Original Article

Structure and content of competitive activity of 15-17 years old badminton players

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Abstract:
       Rational management of sportsmen training is possible only if is available objective information about the structure and content of a particular competitive sportsmen (team) and comparison of these parameters with model parameters of competitive activity of elite level sportsmen in the respective sports.
Aim of the research is to analyze the content of the indicator of competitive activity of qualified badminton players 15-17 years old.Research of scientific and technical literature on the analysis of competitive activity of badminton players revealed the need for modern scientific research. Summarizing the competitive activity indicators of qualified badminton players from Ukraine 15-17 years old we received the following data: the average number of shuttlecock draws in the game 36,63; the average duration of a game 11,78 min.; clean game time 3,82 min.; the average number of strokes in the game (two players) 246,33; the average number of shuttlecock draws in the match 82,42; the average duration of the match 28,99 min.; average clean match time 8,85 min.; the average number of stroke in the match 277,13 (per player); the average number of strokes in the match 554,25 (two players); average match rate 1.03 strokes per second. Ukrainian badminton players 15-17 years old of sport qualification Master of sport and Candidate for master of sport in single matches most often use next technical actions smash (14,82%); throw back (10,88 %), stand (10,13%); strokes below: in the grid zone – 9,87% and in the back zone – 7,94%; high long strokes – 8,29%; short serve – 8,01%; shortened stroke – 7,59%; high serve – 6,8%. Content analysis of competitive activity of qualified badminton players 15-17 years old and its comparison with the world leading sportsmen shows that badminton becomes more tempo kind of sport and Ukrainian badminton players should pay attention to the use of such technical actions as: high long strokes, sweep, throw back ("candle"), stand, transfer. Changes in the rules of badminton have increased the speed of the game. This requires a correction in the educational, methodological and training process of badminton players.
Key words: structure, content, competitive activity, badminton, sportsmen

Introduction
       Rational management of sportsmen training is possible only if is available objective information about the structure and content of a particular competitive sportsmen (team) and comparison of these parameters with model parameters of competitive activity of elite level sportsmen in the respective sports (Bulatova, 1995; Platonov, 2004; Briskin, 2011, Pityn, 2013).
       The problem of quantitative assessment of technical skills is extremely important to control the training process in sports games. Collection of statistical data about sportsmen game actions directly during the game is very important today. Intensification of game activity shows the needs to find ways to optimize all types of training including technical training. From competent solving of technical actions education problem, gradual and optimal allocation of educational material by years of long-term training systems mostly depends on the quality of technical training and growth of players' sports skills (Sidorov, 2004; Philin, 2000; Yaremko, 1999).
       In badminton important value has the opportunity of determination the effectiveness of technical actions in relation to the intensity of the match (stroke exchange rate). Similar information can be used for immediate correction of a particular match and for modeling of adequate modes of training exercises performance (Zhbankov, 2001; Sidorov, 2004). As noted by Platonov V. N. – sport technique is improving depending on changes in the rules of the competition and refereeing, sports equipment improvement (Podchos, 2006).
       In recent years, a number of changes were held in badminton. In particular, increasing the technical arsenal of strokes in relation of equipment improvement (rackets, shoes); change in movement technics by introduction of synthetic coating; increasing the speed of the match and reduce of errors due to changes in the

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rules of the competition. All this leads to a growing need of detailed analysis of badminton players competitive activity.

One of the first who showed interest to analysis of competitive activity of badminton players was Rybakov D., Shtilman M. (1982), Smirnov I. (1990) and other. In 2001 Zhbankov O., Kupriyanov D., Iliyn Y. (2001) for analysis of competitive activity created a computer information-methodical system "Badminton" which is used directly in the sport hall (during the tournament or training). In studies Sidorov I. P. (2004) analyzed the competitive activity indicators and quantification of technical actions of world leading badminton players. Analysis of technical and tactical actions in final matches in single categories of individual championship of Ukraine in 2006 was made by Davydenko O. and Karpenko A. However, remains the need for analysis of competitive activity of badminton players after the introduction of new rules. Aim of the research is to analyze the content of the indicator of competitive activity of qualified badminton players 15-17 years old.

