PERFORMANCE ANALYSIS OF HANDBALL GOALKEEPERS AT THE DIFFERENT WORLD CHAMPIONSHIPS

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Abstract

The objective of this study was to analysis Handball Goalkeeper"s Performance analysis. The selected subject was taken from 2015 France Goalkeeper (2015FG), 2015 Qatar Goalkeeper (2015QG), 2017 Norway Goalkeeper (2017NG), 2017 Croatia Goalkeeper (2017CG), 2019 Denmark Goalkeeper (2019DG), 2019 Norway Goalkeeper (2019NG), 2021 Denmark Goalkeeper (2021DG) and 2021 Sweden Goalkeeper (2021SG) Handball World Championship final match videos were using the study total of eight goalkeepers was taken into the study. Variables would be using Longomatch video analyzing software. The selected variables namely basic notational analysis Types of Shots: (6-MLS) 6-Metre Line Shots successful /unsuccessful, (9-MLS) 9- Metre Line Shots successful /unsuccessful, (7-MT) 7- Metre Throws (Penalty) successful /unsuccessful, (LRS) Long Range Shots away from 9- Metre Line successful /unsuccessful, (FBS) Fast Break Shots successful /unsuccessful, (RS) Running Shots successful /unsuccessful, (BS) Back Shots successful /unsuccessful, (BBS) Blocked Ball Shots successful /unsuccessful. The successful is the Goalkeeper successful save the shots is save point and the Goalkeeper miss the shots is called as unsuccessful is shot miss the point **(Milanović, 2018).** In the position phases of the game, situational activity indicators have been analysis within 5 playing positions in the position attack Playing Zone Wise Shot Analysis: (RW) Right Wing, (RB) Right Back, (CB) Centre Back, (LB) Left Back, (LW) Left Back the pivot player doesn't stay the one place so pivot player shots attempt time staying place covering the five-zone so don't give separate playing zone name **(Foreti, 2013).** Goal Post-Zone Wise Analysis: The handball goal post was divided into Nine zones (Z -1TRC) Zone-1 Top Right Centre, (Z-2TC) Zone-2 Top Centre, (Z-3TLC) Zone-3 Top Left Centre, (Z-4CR) Zone-4 Centre-Right, (Z-5CC) Zone-5 Centre Centre, (Z-6CL) Zone-6 Centre Left, (Z-7BRC) Zone-7 Bottom Right Corner, (Z-8BC) Zone-8 Bottom Centre, (Z-9BLC) Zone-9 Bottom Left Corner **(YIANNAKOS, 2016).** Data analysis performed using a simple calculation method was used.

Keywords: Handball, Performance Analysis, Goalkeeper Analysis and Basic Notational Analysis

Introduction

Handball is the world's second fastest team game. Today, the sport is now played in over 183 countries, including variations (**Realbuzz Team, 2019**). Despite its history, the men's game wasn't implemented in the Olympics until the 1936 Berlin games. The women's game took even longer despite their skill level, eventually being introduced in Montreal in 1976 (IHF, 2016). A team consists of up to 14 players. No more than 7 players may be present on the court at the same time. The remaining players are substitutes (**IHF, 2016**).

Every two years, the Handball World Championship is put on by the International Handball Federation (IHF). The Men's World Championship was the most recent, and it took place in Qatar in 2015. The majority of handball performance-related research has concentrated on the physical demands of field players, particularly locomotor needs and body contact. Performance demands and/or player behaviours have primarily been defined using data from performance analysis based on in-game observations or a review of game recordings. Injury rates (27 percent), physical capacity (18 percent), physiological factors (13 percent), success variables, and performance have all benefited from the use of such data (6 percent). Other studies have shown the distance travelled, the amount of time spent in various intensity categories, the cardiovascular demands, and/or particular strengths and power characteristics. Although

goalkeepers are acknowledged to be important in handball, very few studies on the performance traits of top goalkeepers have been done. The few studies that have been done on goalkeepers have shown that, as would be expected, they do not cover long distances while running or walking. The goalkeeper's job is to stop the other team from scoring goals by blocking the ball with their entire body (unlike field players, goalkeepers are permitted to touch the ball with every body part) inside the goal perimeter. **(Hansen, 2017).**

