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A comparative study on selected psycho- motor parameters of players of certain sports

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Abstract

The purpose of the study was to determine the difference in Balance, Co-ordination and Reaction-Time among the players of Soccer, Handball and Basketball. In this study 15 male players of national level from each of Soccer, Handball and Basketball were selected as subjects by adopting Simple Random Sampling Method (SRS) from Degree College of Physical Education, Amravati. The age of the subjects ranged from 18 to 24 years. The data pertaining to this study were collected by administering Bass Test of Dynamic Balance; Eye-Hand and Eye-Foot Co-ordination Tests; Hand-Reaction Time and Foot-Reaction Time Tests. The statistical technique i.e. F-test (ANOVA) was used to analyse the data and the level of significance to test the hypothesis was kept at 0.05. On the basis of the findings it was concluded that there was significant difference in Dynamic Balance ($F = 6.33$), Eye-Hand Co-ordination ($F = 7.22$) and Hand-Reaction Time ($F = 4.83$) among the players of Soccer, Handball and Basketball, whereas Eye-Foot Coordination ($F = 1.59$) and Foot Reaction Time ($F = 2.97$) did not show any significant difference at 0.05 level of confidence.

Keywords: Psycho- motor, certain sports, Basketball players

Introduction

Different games required different body position of balance, fine co-ordination and quick reaction time to execute any skill successfully. In the game of Football, Handball and Basketball, players are necessary to have all the mentioned variables as to have well control and to give pass or shoot at the target successfully. Hence the researcher was intended to undertake this study.

Statement of the problem

The Sports performance depends on so many factors. Balance, Co-ordination and Reaction Time are much more important variables along with other motor fitness components. So, the research scholar decided to take up the problem stated as, "A Comparative Study on Selected Psycho- Motor Parameters of Players of Certain Sports"

Purpose of the study

The purpose of the study was to compare the psycho-motor parameters viz. Balance, Co-ordination & Reaction Time of Soccer, Handball and Basketball players.

Significance of the study

The following would be the significance of the study:-

- 1) The findings of this study would add to existing knowledge of psycho-motor parameters and their requirement in different games and sports like Soccer, Handball and Basketball etc.
- 2) In screening the players for different games and sports activities.
- 3) To help the players to understand their ability in psycho-motor parameters.
- 4) The findings of the study would provide scope for further study.

Hypothesis

- 1) It was hypothesized that there might be significant differences in Balance, Co-ordination and Reaction Time among the Soccer, Handball and Basketball players.

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- 2) It was also hypothesized that the Soccer players would be superior to Body Balance and Co-ordination than the Handball and Basketball players.
- 3) It was further hypothesized that the Basketball players would be superior to Reaction Time than the Soccer and Handball players.

Delimitation(s)

The present study was delimited to the following aspects:-

- 1) To the male students only.
- 2) To 15 players of National level from each selected game.
- 3) To the students ranged from 18–24 years of age.
- 4) Also to the following variables:-
 - a) Dynamic Balance
 - b) Eye – Foot Co- ordination.
 - c) Eye – Hand Co-ordination.
 - d) Hand Reaction Time.
 - e) Foot Reaction Time

Limitations

The following were the limitations of the study:-

- 1) No. of years of experience and training schedule was not considered.
- 2) No motivational devices were adopted to motivate or

- discourage the subjects during the experimentation.
- 3) Environmental factors were not under control.

Design of the study

15 male players of national level from each of Soccer, Handball and Basketball were selected from Degree College of Physical Education, Amravati. The age of the subjects was ranging from 18 to 24 years. Simple Random Sampling (SRS) procedure was employed. The data pertaining to this study were collected by administering Bass Test of Balance to measure the Dynamic Balance of the subjects in point; Eye-Hand and Eye-Foot Co-ordination tests were used to measure the Co-ordination of the subjects and the score was recorded in seconds; and Nelson's Hand Reaction Time and Foot Reaction Time Tests were used to measure the Reaction Time of the subjects and the score was recorded in seconds

Findings

The data collected on 15 subjects from each of Soccer, Handball and Basketball on Balance, Co-ordination, and Reaction Time were computed by using One-Way Analysis of variance (F-ratio) statistical technique. The result pertaining to these data have been depicted in the following table.

Table 1: One way analysis of variance for the selected variables among the players of Soccer, Handball and Basketball

Variable	Source of variation	Degree of freedom	Sum of squares	Mean sum of squares	F-ratio
Dynamic Balance	Between the groups	2	2981.12	1490.56	6.33*
	Within the groups	42	9883.33	235.31	
Eye Hand Co-ordination	Between the groups	2	14.92	74.6	7.22*
	Within the groups	42	433.6	10.32	
Eye Foot Co-ordination	Between the groups	2	12.4	6.2	1.59@
	Within the groups	42	162.4	3.9	
Hand reaction time	Between the groups	2	0.020648	0.01035	4.83*
	Within the groups	42	0.08963	0.00214	
Foot reaction time	Between the groups	2	0.0010881	0.00545	2.97@
	Within the groups	42	0.0772	0.00183	

Significant at 0.05 level
Tabulated $F_{0.05}(2,42) = 3.22$

Table 2: Paired Mean Difference of Dynamic Balance among the players of Soccer, Handball and Basketball

Mean			Mean Difference	Critical Difference
Soccer	Handball	Basketball		
82.67	70		12.67*	11.31
82.67		63	19.67*	11.31
	70	63	7	11.31

*Significant at 0.05 level.

