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A Proportional Assessment of Physical Appropriateness of U- 19 Hockey Players of Punjab

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ABSTRACT

The purpose of the study was to find out proportional assessment of physical fitness of U-19 year male hockey players of Punjab. This study tried to find out difference in Arm and Shoulder Strength, Abdominal Strength, Agility, Strength and power of Leg Muscles, Speed and Endurance of subjects. This study has been conducted on thirty seven (37) U- 19 male hockey players which were selected through the trails for the different academies run by government and private associations of Punjab. There were four group formed for the study i.e. Punjab and Sind Bank Hockey Academy Jalandhar (PHA), Maharaja Ranjit Singh Hockey Academy Amritsar (MHA), Namdhari Hockey Academy Bhaini Sahib, Ludhiana (NHA), Surjit Hockey Academy Jalandhar (SHA). Data were collected with standardized tests, equipments and standard techniques (Tenner at al. 1969). Analysis of variance (ANOVA) one way and Sheffe`s Test were used as a statistical tool for find out the appropriate results. The basis of results of present study indicated that significant and insignificantly difference among players of hockey academies of Punjab in relation to physical fitness variables arm and shoulder strength, abdominal strength, agility, speed and endurance were found significant different in under 19 F= 8.56, 13.01, 8.99, 11.62, 4.61 and respectively and Coordinative ability no significant different in under 19 year age group. Post hoc test indicates Surjit Academy players better in arm and shoulder strength and abdominal strength as compare to Punjab and Sind Bank, Maharaja Ranjit Singh and Namdhari hockey academy players in under 19 years age group.

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INTRODUCTION

Motor Fitness refers to the efficiency of basic movements in addition to the physical fitness. Although the term is most often used synonymously with physical fitness by the coaches but it is very important for the physical education students to understand the basic difference between physical fitness and motor fitness. Physical fitness is used to denote only the five basic fitness components (muscular strength, muscular endurance, cardiovascular endurance, freedom from obesity and flexibility) whereas motor fitness is a more comprehensive term which included all the ten fitness components including additional five motor performance components (speed, balance, muscular power, coordinative ability) important mainly for success in sports. Modern sports have become highly scientific in these days. The players are creating and breaking new records in today's competitive sports. The level of physical fitness and skill ability is increasing day to day because of development of science and technology. Assessment of motor fitness compound or prediction of soccer playing ability was examined on 33 male soccer players attending coaching camp prior to Intervarsity players were taken as subjects. Five motor fitness compounds speed (50 m. dash), agility (4*10 m. shuttle run) maximum leg strength (leg dynamometer) explosive leg strength (standing broad jump) and cardio-respiratory endurance (Cooper's 12 min. run/walk test) were administered on graded subjects out of 50 marks in playing ability by three judges. Result showed that independent variable (speed ML strength, EC strength and cardiovascular strength) were significantly related to dependent variable. Since the multiple correlations co-efficient is higher than zero order correlation coefficients. Uppal and Roy (1986).

Physical fitness is the basic requirement for most of the task to be under taken by individual in his sports. Many scientific studies over the past twenty year support the value of regular exercise as part of a healthy life style and bright career in sport world. Today players have a much broader perspective and consider physical fitness to be a key component of total health. Healthy living and physical fitness are closely connected. Being physically fit not only helps people live healthy lives. it also helps people live longer. Physical activity and exercise a part of their daily lives when they are young are more likely to keep it in their lives as they grow older and benefit from it throughout their life spans. Physical fitness is the ability to perform activities that require muscular coordination such as walking, running, playing and manipulating instrument and machinery. (Kaur 2010)

Physical fitness can be thought of as an integrated measure of most if not all the body functions involved in the performance of daily physical activity and physical exercise. When physical fitness is tested, the functional status of all these systems is actually being checked. This is the reason why physical fitness is now days considered one of the most important health markers as well as a predictor of morbidity and mortality and mortality for cardiovascular disease and for all causes. Motor fitness between the Sixty rural and sixty urban Indian sportsmen belonged to U.P and Bihar was the sample of the study. All subjects participated in national, state games, inter college and rural tournaments. For comparison the subject were divided into three groups i.e. 13 to 16 years 17 to 19 years and above 19 years. Their height and weight were measured. For testing of players APPHER test was administered. The result of the study indicated that the explosive strength of upper arm muscle was higher in rural boys than urban boys, where as the abdominal muscle power was higher in urban

