Notational Analysis Of Wheelchair Women's Badminton Matches In The International Badminton Tournament

Erdal TAŞGIN[1A], Senay LEYLA[2B], Muhammet BASTEM[2C], Ali Salah ZAYNL ABDEIN[2D], Metin ÖZLÜ[1E], Fatih YILMAZ[2F], Özlem BAĞIŞ[2G], Ela ATAY[2H]

[1] Selcuk University Faculty of Sports Sciences, Campus / KONYA
[2] Selçuk University Institute of Health Sciences, Campus / KONYA

Address Correspondence to E. Taşgın: e-mail:erdaltasgin@selcuk.edu.tr

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A:Orcid ID: 0000-0001-9640-295X -B: 0000-0002-8952-6900-C: 0000-0002-5979-6854-D: 0000-0002-5807-6150

E:Orcid ID: 0000-0002-1657-4717- F: 0000-0001-8012-158X -G: 0000-0002-7365-3921-H: 0000-0003-4836-8683

Abstract

Badminton, which can be played in all age groups for competition and recreation in the world, is the fastest racket sport and has taken its place in international tournaments. In this study, it was aimed to examine the competition performance of wheelchair women Badminton players participating in international competitions. The national team badminton in 19 wheelchair categories with disabilities from 17 countries participating in the 4th International Enes Cup Badminton Tournament with an average age of 36.66 ± 4.88, average height 1.68 ± 0.04, body weight average 59 ± 6.44 athlete (Russia, Japan, Thailand, France, Spain, Malaysia and Turkey) participated on a voluntary basis, Analysis studies were carried out on 7 single women's competitions. As a result of the study, it was determined that the most common type of shots in 1527 strokes performed by wheelchair single female badminton athletes was Clear and the least used stroke was Drive. (p<0.05). It was determined that the most striking region was the back and middle region among the 1519 hit areas performed by the athletes, while the game winning region was the front region with the highest number of 14.94% and the middle region with at least 4.17%. The game-losing hit zone, which is the game-hit hit zone, from 174 athletes performed by the athletes was analyzed as 174 hit-zone, and the game-losing hit zone was analyzed (P <0.05). It was determined that the game losing region was the frontal and at least the middle region with 74 of the most. It was determined that the athletes made a maximum of 36.82% back line error and at least 9.95% a side line error. As a result of the research, it was concluded that the athletes preferred the Clear stroke, the reason for this was the control of the game in wheelchair badminton players, the time saving in the chair control among rallies, and therefore the ethics of preference clear technique, which is a guaranteed hit.

Keywords: Wheelchair Badminton, Game Control, Match Performance.

INTRODUCTION

It has been stated that the sport, which plays an active role in every stage of human life in our age, plays an important role for good personality and mental health as well as healthy physical and psychological development, as well as regular physical activities (10,11,22). Badminton is among the most popular and fastest racket sports in the world that can be easily played in all age groups (21, 26, 24). Badminton has become a fast-paced and competitive sport, played enthusiastically by

Erdal TASGIN Orcid ID: 0000-0001-9640-295X/ Senay LEYLA Orcid ID: 0000-0002-8952-6900-/Muhammet BASTEM Orcid ID: 0000-0002-5979-6854
Ali Salah ZAYNL ABDEIN Orcid ID: 0000-0002-5807-6150 /Metin ÖZLÜ Orcid ID: 0000-0002-1657-4717/ Fatih YILMAZ Orcid ID : 0000-0001-8012-158X
Özlem BAGIS Orcid ID:: 0000-0002-7365-3921/Ela ATAY Orcid ID: 0000-0003-4836-8683

millions of people worldwide. Today, Badminton is an Olympic sports branch (4), organized in national and international associations to which 180 nations belong (15) and as of 2016, more than 100 million licensed athletes worldwide. Badminton sport, whose main country is England, has been played according to fixed rules since 1872, after British colonists recognized this decline game in India (15). For the first time, it started with a very small number of athletes in England's Stoke Mandevilla Center in 1995, primarily for the rehabilitation of war veterans who were disabled after the Second World War. Nowadays, participation is rapidly increasing in terms of both athletes and countries (23). Performance analysis (PA) refers to the process of recording and analyzing athletes' performance during training and competition, focusing on providing objective data that inform and support the coaching process (12). Statistical sports competitor analysis methods are successfully used by professional sports franchises in many countries. (16). The main goal of sports coaches and athletes is constantly looking for new analysis methods in training practices in order to win as many competitions as possible and competitive advantage (13,20). Competition analysis is very useful in terms of providing usable data to sports science, coaches and athletes in terms of the performance and effects of the athlete (27).

