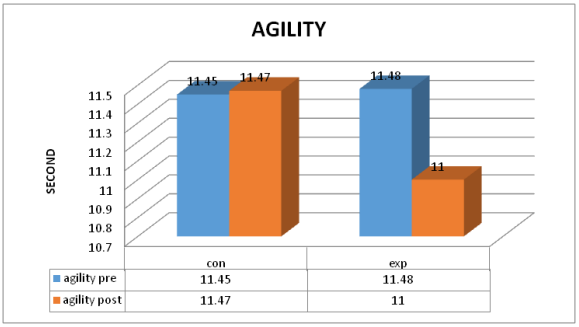

Figure 4.2 Bar Diagram Shows the Pre and Post Mean Values of Control and Experimental Group on Agility

Table 4.3 Analysis of 't'-Ratio the Pre and Post-Test for Control and Experimental Group on Abdominal Strength

Variable	Group	Mean		SD		Sd Error	df	't' ratio
		Pre	Post	Pre	Post			
Abdominal strength	Control	21.47	27.33	7.41	11.87	3.89	14	1.51
	Experimental	23.60	27.33	11.48	11.87	0.59		6.33*

*Significance at .05 level of confidence.

The Table - 4.3 shows that the mean values of pre-test and post-test of control group on abdominal strength were 21.47 and 27.33 respectively. The obtained 't' ratio was 1.51 since the obtained 't' ratio was less than the required table value of 2.15 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental groups on abdominal strength were 23.60 and 27.33 respectively. The obtained 't' ratio was 6.33 since the obtained 't' ratio was greater than the required table value of 2.15 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and experimental group in agility. It may be concluded from the result of the study that experimental group improved in agility due to six weeks of resistance training.

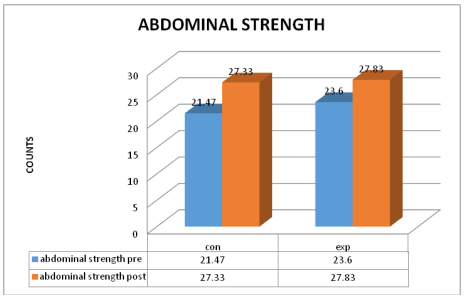

Figure 4.3 Bar Diagram Shows the Pre and Post Mean Values of Control and Experimental group on abdominal strength

Table 4.4 Analysis of 't'-Ratio the Pre and Post-Test for Control and Experimental Group on Resting Pulse Rate

Variable	Group	Mean		SD		Sd Error	df	't' ratio
		Pre	Post	Pre	Post			
Resting pulse rete	Control	76.93	75.47	6.32	4.10	6.17	14	0.93
	Experimental	78.40	75.47	4.67	4.10	0.55		5.36*

*Significance at .05 level of confidence.

The Table - 4.4 shows that the mean values of pre-test and post-test of control group on resting pulse rate were 76.93 and 75.47 respectively. The obtained 't' ratio was 0.93 since the obtained 't' ratio was less than the required table value of 2.15 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental groups on resting pulse rate were 78.40 and 75.47 respectively. The obtained 't' ratio was 5.36 since the obtained 't' ratio was greater than the required table value of 2.15 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant.

The result of the study showed that there was a significant difference between control group and experimental group in resting pulse rate. It may be concluded from the result of the study that experimental group improved in resting pulse rate due to six weeks of resistance training.

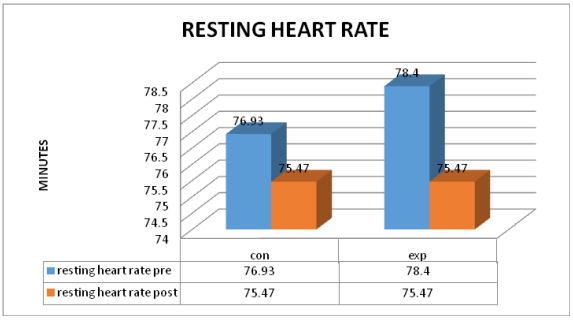

Figure 4.4 Bar Diagram Shows the Pre and Post Mean Values of Control and Experimental Group on Resting Pulse Rate

Table 4.5 Analysis of't'-Ratio the Pre and Post-Test for Control and Experimental Group on Breath Holding Time

Variable	Group	Mean		SD		Sd Error	df	't' ratio
		Pre	Post	Pre	Post			
Breath holding time	Control	57.67	53.67	9.12	12.00	4.35	14	0.92
	Experimental	47.87	53.67	13.55	12.00	1.18		4.93*

*Significance at .05 level of confidence.