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sportsmen than their rural counterparts. The combined explosive power of upper arm shoulder chest and upper back muscle was found to be higher in all the three groups of urban sportsmen. It was concluded that the physical efficiency of the urban group was better than the rural group. Shukla and Sharma (1991)

Body fitness as a signal factor is the most important, that determines high level of fitness and selection strategy in sports and physical education. So for developing an efficient system of marking selection strategy in sports physical fitness is considered to be the most important. Physical fitness is necessary for success in most of games and sports. Without a high level of physical fitness an individual will not be able to withstand the stress and strain caused on the body of various games and sports. Development and maintainers of physical fitness in addition to bring about better performance in games and sports also helps in prevention of injuries in the long run. Thought the year, interest in physical fitness has been somewhat cyclic in nature being fitness during time of war and Kraus webs list in which American youth were found to be inferior when compared with children of other countries with rigid to minimum muscular fitness.

Bompa (1999) examined physical fitness and body composition has an important role for playing field hockey. In field hockey lots of movements and skills are involved so a high level of physical demand is required for match play**. A Player's fitness includes the element of strength, muscular endurance, cardio-respiratory endurance, flexibility and freedom from obesity. In other words a person should posses speed, agility and power etc. Physical fitness has been defined in various ways. Someone defines it as absence of disease and some rate this according to the amount of musculature developed and few define physical fitness as ability to perform certain sports skills.** Relationship between selected physical fitness variables with the playing ability of 22 women hockey players were examined 16 to 22 year. Three judges rate their playing ability. Standardized test 50 m dash, 4*10 yard shuttle run, 12 minute run/walk and sergeant jump were applied to measure physical fitness variables of speed, agility, cardiovascular endurance and explosive strength respectively to establish relationship between variables and playing ability, coefficient correlation was calculated by using Clark and Clark method. Player showed a significant correlation between speed, agility and endurance with their playing ability in hockey**.** Brar (1986).

METHODOLOGY

PURPOSE

The purpose of the study is to compare the different Physical Fitness variables among the male hockey players of different hockey academies of Punjab.

SELECTION OF SUBJECTS

The Thirty seven subjects from total One hundred subjects of U-19 age group male hockey players were drawn from following different four hockey academies of Punjab i.e. Punjab and Sind Bank Hockey Academy Jalandhar (PHA), Maharaja Ranjit Singh Hockey Academy Amritsar (MHA), Namdhari Hockey Academy Bhaini Sahib, Ludhiana (NHA), Surjit Hockey Academy Jalandhar (SHA) Ten players from each academy were selected through purposive sampling technique. Subjects were hosteller and regularly participated in training session of their academies and all were physically fit and thus were capable to performing all the tests

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efficiently. Decimal ages of the players were calculated as per the official record and matriculation certificate and according to method, (Tanner et al 1969).

SELECTION OF VARIABLE AND THEIR CRITERION MEASURES

Table 1 presents the components of motor fitness which were selected for the present study and were measured.

STATISTICAL TECHNIQUE

The data analyzed and compared with the help of statistical procedure in which arithmetic mean, standard deviation and Analysis of variance (ANOVA) and Post hoc test (Sheffe`s Test) were used.

RESULTS AND DISCUSSION

The results of present study have been presented in Table 2,Table 3,Table 4, Table 5 unit of measure, mean, standard deviation of Arm and Shoulder Strength, Abdominal Strength, Agility, Strength & Power of Leg Muscles, Speed, Endurance and Table 6 and Table 7 shows analysis of variance and multiple comparison (Post hoc test, Shaffe) of the selected dimensions of U-19 players of different Hockey Academies of Punjab i.e. Punjab and Sind Bank Hockey Academy Jalandhar (PHA), Maharaja Ranjit Singh Hockey Academy Amritsar (MHA), Namdhari Hockey Academy Bhaini Sahib, Ludhiana (NHA), Surjit Hockey Academy Jalandhar (SHA) respectively.

