

# Technical Analysis of 2012 Female Europe Championship and Olympiad Games Handball Performances

Hikmet VURGUN[1], Turan IŞIK [2], Çağatay ŞAHAN [3], Orhan IŞIK [4]

[1]  
Celal Bayar University Physical Education and Sport High School, Manisa

[2]  
Celal Bayar University Physical Education and Sport High School, Manisa

[3]  
Celal Bayar University Physical Education and Sport High School, Manisa

[4]  
Trakya University Kırkpınar Physical Education and Sport High School, Edirne  
turan\_20032003@yahoo.com

## ABSTRACT

Especially, handball was started to playing quick and dynamic with alterations conducting in the last ten years. So, it was purposed to examine factors which effect on winning at altered and improved handball game. Statistical data of female handball team existing 2012 Europe Championship and 2012 London Olympiad Games were collected by using official statistics of Europe and International Handball Federations. Data belonging mean attack number, throw efficiency, shot efficiency, fast-break goal in each competition, fast-break efficiency, goalkeeper efficiency, saved shot by goalkeeper, turnover number per match, 2 seconds punishment numbers in each match, position shot efficiency (wing, pivot, back field, parallel diving, fast-break and 7 meter shots) were used. SPSS 15.0 for Windows package program was used in analysis of data, independent t test and correlation analysis were performed. In result of committed analysis; it was established that winning teams' shot activity, throw activity, fast-break goal number, goalkeeper activity, saved ball numbers, throw ratio and fast-break throw ratio were higher than lost teams. It was thought that doing trainings to be improved these factors effecting on winning contribute to competition performance positively.

**Keywords:** *Handball, Position Activity, Technical Parameter Analysis, Europe Championship, Olympiad Games*

## INTRODUCTION

Performance analysis in team sports is a basic tool for trainers to provide reliable and valid information related both their own teams and rival teams. Effective competition analysis is required to identify how much degree important of obtained information and whether it can be used to improve performance or not (**Sampaio and Janeira, 2003**). Technical analysis in team sports contributes to preparation of training and competition plans at particular rates. Using technical analysis methods are seen a requirement in terms of providing reliable and valid information related their own teams and rivals and technical analysis came to supporter situation of trainer occupation. Especially, correlating athletes' competition and training performances with technical analysis results facilitates identification of way going to success. At the same time, thanks to technical analysis; trainers can organize training approaches in constitution of special game systems and exercises to be used in trainings by considering these technical analyses (**Janeria et al, 1996**). Also, technical analysis enables transformation to positive conditions of factors such as player selection and season schedule effecting trainer' success directly. Because handball game is played more effective and faster respect to past, technical analysis carry weight in term of how positional requirements are changed and observation of what is required. Nowadays thanks to technological innovations regarding match analysis, reaching technical analysis data of top-level teams is gotten

easy for training and scientists studying in sciences field. Scientific studies are required regarding how these data are used by national and club teams, and providing of new aspects. **Bangsbo and Peitersen (2000)** advocate that game systems of successful teams are examined by researchers and these systems are come to a level to be accessed by national and club teams. Identification of physical, mental, technical and tactic performance level of athletes, establishment of success and unsuccess cases, and development of training models are materialized (**Vurgun, 2010**).

In result of handball competition analysis, establishment of handball game requirements and identification of new game systems will shed other clubs. Therefore, the purpose of this research is to do technical analysis and establish relationships between factors determining loss and winning of Female Handball Competitions in 2012 Europe Championship and 2012 London Olympic Games.

## **MATERIAL AND METHOD**

In this study, data were obtained by using Europe Handball Federation (EHF) and International Handball Federation (IHF) official statistical data of parameters including total team statistics of Female Handball Competitions in 2012 Europe Championship and 2012 London Olympic Games. EHF and IHF use same data collection method in each two championships. Technical parameters are mean attack number, throw efficiency, shot efficiency, fast-break goal in each competition, fast-break efficiency, goalkeeper efficiency, saved shot by goalkeeper, turnover number per match, 2 seconds punishments numbers in each match, position shot efficiency (wing, pivot, back field, parallel diving, fast-break and 7 meter shots). SPSS 15.0 for Windows Package Program was used in analysis of data obtained. Independent t test and correlation analyses were applied to analyze data obtained.

