EVALUATION OF WHEELCHAIR BASKETBALL SKILL PERFORMANCE OF WHEELCHAIR BASKETBALL PLAYERS IN DIFFERENT GAME POSITIONS

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ABSTRACT

In wheelchair basketball the evaluation of the quality of disabled players' movement, motion and action variety, sensomotoric, intelectual, social interaction skills, coordinative and physical abilities besides the natural tests (Brasile, 1986), quantitative and qualitative play results (technical actions carried out by a player during a game and during a minute of a game) are considered to be objective and informative.

The aim of the research was to state and evaluate the playing skills of wheelchair basketball players in different game positions (a playmaker, a forward, a center) in official competitions. The play of 32 baketball players was under research. Aiming to analyse playing results of wheelchair basketball players in different game positions 20 games were video recorded by camera "Panasonic NV-GS27". The following actions of the players (playmakers, forwards, centers) with different functions in the team were recorded: playing time, passing, dribbling, shooting and its efficiency, rebounding and other important technical actions characterizing the activity of the players during the game.

The integral preparation, ability to play, the playing quality were evaluated according to the methods of D. Byrnes and B. Hendrick (1994), giving high or low marks for each action. Results showed that centers were the most active ones, carrying out on average 2.5 actions per minute (forwards — 2.1, playmakers — 1.2), shooting 16 times per game (forwards — 7.7, playmakers — 5). The most universal players were also the centers, their passing and dribbling actions making up 25%, shooting actions — 20% of all the movements. The most accurate main technical actions were carried out by the centers: their shooting accuracy was 36% (that of wing players and playmakers being 30%). Centers' integral qualification and playing skills (according to the methods used) were the highest rated + 42 points.

Quantitative and qualitative playing results and the results of integral preparation of wheelchair basketball players in center position were significantly better than those of the playmakers and forwards.

Keywords: *wheelchair basketball, quantitative and qualitative playing results, integral qualification, player's game positions.*

INTRODUCTION

Wheelchair basketball is a sport game with a ball, adapted to disabled people that are physically handicapped. It was introduced in the USA in 1949. After World War II it was used as a form of integration, socialization and rehabilitation of disabled people. In 1960 the game became popular in many countries all over the world. Now wheelchair basketball is used and known as a form of adapted physical activity and sport for people with physical disabilities and helps to improve their physical state, makes the socialization process more effective.

The quality of basketball actions and ability to play basketball can be specified using both the field test data and a total sum of actions carried out by the team during the game (Stonkus, 2001; Skučas, Stonkus, 2002).

The complex structure of ability to practise technical actions and their units, ability to play are influenced by factors such as sensomotoric,

intelectual, social interaction skills, coordination and team abilities. Abilities and skills of the basketball players are characterized by quantitative and qualitative results of the players during the game, while dynamics of the results is specified by playing tendencies (Stonkus, 2001).

In order to determine and evaluate the quality of the movements, the variety of actions, sensomotoric, intelectual, social interaction skills, the coordination and physical abilities of disabled athletes playing wheelchair basketball it is recommended to collect not only natural (Walandewijck et al., 1999; Molik, Kosmol, 2003; Brunelli et al., 2006) test data, but also the data of qualitative and quantitative play results, which are achieved by players during the game and in 1 minute of the game (Hedrick et al., 1994; Molik, Kosmol, 2001; Walandewijck et al., 2003).

In order to better understand the main features of wheelchair basketball it is necessary to take into account objective quantitative and qualitative playing results of the players during the competitions. On this point of view there are important studies about the type of the player's actions in different playing positions during the team game (playmakers, wings, center forwards).

Research and conclusions of this kind have never been described in scientific literature. In this respect the research is new and relevant.

The aim of the research was to state and evaluate the playing skills of wheelchair basketball players in different game positions (a playmaker, a forward, a center) in official competitions.

RESEARCH METHODS AND ORGANIZATION

The play of 32 baketball players was under research. Aiming to analyse the playing results of wheelchair basketball players in different game positions 20 games were video recorded by camera "Panasonic NV-GS27". The mean age of the players was 31.24 years. All the players participating in the current study had at least five and more years of experience playing wheelchair basketball on the national and international level. The players were divided into three groups according to their playing position during the game: playmakers — 9, forwards — 11, centers — 12. Also the best players of each group were recorded. The research was carried out in 2006 during the Lithuanian Wheelchair Basketball Championship (6 games) and international tournaments in Lithuania and Poland (14 games).