TABLE 1: Selected Variables and Their Criterion Measures

S. No.	Variables	Criterion Measures
1.	Arm and shoulder strength	Pull ups
2.	Abdominal Strength	Sit ups
3.	Agility	Shuttle run
4.	Strength & Power of Leg Muscles	Standing Broad jump
5.	Speed	50 meter Dash
6.	Endurance	600 meter run

TABLE 2: Mean and Standard Deviation of Physical Fitness Variables of Punjab and Sind Bank Hockey Academy.

S.No	Variable	Units	Mean	S.D.
1.	Arm and shoulder strength	Number Count	7.7	2.63
2.	Abdominal Strength	Number Count	30.4	8.96
3.	Agility	Seconds	9.22	0.59
4.	Strength & Power of Leg Muscles	Centimeters	2.18	0.09
5.	Speed	Seconds	7.59	1.03
6.	Endurance	Minutes&Seconds	2.32	0.28

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Table 2 depicts that the mean and standard deviation values of physical fitness variables of Punjab and Sind Bank Hockey Academy players. These values were recorded as variable wise, Arm and shoulder strength 7.7 and 2.63, Abdominal Strength 30.4 and 8.96, Agility 9.22 and 0.59, Strength & Power of Leg Muscles 2.18 and 0.09, Speed 7.59 and 1.03 Endurance 2.32 and 0.28 respectively.

TABLE 3: Mean and Standard Deviation of Physical Fitness Variables of Maharaja Ranjit Singh Hockey Academy.

S. No.	Variable	Units	Mean	S.D.
1.	Arm and shoulder strength	Number Count	7.1	2.13
2.	Abdominal Strength	Number Count	31.5	5.76
3.	Agility	Seconds	9.90	0.31
4.	Strength & Power of Leg Muscles	Centimeters	2.17	0.29
5.	Speed	Seconds	8.47	0.83
6.	Endurance	Minutes&Seconds	2.17	0.34

Table 3 depicts that the mean and standard deviation values of physical fitness variables of Maharaja Ranjit Singh Hockey Academy players. These values were recorded as variable wise, Arm and shoulder strength 7.1 and 2.13, Abdominal Strength 31.5 and 5.76, Agility 9.90 and 0.31, Strength & Power of Leg Muscles 2.17 and 0.29, Speed 8.47 and 0.83 Endurance 2.17 and 0.34 respectively.

TABLE 4: Mean and Standard Deviation of Physical fitness Variables of Namdhari Hockey Academy.

S. No.	Variable	Units	Mean	S.D.
1.	Arm and shoulder strength	Number Count	7.3	2.58
2.	Abdominal Strength	Number Count	28.8	7.35
3.	Agility	Seconds	9.09	0.27
4.	Strength & Power of Leg Muscles	Centimeters	2.30	0.17
5.	Speed.	Seconds	6.31	0.26
6.	Endurance	Minutes&Seconds	1.93	0.44

Table 4 depicts that the mean and standard deviation values of physical fitness variables of Namdhari Hockey Academy players. These values were recorded as variable wise, Arm and shoulder strength 7.3 and 2.58, Abdominal Strength 28.8 and 7.35, Agility 9.09 and 0.27, Strength & Power of Leg Muscles 2.30 and 0.17, Speed 6.31 and 0.26 Endurance 1.93 and 0.44 respectively.

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TABLE 5: Mean and Standard Deviation of Physical fitness Variables of Surjit Hockey Academy.

S.No.	*Variable*	*Units*	*Mean*	*S.D.*
1.	Arm and shoulder strength	Number Count	14	5.16
2.	Abdominal Strength	Number Count	48.85	5.16
3.	Agility	Seconds	9.62	0.21
4.	Strength & Power of Leg Muscles	Centimeters	2.32	0.12
5.	Speed	Seconds	6.41	0.36
6.	Endurance	Minutes&Seconds	1.72	0.35

Table 5 depicts that the mean and standard deviation values of physical fitness variables of Surjit Hockey Academy players. These values were recorded as variable wise, Arm and shoulder strength 14 and 5.16, Abdominal Strength 48.85 and 5.16, Agility 9.62 and 0.21, Strength & Power of Leg Muscles 2.32 and 0.12, Speed 6.41 and 0.36 Endurance 1.72 and 0.35 respectively.

