



DO FEMALE ATHLETES DIFFERS IN TERMS OF SENSO-MOTOR COORDINATION AND TIME MOVEMENT ANTICIPATION ?

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ABSTRACT

The purpose of the study was to analyze if there is any difference exist among female athletes of various sports in terms of senso-motor coordination and time/movement anticipation ability on Vienna test system. Thirty female university players (five from each) of different sports i.e. cricket, football, hockey, badminton, lawn tennis and swimming were selected. Subjects were tested for two psychomotor variables i.e. time/movement anticipation and reaction time. Subject's age ranged between 17 to 23 years with a mean and SD of 19.73 ± 2.14 year. Descriptive statistics and ANOVA was applied to analyze the results. The result showed that the mean and SD of senso-motor coordination of female athletes of badminton, cricket, football, hockey, swimming and tennis were 2.2 ± 0.83 , 5.4 ± 3.4 , 3.6 ± 2.1 , 3.00 ± 1.7 , 6.2 ± 6.01 and 3.00 ± 1.58 respectively. The result also revealed that the mean and SD of time/movement anticipation ability of female athletes of badminton, cricket, football, hockey, swimming and tennis were 0.70 ± 0.14 , 0.56 ± 0.19 , 0.59 ± 0.05 , 0.59 ± 0.09 , 0.43 ± 0.06 , 0.36 ± 0.06 , 0.60 ± 0 , 0.54 ± 0.17 respectively. The one-way ANOVA has shown difference among female athletes of various sports and they do differ in terms of sensomotor coordination and time movement anticipation ($p < 0.05$).

Keywords-Time/movement anticipation, sensomotor coordination and Vienna test system

1. INTRODUCTION

Today performance in sports not only demands systematic training to develop physical, physiological variable and technical aspects of sports but also demands training and consideration of psychological characteristics for the success in this field (Mishra,2013).

Irrespective of the sport in question, an athlete's success or failure is dependent on a combination of physical and psychological abilities. Even though athletes and coaches generally do acknowledge the importance of mental skills, they are rarely practiced in a methodological manner. Usually, the insufficient time is allocated for mental training because of the lack of knowledge in implementing the programme, or due to the myth that mental skills cannot be learnt. Everyone is born with specific and psychological strengths and weaknesses, but skills can be learnt and developed. Being a champion requires the mental skills be systematically practiced and integrated with physical abilities.

Gierczuk, Bujak et al. (2012) compared selected coordination motor abilities (CMA) in elite wrestlers and Taekwon-do competitors and found no significant difference among them. This study is supported by Dogan (2009) who conducted a study in which the aim of the study was to determine multiple choice reaction and visual perception in female and male elite athletes Eating Disorder Prevalence and Symptoms for Track and Field Athletes and Non-athletes. The present study is further supported by Koçak et al. (2010). His study was on Coincidence-anticipation timing and reaction time in youth tennis and table tennis players

Day by day the amount of high quality research is increasing in the area of psychomotor domain. The literature shows that important psychomotor attributes to participate in sport are reaction time, coincidence-anticipation timing, coordination and peripheral perception, Bhabhor, et al. (2013). Gierczuk, Bujak et al. (2016) compared selected coordination motor abilities (CMA) in elite wrestlers and taekwon-do competitors. The CMA tests assessing quick reaction time, frequency of movements, partial spatial orientation, movement adaptability and movement coupling fulfilled the assumed criterion. Vienna test system were employed in the study. It was shown that there were no significant differences in CMA levels between wrestlers and taekwon-do competitors. So the present study is structured to analyze senso-motor coordination and time movement anticipation among female athletes.

2. METHODOLOGY

2.1 Selection of the subjects

To serve the purpose of the investigation, 30 female players of different sports i.e. cricket, football, hockey, badminton, lawn tennis and swimming of university level were selected on the basis of purposive sampling. The age range of participant was 17-23. The sample of 5 female athletes from each sport was selected. Subjects were selected from the students of Lakshmi Bai National University of Physical Education, Gwalior (M.P.). All the subjects in present study were tested on Vienna Test System.

