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NATIONAL TEAMS RANKING BASED ON SITUATIONAL EFFICIENCY INDICATORS OF THE OFFENCE AT THE WORLD HARDBALL CHAMPIONSHIP

Sanja Bajgoric[1], Muris Dug[2], Nina Bijedic[3], Samra Mededovic[1]

[1]University programme Health care, University of Mostar „Dzemal Bijedic"
[2]Faculty of physical education and sport, University of Tuzla
[3]Faculty of Informational technology, University of Mostar „Dzemal Bijedic"

Abstract
This study was based on the 45 games of the 2013 World Junior Handball Championship in Bosnia and Herzegovina. The focus was on the determination of the difference in the scope of the situational efficiency of offence between national teams: Sweden, Spain, France, Croatia and Bosnia and Herzegovina. Following variables were analysed: KPKUK – total number of the contra offences and semi counter offences, ŠPNAUK – total number of shots from positional offence, NAUKM7 – total number of the 7m in offences, BRZNAUK – total number of the rapid offences, BRZCUK – total number of the fast centres, and five variables for assessment of the situational efficiency in successful offences: KPKUS – total number of the successful contra offences and semi counter offences, ŠPNAUS – total number of the successful shots from positional offence, NAUSM7 – total number of the successful 7m in offences, BRZNAUS – total number of the successful rapid offences, BRZCUS – total number of the successful fast centres. The aim of this study was to determine differences of the situational efficiency of analysed national teams, and to rank national teams by percentile of means using analysed variables. The game quality of the analysed national teams was determined on the results of the central and dispersion parameters and same analysed national teams were ranked on the obtained values of the parameters.
Key words: handball, junior, indicators, ranking

INTRODUCTION

Sport is the phenomena of the modern world, and handball, as a team sport, takes special place in the team sports. Handball game has unique define aim, achievement of the high number or receiving lower number of the shots (Rogulj, 2003). Handball game presents confronting two opponents, two teams, that are determined by the individual ability level, characteristics and knowledge achieving better results, causing the similar but never the same development or alteration of the results (Vuleta et al. 2005). Following parameters of the situational efficiency assist coaches to insight the quality of the team, specially every handball player individually. All above mentioned contribute to the better planning of the training process and competitions. Expert coaches need to know to evaluate indicators of the situational efficiency and total of real quality of handball players (Foretić, Rogulj and Trninić, 2010).

METHODS

Participants
All analysed date were obtained by the observation of handball games of the 2013 World Junior Handball Championship and obtained from the official EHF statistics on the mentioned championship. Next national teams were analysed: Sweden, Spain, France, Croatia and Bosnia and Herzegovina.

Indicators
Variables in this study were used to evaluate the situational efficiency in offence, in total ten variables divided into two groups. Five variables were to evaluate the situational efficiency of offences in total: KPKUK – total number of the contra offences and semi counter offences, ŠPNAUK – total number of shots from positional offence, NAUKM7 – total number of the 7m in offences, BRZNAUK – total number of the rapid offences, BRZCUK – total number of the fast centres, and five variables for assessment of the situational efficiency in successful offences: KPKUS – total number of the successful contra offences and semi counter offences, ŠPNAUS – total number of the successful shots from positional offence, NAUSM7 – total number of the successful 7m in offences, BRZNAUS – total number of the successful rapid offences, BRZCUS – total number of the successful fast centres.

Statistical analysis
Statistical analysis in this study was based on the calculation of the percentile for identified variable's values and ranking of the national teams as outstandingly successful (the highest 10 percentile), successful (following 15 percentile), intermediate successful or average

successful (medium 50 percentile), unsuccessful (11-25 percentile) and prominently unsuccessful (the lowest 10 percentile). This kind of analysis can be used when analysing big number of national teams. However, if the number of national teams is smaller (for example, 5) then outstandingly successful and successful can be merged into the highest quartile, intermediate remain into middle two quartile, and unsuccessful and prominently unsuccessful can be merged into lowest quartile. The coefficient of variation (CV) was used to rank national teams by evaluating mean as a permanent. Since CV is a relative unite then can be used to compare success of the national team per one variable as well as success of one national team per different variables. Variables for assessment of the situational efficiency in offence were analysed using descriptive statistics, and analysed national teams were ranked by using mean. The percentiles of obtained values were used to rank national teams.