The aim of this research is to evaluate the variety of strokes, stroke frequencies, number-winning, number-losing strokes, match performance, match times, rest times, sets between strokes and scored regions of international wheelchair national badminton players.

MATERIAL METHOD

Badminton national team with 17 disabilities from 17 countries, with an average age of 36.66 ± 4.88, height average 1.68 ± 0.04, body weight average 59 ± 6.44 participating in the International 4th Enes Cup Badminton Tournament. the tournament was attended by athletes (6 Russia, 5 in Japan, four in Thailand, one in France, one in Spain, one in Malaysia and one Turkey) 6 handicapped wheelchair national badminton athletes have shown a willingness to study and 7 were carried out analyzes on a single women' competition. Demographic (age, height and weight) of the athletes participating in the research were examined with a personal information form.

The competitions are placed in the back areas of the court with the help of two cameras, all the competitions are recorded and the total number of strokes of the athletes (Clear, Drive, Smaç, Drop, Lift, Block, as well as Forehand, Backhand as a service shot) and the total stroke type and Total match areas, numerical distribution of game-winning strokes and game-losing strokes, game-winning and game-losing and hit regions were analyzed with notational method over the records by watching 7 match videos.

Statistical Analysis

The data obtained at the end of the study were evaluated using Statistical Package for Social Science (SPSS) 22.00 statistics program. One-Way Anova analysis was used for the general average of the data obtained from the competitions ($p > 0.05$).

RESULTS

Table 1. Descriptive Statistics on the Wheelchair Badminton Players Participating in the Research.

Variables	N	Number of Matches	Mean	SD
Age	6	7	36.66	4.88
Height	6	7	1.68	0.04
Weight	6	7	59	6.44

When Table 1 is examined, the average age of the badminton athletes with physical disabilities participating in the study was 36.66 ± 4.88 years, the average height was 1.68 ± 0.04 meters, and the body weight averages were 59 ± 6.44 kg.

Table 2. Numerical Distribution of Total Hit and Number of Athletes.

Stroke Types	Number	Percentage (%)
Clear	509	33.33
Lift (Lob)	238	15.59
Drop	224	14.67
Forehand Service	211	13.82
Block	161	10.54
Backhand Service	133	8.71
Smash	35	2.29
Drive	16	1.05
Total	1527	100.00

When Table 2 is examined, the most frequent strokes performed in 1527 strokes performed by wheelchair single female badminton athletes are 33.33% (509 pieces), the most clear and the least strokes type is 1.05% (16 pieces) determined.

Erdal TASGIN Orcid ID: 0000-0001-9640-295X/ Senay LEYLA Orcid ID: 0000-0002-8952-6900-/Muhammet BASTEM Orcid ID: 0000-0002-5979-6854
Ali Salah ZAYNL ABDEIN Orcid ID: 0000-0002-5807-6150 /Metin ÖZLÜ Orcid ID: 0000-0002-1657-4717/ Fatih YILMAZ Orcid ID : 0000-0001-8012-158X
Özlem BAGIS Orcid ID:: 0000-0002-7365-3921/Ela ATAY Orcid ID: 0000-0003-4836-8683

Table 3. Numerical Distribution of Total Strike Zones of Athletes.

Hit Zones	Number	Percentage (%)
Back	805	53.00
Front	522	34.36
Middle	192	12.64
Total	1519	100.0

When Table 3 is analyzed, it was determined that the most frequent hitting region in the 1519 hitting region performed by wheelchair single female badminton athletes was the back region with 53.00% (805 pieces) and the middle region with 12.64% (192 pieces).