The Table - 4.5 shows that the mean values of pre-test and post-test of control group on breath holding time were 57.67 and 53.67 respectively. The obtained 't' ratio was 0.92 since the obtained 't' ratio was less than the required table value of 2.15 for the significant at 0.05 level with 14 degrees of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental groups on breath holding time were 47.87 and 53.67 respectively. The obtained 't' ratio was 4.93 since the obtained 't' ratio was greater than the required table value of 2.15 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and experimental group in breath holding time. It may be concluded from the result of the study that experimental group improved in breath holding time due to six weeks of resistance training

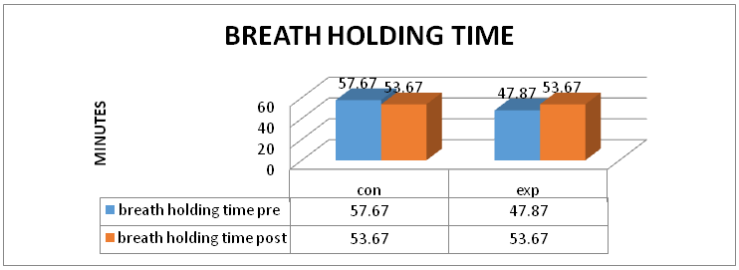

Figure 4.5 Bar Diagram Shows the Pre and Post Mean Values of Control and Experimental Group on Breath holding Time

Discussion on Findings

The results of the study indicate that the experimental group namely resistance training had significantly improved in the selected dependent variables namely leg explosive power, agility, abdominal strength, resting pulse rate, and breath holding time.

Discussion of Hypotheses

Itwas hypothesized that there would be a significant improvement on the selected physical and physiological variables due to resistance training. The present study result show significant improvement on selected variables. Hence, the due to resistance training research hypotheses of the investigator was accepted.

Summary Conclusions and Recommendations

Summary

To achieve the purpose of these study 30 female basketball players were selected from Boiler Plant Girls Higher Secondary School, Trichy. Random group design was used. The subject's age ranged from 18 to 19 years. They were divided in two groups namely experimental group (Group-I) and control group (Group-II). Experimental group underwent resistance training and Control group did not exposed to any specific training.

To carry out the study the investigator used two groups, one experimental group and one control group, each group consists of 15 subjects. All the groups were tested on selected criterion variable and the readings were recorded in their respective unit, as pre-test scores. After pre-test the experimental group was treated with resistance training for a period of six weeks. After six weeks of training both the groups were tested again on the selected criterion variables and the scores were recorded in their respective units as post test scores. The pre and post -test were taken for analysis.

The followings statistical procedure was followed to estimate the effect of resistance training on leg explosive power, agility, abdominal strength, resting pulse rate and breath holding time of higher secondary school basketball players. The researcher used t-ratio to find the significant difference between the means of pre- test and post- test of all the selected variables.

Conclusions

Based on the results of the present study the following conclusions have been school boys.

1. It was concluded that there was significant improvement in selected physical and physiological variables of leg explosive power, agility, abdominal strength, resting pulse rate, and breath holding time due to resistance training among school handball players.
2. The result of the study reveals that resistance training would improve among school boys on physical and physiological variables significantly.

Recommendations

In the light of the experience gained from the present study, a few suggestions are made for future study. In the course of the study the investigator faced several problems for which no sufficient answers were found in the literature. These problems are therefore stated below for future study.

1. A similar study may be conducted for different age group of male and female.
2. A similar study may be conducted by adding more number of physical and physiological variables.
3. A similar study may be conducted at different levels of players in University, State, National, etc.
4. A similar study may be conducted by adding more number of players to support the findings of this study.
5. Similar studies can be conducted for various weight categories.
6. Similar studies can be conducted for various districts.

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