RESULTS

Analysing values of central and dispersion parameters for variable KPKUK, national teams Croatia (Table 1), Sweden (Table 4) and Bosnia and Herzegovina (Table 3) had the highest number of contra offence and semi counter offence (Table 1). The French national team (Table 2) had lower number, while the Spanish national team (Table 5) had the lowest number of contra offence. Analysing values for variable ŠPNAUK, French national team had the highest number of shots from the positional offence (Table 2). The Swedish (Table 4) and Spanish (Table 5) national teams had lower number, while Bosnian and Herzegovinian (Table 3) and Croatian (Table 1) national team had the lowest number of shots from positional offence. Furthermore, analysing values for variable NAUKM7, the higher number of 7m in offence had national teams: Croatia (Table 1), France (Table 2) and Bosnia and Herzegovina (Table 3), while lower number of 7m in offence had Spanish (Table 5) and Swedish (Table 4) national teams. In addition, analysing values of variable BRZNAUK, the national teams of Bosnia and Herzegovina had the highest number of rapid offences. National teams of Croatia (Table 1) and France (Table 2) had lower number, while the lowest number of rapid offences had national teams of Sweden (Table 4) and Spain (Table 5).

Table 1. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence total – national team Croatia

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUK	3	9	9	9,000	0,000	0,000	0,000
ŠPNAUK	3	30	39	33,333	4,933	24,333	0,148
NAUKM7	3	2	6	4,000	2,000	4,000	0,500
BRZNAUK	3	5	7	6,000	1,000	1,000	0,167
BRZCUK	3	0	0	0,000	0,000	0,000	/

Table 2. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence total – national team France

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUK	3	4	9	5,667	2,887	8,333	0,509
ŠPNAUK	3	37	43	39,667	3,055	9,333	0,077
NAUKM7	3	4	5	4,333	0,577	0,333	0,133
BRZNAUK	3	5	6	5,667	0,577	0,333	0,102
BRZCUK	3	6	10	7,333	2,309	5,333	0,315

Table 3. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence total – national team Bosnia and Herzegovina

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUK	3	1	19	8,000	9,644	93,000	1,205
ŠPNAUK	3	26	40	33,333	7,024	49,333	0,211
NAUKM7	3	2	5	3,667	1,528	2,333	0,417
BRZNAUK	3	4	11	8,333	3,786	14,333	0,454
BRZCUK	3	3	11	6,667	4,041	16,333	0,606

Table 4. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence total – national team Sweden

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUK	3	7	11	8,667	2,082	4,333	0,240
ŠPNAUK	3	33	41	36,333	4,163	17,333	0,115
NAUKM7	3	1	3	2,333	1,155	1,333	0,495
BRZNAUK	3	2	5	4,000	1,732	3,000	0,433
BRZCUK	3	1	6	3,333	2,517	6,333	0,755
ŠPBPIUK	3	0	0	0,000	0,000	0,000	/

Table 5. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence total – national team Spain

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUK	3	1	5	3,000	2000	4,000	0,667
ŠPNAUK	3	34	38	35,667	2,082	4,333	0,058
NAUKM7	3	3	3	3,000	0,000	0,000	0,000
BRZNAUK	3	4	5	4,333	0,577	0,333	0,133
BRZCUK	3	0	2	0,667	1,155	1,333	1,732

Tables 6, 7, 8, 9 and 10 represent results of the basic central and dispersion parameter's variables for the evaluation of the situational efficiency in successful offence for national teams of Croatia, France, Bosnia and Herzegovina, Sweden and Spain. Analysing values for variable KPKUS, the highest number of successful contra offences and semi counter offences had the national team of Bosnia and Herzegovina (Table 8), while national teams of Sweden (Table 9), Croatia (Table 6), France (Table 7) and Spain (Table 10) had the lowest number of successful contra offences and semi counter offences. Furthermore, analysing values of difference for variable ŠPNAUS, the most successful shots from the positional offence had national teams of France (Table 7), Bosnia and Herzegovina (Table 8) and Spain (Table 10), while the least successful shots from the positional offence had national teams of Croatia (Table 6) and Sweden (Table 9). However, analysing variable's values NAUSM7, the most successful 7m in offence had the national team of France (Table 7). The less successful 7m in the offence had the national team Bosnia and Herzegovina (Table 8), while the least successful 7m in offence had national teams Croatia (Table 6), Sweden (Table 8) and Spain (Table 10). Moreover, analysing variable's values of BRZNAUS, the Bosnian and Herzegovinian national team (Table 8) had the most successful rapid offences, while less number of successful rapid offences had the Croatian national team (Table 6). The least successful rapid offences had national teams of Sweden (Table 9), Spain (Table 10) and France (Table 7). Analysing results of variable's values of BRZCUS – the total number of successful rapid centres, the national team of France (Table 7) had the highest number of successful rapid centres. Less successful was the national team of Bosnia and Herzegovina (Table 8), while the least successful was the national team of Sweden (Table 9). However, needs to be emphasised that analysing values of BRZCUS variable, national teams of Croatia (Table 6) and Spain (Table 10) had none successful rapid centre. Interestingly, national teams of Bosnia and Herzegovina (Table 8), France (Table 6) and Sweden (Table 9) did not use this element in offence during the championship.