2.2 Criterion Measure

2.2.1 Time/Movement Anticipation

It is ability to imagine the effect of a movement and correctly estimate the movement of objects in space. It is the visualization of a future event or state or the act of looking forward and a prior action that takes into account or forestalls a later action. The reliability ranging from $r=0.92$ to 0.98 . The unit of measurement is movement/sec (Carolien Hermans, 2002).

2.2.2 Sensomotor Coordination

It is the ability to integrate the above listed components so that effective movements are achieved. Co-ordination of nerves or their actions having or involving both sensory and motor functions pathways. The reliability is $r=0.90$. The unit of measurement is movement/sec.

2.2.3 Statistical Analysis:

To assess the time/movement anticipation and senso-motor coordination among female athletes of various sports and games, descriptive statistics and ANOVA were computed. As the F-value was found to be significant, the Scheffe's Test of Post-hoc Comparison was applied to see the significant difference between ordered paired means of different sports groups.

3. RESULTS

Descriptive statistics was computed for the performance of time/movement anticipation and senso-motor coordination on Vienna Test System of female athletes of various sports and games and data pertaining to this has been presented in Table 1 to 4.

TABLE 1

DESCRIPTIVE STATISTICS OF TIME/MOVEMENT ANTICIPATION AND SENSO-MOTOR COORDINATION OF FEMALE ATHLETES OF DIFFERENT SPORTS GROUPS.

Games	Anticipation		Senso-motor coordination	
	Mean	SD	Mean	SD
Badminton	0.70	0.14	2.2	0.83
Cricket	0.56	0.19	5.4	3.43
Football	0.59	0.05	3.6	2.19
Hockey	0.43	0.09	3	1.73
Swimming	0.36	0.06	6.2	6.01
Tennis	0.60	0.20	3	1.58
Total	0.54	0.17	3.9	3.19

Table 1 show the mean and standard deviation of anticipation and Senso-motor coordination score among female athletes from all the six sports. The mean and standard deviation of anticipation among female athletes of various sports i.e. badminton, cricket, football, hockey, swimming and tennis are 0.70 ± 0.14 , 0.56 ± 0.19 , 0.59 ± 0.05 , 0.59 ± 0.09 , 0.43 ± 0.06 , 0.36 ± 0.06 , 0.60 ± 0 , 0.54 ± 0.17 and Senso-motor coordination are 2.2 ± 0.83 , 5.4 ± 3.4 , 3.6 ± 2.1 , 3.00 ± 1.7 , 6.2 ± 6.01 and 3.00 ± 1.58 respectively.

The mean scores of anticipation and Senso-motor coordination of female athletes from all the six sports have been depicted in Figure 1 and 2