A handball game is a system in which the states of the game alternate and are split into the offensive phase and the defence phase. When those two primary phases are considered in terms of the stability of the court, it may be claimed that the defensive phase serves to stabilise things while the offensive phase serves to destabilise things. When performing an assault or defence, the transition between these stages is inactive. **(Ohnjec, 2013).**

Handball is a strenuous contact sport that emphasizes running, jumping, sprinting, throwing, hitting, blocking, and pushing. In addition to technical and tactical skills, it has been argued that muscular strength and power are the most important factors that give a clear -advantage in elite competitions **(Hermassi, 2011).**

A complex intermittent sport like team handball necessitates highly developed anaerobic and aerobic capacities from its participants. Several motor skills, including running, jumping, flexibility, and throwing velocity, are seen to be crucial elements of the game that affect how well a team performs. **(Curiţianu, 2014).**

Players were divided into one of four playing positions; Back (left back, centre back, and right back pooled together), wing (left wing and right wing pooled together), pivot and goalkeeper (GK). Some players rotate between every phase of ball possession and thus only have on-field time in either offensive or defensive play **(Luteberget, 2017).**

Performance analysis

Performance analysis is a branch of sport and exercise research that focuses on real sporting performance rather than athlete self-reports or lab tests. There is a justification for performance analysis as a study field as well as a description of the applied nature of performance analysis research. Performance analysis is primarily done to provide support for individual athletes as well as squads. Within this coaching context, the objective information is often produced by a professional performance analyst who liaises with the coach as part of a coaching process that involves providing feedback to the players. High-performance directors can use the performance indicators used to evaluate and track athlete performance in the design, management, and oversight of elite performance programmes. **(O'Donoghue ,2010).**

Performance indicators that measure a team member's situational effectiveness are gathered by techniques of player registration during play (in real-time), during a later viewing of match records, or by combining both. Due to the ability of handball experts to evaluate and analyse technical, tactical, and other situation-specific aspects of player behaviour in games, video recordings of matches are very helpful. Each game and the behaviour of the players within it is a particular expression of the skills, knowledge, traits, and other characteristics of athletes, but it is also a reflection of the work done by coaches and other team supporting employees. However, each matchup between the same two opponents only results in a comparable, never the same, game progression or result. **(Milanović, D, 2018).**

Goalkeepers

Goalkeepers play a crucial part in handball. The few studies that have been done on goalkeepers have shown that, as would be expected, they do not cover long distances while running or walking. The goalkeeper's job is to stop the other team from scoring goals by touching the ball with every part of their body inside the goal perimeter (unlike field players, who are only allowed to use certain body parts). **(Clint Hansen, 2017**).

Purpose of the Study

The purpose of the study was to Performance Analysis of Handball Goalkeepers at the Different World Championships.

Material and methods

The sample of cases

The objective of this study was to analysis Handball Goalkeepers' Performance analysis. The selected subject was taken from 2015 France Goalkeeper (2015FG), 2015 Qatar Goalkeeper (2015QG), 2017 Norway Goalkeeper (2017NG), 2017 Croatia Goalkeeper (2017CG), 2019 Denmark Goalkeeper (2019DG), 2019 Norway Goalkeeper (2019NG), 2021 Denmark Goalkeeper (2021DG) and 2021 Sweden Goalkeeper (2021SG) Handball World Championship final match videos were using the study total of eight goalkeepers was taken into the study. Variables would be using Longomatch video analyzing software.

