LONGITUDINAL STUDY ON THE EFFECTIVENESS OF THE GAME ACTIONS AT THE WORLD MEN'S HANDBALL CHAMPIONSHIP SENIORS (2005-2015)

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Abstract
Handball is a sport relatively young, appeared at the end of the 19th century (Germany, Denmark, Czech Republic) and quickly spread worldwide. Ancestors of this game are still found in ancient cultures. Determination of the effectiveness of the game in the teams participating in the World Handball Championships may be a reference to the revaluation playing model at senior level high performance handball. This study may lead to the identification of elements that indicate trends of male handball for the period 2005-2015, thus creating the conditions for determining the principles for achieving training and participation in high level competitions. Taking into account that the study covers a period of 10 years which took place 6 editions of Men's World Handball Championships, the data obtained and analyzed got a high degree of reliability and can be used as benchmarks for the following competitions.

Keywords: handball, analysis, World Championship, men

Introduction

Handball is a sport relatively young, appeared at the end of the 19th century (Germany, Denmark, Czech Republic) and quickly spread worldwide. Ancestors of this game are still found in ancient cultures.
At the international level, the leading forum is International Handball Federation (founded in 1926). The first edition of the World Championships was held in Germany in 1938. In parallel until 1966 were organized competitions for indoor (7) and outdoor (11) handball, and starting with 1967 is organized competitions just for indoor handball. Until 1993 the rhythmicity of organization was every 3 or 4 years and from 1993 is held every two years in January and February (for a two weeks).
The number of participating teams increased from 4 (1938) to 24 (1995). The competition format launched in 1995 has continued into 2001: the first phase is formed 4 groups of 6 teams, then move on to the knockout stage – last 16, quarterfinals, semifinals, final for 3rd place and the final. In 2003 after the first phase is formed four main groups of four teams, meaning the top four ranked in the first group phase. Ranked first in the group qualify for the semifinals, while the other teams play matches rankings. In 2005, after the first phase is formed two main groups of six teams each and the top two teams from each group qualify for the semifinals and the other games leader board dispute; the teams eliminated in the first phase of group play in the President's Cup (places 13-24). Since 2007, after the first phase is formed two main groups of 6 teams each and the top four from each group qualify for the quarterfinals and other games leaderboard dispute; the teams eliminated in the first phase of group play in the President's Cup (places 13-24).
The number of games played is variable depending on the position in the final ranking: places 13-24 disputing 5 to 7 games, places 5 to 12 have between 6 and 9 games, the top 4 have 9 or 10 games.

Material method

Determination of the effectiveness of the game in the teams participating in the World Handball Championships may be a reference to the revaluation playing model at senior level high performance handball.
This study may lead to the identification of elements that indicate trends of male handball for the period 2005-2015, thus creating the conditions for determining the principles for achieving training and participation in high level competitions.
In carrying out the study the main methods used were bibliographical research and statistics. The bibliographic method was used to study because of the analyzes conducted after World Championships. Statistical method was used to process the data supplied by IHF after deployment and game actions quantified we used in the study.

Results and discussions

The game actions which were performed statistical analysis are: shots efficiency (6m, wings, 9m, 7m), goalkeepers' efficiency, interception and blocked shots.

For these actions the analysis was performed as follows: for all participating teams (24), places 1-4, places 5-12, places 1-12, places 13-24 (table 1-5).

Table 1 Game actions efficiency for all teams (places 1-24)

Edition	Statistical parameters / Game actions	Throwings efficiency (%)			7m throwings efficiency (%)	Fast break efficiency (%)	Throwins efficiency (%)	Goalkeeers efficiency (%)	Interceptions (no.)	Blocked shots (no.)
		6m	wing	backcourt						
2005	X (1-24)	55,83	51,67	37,17	72,00	73,79	53,63	32,45	34,17	18,83
2007	X (1-24)	65,88	51,58	39,46	73,00	72,75	54,46	32,38	34,58	27,58
2009	X (1-24)	66,08	54,75	40,00	71,21	74,13	54,92	32,92	40,46	26,83
2011	X (1-24)	72,46	55,96	38,21	72,00	74,50	55,29	35,17	30,50	24,88
2013	X (1-24)	67,25	53,58	39,58	72,13	74,21	55,88	31,38	68,96	17,21
2015	X (1-24)	64,83	60,71	37,42	73,13	79,29	57,79	30,00	31,75	19,96
X		65,39	54,71	38,64	72,25	74,78	55,33	32,38	40,07	22,55