TABLE 6: Analysis of Variance of the Mean Score of Arm and Shoulder Strength, Abdominal Strength, Agility, Strength & Power of Leg Muscles, Speed and Endurance of U-19 Hockey Players of Different Hockey Academies of Punjab.

Variables	**Groups**				**Source of Variance**	**Sum of Squares**	**df**	**Mean Sum of Square**	**`F` ratio**
	Mean								
	PHA	**MHA**	**NHA**	**SHA**					
Arm and shoulder strength	7.7	7.1	7.3	14	BG	251.603	3	83.86	8.566*
					WG	323.108	33	9.79	
Abdominal Strength	30.4	31.5	28.8	48.8	BG	2005.454	3	668.485	13.012*
					WG	1695.357	33	51.37	
Agility	9.22	9.90	9.09	9.62	BG	4.046	3	1.349	8.997*
					WG	4.946	33	.150	
Strength & Power of Leg Muscles	2.18	2.17	2.30	2.32	BG	.170	3	.057	1.614
					WG	1.162	33	.035	
Speed Means	7.59	8.47	6.31	6.41	BG	29.706	3	9.902	11.623*
					WG	28.113	33	.852	
Endurance	2.32	2.17	1.93	1.72	BG	1.771	3	.590	4.611*
					WG	4.225	33	.128	

*Significant difference at 0.05 level Tab.F`0.05(3, 33) = 4.46

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FIGURES

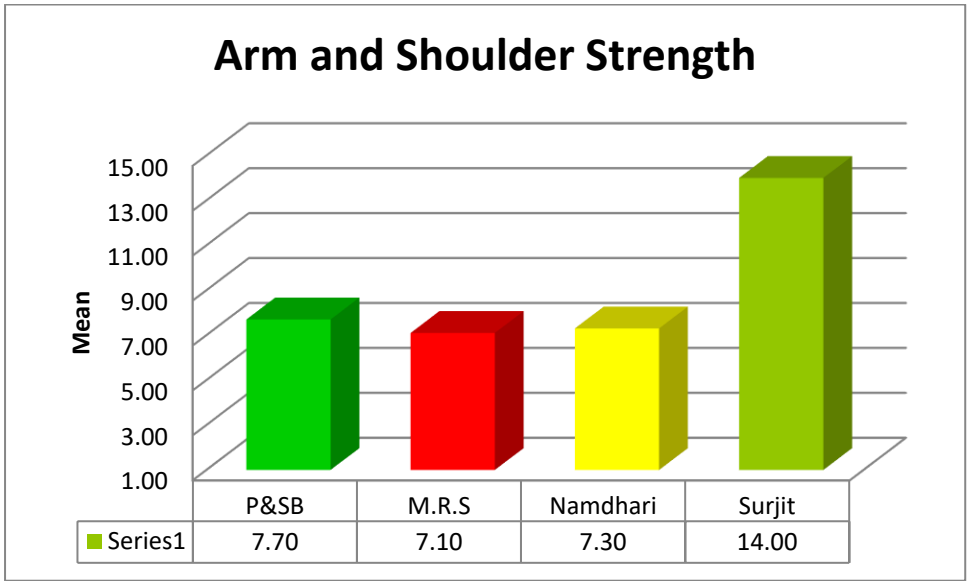

FIGURE 1: Mean difference among male hockey academies related to arm and shoulder strength under 19 years age group