Table 6. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence successful – national team Croatia

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUS	3	4	6	5,333	1,155	1,333	0,217
ŠPNAUS	3	16	23	19,667	3,512	12,333	0,179
NAUSM7	3	1	3	1,667	1,155	1,333	0,693
BRZNAUS	3	3	4	3,333	0,577	0,333	0,173
BRZCUS	3	0	0	0,000	0,000	0,000	/

Table 7. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence successful – national team France

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUS	3	3	6	4,333	1,528	2,333	0,353
ŠPNAUS	3	17	27	22,333	5,033	25,333	0,225
NAUSM7	3	3	4	3,667	0,577	0,333	0,157
BRZNAUS	3	0	2	1,333	1,155	1,333	0,866
BRZCUS	3	2	4	3,000	1,000	1,000	0,333

Table 8. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence successful – national team Bosnia and Herzegovina

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUS	3	0	16	6,667	8,327	69,333	0,249
ŠPNAUS	3	17	28	21,667	5,686	32,333	0,262
NAUSM7	3	2	4	3,000	1,000	1,000	0,333
BRZNAUS	3	3	7	4,333	2,309	5,333	0,533
BRZCUS	3	1	4	2,333	1,528	2,333	0,655

Table 9. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence successful – national team Sweden

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUS	3	5	8	6,333	1,528	2,333	0,241
ŠPNAUS	3	18	23	21,000	2,646	7,000	0,126
NAUSM7	3	1	2	1,667	0,577	0,333	0,346
BRZNAUS	3	1	2	1,667	0,577	0,333	0,346
BRZCUS	3	0	3	1,333	1,528	2,333	1,146

Table 10. Basic central and dispersion parameters of variables to evaluate the situational efficiency in offence successful – national team Spain

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance	C.V
KPKUS	3	1	4	2,667	1,528	2,333	**0,573**
ŠPNAUS	3	17	24	21,667	4,041	16,333	0,187
NAUSM7	3	1	3	2,000	1,000	1,000	0,500
BRZNAUS	3	1	2	1,333	0,577	0,333	0,433
BRZCUS	3	0	0	0,000	0,000	0,000	/

Table 11 shows ranking of national teams according to the total number of shots. By analysed results, the ranking using percentile was determined. National teams were ranked in area of the situational efficacy in offence for total category. The rank 1 presents exceptionally successful and successful national teams according to numbers of shots referring to the national team which number of successful shots were placed in upper 25% (76-100 percentiles).

The rank 2 presents national teams which total numbers of shots was placed in the medium of 50% that can be considered as normal or expected number of shots (26-75 percentiles). The rank 3 presents unsuccessful and exceptionally unsuccessful national teams according to total number of shots referred to the one which number of shots was placed in lower 25% (1-25 percentiles).

Table 11. Ranking national teams according to total number of shots

	KPKUK		ŠPNAUK		NAUKM7		BRZNAUK		BRZCUK	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Croatia	9	1	33,333	3	4	2	6	2	0	3
France	5,667	3	39,667	1	4,333	1	5,667	2	7,333	1
B&H	8	2	33,333	3	3,667	2	8,333	1	6,667	2
Sweden	8,667	2	36,333	2	2,333	3	4	3	3,333	2
Spain	3	3	35,667	2	3	3	4,333	3	0,667	3

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Table 12 shows raking of national teams based on the absolute efficiency according to the average number of scored shots. National teams were ranked in the area of efficiency in offence for successful category. The rank 1 presents exceptionally efficient and efficient national teams according to number of scored shots referring to national teams which efficiency was in upper 25% (76-100 percentiles). The rank 2 presents national teams which total number of scored shots was placed in the medium of 50% that can be considered as normal or expected number of scored shots – expected efficiency (26-75 percentiles). The rank 3 presents inefficient and exceptionally inefficient national teams according to total number of scored shots referring to the one which number of scored shots was placed in lower 25% (1-25 percentiles).