## RESULTS

Table 1. Comparing Means of Winning and Losing Teams Participated to Europe Championship

Parameters	Winning Case	N	X	SD	t	p
Attack number (number)	Winning	47	62,68	6,115	-,345	,731
	Losing	47	63,13	6,422		
Throw efficiency (%)	Winning	47	43,34	5,939	4,101	,000
	Losing	47	37,57	7,592		
Shot efficiency (%)	Winning	47	56,43	7,110	4,573	,000
	Losing	47	49,00	8,564		
Fast-break goal (number)	Winning	47	3,91	1,943	2,902	,005
	Losing	47	2,83	1,672		
Fast-break efficiency (%)	Winning	47	76,72	23,259	1,083	,281
	Losing	47	70,77	29,664		
Goalkeeper efficiency (%)	Winning	47	36,40	8,941	3,582	,001
	Losing	47	30,19	7,840		
Saved shot by goalkeeper (number)	Winning	47	13,26	3,554	2,102	,038
	Losing	47	11,70	3,611		
7m shot ratio (%)	Winning	47	8,70	4,832	-,413	,681
	Losing	47	9,09	4,133		
Pivot shot ratio (%)	Winning	47	14,74	6,492	1,989	,050
	Losing	47	12,17	6,048		
Wing shot ratio (%)	Winning	47	18,13	7,534	-1,004	,318
	Losing	47	19,85	9,034		
Parallel diving shot ratio (%)	Winning	47	7,04	5,167	,965	,337
	Losing	47	5,96	5,725		
Fast-break shot ratio (%)	Winning	47	10,49	4,481	2,497	,014
	Losing	47	8,06	4,927		
Setter shot ratio (%)	Winning	47	40,79	10,946	-1,340	,184
	Losing	47	44,04	12,558		
Time punishment (number)	Winning	47	6,43	3,063	,860	,392
	Losing	47	5,83	3,631		
Turnover number per match (number)	Winning	47	14,49	3,587	-1,185	,239
	Losing	47	15,40	3,893		

Table 1 was examined; it was observed that there were significant differences in parameters of throw efficiency, shot efficiency, fast-break goal, goalkeeper efficiency, saved shot by goalkeeper, fast-break shot ratio ( $p < 0,05$ ). Winning teams have higher means in these parameters. Winning teams have more higher means in parameters of fast-break efficiency, pivot shot ratio, parallel diving shot ratio and time punishment, notwithstanding losing teams have more higher means in parameters of turnover number per match, setter shot ratio, wing shot ratio, 7m shot ratio, attack number, but there is no significant difference among these parameters ( $p < 0,05$ ).

Table 2. Comparing Means of Winning and Losing Teams Participated to Olympiad Games

Parameters	Winning Case	N	X	SD	t	p
Attack number (number)	Winning	38	61,61	6,512	-,221	,826
	Losing	38	61,92	5,920		
Throw efficiency (%)	Winning	38	44,39	6,043	4,964	,000
	Losing	38	37,29	6,430		
Shot efficiency (%)	Winning	38	58,26	7,307	4,178	,000
	Losing	38	51,16	7,518		
Fast-break goal (number)	Winning	38	4,45	2,728	2,630	,011
	Losing	38	3,05	1,800		
Fast-break efficiency (%)	Winning	38	79,74	18,297	,419	,677
	Losing	38	77,79	22,068		
Goalkeeper efficiency (%)	Winning	38	37,55	10,365	2,947	,004
	Losing	38	30,89	9,299		
Saved shot by goalkeeper (number)	Winning	38	13,03	3,731	2,084	,041
	Losing	38	11,37	3,183		
7m shot ratio (%)	Winning	38	8,76	4,907	-,592	,555
	Losing	38	9,47	5,530		
Pivot shot ratio (%)	Winning	38	15,21	7,788	1,175	,244
	Losing	38	13,24	6,828		
Wing shot ratio (%)	Winning	38	14,42	6,246	-,874	,385
	Losing	38	15,61	5,549		
Parallel diving shot ratio (%)	Winning	38	10,97	5,810	1,013	,314
	Losing	38	9,53	6,616		
Fast-break shot ratio (%)	Winning	38	12,32	6,156	2,168	,033
	Losing	38	9,37	5,687		
Setter shot ratio (%)	Winning	38	38,11	11,434	-2,095	,040
	Losing	38	43,39	10,561		
Time punishment (number)	Winning	38	7,68	6,905	1,001	,320
	Losing	38	6,42	3,576		
Turnover number per match (number)	Winning	38	14,79	4,966	-1,890	,063
	Losing	38	16,92	4,868		