Table 2 Game actions efficiency for places 1-4

Edition	Statistical parameters / Game actions	Throwings efficiency (%)			7m hrowing efficiency (%)	Fast break efficiency (%)	Throwins efficiency (%)	Goalkeeers efficiency (%)	Interceptions (no.)	Blocked shots (no.)
		6m	wing	backcourt						
2005	X (1-4)	63,00	57,75	44,25	77,25	81,25	61,50	34,25	55,75	35,25
2007	X (1-4)	70,00	59,00	44,50	71,25	78,00	58,50	35,25	50,50	44,50
2009	X (1-4)	68,50	61,50	45,75	80,25	77,25	61,25	36,00	44,75	35,00
2011	X (1-4)	75,50	60,75	46,25	78,50	76,50	61,50	30,75	42,00	37,25
2013	X (1-4)	69,75	60,75	42,75	83,75	79,00	61,50	35,50	112,25	36,75
2015	X (1-4)	70,25	66,25	38,75	75,75	81,75	61,00	33,25	44,00	28,50
X		69,50	61,00	43,71	77,79	78,96	60,88	34,17	58,21	36,21

Table 3 Game actions efficiency for places 5-12

Edition	Statistical parameters /	Throwings efficiency (%)			7m throwings efficienc	Fast break efficiency (%)	Throwins efficiency (%)	Goalkeeers efficiency (%)	Interceptions (no.)	Blocked shots (no.)
		6m	wing	backcourt						

	Game actions				y (%)					
2005	X (5-12)	58,50	55,88	40,38	71,75	74,00	57,13	35,88	39,50	23,25
2007	X (5-12)	70,50	56,63	41,00	71,75	76,13	58,00	31,63	38,25	34,38
2009	X (5-12)	68,13	57,13	42,38	71,75	76,38	56,25	36,25	33,25	31,00
2011	X (5-12)	73,63	59,75	40,38	76,88	75,88	57,25	33,50	33,25	31,25
2013	X (5-12)	67,63	60,00	42,63	70,38	77,00	58,88	33,75	56,00	19,63
2015	X (5-12)	68,88	68,50	40,13	76,63	80,38	61,38	31,50	28,38	24,25
X		67,88	59,65	41,15	73,19	76,63	58,15	33,75	38,11	27,29

Table 4 Game actions efficiency for places 1-12

Edition	Statistical parameters / Game actions	Throwings efficiency (%)			7m throwings efficiency (%)	Fast break efficiency (%)	Throwins efficiency (%)	Goalkeeers efficiency (%)	Interceptions (no.)	Blocked shots (no.)
		6m	wing	backcourt						
2005	X (1-12)	60,00	56,50	41,67	73,58	76,42	58,58	35,33	44,92	27,25
2007	X (1-12)	70,33	57,42	42,17	71,58	76,75	58,17	32,83	42,33	37,75
2009	X (1-12)	68,25	58,58	43,50	74,58	76,67	57,92	36,17	37,08	32,33
2011	X (1-12)	74,25	60,08	42,33	77,42	76,08	58,67	32,58	36,17	33,25
2013	X (1-12)	68,33	60,25	42,67	74,83	77,67	59,75	34,33	74,75	25,33
2015	X (1-12)	69,33	67,75	39,67	76,33	80,83	61,25	32,08	33,58	25,67
X		68,42	60,10	42,00	74,72	77,40	59,06	33,89	44,81	30,26

