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Influence of anthropometric factors, physical training on physical variables of hockey players

Dr. Savitri S Patil
Teacher, Department of Physical Education, Govt. P U Colleges for Boys and Girls, Vijayapur, Karnataka, India

Abstract
The present study was an attempt to evaluate the degree of Anthropometric Factors, Physical Training on Physical variables on hockey girl players. To carry out this study, 100 girl hockey players has selected. The age limit of players was ranged between 14 to 17 years. The samples were taken from the Sanganabasava Residential School, Kawalgi in Vijayapur district, Karnataka. Cardio Respiratory Endurance, Strength, and anthropometric variables Height and Weight were chosen as research variables to assess their effect and impact on hockey plying ability. To assess the significance impact of training and anthropometric on physiological and motor and skills performance of hockey players and see significant difference between pre& post training effect on research variables t- test was applied. Significant effect was noticed in anthropometric and physical variables of school hockey players.

Keywords: training effect, anthropometric factors, physical, motor, physiological variables

Introduction
Physical fitness is important for all human beings irrespective of their age a given work cannot be carried out if the required physical strength is not available. Body may possess extraordinary skill in football, but if he does not keep himself in the game till the end of the allotted time, he may not find a place in the team. So fitness becomes the first and foremost aspect to enjoy one's life fully. Modernization and urbanization have reduce the physical fitness of human beings and increased the defends on machines for all to work. Manual labor has been considerably reduced and physical activity is considered to be low in dignity and hence avoided. Therefore, general physical fitness has come down, and to restore it, human beings will have to revert to the age old habits.
Physical fitness includes speed, flexibility, rhythm, power, strength, co-ordination, muscular endurance, cardiovascular endurance; agility etc. These characters are all equated with the healthy function of the body. Another important part of physical fitness is the athletic powers. The various aspect of physical fitness and the skill are interred related.

Hockey
Hockey is indeed said to be the oldest of all games played with a ball and stick. It has the thrill of a romantic journey travelling around the world in search of a home where it would be accorded the respect it deserves. It has become a reality in India; Hockey is one among the fastest team sports. The name of the game reflects the shape of the main implement used: the old French world "hoquet" meant a shepherd's crook and some experts believe that the game was simply named by making a few alterations to the spelling of the old French word Hockey is a game of great skills which calls for keen eyes, physical fitness and speed of movements.

Cardio Respiratory Endurance
Cardiovascular endurance can be defined as the component which helps to determine if the heart and lungs are working in coordination. It shows the ability of the body to deliver oxygen and nutrients to tissues and to remove wastes.

Strength
Muscle strength can be defined as the capability of the muscles to lift weight. By doing weight training exercises every alternate day increases the muscle mass of the body.
Strength offers protection from impact and gives more stability on the puck and the ability to establish position in front of the net and move others off the puck in the corners.

Anthropometric Variables
Height: Height Define distance from the bottom to the top of something or the highest point or the greatest point or the greatest degree.

Weight: A body's relative mass or the quantity of matter contained by it, giving rise to a downward force, the heaviness of a person or thing.

Hypotheses
1. There would be significant effect of anthropometric and training on Cardio Respiratory Endurance, strength, weight and height variable between control and experimental group.
2. There would be positive effect of 16 training on physical, anthropometric, skill performance variable between control and experimental group**.**
3. It was hypothesized that would not be a significant difference in anthropometric, physical and motor variables of hockey players.

2. Delimitations
1. The study was delimited girls and hockey players.
2. The study is delimited to the age of 14 to 17 years.

3. The sample was delimited to residential school of vijayapur Dist only.
4. The study was delimited to 100 girl hockey players.
5. The study was delimited to Anthropometric, physical variables.

3. Limitations

1. Certain factors like Socio economic status, culture, living styles and other involment of the girls which might affect the results was considered as limitation.
2. The influence of certain factors like style, daily work, diet and other factors on the result of the study was not taken into consideration.

Discussion and interpretation of results

The study was carried out to assess the impact of anthropometric and physical training variables on physiological and physical variables related performance ability of hockey skills performance. It was hypothesized that training and anthropometric factors would bring changes in skill performance and physiological variables of hockey players, sample was made to expose to 16 week training and parameter was assessed at pre& post session, the difference noticed due the training has discussed in the following tables.

Table 1: Comparison of two groups with respect to post-test scores of end cardio respiratory endurance Harvard steps of hockey players by Analysis of covariance (ANCOVA)

Groups	Pre test		Post-test		
	Mean	SD	Mean	SD	Adjusted mean
Control group	38.36	4.20	38.26	0.99	38.47
Experiment group	40.88	1.36	45.44	1.40	45.23
F-test	16.2950@		814.0315#		
P-value	0.0001*		0.0001*		

*p<0.05, @one way ANOVA applied, # ANCOVA applied

The results of the above table clearly show the following:

A significant difference was observed between two groups i.e. control group and experiment group with respect to pretest endurance Harvard steps scores of hockey players (F=16.2950, p<0.05) at 5% level of significance. It means that, the pretest endurance Harvard steps scores of hockey players are not homogenous and different in control and experiment group.