Table 2 was examined; it was observed that there were significant differences in parameters of throw efficiency, shot efficiency, fast-break goal, goalkeeper efficiency, saved shot by goalkeeper, fast-break shot ratio and setter shot ratio ( $p < 0,05$ ). Winning teams have higher means in these parameters except for setter shot ratio. Besides, winning teams have more higher means in parameters of fast-break efficiency, pivot shot ratio, parallel diving shot ratio and time punishment, notwithstanding losing teams have more higher means in parameters of attack number, 7m shot ratio, wing shot ratio, turnover number per match, but no significant difference was found among these parameters ( $p < 0,05$ ).

Table 3. Examining Relationship among Parameters Effecting Teams' Winning the Match (Europe Championship)

	Correlation	Throw efficiency (%)	Shot efficiency (%)	Fast-break goal (number)	Goalkeeper efficiency (%)	Saved shot by goalkeeper (number)	Pivot shot ratio (%)	Fast-break shot ratio (%)
Shot efficiency (%)	r	,812						
	p	,000						
Fast-break goal (number)	r	,471	,330					
	p	,000	,001					
Goalkeeper efficiency (%)	r	-,167	-,142	-,036				
	p	,108	,172	,730				
Saved shot by goalkeeper (number)	r	-,046	-,029	,047	,848			
	p	,661	,782	,651	,000			
Pivot shot ratio (%)	r	,090	,148	,084	-,038	-,059		
	p	,391	,154	,420	,715	,569		
Fast-break shot ratio (%)	r	,299	,259	,771	,022	-,006	-,057	
	p	,003	,012	,000	,830	,956	,582	
Setter shot ratio (%)	r	-,355	-,392	-,239	,138	,137	-,498	-,196
	p	,000	,000	,021	,184	,187	,000	,058

Table 4. Examining Relationship among Parameters Effecting Teams' Winning the Match (Olympic Games)

	Correlation	Throw efficiency (%)	Shot efficiency (%)	Fast-break goal (number)	Goalkeeper efficiency (%)	Saved shot by goalkeeper (number)	Pivot shot ratio (%)	Fast-break shot ratio (%)
Shot efficiency (%)	r	,838						
	p	,000						
Fast-break goal (number)	r	,324	,209					
	p	,004	,071					
Goalkeeper efficiency (%)	r	,157	,207	,269				
	p	,177	,073	,019				
Saved shot by goalkeeper (number)	r	,025	,113	,186	,730			
	p	,827	,330	,107	,000			
Pivot shot ratio (%)	r	,069	,166	-,096	,282	,170		
	p	,555	,152	,410	,013	,141		
Fast-break shot ratio (%)	r	,206	,105	,861	,221	,091	-,159	
	p	,074	,366	,000	,055	,436	,170	
Setter shot ratio (%)	r	-,213	-,426	-,202	-,284	-,165	-,497	-,230
	p	,065	,000	,080	,013	,154	,000	,046

Table 3 is examined; while there is linear relationship among shot efficiency, fast-break goal number and fast-break shot ratio with throw efficiency, there is opposite way relationship between throw efficiency and setter shot ratio ( $p < 0,05$ ). While there is linear relationship among fast-break goal number and fast-break shot ratio with shot efficiency ( $p < 0,05$ ), there is opposite way relationship between shot efficiency and setter shot ratio ( $p < 0,05$ ). While there is linear relationship between fast-break goal number and fast-break shot ratio ( $p < 0,05$ ), there is opposite way relationship between fast-break goal number and setter shot ratio ( $p < 0,05$ ). There is linear relationship between goalkeeper efficiency, saved shot number by goalkeeper ( $p < 0,05$ ). Besides, there is opposite way relationship between pivot shot ratio and setter shot ratio ( $p < 0,05$ ).

When Table 4 is examined; there is linear relationship among shot efficiency and fast-break goal number with throw efficiency ( $p < 0,05$ ), besides there is opposite way relationship between throw efficiency and setter shot ratio ( $p < 0,05$ ). There is linear relationship among fast-break shot ratio and goalkeeper efficiency with fast-break goal number ( $p < 0,05$ ). While there is linear relationship between saved shot number by goalkeeper and pivot shot ratio with goalkeeper efficiency ( $p < 0,05$ ), there is opposite way relationship between goalkeeper efficiency and setter shot ratio ( $p < 0,05$ ). Besides, there is opposite way relationship between pivot shot ratio and setter shot ratio ( $p < 0,05$ ), similarly there is opposite way relationship between fast-break shot ratio and setter shot ratio ( $p < 0,05$ ).