The sample of variables

The selected variables namely basic notational analysis Types of Shots: (6-MLS) 6- Metre Line Shots successful /unsuccessful, (9-MLS) 9- Metre Line Shots successful /unsuccessful, (7-MT) 7- Metre Throws (Penalty) successful /unsuccessful, (LRS) Long Range Shots away from 9- Metre Line successful /unsuccessful, (FBS) Fast Break Shots successful /unsuccessful, (RS) Running Shots successful /unsuccessful, (BS) Back Shots successful /unsuccessful, (BBS) Blocked Ball Shots successful /unsuccessful. The successful is the Goalkeeper successful save the shots is save point and the Goalkeeper miss the shots is called as unsuccessful is shot miss the point **(Milanović, 2018).** In the position phases of the game, situational activity indicators have been analysis within 5 playing positions in the position attack Playing Zone Wise Shot Analysis: (RW) Right Wing, (RB) Right Back, (CB) Centre Back, (LB) Left Back, (LW) Left Back the pivot player doesn't stay the one place so pivot player shots attempt time staying place covering the five-zone so don't give separate playing zone name **(Foreti, 2013).** Goal Post-Zone Wise Analysis: The handball goal post was divided into Nine zones (Z -1TRC) Zone-1 Top Right Centre, (Z-2TC) Zone-2 Top Centre, (Z-3TLC) Zone-3 Top Left Centre, (Z-4CR) Zone-4 Centre-Right, (Z-5CC) Zone-5 Centre Centre, (Z-6CL) Zone-6 Centre Left, (Z-7BRC) Zone-7 Bottom Right Corner, (Z-8BC) Zone-8 Bottom Centre, (Z-9BLC) Zone-9 Bottom Left Corner **(YIANNAKOS, 2016).**

Statistical Analysis

Data analysis performed using a simple calculation method was used.

Results and discussion

TABLE –I :GOALKEEPER'S TOTAL NUMBER OF SHOTS SUCCESSFUL AND UNSUCCESSFUL EFFICIENCY IN BASIC NOTATIONAL ANALYSIS VARIABLES

S.No	Variable	2015-France Goalkeeper			2015-Qatar Goalkeeper			2017-Norway Goalkeeper			2017-Croatia Goalkeeper			2019-Denmark Goalkeeper			2019-Norway Goalkeeper			2021-Denmark Goalkeeper			2021-Sweden Goalkeeper		
		Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %
1.	6-MLS	15	5	33	30	12	40	18	4	22	17	5	29	26	11	42	21	4	19	24	6	25	23	8	35
2.	9-MLS	21	12	57	13	10	77	17	10	59	12	4	33	6	4	67	10	5	50	9	7	78	14	4	29
3.	7-MT	3	0	0	3	1	33	5	2	40	4	2	50	3	1	33	3	1	33	4	1	25	2	1	50
4.	LRS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	50	1	0	0	1	0	0
5.	FBS	1	0	0	2	0	0	1	1	100	3	0	0	0	0	0	2	0	0	1	1	100	0	0	0
6.	RS	0	0	0	0	0	0	1	1	100	2	1	50	2	2	100	3	0	0	0	0	0	0	0	0
7.	BS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8.	BBS	0	0	0	0	0	0	1	0	0	2	1	50	1	1	100	0	0	0	0	0	0	0	0	0