A significant difference was observed between two groups i.e. control group and experiment group with respect to posttest endurance Harvard steps scores of hockey players (F=814.0315, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the posttest cardio rspertory endurance Harvard steps scores of hockey players are different in two groups i.e. control and experiment group.

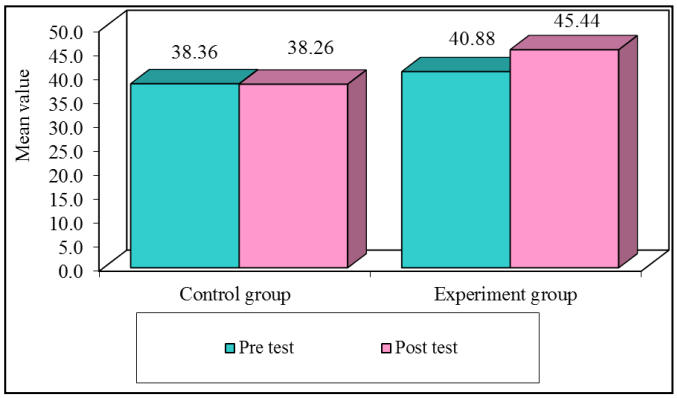

Fig 1: Comparison of control and experiment groups with respect to pretest and posttest endurance Harvard steps scores of hockey players

The above figure indicates that Endurance in both the groups i.e. Experimental and control indicates the influence of co-ordination more on Experimental group. In pretest mean was 45.44 and 40.88 Increased in posttest where control as group showed very little change in pretest as well as in posttest i.e. 38.26. to 38.36 Hence the training for 12 week training influenced on the Endurance of subject

Table 2: Comparison of two groups with respect to post-test scores of strength sit-ups of hockey players by Analysis of covariance (ANCOVA)

Groups	Pre test		Post-test		
	Mean	SD	Mean	SD	Adjusted mean
Control group	9.22	0.91	9.58	1.11	9.60
Experiment group	9.34	0.82	12.76	0.72	12.74
F-test	0.4780@		298.7752#		
P-value	0.4909		0.0001*		

*p<0.05, @one way ANOVA applied, # ANCOVA applied

The results of the above table clearly show the following:

- A non-significant difference was observed between two groups i.e. control group and experiment group with respect to pretest strength sit-ups scores of hockey players (F=0.4780, p>0.05) at 5% level of significance. It means that, the pretest strength sit-ups scores of hockey players are homogenous and similar in control and experiment group.
- A significant difference was observed between two groups i.e. control group and experiment group with respect to posttest strength sit-ups scores of hockey players (F=298.7752, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the posttest strength sit-ups scores of hockey players are different in two groups i.e. control and experiment group.

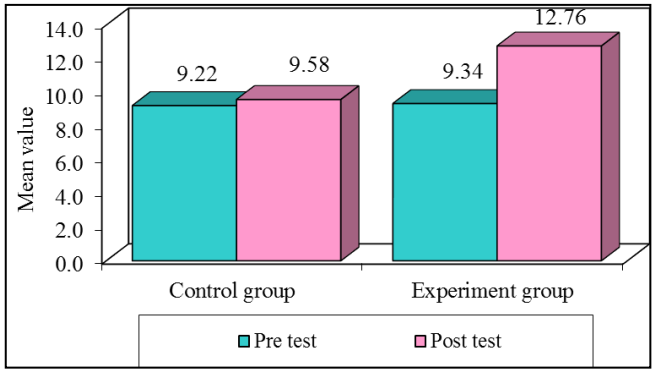

Fig 2: Comparison of control and experiment groups with respect to pretest and posttest strength sit-ups scores of hockey players

The above figure indicates that Strength in both the groups i.e. Experimental and control indicates the influence of Strength more on Experimental group. In pretest mean was 12.76. And 9.58 Increased in posttest where control as group showed very little change in pretest as well as in posttest i.e. 9.22. To 9.53 Hence the training for 12 week training influenced on the Strength of subject

Table 3: Comparison of two groups with respect to post-test scores of height of hockey players by analysis of covariance (ANCOVA)

Groups	Pre test		Post-test		
	Mean	SD	Mean	SD	Adjusted mean
Control group	4.79	0.56	4.79	0.56	4.80
Experiment group	4.80	0.56	4.81	0.56	4.81
F-test	0.0012@		77.3015#		
P-value	0.9729		0.0001*		

*p<0.05, @one way ANOVA applied, # ANCOVA applied

The results of the above table clearly show the following:

- A non-significant difference was observed between two groups i.e. control group and experiment group with respect to pre-test height scores of hockey players (F=0.0012, p>0.05) at 5% level of significance. It means that, the pre-test height scores of hockey players are homogenous and similar in control and experiment group.
- A significant difference was observed between two groups i.e. control group and experiment group with respect to post-test height scores of hockey players (F=77.3015, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the post-test height scores of hockey players are different in two groups i.e. control and experiment group.