Research tasks are next: to analyze scientific and methodological literature on the content of competitive activity of badminton players; to create an analysis of competitive activity indicators and study technical arsenal of qualified badminton players 15-17 years old; to compare the indicators of competitive activity and quantitative parameters of evaluation of technical actions of leading world badminton players and qualified badminton players 15-17 years old from Ukraine before and after new rules introduction.

Methods & material
1. Theoretical analysis and synthesis of scientific and methodological literature.
2. Pedagogical observation with video use.
3. Methods of mathematical statistics.

During 2007-2008 we conducted a videography of single matches of young men 15-17 years old with sports qualifications Master of sport and Candidate for master of sport during a series of competitions. In particular, Championships of Ukraine (2007, 2008), Championship of Ukraine U17 and junior (2007), Championship of Ukraine (first league) (2008). Overall was analyzed 12 single match of 24 athletes (20 Master of sport and 4 Candidate for master of sport).

Results and discussion
Badminton is one of Olympic kinds of sports that include competitions in singles, doubles and mixed categories. Highlighted five chronologically successive main stages of the historical development of the sport and its orientation (Podchos, Karatnyk, Pityn, 2006; Shershakov, 1991) (Table 1).

Table 1.Stages of badminton development

Stage	Duration	Content
I	2 000 BC - 1650 year AD	The prototype of badminton. "The game of shuttlecock".
II	1650-1898 years	Formation of the game "Badminton".
III	1898-1972 years	International development of badminton as a sport.
IV	1972-1992 years	The entry of "Badminton" to the Olympic family of sports.
V	1992 − today	Modern development of "Badminton"

Each stage is characterized by objective factors in determination of the structure and content of competitive activity of badminton players. However, the most progressive changes taking place in the last stage (since 1992), which is associated with the inclusion of badminton to the Olympics Games program.

As experts Rybakov D., Shtilman M. (1982), Smirnov Y. (1990) note playing activity of badminton player is going on in this mode: drawing of shuttlecock lasts an average of 10-15 sec (in some cases up to 30-50 sec) service - 7-10 sec. Clean gaming time during the game 3-6 minutes. At 20-70 draws of shuttlecock during the game. At match day that consists of six matches the number drawings can be up to 420; clean playing time in some cases 1 hour - 1 hour 20 min. The heart rate during the game 130-195 beats per minute. One drawing consists of 25-30 strokes. Even if 2/3 of these strokes are aimed at the corners of the court (the length of one court diagonally 8.5 m), during one of the drawing points badminton player runs about 100 m. In a typical calculation this value is nearly 9 km per match (Platonov, 2003; Rybakov, Shtilman, 1982). Sidorov I. P. by analyzing the matches of men's singles category of high class badminton competitions (World Championship, European Championship, Olympic Games, various Cup meeting) that occurred during 1997-2003 identifies the following indicators of competitive activity of world leading badminton players: the average duration of a game – 28,8 min.; clean game time – 7,8 min.; the average number of strokes in the game (per player) – 241,6; the average rate of the match 0,53 strokes per second (Smirnov, 1990). Summarizing the competitive activity indicators of qualified badminton players from Ukraine 15-17 years old we received the following data: the average number of shuttlecock draws in the game 36,63; the average duration of a game 11,78 min.; clean game time 3,82 min.; the average number of strokes in the game (two players) 246,33; the average number of shuttlecock draws in the match 82,42; the average duration of the match 28,99 min.; average clean match time

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8,85 min.; the average number of stroke in the match 277,13 (per player); the average number of strokes in the match 554,25 (two players); average match rate 1.03 strokes per second. Making the comparison of competitive activity indicators we see that Ukrainian sportsmen indicators such as average game duration during the match, the average clean match time, the average number of strokes in the game (per player) is almost twice lower than the world's leading badminton players. As for the rate of the game we found quicker game of badminton players from Ukraine. The difference between indicators of the speed of the game we explain with the fact that the results of the world leading sportsmen were made in the 1997-2003 years and our in 2007-2008 years to which undoubtedly influenced changes in competition rules in badminton in 2006 which led to a reduction of the total time of the match and increased its intensity (Table 2).

