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GRT COMPARISON OF PHYSIOLOGICAL VARIABLES OF WHEELCHAIR-BASED SPORTS PERSONS

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Abstract:-There are many sports which have recently become adaptable for individual who are confined to wheelchairs. Individuals who are quadriplegic and paraplegic can continue to participate in sports, win championship and even take home Olympic medals. Wheelchair games have progressed beyond anyone's expectations, particularly in the recent years and very nearly all games have ended up versatile to wheelchairs, the absolute most prominent wheelchair games and some not some well known. Ten male Wheelchair Basketball players and Lawn Tennis Players from Paraplegic Rehabilitation Centre, Pune, have selected for the study. 't' ratio has been computed to examine the significance difference. Vital Capacity, Body Mass Index (BMI), and Heart Rate, have been selected for the Physiological Variables. No significance difference found between & vital capacity (579.00 ± 90.00 vs 576.00 ± 60.00) and Heart rate before the game (70.00 ± 14.00 vs 66.90 ± 16.00), & Heart rate after the game (83.50 ± 24 vs 83.40 ± 19.00) of Wheelchair Basketball and Lawn Tennis Players, there were significant difference was found in Body Mass Index (BMI) (25.51 ± 7.67 vs 28.78 ± 7.12) of Wheelchair Basketball and Lawn Tennis Players. BMI was found higher of wheelchair Lawn Tennis player when compare with the Wheelchair Basketball Players.

Keywords: Wheelchair Basketball and Lawn Tennis Players, Vital Capacity, Heart Rate, & Body Mass Index (BMI).

INTRODUCTION

There are numerous games which have as of late gotten to be versatile for person who are kept to wheelchairs. People who are quadriplegic and paraplegic can keep on participating in games, win title and even take home Olympic awards (Simon R.2006). Wheelchair games have progressed beyond anyone's expectations, particularly in the recent years and very nearly all games have ended up versatile to wheelchairs, the absolute most prominent wheelchair games and some not well known. Basketball is a stand-out amongst the most famous wheelchair sports, which was present in the 1940's. Wheelchair basketball is a highly developed sport and it's practiced both for fun and professionally on elite competitive levels. So many wheelchair basketball leagues and tournaments are organized by the Federations for men and women.(Simon R.2006) Wheelchair tennis is

additionally an exceptionally well known furthermore standout amongst the most mainstream wheelchair sports for impaired people to partake in (Simon R.2005). Wheelchair tennis has the same controls and regulations as typical tennis with the exception of that the ball can bounce twice instead of simply once (Joseph P.W.,2011). This makes it simpler to make history to the ball. This game might be adjusted to all people, paying little heed to their manifestation of incapacity.

METHODOLOGY

Ten male Wheelchair Basketball and Lawn Tennis Players from Paraplegic Rehabilitation Centre, Pune, Maharashtra, India, have been selected for the study. To examine the significance of the difference between Wheelchair Basketball and Lawn Tennis sports persons-'t' ratio has been computed. All statistical process was done through the SPSS 20 version.

SELECTION OF VARIABLES

Following physiological variables have been selected for the study:

- 1.Vital Capacity
- 2.Body Mass Index (BMI)
- 3.Heart Rate

HYPOTHESES

- 1.It was hypothesized that there would be no significant difference of Vital Capacity be found between wheelchair basketball and Lawn tennis player.
- 2.It was hypothesized that there would be no significant difference of BMI be found between wheelchair basketball and Lawn tennis player.
- 3.It was hypothesized that there would be no significant difference of Heart Rate be found before game between wheelchair basketball and Lawn tennis player.
- 4.It was hypothesized that there would be no significant difference of Heart Rate be found after the game between wheelchair basketball and Lawn tennis players

METHODOLOGY TO COLLECT DATA

Before going to Collection of the data researchers have been taken the written consent for the study to the participant and to insure them all the data which have been taken by them it have been confidentially and only for research purpose. After taken the written consent by the participant the researcher has been started the data collection process by following means and methods.

Heart Rate

Equipment: Stop watch.

Procedure: Participant was seated on the wheelchair in erect and relaxed position. Researcher took the hand of participant and placed the index and middle fingers together on the wrist of the participants, about 1/2 inch on the inside of the joint, in line with the index finger. Once researcher found a pulse, he started counting the number of beats within one minute period.

Scoring: Researcher recorded the beat within one minute of period of time, before the 20 Min. and after the 20 min. of the Game.

Vital Capacity

Equipment: Dry Spirometer.

Procedure: The participant was recommended to adopt the test position by seated erect on his wheelchair and hold the spirometer with the hand and participant was asked to take as deep a breath

as possible. Once participant had sealed the lips around the mouth-piece of spirometer, the researcher told the participants to blast out the air on the mouth-piece of spirometer. Reading was recorded from the dial of the spirometer, every time dial was recognized to bring the zero point each time after use. Care was taken to prevent air from escaping either through the nose or around the mouth piece of spirometer. Spirometer was disinfected by an antiseptic solution after use by each participant.