Table – I Shows the Goalkeeper's total number of shots Successful and Unsuccessful efficiency in basic notational analysis variables the 2015FG was 33 % of 6-MLS save Efficiency, 57 % of 9-MLS Save Efficiency and other selected basic notational analysis variables are 0 % of Save Efficiency. The 2015QG was 40 % of 6-MLS Save Efficiency, 77 % of 9-MLS Save Efficiency, 33 % of 7-MT Save Efficiency and other selected basic notational analysis variables are 0 % of Save Efficiency. The 2017NG was 22 % of 6-MLS Save Efficiency, 59 % of 9-MLS Save Efficiency, 40 % of 7-MT Save Efficiency, FBS, RS also 100 % of Save Efficiency and other selected basic notational analysis variables are 0% of Save Efficiency. The 2017CG was 29 % of 6-MLS Save Efficiency, 33 % of 9-MLS Save Efficiency, 50 % of 7-MT Save Efficiency, RS, BBS also 50 % Save Efficiency and other selected basic notational analysis variables are 0% of Save Efficiency. The 2019DG was 42 % of 6-MLS Save Efficiency, 67 % of 9-MLS Save Efficiency, 33 % of 7-MT Save Efficiency, RS, BBS also 100 % Save Efficiency and other selected basic notational analysis variables are 0% of Save Efficiency. The 2019NG was 19 % of 6-MLS Save Efficiency, 50 % of 9-MLS Save Efficiency, 33 % of 7-MT Save Efficiency, LRS 100 % Save Efficiency and other selected basic notational analysis variables are 0% of Save Efficiency. The 2021DG was 25 % of 6-MLS Save Efficiency, 78 % of 9-MLS Save Efficiency, 25 % of 7-MT Save Efficiency, FB 100 % Save Efficiency and other selected basic notational analysis variables are 0% of Save Efficiency. The 2021SG was 35 % of 6-MLS Save Efficiency, 29 % of 9-MLS Save Efficiency, 50 % of 7-MT Save Efficiency and other selected basic notational analysis variables are 0% of Save Efficiency.

FIGURE –I : GOALKEEPER'S TOTAL NUMBER OF SUCCESSFUL SAVE EFFICIENCY IN BASIC NOTATIONAL ANALYSIS VARIABLES

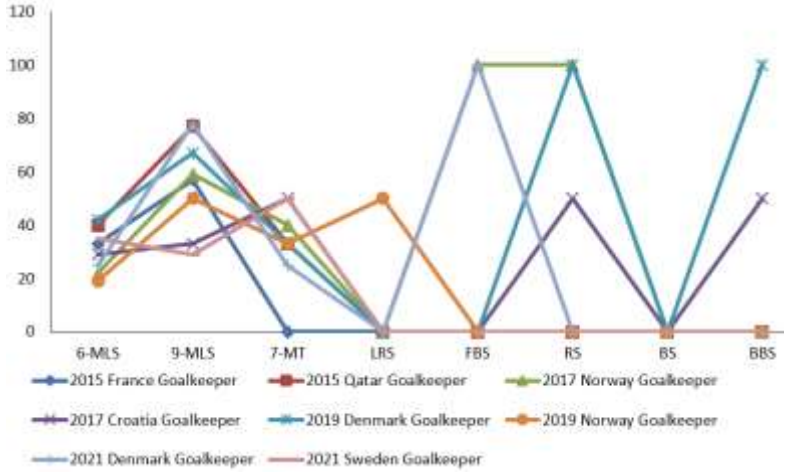


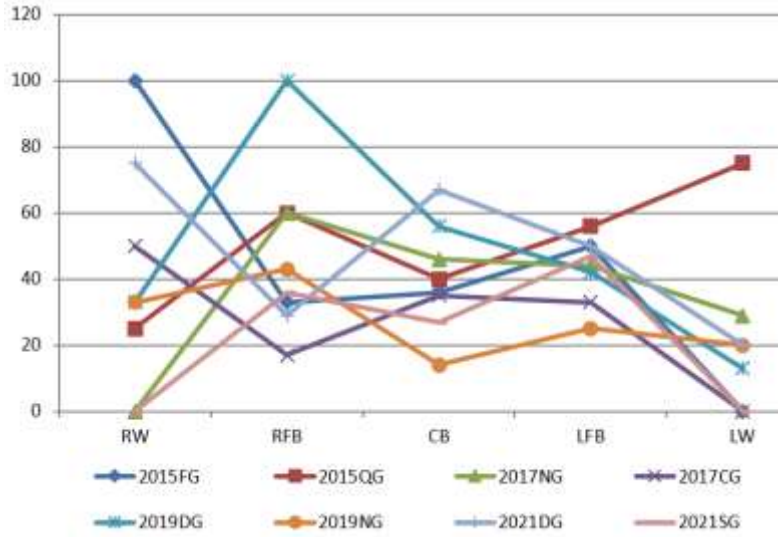
TABLE –II : TOTAL NUMBER OF PLAYING POSITION ZONE–WISE SHOTS PERFORMANCE ANALYSIS EFFICIENCY

