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A Study of Eye-Hand Coordination Ability and Reaction Time of Handball and Hockey Players Participating in University and State Level Tournaments

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1.0 Introduction

Vision is one of the several sensory organs that receive information from the external environment. Moreover, for years it has been recognized that many sports place demands on vision and particular visual skills. For example, it has been believed that there is a strong relationship between ball sports, body and visual status (Hitzeman & Beckerman, 1993). In spite of this early recognition of visual importance in sports it stood neglected for many years and it was not before the middle of 20th century that new scientific opinions were developed and the thought, "sports being a multidisciplinary approach" came into picture (Jafarzadehpur & Yarigholi, 2004).

Sports Vision as such includes specific visual determinants which precisely coordinates a player's activity during the game. It has been seen that successful players in general have better skill, accuracy and spatio-temporal constraints on visual information acquisition. As such if two similar players meet in competition and one has a better trained visual system, the player with enhanced visual system will perform better (Loran & Griffiths, 2001). Sport activities often have a close relationship between perception and action therefore temporally constrained sport tasks require that players extract the most valuable source of visual information and use this information to quickly anticipate the opponent's movement outcome (Shim et al., 2006). Along with vision, the reaction time (a measure of how quickly an organism can respond to a particular stimulus) has been widely studied, as its practical implications may be of great consequence, e.g. a slower than normal reaction time can have unwanted results (Revien & Gabor, 1981).

Therefore it should hold true that if a subject's visual system is at higher level, then the overall performance will be at higher level as well (Griffiths, 2002). Many factors have been shown to affect reaction times, including age, gender, physical fitness, fatigue, distraction, personality type, and whether the stimulus is auditory or visual. Thus, is evident that eye-hand coordination and reaction time plays important role in sports. Since, hockey and handball are team sports where co-ordination between players is must which may be better achieved by development of eye-hand co-ordination ability and reaction time of individual players. Hence, it is necessary to study the eye-hand co-ordination ability and reaction time of handball and hokey players participating in University and State level tournaments.

2.0 Methodology

2.1 Delimitations of the study

The study was delimited to

- Only Hokey and Handball players
- Hokey and Handball players belonging to 18 to 25 years age group
- Hokey and Handball players participating State and University level tournaments were selected

2.2 Limitations of the Study:

- There was no control on the sports skill of players
- There was no control over environmental conditions while collecting data from the players
- No incentive was offered to the players for providing data for this study

2.3 Selection of subjects

100 male hockey players and handball players each were selected as subjects for this study from Nagpur region, out of which number of hockey and handball players participating in State and university level tournaments were 50 players each. The age of the subjects ranged between 18 and 25 years.

2.4 Design of the Study

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

2.5 Reliability of the Data

The reliability of data was checked by establishing 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 collection.

2.6 Eye-Hand Co-ordination Test

The objective of the test is 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 (Eye-Hand coordination). To undertake this test things required were tennis ball, stopwatch, smooth wall and an assistant. This test requires the athlete 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.

2.7 Reaction Time

The reaction time of the hockey and handball players was determined using Nelson hand reaction time test.

2.8 Statistical Technique Employed and Significance Level

The data characteristics (descriptive statistics) such as Mean, Standard deviation, Minimum, Maximum, Range, etc. will be 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 Hockey Players

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

	State Level Players		University Level Players	
	No. Of Players	Percent	No. Of Players	Percent
High Score	11	11	8	8
Above Average	46	46	32	32
Average	24	24	41	41
Below Average	11	11	9	9
Low	8	8	10	10
Total	100	100	100	100

Above **Table 1** presents results regarding the assessment of eye-hand co-ordination among state and university level hockey players. The results indicated that 46% state level hockey players have above average eye-hand co-ordination whereas 24% have average, 11% each have high score and below average score and 8% players have low eye-hand co-ordination score. However, 41% university level hockey players have average eye-hand co-ordination whereas 32% have above average score, 10% , 9% and 8% hockey players have low, below average and high eye-hand co-ordination.

3.1.2 Eye-Hand Co-ordination of Handball Players

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

	State Level Players		University Level Players	
	No. of Players	Percent	No. of Players	Percent
High Score	14	14	45	45
Above Average	44	44	27	27
Average	26	26	18	18
Below Average	11	11	7	7
Low	5	5	3	3
Total	100	100	100	100

Above **Table 2** presents results regarding the assessment of eye-hand co-ordination among state and university level handball players. The results indicated that 44% state level handball players have above average eye-hand co-ordination whereas 26% have average, 14% have high score, 11% have below average and 5% have low eye-hand co-ordination. However 45% university level hockey players have high eye-hand co-ordination whereas 27% have above average score, 18% , 7% and 3% handball players have average, below average and low eye-hand co-ordination.

3.2 Reaction Time

3.2.1 Reaction Time of Hockey players

Table 3: Reaction Time of Hockey players

Hockey Players	State Level Players		University Level Players	
	No. of Players	Percent	No. of Players	Percent
Excellent	22	22	36	36
Good	27	27	30	30
Average	37	37	23	23
Below Average	14	14	11	11
Total	100	100	100	100

Above **Table 3** presents results regarding the assessment of reaction time among state and university level hockey players. The results indicated that 37% state level hockey players have average reaction time whereas 27% have good, 22% have excellent score and 14% players have below average reaction time score. However, 36% university level hockey players have excellent reaction time whereas 30% have good score, 23% and 11% hockey players have average and below average reaction time.

3.2.2 Reaction Time of Handball players

Table 4: Reaction Time of Handball players

Handball Players	State Level Players		University Level Players	
	No. of Players	Percent	No. of Players	Percent
Excellent	16	16	28	28
Good	27	27	38	38
Average	45	45	21	21
Below Average	12	12	13	13
Total	100	100	100	100

Above **Table 4** presents results regarding the assessment of reaction time among state and university level handball players. The results indicated that 45% state level handball players have average reaction time whereas 27% have good, 16% have excellent score and 12% have below average reaction time. However 38% university level handball players have good reaction time whereas 28% have excellent score, 21% and 13% handball players have average and below average reaction time.

4.0 Conclusions

4.1 Eye-Hand Co-ordination of Hockey Players

- The study results revealed that majority of the state level hockey players have above average eye-hand co-ordination.

4.2 Eye-Hand Co-ordination of Handball Players

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

4.3 Reaction Time of Hockey players

- On the basis of the study results, it is concluded that majority of the state level hockey players have average reaction time.

4.4 Reaction Time of Handball players

- From the study results, it is revealed that majority of the state level handball players have average reaction time.

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