Scoring: Researcher recorded the score from the dial of the dry spirometer.

Body Mass Index

Body Mass Index (BMI) was calculated with the following formula:
$$\text{BMI} = \text{Body weight (kg)} / \text{Height}^2 \text{ (m)}$$

Lying Height

Equipment: Flexible steel tape, marker.

Procedure: The lying height was taken of the participants lying erect on the floor without shoes. The participants was instructed to keep the heels together touching the buttocks and back with the floor, head is erect without tilt and to take and hold the breath during the measurement. The tester had used the marker for marking the points of horizontal height of tip of the heel to the hip joint from hip joint to shoulder joint and shoulder joint to the top of the head, and to instruct the participants come out with the help of helper after the marking of the points. Tester were measured the points with the help of flexible steel tape and add together these points. Height was recorded to the nearest 0.01 centimeter.

Scoring: Researcher records the measurement of the marked points and adds together all marking points which were the height of the participants.

Body Weight

Equipment: Large electronic weight machine platform.

Procedure: The body weight of the participants was examined on the large electronic weighing machine platform (which is provided by the Paraplegic rehabilitation centre) to the accuracy of 0.1 kilogram. Participants was asked to sit in the centre with the help of the helper of the platform of weighing machine with minimum clothing i.e. (shorts only), the reading was recorded from the dial of the weighing machine.

Scoring: Researcher recorded the reading of the weight from the dial of weighing machine.

Analysis

Table-1 Mean Difference of Wheelchair Basketball and Lawn Tennis Players on Vital Capacity

S.No.	Variables	Mean	S.D.	't' ratio
1.	Vital Capacity of Wheelchair Basketball Players.	579.00	28.4605	0.256
2.	Vital Capacity of Wheelchair Lawn Tennis Players	576.00	23.6643	

t.05 (18)=1.734 Level of significance=0.05

Table -1 shows that no significant difference was found between vital capacity of Wheelchair Basketball and Lawn Tennis Players, as they obtained 't' value (0.256) were below the table value (1.734) required for the 't'-ratio to be significant at 0.05 level of confidence with 18 degree of freedom.

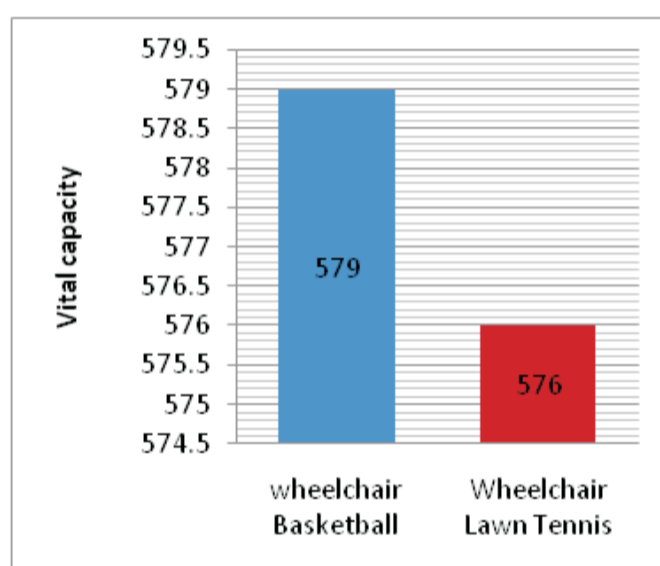


Fig-1 Mean score of Vital Capacity of Wheelchair Basketball and Lawn Tennis Players.

Table-2 Mean Difference of Wheelchair Basketball and Lawn tennis Players on Body Mass Index (BMI)

S.No.	Variables	Mean	SD	't' ratio
1.	BMI of Wheelchair Basketball Players.	25.51	2.3481	3.147*
2.	BMI of Wheelchair Lawn Tennis Players	28.78	2.2996	

t.05 (18)=1.734 Level of significance=0.05

Table -2 shows that significant difference was found between Body Mass Index (BMI) of Wheelchair Basketball and Lawn Tennis Players, as they obtained 't' value (3.147) was above the

table value (1.734) required for the 't'-ratio to be significant at 0.05 level of confidence with 18 degree of freedom.