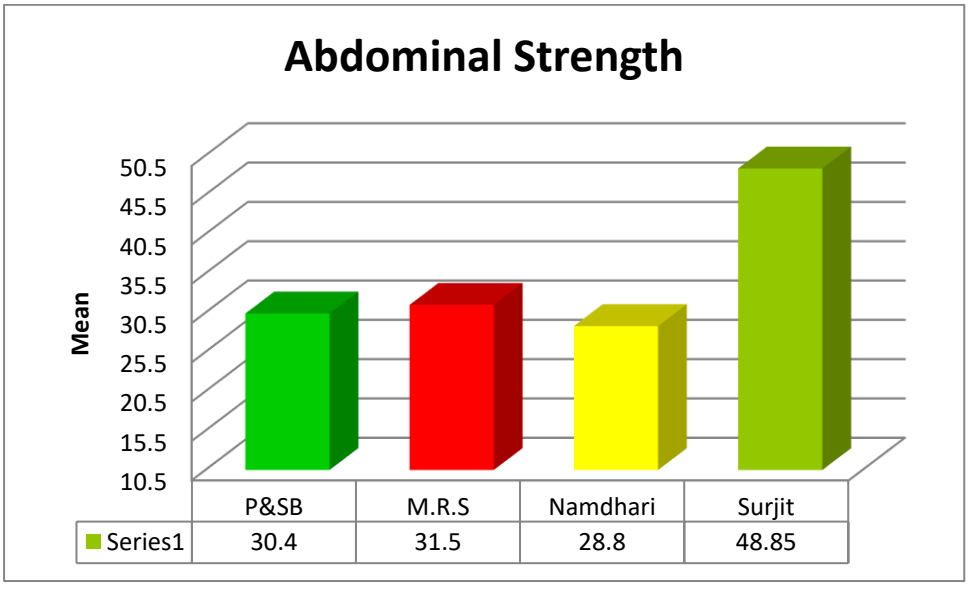

Figure 2: Mean difference among male hockey academies related to abdominal strength under 19 years age group

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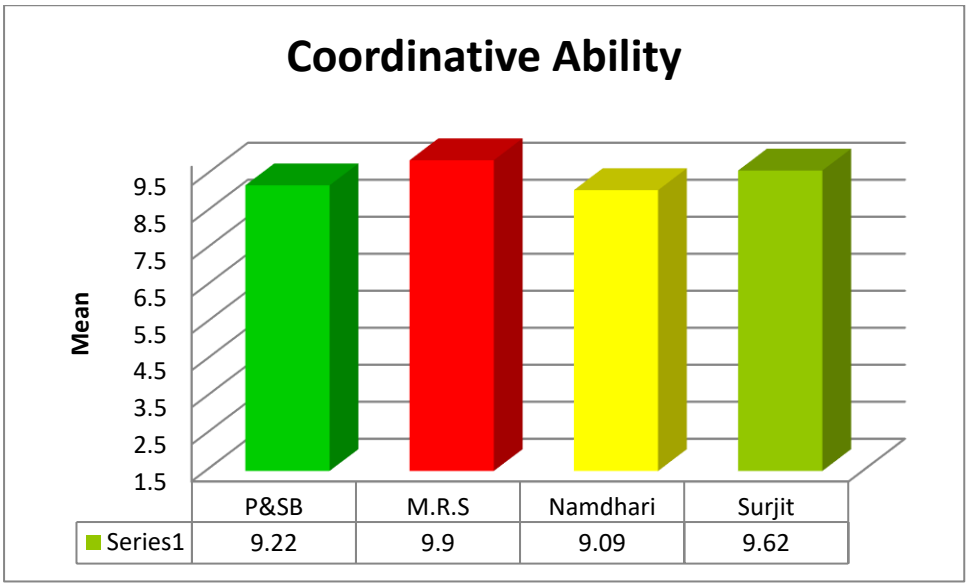

Figure 3: Mean difference among male hockey academies related to coordinative ability under 19 years age group