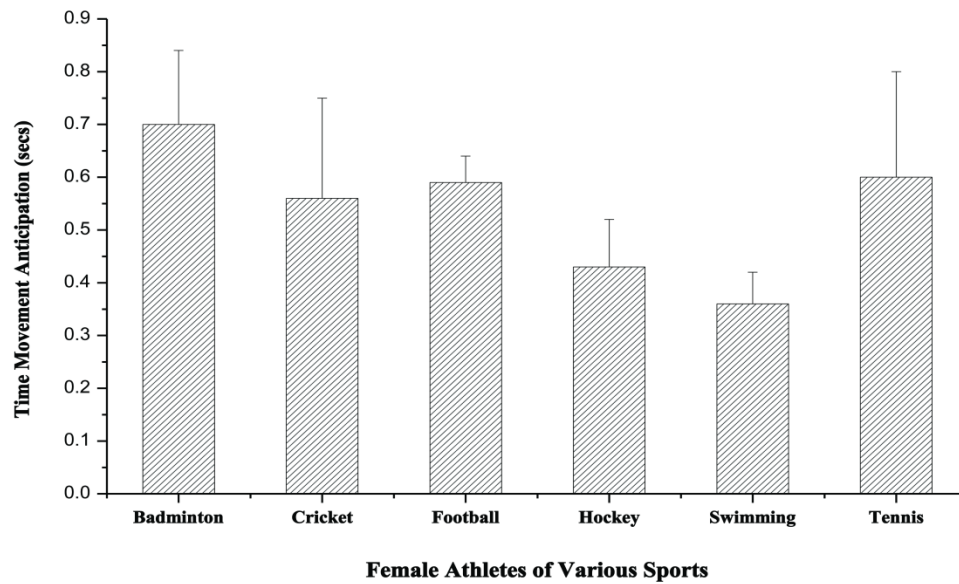


Figure.1 Mean Values of Anticipation of Female Athletes

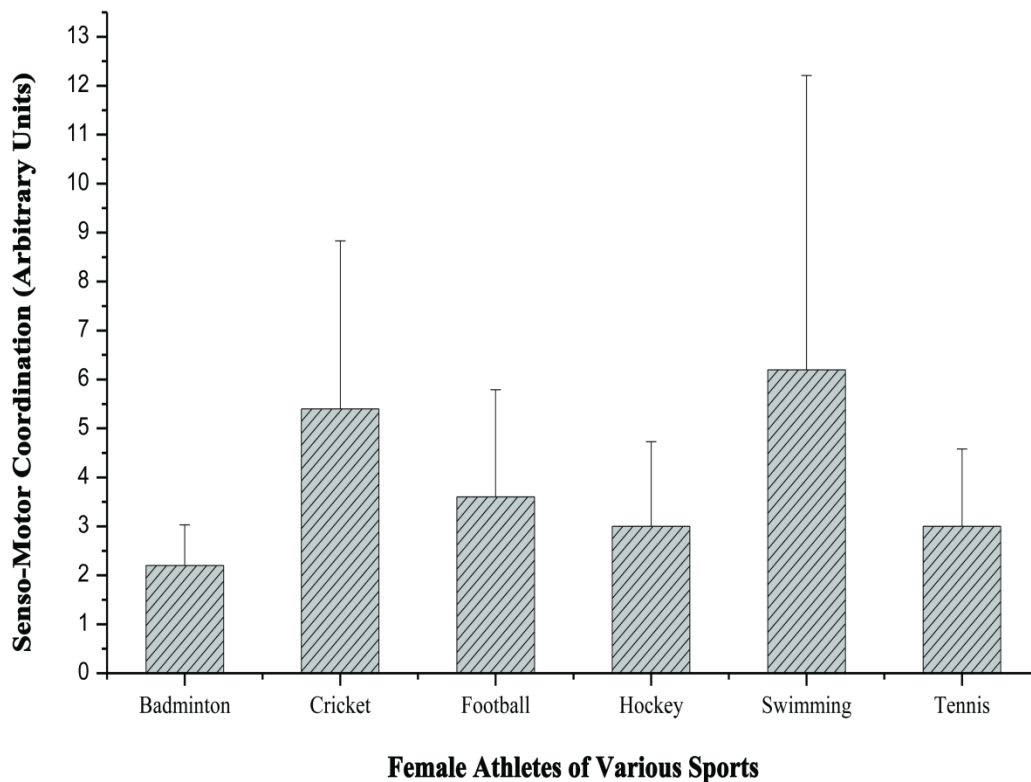


Figure.2 Mean Values of Scores Motor Coordination of Female Athletes

TABLE 2
ANALYSIS OF VARIANCE FOR TIME MOVEMENT ANTICIPATION OF FEMALE
ATHLETES OF VARIOUS SPORTS AND GAMES

Source of variance	Sum of Square	df	Mean Squares	F-value	Sig.
Between Groups	0.384	5	.077	3.883*	.010
Within Groups	0.475	24	.020		
Total	0.858	29			

*Significant at .05 level

F 0.05 (5,24 df)=2.62

Table 2 reveals that there were statistically significant difference in time movement anticipation among female athletes of various sports and games, as the obtained F-value of 3.883 was higher than the required F.05 (5, 24)=2.62.