Table 5 Game actions efficiency for places 13-24

Edition	Statistical parameters / Game actions	Throwings efficiency (%)			7m throwings efficiency (%)	Fast break efficiency (%)	Throwins efficiency (%)	Goalkeeers efficiency (%)	Interceptions (no.)	Blocked shots (no.)
		6m	wing	backcourt						
2005	X (13-24)	51,67	46,83	32,67	70,42	71,17	48,67	29,00	22,45	10,42
2007	X (13-24)	61,42	45,75	36,75	74,42	68,75	50,75	31,92	26,83	17,42
2009	X (13-24)	63,92	50,92	36,50	67,83	71,58	51,92	29,67	43,83	21,33
2011	X (13-	70,67	51,83	34,08	66,58	72,92	51,92	37,75	24,83	16,50

	24)									
2013	X (13-24)	66,17	46,92	36,50	69,42	70,75	52,00	28,42	63,17	9,08
2015	X (13-24)	60,33	53,67	35,17	69,92	77,75	54,33	27,92	29,92	14,25
X		62,36	49,32	35,28	69,77	72,15	51,60	30,78	35,17	14,83

Statistical analysis was performed on several levels: for all participating teams (24), places 1-4, places 5-12 places 1-12, places 13-24 (table 1-5); and the results are sometimes surprising considering the fact that the number of games played is variable: the first 4 ranked disputed 9 or 10 games, the 5-12 ranked had between 6 and 9 games, the teams ranked 13 to 24 were each between 5 and 7 games. Should be taken in mind that the higher stages of the competition were qualifying the best teams and game results are closer.
To determine the shots efficiency were quantified all shots variants: 6m, wing, 9m, 7m, fast break and breakthrough. Thus for all participating teams throwing efficiency is on average 55,33% (minimum-53,63%, maximum-57,79%), while for the first 4 ranked the average is 60,88% (minimum-58,50%, maximum-61,50%). For teams ranked 5 to 12 average is 58.15% (minimum-57,13%, maximum-61,38%); situation for places 1-12 shows an average of 59,06% (minimum-57,92%, maximum-61,25%) and for places 13-24 average is 51,6% (minimum-48,67%, maximum-54,33%). These issues are summarized in figure 1.

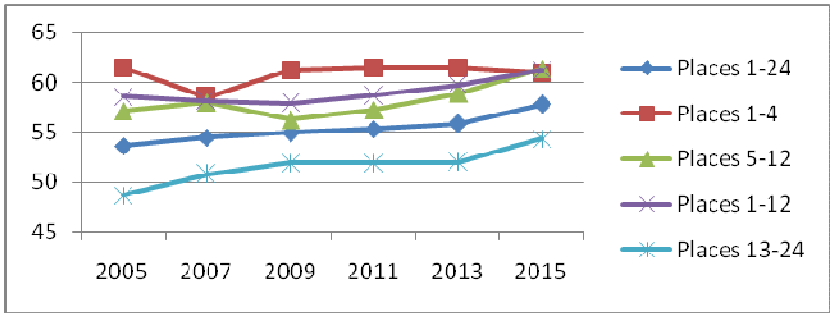

Figure 1 Throwing efficiency for 2005-2015 period

Goalkeepers' efficiency is crucial to the fate of a game, and an average their effectiveness in defense throws is 32.38% (minimum-30%, maximum-35.17%). On average goalkeepers efficiency for places 1-4 is 34,17% (minimum-30,75%, maximum-35,25%); for next 8 average is 33,75% and for the places 1-12 average is 33,89%. For the last 12 teams the average efficiency is 30,78%. The evolution of efficiency for all 6 final tournaments analyzed by category is shown in figure 2.