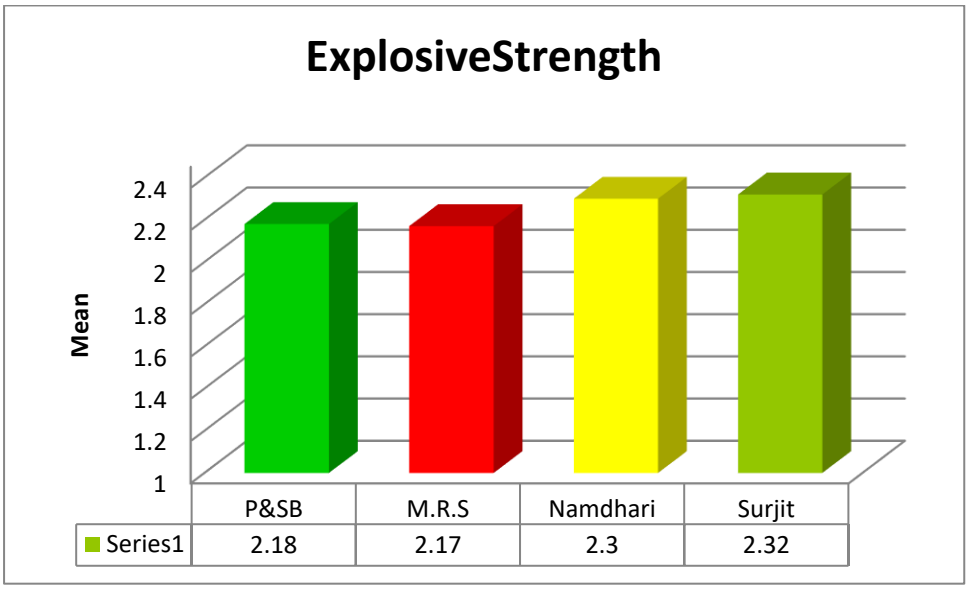

Figure 4: Mean difference among male hockey academies related to explosive strength under 19 years age group.

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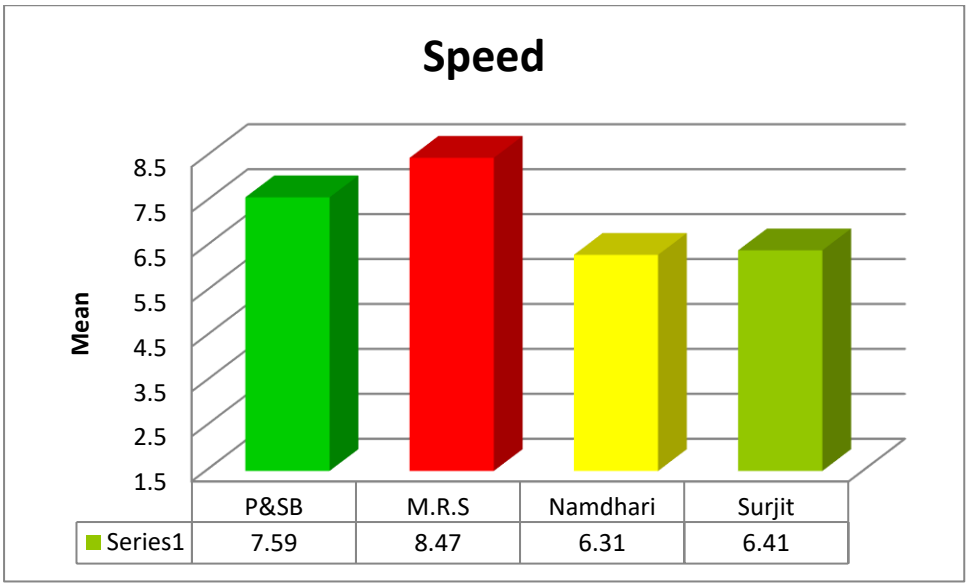

Figure 5: Mean difference among male hockey academies related to speed under 19 years age group.

