Comparison of Physical and Psychological Movement Choice Variables Between Wheelchair Badminton and Wheelchair Table Tennis Athletes

Talal Alotaibi[1], Fayez Almutairi[2]

[1]M. P. Ed II Student, Faculty of General & Adapted Physical Education and Yoga, RKMVERI, Coimbatore

[2]Assistant professor, Faculty of General & Adapted Physical Education and Yoga, RKMVERI, Coimbatore

Abstract: *The objective of this study was to compare the selected physical and psychomotor variables between wheelchair badminton and wheelchair table tennis players. Thirty wheelchair badminton and wheelchair table tennis players were identified and selected to participate in the study from the state of Tamil Nadu. Out of thirty players, fifteen of from wheelchair badminton, and fifteen of from wheelchair table tennis players. To test the significance of changes made in both groups, an independent t - test was applied. The significance of the means of the obtained test results was tested at 0.05 level of confidence. The analysis of the data revealed that there is a significant difference between wheelchair badminton and wheelchair table tennis players in selected physical and psychomotor variables.*

Keywords: Wheelchair badminton, Wheelchair table tennis, Physical, Psychomotor

1. Introduction

Wheelchair badminton has been played internationally since the 1990s, but the sport really came to prominence in 2014. Following a bid by the Badminton World Federation (BWF) to include Para badminton as a Paralympic sport, the International Paralympic Committee (IPC) selected the sport for Tokyo 2020. Since then, it has continued to grow in popularity, moving from 230 athletes from 35 countries at 2015's World Championships to more than 300 athletes from almost 50 countries competing at last year's Worlds in Basel, Switzerland. Wheelchair table tennis is a para sports which follows the rules set by the International Table Tennis Federation (ITTF). The usual table tennis rules are in effect with slight modifications for wheelchair athletes. Athletes from disability groups can take part. Athletes receive classifications between 1 - 11. Classes 1 - 5 are for those in wheelchairs and classes 6 - 10 for those who have disabilities that allow them to play standing. Within those groups, the higher classification means the more function the athlete has. Class 11 is defined for players with an intellectual disability. The roles of classification are to determine eligibility to compete for athletes with disability and to group athletes equitably for competition purposes. Athletes are grouped by reference to functional ability, resulting from their impairment.

2. Methodology

2.1 Selection of Subjects

Thirty wheelchair badminton and wheelchair table tennis players were selected as subjects randomly from the state of Tamil Nadu. Out of thirty players, fifteen of from wheelchair badminton, and fifteen of from wheelchair table tennis players.

2.2 Selection of Variables

Table I: Selected Variables and their Standardized Test Items

S. No	Variables	Test	Units of Measurement
Physical Fitness Variables			
1	Flexibility	Back Scratch	In Cm
2	Arm Strength	Dynamometer	In Kg
3	Shoulder Power	Medicine Ball Put	In meter
Psychomotor Variables			
1	Reaction time	Chronoscope	In second
2	Hand - eye coordination	Mirror tracing apparatus	Number of errors

2.3 Research Design

The study was formulated as a static group comparison design.

3. Statistical Techniques

The following statistical procedures were employed to estimate and compare the selected physical and psychomotor variables between wheelchair badminton and wheelchair table tennis players. An Independent "t" ratio was applied to find out the significant difference. The significance of the means of the obtained test results was tested at 0.05 level of confidence.
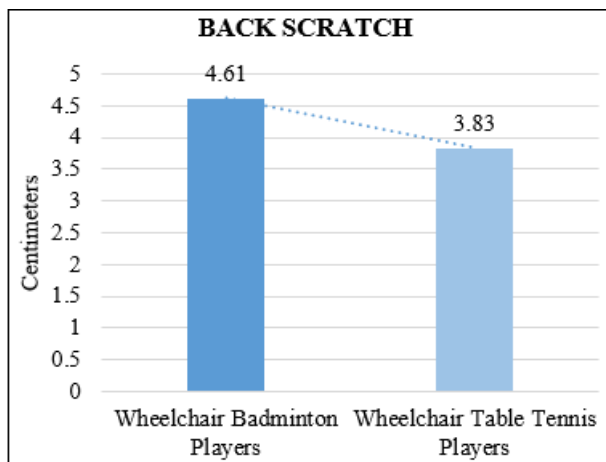
4. Results

Table II: Computation of 't' Ratio on Back Scratch of Wheelchair Badminton and Wheelchair Table Tennis Players

Groups	Mean	SD	Mean Difference	T Value
Wheelchair Badminton Players	4.61	0.67	0.78	2.50*
Wheelchair Table Tennis Players	3.83	1.01		