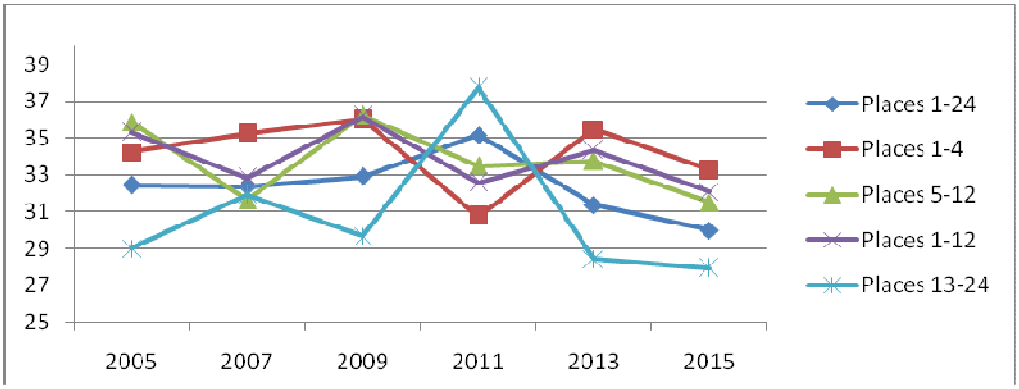

Figure 2 Goalkepers efficiency for 2005-2015 period

The number of interceptions made indicates the offensive tendency of the team and the ability to score goals easily on fast break. The overall average is 40,07 interceptions for participating teams or 5,7 interceptions per

game. For the first 4 ranked the average is 58,21 interceptions or 6,4 interceptions per game; for places 5-12 the average is 38,11 interceptions per team or 5.4 interceptions per game; for 1-12 places average is 44,81 interceptions or 5,6 interceptions per game; and for the last 12 teams the average is 35,17 interceptions or 5,9 interception per game. The trend depending to the final ranking is easily visible in figure 3.

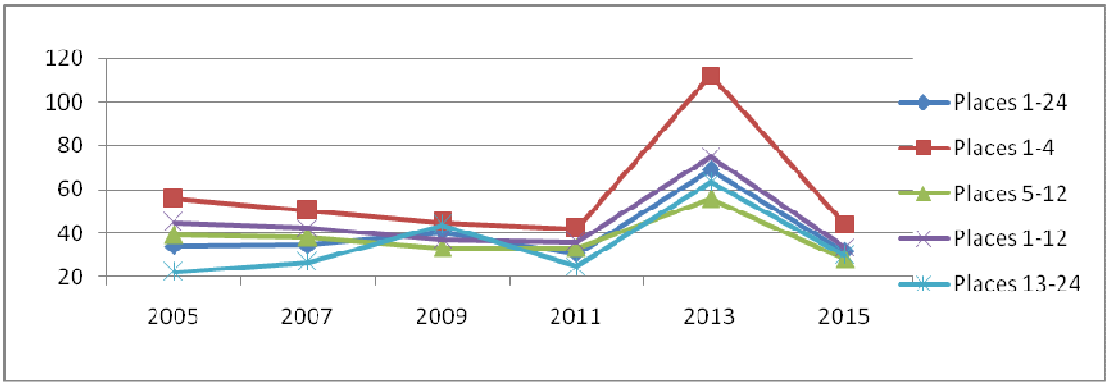

Figure 3 Interceptions number for 2005-2015 period

Another action that could lead to a rebound and increase efficiency defense is blocking shots, and things are not the same for all teams; the average of all teams is 22,25 blocked shots or 3,2 per game. For places 1-4 the average is 36,21 and 4 per game; for places 5-12 the average is 27,29 per team and 3,9 per game; for the top 12 ranked team the average is 30,26 and 4,3 per game, and for the last 12 teams the average is 14,83 per team and 2,4 per game (figure 4).