## DISCUSSION

This study was applied to identify factors effecting winning the match in handball game. Basic parameters such as throw efficiency percent of team and offence player, goalkeeper efficiency, fast-break efficiency and time punishment were examined.

Throw efficiency is an important parameter effecting result (success) in team sports. It is required that shot should be accomplished with goal because defense, doing as team, or salvation by goalkeeper and all actions materialized in offence are gained value. Because every shot becoming goal is write in favour of team as score, it has an important impact on competition result (Gruić et al., 2006). In this study, it was established that winning teams' throw efficiency, shot efficiency, fast-break and setter shot efficiency were higher than losing teams (both Europe Championship and Olympic Games teams). In own study, Vurgun (2010) established that teams being successful have better throw efficiency as other teams and emphasized that high of throw efficiency is an important factor. Research results conducted by Vurgun advocate this study results. Although a lot of study was conducted on handball game, there is too little research regarding the effect of throw efficiency on competition performance. In this context, it is thought that this research provide a source literature.

It was found that winning teams' goalkeeper efficiency and saved shot by goalkeeper are higher than losing teams in this research. It means that offence is unsuccessful that shots are ended in goalkeeper (Vurgun, 2010). In a study comparing goalkeeper efficiency of final four and 9<sup>th</sup>-12<sup>th</sup> range teams, it was established that goalkeeper efficiency of teams entering final four was higher than 9<sup>th</sup>-12<sup>th</sup> range teams (Toborsky, 2008). In another study, it was found that goalkeeper efficiency of gaining teams was higher than losing teams, too (Vurgun, 2010). Being well of goalkeeper efficiency pave the way for winning the match by affecting performance of rival team. Certainly, goalkeeper efficiency isn't sole factor effecting winning the match. Sending ball, saved by goalkeeper, to game and obtaining score are important.

As known, fast-break is defined as scoring easily. As to another definition is that offence is accomplished successfully before rival defense don't organize (Yiannakos et al., 2005). Fast-break goals obtained as soon as possible via effective pass affect competition success positively. No significant difference was established between fast-break efficiency winning and losing teams in this study. Though winning and losing teams have similar number fast-break efficiency, it was established that fast-break goal numbers of winning teams are higher than losing teams significantly. Considering this knowledge, it can be said that doing fast-break activity haven't contribution the teams directly, fast-break activity' transformation to score is what is important. According to Calin (2010), fast-break is used effectively by every team aspiring high level success in handball.

Fast-break organization is progressed within the match suddenly. Besides, some team uses this offence technique as a tactic (Tuma, 2008). Especially, the fact that Europe Teams use fast-break effectively as other continent is sample this case (Johanson, 2004). A lot of study existing in literature illustrated that competition performances of teams using fast-break effectively is more well (Vurgun, 2010; Çelikkilek, 2006; Gruić et al, 2006; Ohnjec, 2003). Calin (2010) established that per 23 of all goals was obtained via fast-break in World Championship committed in China. As seen, fast-break is an important factor regarding winning the match. So, fast-break has been concern source for all teams (Bilge, 2012). Conducted this research result shows parallelism with research results existing in literature.

## CONCLUSION AND SUGGESTIONS

This research results emphasizes that fast-break is an important factor regarding winning the match in handball game. The fact that goalkeeper efficiency and ball number saved by goalkeepers are drawn the attention as important factors regarding winning the match, too. The most important factors effecting winning the match are throw and shot efficiency. Because, the fact that every offence is ended with success is related to effective shot performance. Upper extremity power trainings may be contribute to improvement of shot efficiency, these type trainings should be practiced for improvement of shot efficiency. Also, the fact that players should improve different shot techniques usage skills is required. Role of goalkeepers in competition success shouldn't be forgotten and especially goalkeeper selection should be elaborated during talent selection and they are regarded in their development period. The fact that cooperation practices as well as positioning, timing and correct move practices are applied is thought to be useful. Considering the effect of fast-break on competition success, it can be advocated the fact that weighting practices intended to fast-break is required. Handball game is progressed to tactic percept based on fast-break. Therefore, teams wanting success in handball should follow this progress.

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