Level of significant fixed at 0.05 with df 28 table value is 2.04

Table – II shows that back scratch mean values and standard deviation of wheelchair badminton and wheelchair table tennis players were 4.61± 0.67and 3.83 ± 1.01 respectively. The obtained 't' value 2.5 which were greater than tabulated value 2.04 in the level 0.05. So that researcher's hypothesis accepted and null hypothesis rejected.
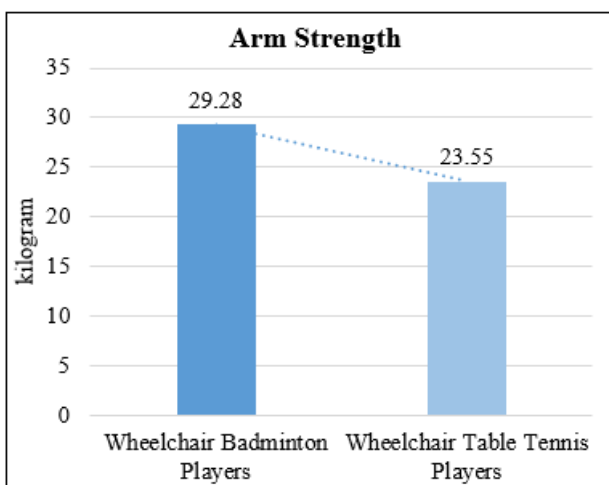

Figure I: The Bar Diagram Shows that Back Scratch of Wheelchair Badminton and Wheelchair Table Tennis Players

Table III: Computation of 't' Ratio on Arm Strength of Wheelchair Badminton and Wheelchair Table Tennis Players

Groups	Mean	SD	Mean Difference	t Value
Wheelchair Badminton Players	29.28	1.75	5.73	4.46*
Wheelchair Table Tennis Players	23.55	4.65		

Level of significant fixed at 0.05 with df 28 table value is 2.04

Table – III shows that arm strength mean values and standard deviation of wheelchair badminton and wheelchair table tennis players were 29.28 ± 1.75 and 23.55 ± 4.65 respectively. The obtained 't' value 4.46 which were greater than tabulated value 2.04 in the level 0.05. So that researcher's hypothesis accepted and null hypothesis rejected.
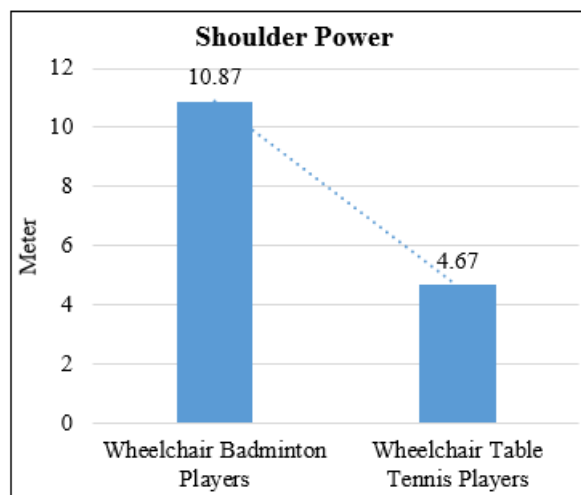

Figure II: The Bar Diagram Shows that Arm Strength of Wheelchair Badminton and Wheelchair Table Tennis Players

Table IV: Computation of 't' Ratio on Shoulder Power of Wheelchair Badminton and Wheelchair Table Tennis Players

Groups	Mean	SD	Mean Difference	t Value
Wheelchair Badminton Players	10.87	3.9	6.2	3.72*
Wheelchair Table Tennis Players	4.67	5.12		

Level of significant fixed at 0.05 with df 28 table value is 2.04

Table – VI shows that shoulder power mean values and standard deviation of wheelchair badminton and wheelchair table tennis players were 10.87 ± 3.9 and 4.67 ± 5.12 respectively. The obtained 't' value 3.72 which were greater than tabulated value 2.04 in the level 0.05. So that researcher's hypothesis accepted and null hypothesis rejected.
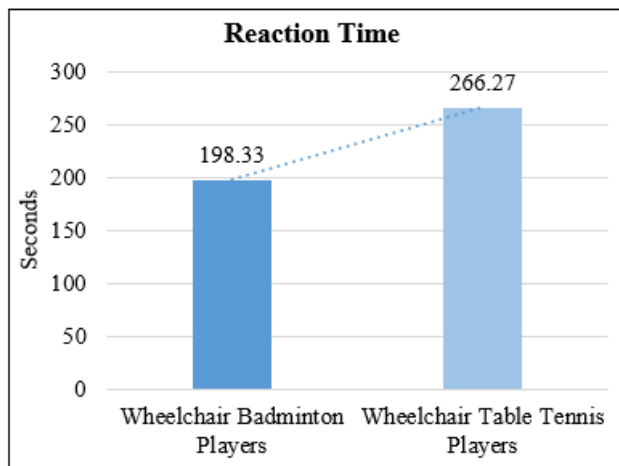