The basic movements of the game were recorded. According to D. Byrnes and B. Hendrick (1994) methodology the following actions of the players (playmakers, forwards, centers) with different functions in the team were recorded in a special protocol: playing time, passing, dribbling, shooting and its efficiency, rebounding and other important technical actions characterizing the activity of the players during the game.

The integral qualification, ability to play, the playing quality were evaluated according to the methods of D. Byrnes and B. Hendrick (1994), giving high or low marks for each action:

1. Back picks + 4
2. 2-point field goals made +5
3. 2-point field goals missed –3
4. 3-point field goals made +6
5. 3-point field goals missed –4
6. Foul goals made +4
7. Foul goals missed –2
8. Offence rebounds +4
9. Defensive rebounds +4
10. Personal fouls –2
11. Assists +5
12. Turnovers –6
13. Bloked shots +5
14. Steals +5
15. Forced turnovers on defence +6
16. Technical fouls –10

The results of the research were analysed using the SPSS 12.0 program package. One-way analysis of variance (ANOVA) was used to compare the results of the players of different playing positions and groups. Newman-Keul's analysis was used for post-hoc comparisons. The level of $p < 0.05$ was considered as significant.

RESULTS

On average playmakers (n = 9) played 32 min. per game, made 37 actions in a game and 1.2 action in one minute of the game (as shown in the Table). The largest part of the technical actions were passings — 33%, dribbling — 21%, shootings — 16% (as shown in the Figure). 2-point shooting accuracy was 30%, fouls shooting accurancy was 25%.

The best playmaker made 80 actions in a game and 2.2 action in 1 game minute. 29% of actions were dribbling 27% — passing and 15% — shootings. Shooting accuracy was 33%, fouls shooting 33%, scored on average 9 points in a game.

Table. **The playing results of wheelchair basketball players in different game positions**

Actions			Playmakers		Forwards		Center forwards	
			$\overline{X}$	The best	$\overline{X}$	The best	$\overline{X}$	The best
Time played, min			32	40	33	37	33	40
Passing			13 ± 2.3	23	15 ± 1.8	23	20* ± 2.7	28
Dribbling			9 ± 1.6	25	10 ± 2.4	19	20* ± 2.8	29
Shooting	Short distance	Made shots	6	10	7	13	15	18
		Scored	1.6	4.75	2.2	5.5	5.6	8.3
		Accuracy, %	30	33	31	42	37	39
	Long distance	Made shots	0	0	0,7	1	1	1
		Scored	0	0	0.1	0.5	0.25	0.3
		Accuracy, %	0	0	14	50	40	33
	Total	Made shots	5	13	7.7	14	16	19
		Scored	1.5	4.3	2.3	6	5.85	6.6
		Accuracy, %	30	33	30	42	36	39
Free shots		Made shots	1	2	1	3	2	0
		Scored	0.25	0	0.3	1.25	0.8	0
		Accuracy, %	25	0	33	42	40	0
Scored points			3	9	5	14	13	18
Rebounds			2	4	4	6	9	9
Personal fouls			1	1	2	2	1	2
Assists			2	4	1	2	1	3
Technical faults			2	4	2	4	4	5
Blocked shots			0	0	0	0	1	1
Steals			1	2	1	3	2	3
Picks			3	5	2	2	2	4
Forced turnovers on defence			1	3	0	1	1	1
Total actions made			37 ± 3.6	80	42 ± 4.2	79	74* ± 4.6	104
During 1 game minute			1.2	2.2	1.4	2.1	2.5	2.8
Real amount per 40 min			49	88	56	85	100	112

Note. * — $p < 0.05$ significant diferences among center forwards and other groups.

The forwards played 33 minutes per game, made 42 actions in a game and 1.4 action in 1 game minute. Passings made up 33%, dribbling — 22%, shootings — 17% of the actions. Their shooting accuracy was 30%, and they scored 5 points in a game.

The results of the best forward were significantly better than an average mean. The best athlete played 37 minutes during the game, made 79 actions (2.1 in 1 game minute). 29% of the actions were passing, dribbling — 24%, shootings — 18%. Very good shooting accuracy was 42%, 14 points scored during the game (shown in the Figure and the Table).

The centers played 33 minutes during the game on the average and made 74 actions per game (2.5 in 1 game minute). Passing and dribbling were 25%, shootings — 20% of all the actions. Their shooting accuracy was 36%, and they scored 13 points per game on the average.

