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Eye-Hand Coordination Ability and Reaction Time of Table Tennis and Badminton Players of RTM Nagpur University

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1.0 Introduction

Nowadays people are more involved in playing games professionally and with modern communication technologies, sports such as table tennis, volleyball, badminton, cricket, football are preferred (Bhabhor et al., 2013). Moreover, adequate sports activity improves health and physical development by increasing muscle strength, alertness, sensory development, muscle coordination, speed, strength, and stamina. Playing table tennis and badminton requires a constant analysis of the movements, forcing the player to react precisely and quickly and that is what demands that the player has good reaction ability. For example, research shows that a many times the table tennis and and badminton player has 0.1 s to react to the opponent's attack and hence, these sport (table tennis and and badminton) have been classified as reaction sports (Marion and Suzanne, 1989). Reaction time is defined as the period of time that elapses between the occurrence of a stimulus and initiation of the movement. It involves reception of the stimuli by the sense organ, conduction of the information through the nerve to the brain and from the brain to the muscle contraction, and the movement of the muscle (Welford, 1977).

Visual reaction time is the time taken by an individual to react to a visual stimulus. Reaction time acts as a reliable indicator of rate of processing of sensory stimuli by central nervous system and its execution in the form of motor response (Solanki et al., 2012). It determines the alertness of a person because how quickly a person responds to a stimulus depends on his reaction time. Multiple factors influence the reaction time of a sportspers, which include but are not limited to age, sex, left or right hand dominance, central versus peripheral vision, practice, fatigue, exercise and medical condition (Bamne et al., 2011). Thus, is evident that eye-hand coordination and reaction time plays important role in sports. Since, Table Tennis and badminton are an individual sports where eye-hand co-ordination and fast reaction time is must; there is a need to determine the same. In view of the above, this study was carried out to know the status of Table Tennis and Badminton player's eye-hand co-ordination ability and reaction time.

2.0 Methodology

2.1 Selection of subjects

240 male players were selected as subjects for this study. Out of 240 players 120 were Table Tennis Players and 1200 were Badminton Players. All the subjectys belonged to Nagpur region and only those players were selected who had participated in inter collegiate level tournaments. In this study the age of subjects (Table Tennis and Badminton players) ranged between 18 and 25 years.

2.2 Design of the Study

To study the eye-hand coordination and reaction time a two group descriptive research design was employed.

2.3 Reliability of the Data

In this research investigation, the reliability of data was checked by determining the subject's reliability, instrument's reliability, the tester competency and reliability of tests. All the standard methods as well as instruments were used for data generation.

2.4 Eye-Hand Co-ordination Test

The Eye-Hand coordination test was conducted with an objective to monitor the ability of the player's vision system to coordinate the information received through the eyes to control,

guide, and direct the hands in the accomplishment of catching a ball. For conducting this test a tennis ball, stopwatch, smooth wall and an assistant was all that is needed. Here, during the test the procedure requires the player to throw and catch a tennis ball off a wall. The player throws a tennis ball with their right hand against the wall and catches it with the left hand, throws the ball with the left hand and catches it with the right hand. This cycle of throwing and catching is repeated for 30 seconds. The number of catches and stops the test after 30 seconds were recorded.

2.5 Reaction Time

The reaction time of the Table Tennis and Badminton players was determined using standard Nelson Hand Reaction Time Test.

2.6 Statistical Analysis of the Data and Significance Level

The data characteristics like Frequency, Percentage and Chi-Square were determined using SPSS 18.0 Statistical package. The significance level was 0.05 (or equivalently, 5%).

3.0 Results of Study

3.1 Eye-Hand Co-ordination

3.1.1 Eye-Hand Co-ordination of Table Tennis Players

Table 1: Eye-Hand Co-ordination of Table Tennis Players

Eye-Hand Co-ordination	Table Tennis Players		Chi-Square: 30.667; Chi-Square$_{tabular}$: 9.49; p<0.05
	No. Of Players	Percent	
High Score	32	26.7	
Above Average	40	33.3	
Average	28	23.3	
Below Average	12	10.0	
Low	8	6.7	
Total	120	100.0	

Above **Table 1** presents results of eye-hand co-ordination test of Table Tennis players. The results showed that 26.7% Table Tennis players have high score, while 33.3% have above average scores and both these groups show good eye-hand co-ordination whereas 23.3% have average, 10.0% have below average score and further 6.7% players have low eye-hand co-ordination score.

3.1.2 Eye-Hand Co-ordination of Badminton Players

Table 2: Eye-Hand Co-ordination of Badminton Players

Eye-Hand Co-ordination	Badminton Players		Chi-Square: 64.083; Chi-Square$_{tabular}$: 9.49; p<0.05
	No. of Players	Percent	
High Score	52	43.3	
Above Average	32	26.7	
Average	25	20.8	
Below Average	7	5.8	
Low	4	3.3	
Total	120	100.0	

Above **Table 2** presents results of eye-hand co-ordination test of Badminton players. The results showed that 43.3% Badminton players have high score, while 26.7% have above average scores and both these groups show good eye-hand co-ordination whereas 20.8% have average, 5.8% have below average score and further 3.3% players have low eye-hand co-ordination score.

3.2 Reaction Time

3.2.1 Reaction Time of Table Tennis players

Table 3: Reaction Time of Table Tennis players

Reaction Time	Table Tennis Players		Chi-Square: 64.267; Chi-Square$_{tabular}$: 7.82; p<0.05
	No. of Players	Percent	
Excellent	60	50.0	
Good	38	31.7	
Average	22	18.3	
Below Average	0	0.0	
Total	120	100.0	

Above **Table 3** presents results of the reaction time assessment of Table Tennis players. The results showed that 50.0% Table Tennis players have excellent score, while 31.7% have good scores and both these groups show good reaction time

whereas 18.3% players have average reaction time score.

3.2.2 Reaction Time of Badminton players

Table 4: Reaction Time of Badminton players

Reaction Time	Badminton Players		Chi-Square: 57.867; Chi-Square$_{tabular}$: 7.82; p<0.05
	No. of Players	Percent	
Excellent	58	48.3	
Good	36	30.0	
Average	26	21.7	
Below Average	0	0.0	
Total	120	100.0	

Above **Table 4** presents results of the reaction time assessment of Badminton players. The results showed that 48.3% Badminton players have excellent score, while 30.0% have good scores and both these groups show good reaction time whereas 21.7% players have average reaction time score.

4.0 Conclusions

4.1 Eye-Hand Co-ordination of Table Tennis Players

- The study results revealed that majority of Table Tennis players have above average eye-hand co-ordination.

4.2 Eye-Hand Co-ordination of Badminton Players

- In view of the study results, it is concluded that majority of Badminton players have high eye-hand co-ordination.

4.3 Reaction Time of Table Tennis players

- On the basis of the study results, it is concluded that majority of the Table Tennis players have excellent reaction time.

4.4 Reaction Time of Badminton players

- From the study results, it is revealed that majority of Badminton players have excellent reaction time.

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