Figure III: The Bar Diagram shows that Shoulder Power of Wheelchair Badminton and Wheelchair Table Tennis Players

Table V: Computation of 't' Ratio on Reaction Time of Wheelchair Badminton and Wheelchair Table Tennis Players

Groups	Mean	SD	Mean Difference	t Value
Wheelchair Badminton Players	198.33	46.47	67.93	3.45*
Wheelchair Table Tennis Players	266.27	60.45		

Level of significant fixed at 0.05 with df 28 table value is 2.04

Table – V shows that reaction time mean values and standard deviation of wheelchair badminton and wheelchair table tennis players were 198.33 ± 46.47 and 266.27 ± 60.45 respectively. The obtained 't' value 3.45 which were greater than tabulated value 2.04 in the level 0.05. So that researcher's hypothesis accepted and null hypothesis rejected.
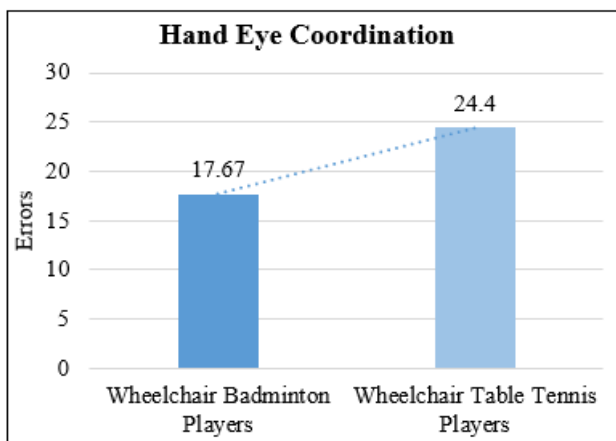
Figure IV: The Bar Diagram Shows that Reaction Time of Wheelchair Badminton and Wheelchair Table Tennis Players

Table VI: Computation of 't' Ratio on Hand Eye Coordination of Wheelchair Badminton and Wheelchair Table Tennis Players

Groups	Mean	SD	Mean Difference	t Value
Wheelchair Badminton Players	17.67	6.07	6.73	2.43*
Wheelchair Table Tennis Players	24.4	8.84		

Level of significant fixed at 0.05 with df 28 table value is 2.04

Table – VI shows that hand eye coordination mean values and standard deviation of wheelchair badminton and wheelchair table tennis players were 17.67 ± 6.07 and 24.4 ± 8.84 respectively. The obtained 't' value 2.43 which were greater than tabulated value 2.04 in the level 0.05. So that researcher's hypothesis accepted and null hypothesis rejected.

Figure V: The Bar Diagram shows that Hand Eye Coordination of Wheelchair Badminton and Wheelchair Table Tennis Players

5. Discussion

The purpose of the study was comparing the selected Physical fitness variables of back scratch, arm strength and shoulder power and psychomotor variables of reaction time and hand eye coordination compare among wheelchair badminton and wheelchair table tennis players

5.1 Flexibility

The result of the study indicated that, there was a significant difference among state level wheelchair badminton player were better flexibility compared than and wheelchair table tennis players.

5.2 Arm Strength

The result of the study indicated that, there was a significant difference among state level wheelchair badminton player were better arm strength compared than and wheelchair table tennis players.

5.3 Shoulder Power

The result of the study indicated that, there was a significant difference among state level wheelchair badminton player were better shoulder power compared than and wheelchair table tennis players.

5.4 Reaction Time

The result of the study indicated that, there was a significant difference among state level wheelchair badminton player were better reaction time compared than and wheelchair table tennis players.

5.5 Hand Eye Coordination

The result of the study indicated that, there was a significant difference among state level wheelchair badminton player were better hand eye coordination compared than and wheelchair table tennis players

6. Conclusions

It was concluded by that there was a significant difference between a wheelchair badminton players and wheelchair table tennis players in Tamil Nadu of the selected physical fitness variables of back scratch, arm strength, shoulder power and psychomotor variables of reaction time & hand eye coordination

References

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