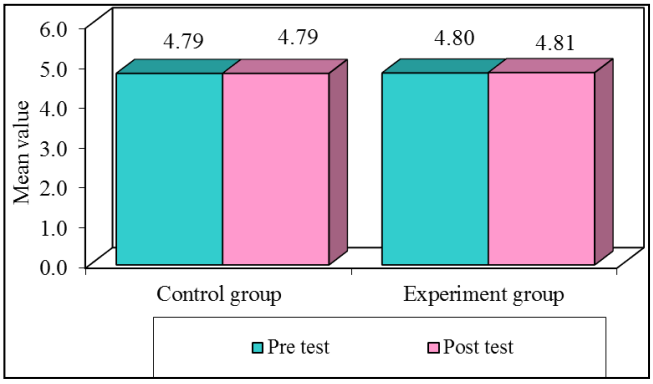

Fig 3: Comparison of control and experiment groups with respect to pretest and post-test height scores of hockey players

The above figure indicates that Height in both the groups i.e. Experimental and control indicates the influence of Height more on Experimental group. In pre-test mean was 4.80. And 4.81 Increased in post-test where control as group showed very little change in pre-test as well as in post-test i.e.4.79 to 4.79. Hence the training for 12 week training influenced on the Height of subject

Table 4: Comparison of Two Groups With Respect To Post-test Scores of Weight of Hockey Players by Analysis of Covariance (ANCOVA)

Groups	Pre test		Post-test		
	Mean	SD	Mean	SD	Adjusted mean
Control group	41.50	5.00	42.96	4.93	43.08
Experiment group	41.76	4.74	43.88	4.56	43.76
F-test	0.0712@		6.5205#		
P-value	0.7902		0.0122*		

*p<0.05, @one way ANOVA applied, # ANCOVA applied

The results of the above table clearly show the following:

- A non-significant difference was observed between two groups i.e. control group and experiment group with respect to pretest weight scores of hockey players (F=0.0712, p>0.05) at 5% level of significance. It means that, the pretest weight scores of hockey players are homogenous and similar in control and experiment group.
- A significant difference was observed between two groups i.e. control group and experiment group with respect to posttest weight scores of hockey players (F=6.5205, p<0.05) at 5% level of significance. Hence, the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the posttest weight scores of hockey players are different in two groups i.e. control and experiment group.

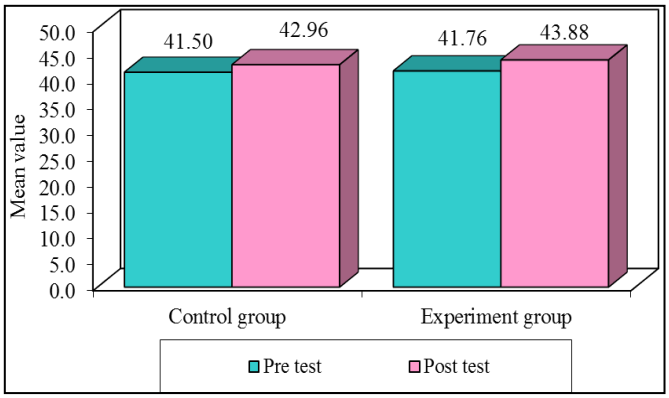

Fig 4: Comparison of control and experiment groups with respect to pre-test and post-test weight scores of hockey players

The above figure indicates that Weight in both the groups i.e. Experimental and control indicates the influence of Weight more on Experimental group. In pre-test mean was 43.88. And 41.76 Increased in post-test where control as group showed very little change in pre-test as well as in post-test i.e.41.50 to 42.96 Hence the training for 12 week training influenced on the weight of subject

Conclusion

1. Endurance strength, leg explosive strength has improved result of experimental group comparing to the control group.
2. In Height variable slight changes has noticed as average score of experimental group.
3. The experimental hockey player group weight variable has similar result comparing to the control group. And difference was noticed in experimental at was calculated at pre-post session of training
4. The Endurance has increased due to experimental training in major group comparing to the counterpart.
5. Both the experimental group and Control group are has similar result of leg explosive strength variable.

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