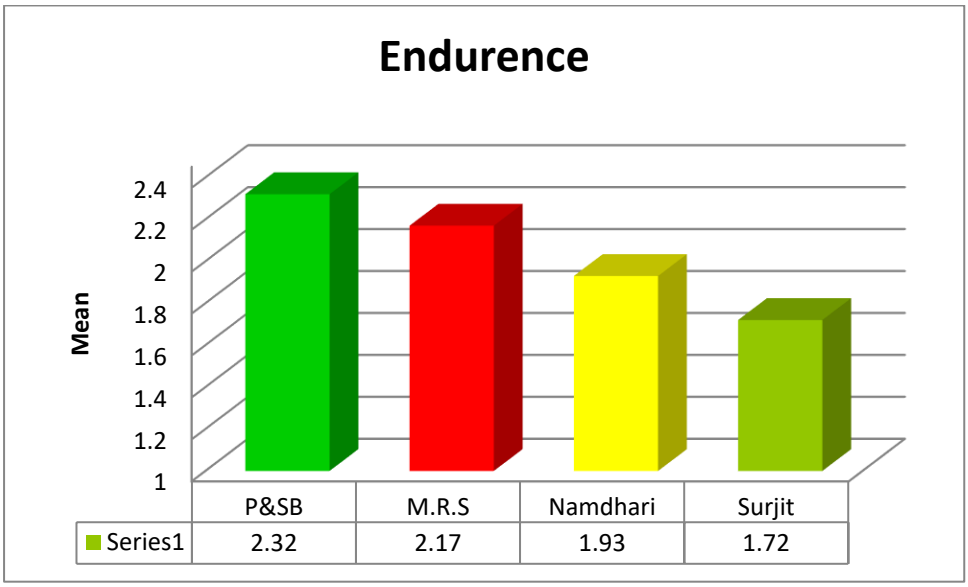

Figure 6: Mean difference among male hockey academies related to endurance under 19 years age group.

The results as found have been presented in Table -6, 7 and graphical presentation is given in figure 1 to 6.The mean values of Arm and shoulder strength were PHA 7.7,MHA 7.1,NHA 7.3 and SHA 14 respectively. F-ratio indicates significant differences among the academies (F=8.566*). Post hoc test indicates that hockey players of SHA were found better in Arm and shoulder strength that other academies (t=0.60, 0.40, 6.30, 0.20, 6.90 and 6.70 respectively).

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The mean values of Abdominal Strength were PHA 30.4, MHA 31.5, NHA 28.8 and SHA 48.85 respectively. F-ratio indicates significant differences among the academies (F=13.012*). Post hoc test indicates that hockey players of SHA were found better in Abdominal Strength that other academies (t=1.10, 1.60, 18.45, 2.70, 17.35 and 20.05 respectively). The mean values of Agility were PHA 9.22, MHA 9.90, NHA 9.09 and SHA 9.62 respectively. F-ratio indicates significant differences among the academies (F= 8.997*). Post hoc test indicates that hockey players of all academies were found no difference in compare to each other academies (t= 0.68, 0.12, 0.40, 0.80, 0.27 and 0.53 respectively). The mean values of Strength & Power of Leg Muscles were PHA 2.18, MHA 2.17, NHA 2.30 and SHA 2.32 respectively. F-ratio indicates no significant differences among the academies (F= 1.67). The mean values of Speed were PHA 7.59, MHA 8.47, NHA 6.31 and SHA 6.41 respectively. F-ratio indicates significant differences among the academies (F= 11.623*). Post hoc test indicates that hockey players of all academies were found no difference in compare to each other academies (t=0.87, 1.27, 1.18, 2.15, 2.06 and 0.09 respectively). The mean values of Endurance were PHA 2.32, MHA 2.17, NHA 1.93 and SHA 1.72 respectively. F-ratio indicates significant differences among the academies (F= 4.611*). Post hoc test indicates that hockey players of all academies were found no difference in compare to each other academies (t=0.14, 0.39, 0.59, 0.24, 0.44 and 0.20 respectively)

Table 7: Post hoc Test Sheffe`s Test shows multiple comparisons of U-19 hockey players of different hockey academies of Punjab

Groups	Arm and shoulder strength	Abdominal Strength	Agility	Speed	Endurance
PHA vs MHA	.60	1.10	.68	.87	.14
PHA vs NHA	.40	1.60	.12	1.27	.39
PHA vs SHA	6.30**	18.45**	.40	1.18	.59
MHA vs NHA	.20	2.70*	.80	2.15	.24
MHA vs SHA	6.90**	17.35**	.27	2.06	44
NHA vs SHA	6.70**	20.05**	.53	.09	.20

CONCLUSION

Thus from the above results it can be summarized that Surjit Hockey Academy Jalandhar (SHA) better in Arm and shoulder strength and Abdominal Strength. Similar results have been noticed when Agility, Strength & Power of Leg Muscles, Speed and Endurance were compared each other academies.

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