Table 12. Absolute efficacy according to number of scored shots

	KPKUS		ŠPNAUS		NAUSM7		BRZNAUS		BRZCUS	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Croatia	5,333	2	19,667	3	1,667	3	3,333	2	0	3
France	4,333	3	22,333	1	3,667	1	1,333	3	3	1
B&H	6,667	1	21,667	2	3	2	4,333	1	2,333	2
Sweden	6,333	2	21	3	1,667	3	1,667	2	1,333	2
Spain	2,667	3	21,667	2	2	2	1,333	3	0	3

The table 13 shows ranking national teams based on the relative efficiency in percentiles successful/total. National teams were ranked in the area of the situational efficiency in offence for successful/total category. The rank 1 presents exceptionally efficient and efficient national teams per percentile of scored shots in regard to number shots referring to national teams which efficiency was placed in upper 25% (76-100 percentiles). The rank 2 presents national teams which percentiles of scored shots were placed in the medium of 50%, that can be considered as normal or expected percentile of scored shots according to the number of shots – expected relative efficiency (26-75 percentiles). The rank 3 presents inefficient and exceptionally inefficient national teams per percentile of scored shots according to the number shots referring to the one which percentile of shots was in 25% (1-25 percentiles).

Table 13. Relative efficacy in percentile SUCCESSFUL/TOTAL

	KPKUS/US		ŠPNAUS/UK		NAUS/UKM7		BRZNAUS/UK		BRZCUS/UK	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Croatia	59%	3	59%	2	42%	3	56%	1	0%	3
France	76%	2	56%	3	85%	1	24%	3	41%	1
B&H	83%	2	65%	1	82%	2	52%	2	35%	2
Sweden	73%	3	58%	3	71%	2	42%	2	40%	2
Spain	89%	1	61%	2	67%	3	31%	3	0%	3

DISCCUSION

The aim of this study was to determine indicator differences of the situational efficiency by analysing national teams. Based on central and dispersal parameters, the quality of game were determent and analysed national teams were ranked based on recognised values of parameters. The quality of a game as well as characteristics (per game) of national teams can be given by analysed results of variables. In the contra offence and semi counter offence, the Creation national team was medium efficient and for them this was the average element of the game as well as the rapid offence. Furthermore, they were varied in realisation of the shot from 7m but the shot efficiency in the positional offence was relatively weak eventually average. The French national team was extremely and constantly efficient in the shot success from the positional offence, realisation of 7m, and realisation of the rapid offence. Observing to the rapid centre, they varied more less but in the realisation of contra and semi counter were eventually average. The Spanish national team was medium efficient in the contra offence the rapid offence and the rapid centre. Also, the rapid centre was not the best tramp in analysed games, they were more or less efficient depending on an opponent while the efficiency from the positional offence was average. The national team of Spain was more or less efficient in the shot efficiency from the positional offence and shot efficiency of the shot

of 7m. Interestingly, the shots were not the best trump for them. Furthermore, the realisation of shots from 7m was variable as well. However, their inefficacy and exceptional inefficacy was evident in the realisation of the contra offence, the rapid centre and the rapid offence. The national team of Bosnia and Herzegovina was analysed last on purpose. They took 14 place and surely, they had weaker opponent compared to first fourth national teams. Never the less, can be concluded in which variables they were exceptionally efficient, medium efficient and exceptionally inefficient. The Bosnian and Herzegovinian national team was exceptionally efficient and efficient in the realisation of the contra offence and the rapid offence. Additionally, they were medium efficient in the realisation of the rapid offence, while the rapid centre was not the best trump, as well as in the realisation of the shot from the positional offence and shots from 7m.

Practical Aspect

This kind of analysis, besides other analysis, assists coaches and handball experts to analyse a game, team players or individual handball player/all this depend on the requirements what is wished to be analysed/. Based on analysis, segments of a game, elimination of errors, improvement of particular parameters can be analysed and all that for the purpose of better results.

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