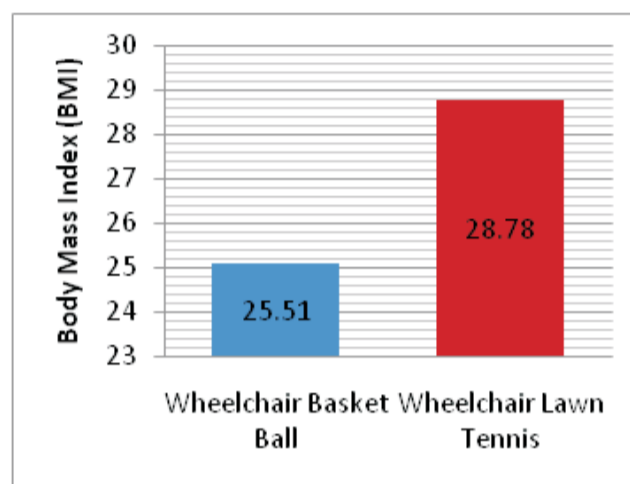


Fig-2 Mean score of Body Mass Index (BMI) of Wheelchair Basketball and Lawn Tennis Players.

Table-3 Mean Difference of Wheelchair Basketball and Lawn Tennis Players on Heart Rate before Game

S.No.	Variables	Mean	S.D	't'ratio
1.	Heart Rate of Wheelchair Basketball Players.	70.00	8.4982	.963
2.	Heart Rate of Wheelchair Lawn Tennis Players	66.90	5.6065	

t.05 (18)=1.734 Level of significance=0.05

Table -3 shows that no significant difference was found between Heart Rate before game of Wheelchair Basketball and Lawn Tennis Players, as they obtained 't' value (0.963) was below the table value (1.734) required for the 't'-ratio to be significant at 0.05 level of confidence with 18 degree of freedom.

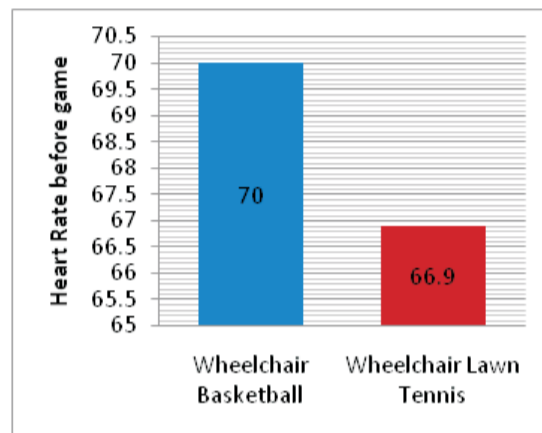


Fig-3 Mean score of Heart Rate before the game of Wheelchair Basketball and Lawn Tennis Players.

Table-4 Mean Difference of Wheelchair Basketball and Lawn Tennis Players on Heart Rate after Game

S.No.	Variables	Mean	S.D	't'ratio
1.	Heart Rate of Wheelchair Basketball Players.	83.50	6.8516	.034
2.	Heart Rate of Wheelchair Lawn Tennis Players	83.40	6.2928	

$t_{.05(18)}=1.734$ Level of significance = 0.05

Table -4 shows that no significant difference was found between Heart Rate after game of Wheelchair Basketball and Lawn Tennis Players, as they obtained 't' value (0.34) was below the table value (1.734) required for the 't'-ratio to be significant at 0.05 level of confidence with 18 degree of freedom.

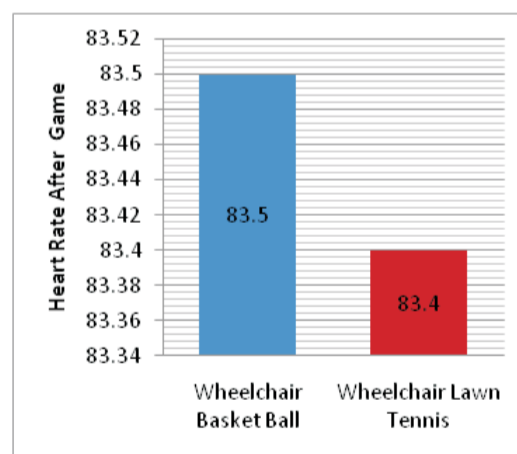


Fig-4 Mean score of Heart Rate after game of Wheelchair Basketball and Wheelchair Lawn Tennis Players.

CONCLUSION

Within the limitations of the present study, the conclusion was drawn from the study:

The consequence of the study showed that there was no critical difference exists in Vital Capacity (579.00 ± 90.00 v/s 576.00 ± 60.00), Heart rate before the game (70.00 ± 14.00 v/s 66.90 ± 16.00), & Heart rate after the game (83.50 ± 24 v/s 83.40 ± 19.00) among the Wheelchair Basketball and Lawn Tennis players. There was important contrast in Body Mass Index (BMI) (25.51 ± 7.67 v/s 28.78 ± 7.12) of Wheelchair Lawn Tennis players. BMI was found higher of Wheelchair Lawn Tennis players when compared with the Wheelchair Basketball Players.

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