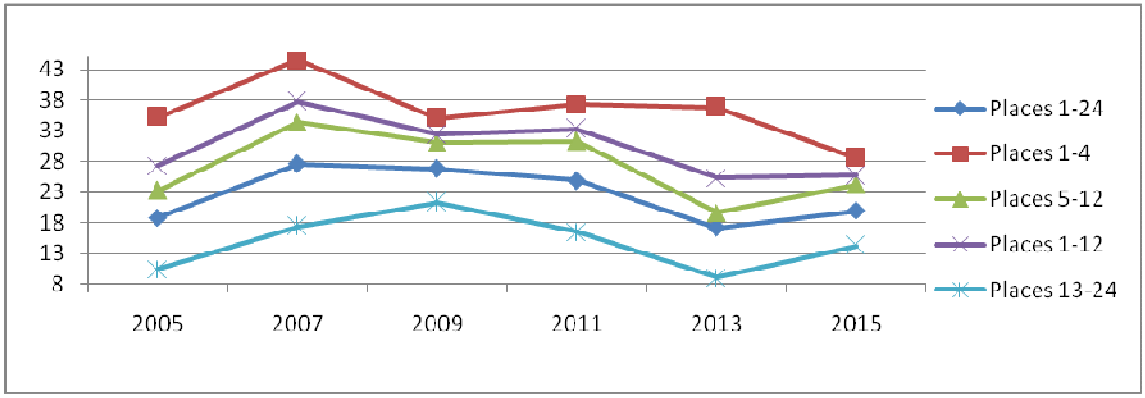

Figure 4 Blocked shots number for 2005-2015 period

This study took as benchmark the data of special literature, data regarding the minimum actions efficiency (Taborsky F., 2001) and comparing with what we find (table 1):

Table 1 Actions efficiency of our study comparing to the data of special literature

Actions efficiency	Efficiency (Taborsky F., 2001)	Efficiency for all participant teams (our study)	Efficiency for places 1-4 (our study)	Efficiency for places 1-12 (our study)
backcourt shots	40 – 45%	38,64%	43,71%	42%
wing shots	55 – 60%	54,71%	61%	60,1%
6 m shots	60 – 65%	65,39%	69,5%	62,36%
fastbreak shots	70 – 75%	74,78%	78,96%	77,4%
7 m shots	75 – 80%	73,13%	77,79%	76,33%
attacks without shots	15 – 20%	5,7 interceptions 3,2 blocked shots	6,4 interceptions 4 blocked shots	5,6 interceptions 4,3 blocked shots
goalkeepers	35 – 40%	32,38%	34,17%	33,89%

The efficiency of 9m shots, wings shots, 7 m shots (for all participating teams) and goalkeepers is below the recommended level; the other parameters are analyzed are in range and punctually they are even slightly exceeded.

Conclussions

One of the concerns of participating teams was to increase throws efficiency manifested by an ascendent trend (figure 1).

This positive trend for throws efficiency had repercussions on goalkeepers' efficiency that showed a decreasing trend (figure 2).

The average number of interceptions, respectively blocked shots is important for teams ranked in the top of the final standings because it favors increasing the defense efficiency and scoring goals easier (figures 3 and 4).

As a result of comparing the data obtained from the analysis performed should be reconsidered margins effectiveness of actions to be monitored useful landmarks in training and competition, imposing to reconsider the role model of the performance handball game for seniors. Thus for the teams seeking a qualification at the World Championship is recommended that game action efficiency to be places in the margins of the places 1-12 from Table 1 in the context of the playing games with teams that constantly qualify for the final tournament. In the qualifying games the efficiency must be much higher because the teams encountered are a lower value.

Teams that aspire to win the competition or medals is need to exceed average requirements for places 1-4 (table 1).

Taking into account that the study covers a period of 10 years which took place 6 editions of Men's World Handball Championships, the data obtained and analyzed got a high degree of reliability and can be used as benchmarks for the following competitions.

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RATIONAL NUTRITION ROLE IN ENHANCING SPORTS PERFORMANCE

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Abstract:

In modern society sports performance reached levels, which, years ago they were seen only from the perspective of an ideal to be achieved. Activity athlete needs a healthy diet to satisfy the energy needs of the body and help to increase sports performance . Adopting a healthy diet provides a complete food energy to maintain body without leading to anemierea body and mind .

Sensible eating, sports, food must consist of providing training energy reserves, foods that produce enzymes, but which serve food plastic, repair and maintenance of tissues. Food has always played a leading role in the lives of athletes, improper nutrition weight causing major imbalances.

The conclusion of the work presented is that sports training is a process that takes time and a reasonable diet to achieve the desired performance. Theory and practice of increasing performance capacity is modeled using predisposing factors, but increase them with food.