Table 4. The Ratio of Athletes' Game Winning Strike Zones to Total Hit Zones.

Stroke Types	Game Winner Hit Zones (A)	Total Hit Zone (B)	Percentage of A / B (%)
Front	78	522	14.94
Back	88	805	10.93
Middle	8	192	4.17
Total	174	1519	11.45

When Table 4 is analyzed, it is determined that the game-winning region is the front region with the highest number of 78 (14.94%) and the middle region with the least 8 (4.17%). The hit zone, which won the game from the 1519 hit zone performed by the athletes, was analyzed as a total of 174 hit zones (11.45%).

Table 5. The Ratio of Athletes' Losing Strike Zones to Total Hit Zones.

Stroke Types	Game Winner Hit Zones (A)	Total Hit Zone (B)	Percentage of A / B (%)
Front	74	522	14.18
Back	82	805	10.19
Middle	14	192	7.29
Total	170	1519	11.19

When Table 5 is examined, it was determined that the game losing region is the most 74 (14.18) and the front and at least 14 (7.29%) middle regions. Losing the game from the 1519 hit zone, performed by the athletes, was analyzed as 170 hit zone (11.19%).

Table 6. Numerical Distribution of the Errors Athletes Make in the Match.

Types of Errors	Number of Errors	Percent (%)
Backline Error	74	36.82
File Error	39	19.40
Frontline Error	36	17.91
Service Error	32	15.92
Sideline Error	20	9.95
Total	201	100.00

When Table 6. is examined, it was determined that a total of 201 errors were made. It was determined that most of the athletes made 74 (36.82%) back line errors and at least 20 (9.95%) sideline errors.

Table 7. 22 Average of the Minimum and Maximum Rally Times of the Match.

	Total	Mean
Rally Time	27 min. 35 sec.	5 sec. 5 sp-sec.
Minimum Rally Time	5 sec. 11 sp-sec.	1 sec.
Maximum Rally Time	99 sec. 42 sp-sec.	19 sec. 9 sp-sec.
min: minute, sec: second, sp-sec: split-second		

When Table 7 is analyzed, the average rally time of 7 matches is 5 seconds and the average minimum rally time is 1 second and the average maximum rally time is 19 seconds and 9 seconds.

DISCUSSION AND CONCLUSION

In the last thirty years, while many institutions have been implementing a structured analysis process to gain a competitive advantage, it has been stated that sports performance analyzes started to be applied mostly in the early 2000s (7). Competition analyzes are important tools that collect information about the actions performed, contribute to the evaluation of this information and to organize training programs, and determine the changes in the performance of the players individually (5,9). The main purpose of this study is to analyze the match performance and stroke variety of international wheelchair women badminton players by region. In many studies, sufficient analysis studies regarding wheelchair badminton athletes have not been found. The average age of the physically disabled badminton athletes participating in the study was 36.66 ± 4.88 years, their average height was 1.68 ± 0.04 meters and their body weight averages were 59 ± 6.44 kg (Table 1). When other studies are examined, it can be assumed that the average age is high, because of the absence of a certain age category, participation of athletes of all ages and accidents at an advanced age (19, 18).

Erdal TASGIN Orcid ID: 0000-0001-9640-295X/ Senay LEYLA Orcid ID: 0000-0002-8952-6900-/Muhammet BASTEM Orcid ID: 0000-0002-5979-6854
Ali Salah ZAYNL ABDEIN Orcid ID: 0000-0002-5807-6150 /Metin ÖZLÜ Orcid ID: 0000-0002-1657-4717/ Fatih YILMAZ Orcid ID : 0000-0001-8012-158X
Özlem BAGIS Orcid ID:: 0000-0002-7365-3921/Ela ATAY Orcid ID: 0000-0003-4836-8683