Table 2. Competitive activity indicators of world leading badminton players and qualified badminton players of Ukraine

№	Competitive activity indicators	By data of Sidorov I.P.	By our data
1.	Average duration of a game (min.)	28,8	11,8
2.	Clean game time (min.)	7,8	3,8
3.	Average number of strokes in the game (per player)	241,6	123,2
4.	Average match rate (strokes per second)	0,53	1,03

The content of qualified sportsmen competitive activity in badminton is defined by technical and tactical actions that are used by them during the game. Analysis of competitive activity gave us the opportunity to identify the significant components of competitive activity of badminton players. They included serve, strokes when playing top (high, shortened, cut, smash) strokes in the game below (on a grid, high, flat), flat strokes, strokes when playing in grid zone (throw back, stand, finishing moves, sweep, transfer). In studies of Sidorov I. P. (2004) was conducted quantitative assessment of technical actions of world leading badminton players (% of the average number of strokes in the game 241,6). We analyzed matches of men's singles category of high class badminton competitions (World Championship, European Championship, Olympic Games, various Cup meeting) that took place during 1997-2003. According to this author were received the following results: the largest number of strokes are such technical actions throw back from the grid by open and closed sides of the racket (respectively 9,6 and 10,8%); smash 10,3%; about the same percentage (from 7,2% to 7,6%) have the following technical actions: short serve (which was performed mostly by the closed side); high stroke on a high trajectory; shortened stroke; stand on the grid.

During our research in determining the average value of technical actions, which are used in single games by qualified badminton players of Ukraine 15-17 years old we received the following results: the largest number of strokes has smash (14,82%); throw back and stand respectively 10,88% and 10,13%; strokes below: in the grid zone – 9,87% and in the back zone – 7,94%; high long strokes – 8,29%; short serve – 8,01%; shortened stroke – 7,59%; high serve – 6,8% (Figure).
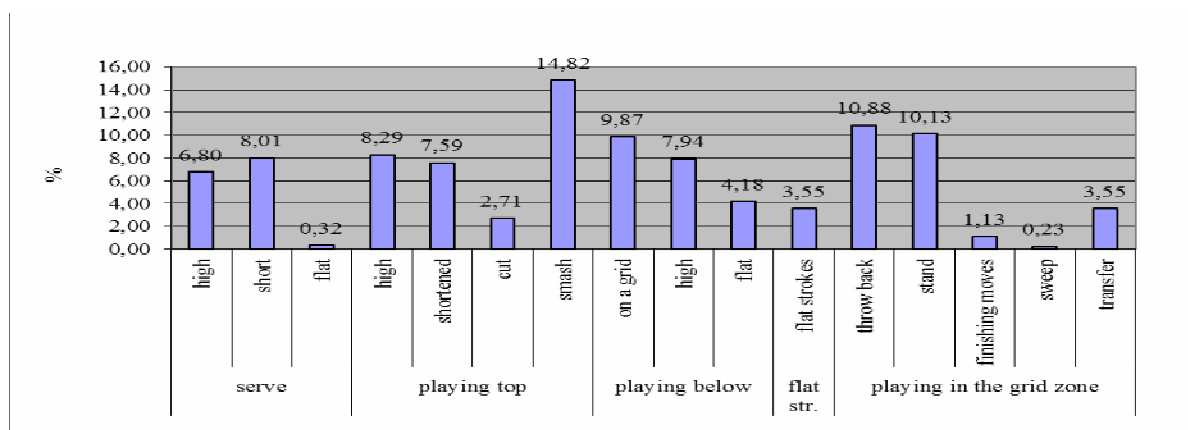

Fig.1. Average value of technical actions (%) of qualified badminton players of Ukraine 15-17 years old (n=24) in single matches

During comparison of quantitative indicators of technical actions evaluation were identified differences when using shortened stroke and short serve among world leading players and qualified players in Ukraine. World leading players more often use in comparison with Ukrainian players such technical actions: high strokes when playing top (10,3% and 8,29%); sweep (4,5% with 2,71%); throw back (20,4% with 10,88%); stand (14,5% with 10,13%); transfer along the grid (5,1% with 3,55%). In turn, Ukrainian badminton players more often use such technical actions: high serve (6,8% with 4,3%); smash (14,82% with 10,3%); high strokes in the game below (7,94% with 1,5%); flat strokes in the game below (4,18% with 0,6%) (Table 3).