The findings of table 2 reveal that the mean of Dynamic Balance significantly differs in between Soccer and Handball players (MD = 12.67) and Soccer and Basketball players (MD = 19.67) as the mean difference values are higher than the critical difference value of 11.31 at 0.05 level of confidence. It is also learnt from the above table that the mean difference value of Handball and Basketball players (MD = 7) is less than the critical difference value of 11.31, hence there is no significant difference in Dynamic Balance in Handball and Basketball players.

Table 3: Paired Mean Difference of Eye-Hand Co-ordination among the players of Soccer, Handball and Basketball

Mean			Mean Difference	Critical Difference
Soccer	Hand ball	Basketball		
30.87	34.27		3.4*	2.37
30.87		35.07	4.2*	2.37
	34.27	35.07	0.8	2.37

* Significant at 0.05 level.

The findings of table 3 reveal that the mean of Eye-Hand Co-ordination significantly differ in between Soccer and Handball players (MD = 3.4), Soccer and Basketball players (MD = 4.2) as the mean difference values are higher than the critical difference value of 2.37 at 0.05 level of confidence. The table also depicts that the mean difference value of Handball and Basketball players (MD = 0.8) is less than the critical difference value of (2.37), hence there is no significant difference in Eye-Hand Co-ordination in Handball and Basketball players.

Table 4: Paired Mean Difference of Hand-Reaction Time among the players of Soccer, Handball and Basketball

Mean			Mean Difference	Critical Difference
Soccer	Handball	Basketball		
0.64	0.59		0.05*	0.04
0.64		0.63	0.01	0.04
	0.59	0.63	0.04	0.04

*Significant at 0.05 level.

The findings of table 4 reveal that the mean of Hand-Reaction Time significantly differs in between Soccer and Handball players (MD = 0.05) as the mean difference value is higher than the critical difference value of 0.04 at 0.05 level of confidence. The table also depicts that the mean difference value of Soccer and Basketball players (MD = 0.01) and Handball and Basketball players (MD = -0.04) are less than the critical difference value of 0.04, hence there is no significant difference in Hand-Reaction Time in Soccer and Basketball player; and Handball and Basketball players.

Discussion of findings

On the basis of findings from tables 1, 2, 3, 4, it was revealed that there were significant mean differences in Dynamic Balance, Eye-Hand Co-ordination and Hand Reaction Time among the Soccer, Handball and Basketball players, it may be because of the difference in the dimension of the field and also due to the toughness of the surface of the Basketball court. Again the game Football is played with foot whereas the Handball and Basketball is played by hands that is why significant difference occurred in Dynamic Balance, Eye-Hand Co-ordination and Hand Reaction Time in this study.

The result also revealed that Soccer players were superior to Dynamic Balance than Handball and Basketball players, it may be because of as the major game Football area/size and the duration of the game is more. The frequency of movement pattern at large area on the basis of vision consistency is understood to have influence the dynamic balance.

The result also revealed that significant difference was found in Eye-Hand Co-ordination in between Soccer and Handball; Soccer and Basketball. It may be because, Football game is played with foot only and hands are not used. That is why such results occurred in this study. It was also learnt from the table that no significant difference was found in Eye-Hand Co-ordination in between Handball and Basketball players. It may be because hands are used in both the games for passing, dribbling and shooting.

The findings also revealed that there was no significant difference in Eye-Foot Co-ordination among the Soccer, Handball and Basketball players, it may be because all the selected ball games are dynamic in nature, all the players need to be always on their toes, hence every player must have developed optimum level of Eye-Foot Co-ordination, therefore insignificant differences occurred in the findings.

It is also learnt from the study that the Handball players were superior in Hand Reaction Time than Soccer players, it may be attributed to the fact that Handball players play with the hands which requires a good Hand Reaction Time of hands for receiving a ball whereas Football is played with the foot, hands are lastly used. Hence significant difference occurred in the study. It was also learnt from the study that there was no significant difference in Hand Reaction Time in between Handball and Basketball players it may be because both the games are played with using hands, hence such results occurred in the study.

The findings also revealed that there was no significant difference in Foot-Reaction Time among the Soccer, Handball and Basketball players, it may be because all the selected games are dynamic in nature, hence every player have developed optimum level of Foot Reaction Time, therefore insignificant difference occurred in the study.

Conclusion

Within the limitations of the present study and on the basis of findings the following conclusions are drawn:

- 1) The findings of the study revealed that there was significant difference in Dynamic Balance, Eye-Hand Co-ordination and Hand Reaction Time among the Soccer, Handball and Basketball players.
- 2) There was no significant mean difference among the Soccer, Handball and Basketball players in Eye-Foot Co-ordination and Foot Reaction Time.
- 3) The findings also revealed that Soccer players had shown significantly superior performance than the Handball and Basketball players in Dynamic Balance.
- 4) The findings of the study also revealed that the Basketball players had shown superior Eye-Hand Co-ordination than Soccer and Handball players.
- 5) The findings also revealed that Handball players possessed superior Hand Reaction Time than Soccer players.

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