Among the 1527 strokes performed by wheelchair single female badminton athletes, it was determined that the most used shot type was 33.33% (509 pieces), and the least shot type was 1.05% (16 pieces). In the studies conducted with badminton players without physical disabilities, the lift type of 221% of the most preferred strokes of athletes in the total of 2071 strokes made by athletes in single female under 15 years of badminton competitions (27) is the lift, smash, respectively, of the first three strokes most preferred by female athletes. and clear hit, and male athletes have been reported to have net drop, lift and drive hit (17). Considering the preferred stroke types, it can be stated that other strokes that men and women generally prefer lift strokes show due to gender factor. The fact that wheelchair badminton players do not prefer the lift stroke is primarily because the strokes made on the front line are risky, but the clear shot on the front area of the field is a more guaranteed and controlled stroke. In the study conducted by Ming et al (2008), it was seen that the most preferred stroke was Clear and paralleled with the research conducted.

It was determined that the most frequent hitting region in the 1519 hitting zone performed by wheelchair single female badminton athletes was the back region with 53.00% and the middle region with 12.64% (Table 3). In different studies, it has been reported that in single-woman competitions under the age of 15, the beats are mostly performed from the front area of the court, 41.28% and from the back and middle court areas respectively (27). The reason for the different results of the research was thought to be due to the high rate of Clear playing of the athletes with disabilities and the impact of the chair equipment used by them.

It was determined that the game-winning region was the frontal region with 14.94% and at least the middle region with 4.17% (Table 4). The hit zone, which won the game from the 1519 hit zone performed by the athletes, was analyzed as 174 hit zone (11.45%) in total. In other different studies, it was reported that a total of 385 strokes in game play were performed in front of the net and 85 strokes at different levels were 22.0%, 230 strokes in the middle area were 59.8%, and 70.2% strokes in the back area, and the scoring strokes were mostly from the middle area, front court and Finally, it was determined that it was being made from the back court (17). In the wheelchair badmintoists, since a similar analysis was not available in the literature,

no parallelism or opposite opinion was revealed with the research conducted.

In the study, it was determined that the game losing region was the front region with 14.18% at most and the middle region with at least 7.29%. A total of 170 hit zones that lost the game from the 1519 hit zone performed by the athletes were analyzed as 11.19%. In other studies, it has been reported that the ratio of the error occurrence regions to the total number of false strokes in the game-losing hits is the highest occurrence at the front region with 51.7% (27). In another study conducted on similar age groups, it can be said that the strokes made with simple errors mostly occur in the file (front) region (14) and are in parallel with the findings of the research.

It can be said that the athletes made a maximum of 36.82% back line error and at least 9.95% a side line, a total of 201 line errors (Table 6), and the number of errors was high due to the excessive use of the Clear stroke technique. In a different study conducted on 17-year-old national badminton players, it was analyzed that the area with the most mistakes was the frontal court (8,87 ± 1,34) region (8). It has been reported that the error occurrence areas of the strokes performed by athletes in single women under the age of 15 were the most common with 169 errors (51.7%) (27). However, since badminton playing in a wheelchair is not included in the front court area of athletes, there is no similarity with these studies in this sense.

Considering the different studies on rally times, 20 single men without disabilities found that the average rally time was 9 seconds in the Beijing Olympics and 10.4 seconds in the London Olympics. In addition, in another study conducted with athletes without disabilities, the average rally time of 20 single boys matches was reported to be 9 seconds in Sets 1 and 2 (Abian et al 2013) and is in line with the research conducted (Table 7). In the study conducted in the 2015 World Championship, the average rally time was found to be 10.033 for men and 12.061 seconds for women (25) and different results were obtained with the research conducted (Table 7). From this point of view, it is thought that the current studies are not on individuals with disabilities, causing the difference in the average rally time.

It can be said that the results to be revealed through the trainers and analysts who attended

Erdal TASGIN Orcid ID: 0000-0001-9640-295X/ Senay LEYLA Orcid ID: 0000-0002-8952-6900-/Muhammet BASTEM Orcid ID: 0000-0002-5979-6854
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more analysis training in the pre-season period will be effective in directing the athletes and also minimizing the error rate. When the results of the research are evaluated, it is recommended to diversify the research in terms of how the training programs organized by Badminton teams are reflected in the competition and their effects.

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