Table 3. Quantitative evaluation of technical actions of world leading badminton players and qualified badminton players of Ukraine (% of total amount of strokes)

%	Serve			Playing top				Playing below			Flat strokes	Playing in the grid zone				
	high	short.	flat	high	shortened	cut	smash	on a grid	high	flat		throw back	stand	finishing moves	sweep	transfer
By data of Sidorov I.P.	4,3	7,2	0,04	10,3	7,6	4,5	10,3	7,9	1,5	0,6	3,1	20,4	14,5	1,4	0,13	5,1
By our data	6,8	8,005	0,32	8,29	7,59	2,71	14,82	9,87	7,94	4,18	3,55	10,88	10,13	1,13	0,23	3,55

Conclusion

Research of scientific and technical literature on the analysis of competitive activity of badminton players revealed the need for modern scientific research.

Indicators of competitive activity of qualified badminton players from Ukraine 15-17 years old we received the following data: the average number of shuttlecock draws in the game 36,63; the average duration of a game 11,78 min.; clean game time 3,82 min.; the average number of strokes in the game (two players) 246,33; the average number of shuttlecock draws in the match 82,42; the average duration of the match 28,99 min.; average clean match time 8,85 min.; the average number of stroke in the match 277,13 (per player); the average number of strokes in the match 554,25 (two players); average match rate 1.03 strokes per second. Ukrainian badminton players 15-17 years old of sport qualification Master of sport and Candidate for master of sport in single matches most often use next technical actions smash (14,82%); throw back (10,88 %), stand (10,13%); strokes below: in the grid zone – 9,87% and in the back zone – 7,94%; high long strokes – 8,29%; short serve – 8,01%; shortened stroke – 7,59%; high serve – 6,8%. Content analysis of competitive activity of qualified badminton players 15-17 years old and its comparison with the world leading sportsmen shows that badminton becomes more tempo kind of sport and Ukrainian badminton players should pay attention to the use of such technical actions as: high long strokes, sweep, throw back ("candle"), stand, transfer. Changes in the rules of badminton have increased the speed of the game. This requires a correction in the educational, methodological and training process of badminton players. Prospects for further research are to analyze the relationship between speed-strength training and competitive activity of qualified badminton players.

References

Briskin Y, Pityn M., Antonov S. (2011) Indicators of special training of highly skilled archers in pre mesocycle. *Journal of Physical Education and Sport*, 11(3), pp. 336 – 341.
Bulatova M. (1995) *Sportsmen physical training*. Olympic literature
Championship of Ukraine in single category 2006. Analysis of technical and tactical actions in final matches [Electronic resource] – Access: http://www.badminton.kiev.ua/tournament/2006/02/chukr/ttd.htm
Philin V. (2000) *Basics of youth sport*. Physical education and sport.
Pityn M., Briskin Y., Zadorozhna O. (2013) Features of theoretical training in combative sports. *Journal of Physical Education and Sport*, 13(2), pp. 195−198.
Platonov V. (2004) *System of sportsmen training in Olympic sport. General theory and practice*. Olympic literature
Platonov V., Drukov V. (2003) Organizational and methodological principles of high qualified sportsmen training in Olympic cycles. *Actual problems of physical culture and sport,* 12(3), pp. 20-24
Podchos Z., Karatnyk I., Pityn M. (2006) Historical development of badminton. *Articles collection of second international electronic conference,* 6(1), pp. 197-200
Rybakov D., Shtilman M. (1982) *Sport badminton basics*. Physical culture and sport
Shershakov N. (1991) Speedy shuttlecock. *Physical culture in school*, 21(9), pp. 55-58
Sidorov I. (2004) Technic in badminton game and its success on stage of basic development. *Pedagogy, psychology and medico-biological problems of physical education and sport,* 4(1), pp 350-355
Smirnov Y. (1990) *Badminton*. Physical education and sport.
Yaremko M. (1999) Speed-strength characteristics of hit actions in kickboxing. *Young sport science of* Ukraine, 9(3), pp. 268-272
Zhbankov O., Kupriyanov D., Ilyin Y. (2001) Informational system of technical actions in badminton. *Theory and practice of physical culture,* 1(9), pp. 62-63