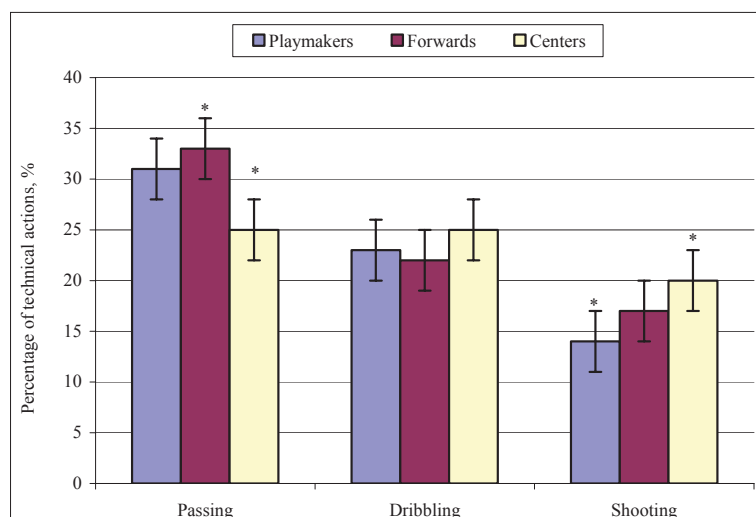On the average the best center played 36 minutes per game, made 102 actions (2.8 during 1 played minute). Passing was 27%, dribbling — 28% and shootings — 17%. Shooting accuracy was 39%, on the average 14 points were scored per game.

DISCUSSION

According to the wheelchair basketball rules each team has to consist of players with different level of impairment because of limited total point number of the players in the field during the game (Coubariaux, 1994). According to the international rules the total point limit is 14 points. Because of that all players with different number of classification points have different functions in the field during the game. Playmakers are usually 1—1.5 point players, forwards are 3—4 point players, centers — 4—4.5 point players (Dewell, 2001).

The results of our research revealed the fact that the most active players were centers carrying out on the average 2.5 actions per minute played

Figure. **Average results of technical actions of the players in different playing positions during the game**

Note. * — p < 0.05 significant differences among groups.

(the greatest number was 2.8). The next were forwards carrying out 2.1 actions a minute, and playmakers carrying out 2.1 actions per minute (as shown in the Table).

Comparing the quantitative results of running basketball and wheelchair basketball players in different game positions, quite a different situation is observed: the most active players in basketball are playmakers, carrying out 3.4—4 actions per minute, the next active are forwards — 3.8 and centers — 2.4—2.7 actions per 1 played minute (Stonkus, 2001).

The most active wheelchair basketball players under the research were 4—4.5 point centers with minimal impairments. They were the best team players, fast in a wheelchair and able to perform different movements quickly.

According to the research results, the most universal players were also centers, their passing and dribbling actions being 25%, shooting actions — 20% of all the movements analyzed (as shown in the Figure). The most significant action in the play of playmakers and wings was passing (31% and 33%), shooting being significantly worse (14% and 17%).

The action percentage of able-bodied players were the following: playmakers — passing 43%, dribbling 33%, shooting — 11%. Forwards made 41%, 30% and 13% of the actions, centers — 31%, 21% and 13—20% (Stonkus, 2001).

The function of wheelchair basketball playmakers and forwards is to make picks to help centers move closer to the basket or to pass to score. A small number of shootings made by playmakers can be explained by not having enough technical and tactical preparation.

The qualitative playing results of centers were the best: shooting accuracy — 36% (the best 39%), foul shooting accuracy — 40%. The lowest number of technical faults was produced by playmakers and forwards. The best qualitative results of the center forwards can be explained by the fact that centers are tall, and most of them adjusted their wheelchairs to the highest sitting position, thus making it difficult to stop them shooting and scoring. Besides, center forwards usually have minimal impairment, their sitting position is good and stable at the shooting moment.

The results of integral preparation, ability to play (according to D. Byrnes and B. Hendric, 1994 method) of wheelchair basketball players in different game positions were the following:

playmakers +13 (the best +52);
forwards +18 (the best +45);
centers +42 (the best +63).

These data were similar to the results of other studies (Skučas, Stonkus, 2002) about game analyses of wheelchair basketball players in different playing positions.

Influenced by the factors mentioned above the results of integral preparation of the wheelchair basketball center players were significantly better than those of the playmakers and forwards.

CONCLUSIONS

1. Center players were the most universal, active, and they carried out most accurate main technical actions.
2. Centers' integral preparation and playing skills were rated the highest in comparison with these values of forwards and playmakers.
3. The best players of each playing position showed similar playing skills and they were better than the average mean.