As the F-value was found to be significant, the post hoc test was applied to see the significant difference between the sports groups and data pertaining to this has been presented in Table 3 and 4

TABLE 3
SIGNIFICANCE OF DIFFERENCES BETWEEN ORDERED PAIRED MEANS ON TIME
MOVEMENT ANTICIPATION FOR FEMALE ATHLETES OF VARIOUS
SPORTS AND GAME

Badminton	Cricket	Football	Hockey	Swimming	Tennis	MD	CI
0.70	0.56	-	-	-	-	0.14	0.32
0.70	-	0.59	-	-	-	0.11	
0.70	-	-	0.43	-	-	0.27	
0.70	-	-	-	0.36	-	0.34*	
0.70	-	-	-	-	0.60	0.10	
-	0.56	0.59	-	-	-	0.03	
-	0.56	-	0.43	-	-	0.13	
-	0.56	-	-	0.36	-	0.20	
-	0.56	-	-	-	0.60	0.04	
-	-	0.59	0.43	-	-	0.16	
-	-	0.59	-	0.36	-	0.23	
-	-	0.59	-	-	0.60	0.01	
-	-	-	0.43	0.36	-	0.07	
-	-	-	0.43	-	0.60	0.17	
-	-	-	-	0.36	0.60	0.24	

The data in table 3 clearly reveals that mean differences between Badminton-Cricket followed by Football, Hockey, and Tennis female athletes; between Cricket-Football followed by Hockey, Swimming and Tennis; between Hockey- Swimming followed by Tennis female athletes; Between Swimming-Tennis female athletes were not found statistically significant, as the paired mean differences. of 0.14, 0.11, 0.27, 0.10, 0.03, 0.13, 0.20, 0.04, 0.16, 0.23, 0.01, 0.07, 0.17 and 0.24 were lower than the confidence interval of 0.32 The significant difference was observed between Badminton- Swimming female athletes, as the paired mean difference. of 0.34 was higher than the confidence interval.

TABLE 4
ANALYSIS OF VARIANCE FOR SOMOTOR COORDINATION OF FEMALE ATHLETES
OF VARIOUS SPORTS AND GAMES

Source of variance	Sum of Square	df	Mean Squares	F-value	Sig.
Between Groups	60.70	5	12.14	1.235	.324
Within Groups	236.00	24	9.83		
Total	296.70	29			

Insignificant at .05 level

F 0.05 (5, 24) = 2.62

Table 4 reveals that there was no significant difference in sensomotor coordination among female athletes of various sports and games, as the obtained F-value of 1.235 was less than the required F.05 (5, 24)=2.62.

4. DISCUSSION

From the findings it is clearly seen that there is significant difference in the sensomotor coordination and time/movement anticipation ability among female athletes of various sports. After analyzing the cognitive ability of female athletes of various sports, the results revealed that the multiple comparison of all the sports groups are insignificant in terms of mean difference of Anticipation and Sensomotor coordination among the various sports groups.

This study is supported by Dogan (2009) who conducted a study in which the aim of the study was to determine multiple choice reaction and visual perception in female and male elite athletes Eating Disorder Prevalence and Symptoms for Track and Field Athletes and Non-athletes. The present study is further supported by Koçak et al. (2010). His study was on Coincidence-anticipation timing and reaction time in youth tennis and table tennis players.

After conducting the post hoc test no difference was observed among various sport groups on their sensomotor coordination and anticipation. Sensomotor coordination is the hand and eye coordination to check the visual motor coordination, in which all sport groups in the present sample, seems to have equal ability.

Further on the basis of mean scores it was concluded that swimmers are better than others female athletes in terms of anticipation (0.36 ± 0.1) and sensomotor coordination (6.2 ± 6.01).

5. CONCLUSIONS

Based on the finding of this study, the following conclusion have been drawn-

1. The findings of the present study strongly indicate that the psychomotor variable i.e. anticipation ability and sensomotor coordination among female athletes of various sports were not similar.
2. It was revealed that the swimmers possess better sensomotor coordination and time/movement anticipation ability may be due to that swimming is perfect for improving the coordinative ability and performance. That's because regular swimming increases the lung capacity and cardiovascular health. and in turn, this improves the endurance and stamina which is indirectly connected to psycho motor domain.

3. The results may also be owing to the reason of small sample size in the present study, but if the similar study would be done on large sample size and higher achievement level then it may bring significant changes in the results.

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