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SKIRTINGO AMPLUA VEŽIMĖLIŲ KREPŠINIO ŽAIDĖJŲ ŽAIDIMO ĮGŪDŽIŲ RODIKLIAI

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SANTRAUKA

Žaidžiant vežimėlių krepšinį, neįgaliųjų judėjimo kokybei ir judesių, veiksmų įvairovei, sensomotoriniams, intelektiniams, socialiesiems interakciniams mokėjimams, koordinaciniams ir fiziniams gebėjimams nustatyti ir įvertinti be natūraliųjų testų (Brasile, 1986; Walandewijck, Dady, Theisen, 1999) rodiklių, objektyvūs ir informatyvūs yra kiekybiniai bei kokybiniai žaidimo rodikliai — technikos veiksmai, kuriuos atlieka žaidėjai per vienerias rungtynes ir vieną žaistą minutę (Hedrick et al., 1994 ir kt.).

Norint geriau suprasti vežimėlių krepšinį, jo požymius, būtini objektyvūs kiekybiniai ir kokybiniai varžybų rodikliai, atskleidžiantys įvairias komandos žaidėjo (įžaidėjo, krašto, vidurio puolėjo) funkcijas, jų veiklos pobūdį. Tyrimų, kurių metu būtų nustatomi ir įvertinami įvairias funkcijas komandoje atliekantys vežimėlių krepšinio žaidėjai, aptikti nepavyko.

Tyrimo tikslas — nustatyti ir įvertinti įvairių amplua vežimėlių krepšinio žaidėjų (įžaidėjų, krašto, vidurio puolėjų) žaidimo rodiklius oficialiose varžybose. Šiuo tikslu skaitmenine vaizdo kamera „Panasonic NV-GS27" nufilmuotos vežimėlių krepšinio varžybos. Ištirtas 32 žaidėjų žaidimas, nufilmuota 20 rungtynių. Žaidėjų amžius — 31,24 m. Visi tirti žaidėjai turėjo penkerių ir daugiau metų žaidimo stažą nacionaliniu ir tarptautiniu lygiu. Pagal užimamą žaidimo poziciją vežimėlių krepšinio žaidėjai buvo suskirstyti į tris grupes: įžaidėjus (9), krašto puolėjus (11), vidurio puolėjus (12). Taip pat buvo nustatomi geriausi kiekvienos pozicijos žaidėjai. Tyrimas atliktas 2006 m. Lietuvos vežimėlių krepšinio čempionato (6 rungtynių) ir tarptautinių turnyrų (14 rungtynių) Lietuvoje ir Lenkijoje metu. Remiantis D. Byrnes ir B. Hendrick (1994) metodika, specialiuose protokoluose buvo registruojami šie žaidimo veiksmai: žaidimo trukmė, kamuolio perdavimas, varymas, metimas į krepšį ir jo veiksmingumas, kamuolio atkovojimas po krepšiu ir kiti svarbūs žaidėjų aktyvumą apibūdinantys technikos veiksmai. Integralusis parengtumas, gebėjimas žaisti, žaidimo kokybė įvertinta pagal D. Byrnes ir B. Hendrick (1994) metodiką, už atliktus veiksmus skiriant teigiamus ir neigiamus taškus.

Tyrimo rezultatai parodė, kad aktyviausi vežimėlių krepšinio žaidėjai yra vidurio puolėjai, vidutiniškai atliekantys po 2,5 veiksmo per žaistą minutę (krašto puolėjų šis rodiklis — 2,1, įžaidėjų — 1,2), kamuolį į krepšį meta po 16 kartų per rungtynes (krašto puolėjai — po 7,7, įžaidėjai — po 5). Tiksliausiai pagrindinius techninius veiksmus atliko taip pat vidurio puolėjai: jų metimų į krepšį tikslumas — 36% (krašto puolėjų ir įžaidėjų — 30%).

Pagal atliekamų veiksmų įvairovę universaliausi taip pat buvo vidurio puolėjai: jų atliekamų pagrindinių technikos veiksmų sklaida mažiausia — kamuolio perdavimo ir kamuolio varymo veiksmai sudaro 25%, metimai į krepšį — 20% visų atliekamų technikos veiksmų.

Integraliojo parengtumo, gebėjimo žaisti rodikliai (vertinant pagal D. Byrnes ir B. Hendrick metodiką) taip pat geriausi vidurio puolėjų — +44 taškai (krašto puolėjų — +13, įžaidėjų — +11).

Raktažodžiai: vežimėlių krepšinis, kiekybiniai ir kokybiniai žaidimo rodikliai, integralusis parengtumas, žaidėjų amplua.

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