S.No	Variable	2015-France Goalkeeper			2015-Qatar Goalkeeper			2017-Norway Goalkeeper			2017-Croatia Goalkeeper			2019-Denmark Goalkeeper			2019-Norway Goalkeeper			2021-Denmark Goalkeeper			2021-Sweden Goalkeeper		
		Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %	Shots	Saves	Save Efficiency %
1.	RW	2	2	100	4	1	25	2	0	0	4	2	50	6	2	33	3	1	33	4	3	75	0	0	0
2.	RFB	12	4	33	5	3	60	5	3	60	6	1	17	6	6	100	7	3	43	14	4	29	11	4	36
3.	CB	22	8	36	20	8	40	13	6	46	23	8	35	9	5	56	14	2	14	12	8	67	11	3	27
4.	LFB	4	2	50	16	9	56	16	7	44	6	2	33	12	5	42	12	3	25	4	2	50	15	7	47
5.	LW	0	0	0	4	3	75	7	2	29	1	0	0	8	1	13	5	1	20	5	1	20	3	0	0

Table – II shows that the Total Number of Playing Position Zone –Wise Shots Analysis Performance Efficiency 2015FG was 100 % of RW Playing Position Shots Save Efficiency, 33 % of RFB Playing Position Shots Save Efficiency, 36 % of CB Playing Position Shots Save Efficiency, 50 % of LFB Playing Position Shots Save Efficiency and LW position players no taken any attempt the match. The 2015QG was 25 % of RW Playing Position Shots Save Efficiency, 60 % of RFB Playing Position Shots Save Efficiency, 40 % of CB Playing Position Shots Save Efficiency, 56 % of LFB Playing Position Shots Save Efficiency and 75 % of LW Playing Position Shots Save Efficiency. The 2017NG was RW position players not taken any attempt the match. 60 % of RFB Playing Position Shots Save Efficiency, 46 % of CB Playing Position Shots Save Efficiency, 44 % of LFB Playing Position Shots Save Efficiency and 29 % of LW Playing Position Shots Save Efficiency. The 2017CG was 50 % of RW

Shots Save Efficiency, 17 % of RFB Shots Save Efficiency, 35 % of CB Shots Save Efficiency, 33 % of LFB Shots Save Efficiency and 0 % of LW Playing Position Shots Save Efficiency. The 2019DG was 33 % of RW Playing Position Shots Save Efficiency, 100 % of RFB Playing Position Shots Save Efficiency, 56 % of CB Playing Position Shots Save Efficiency, 42 % of LFB Playing Position Shots Save Efficiency and 13 % of LW Playing Position Shots Save Efficiency. The 2019NG was 33 % of RW Playing Position Shots Save Efficiency, 43 % of RFB Playing Position Shots Save Efficiency, 14 % of CB Playing Position Shots Save Efficiency, 25 % of LFB Playing Position Shots Save Efficiency and 20 % of LW Playing Position Shots Save Efficiency. The 2021DG was 75 % of RW Playing Position Shots Save Efficiency, 29 % of RFB Playing Position Shots Save Efficiency, 67 % of CB Playing Position Shots Save Efficiency, 50 % of LFB Playing Position Shots Save Efficiency and 20 % of LW Playing Position Shots Save Efficiency. The 2021SG was RW position players no taken any attempt the match., 36 % of RFB Playing Position Shots Save Efficiency, 27 % of CB Playing Position Shots Save Efficiency, 47 % of LFB Playing Position Shots Save Efficiency and 0 % of LW Playing Position Shots Save Efficiency.

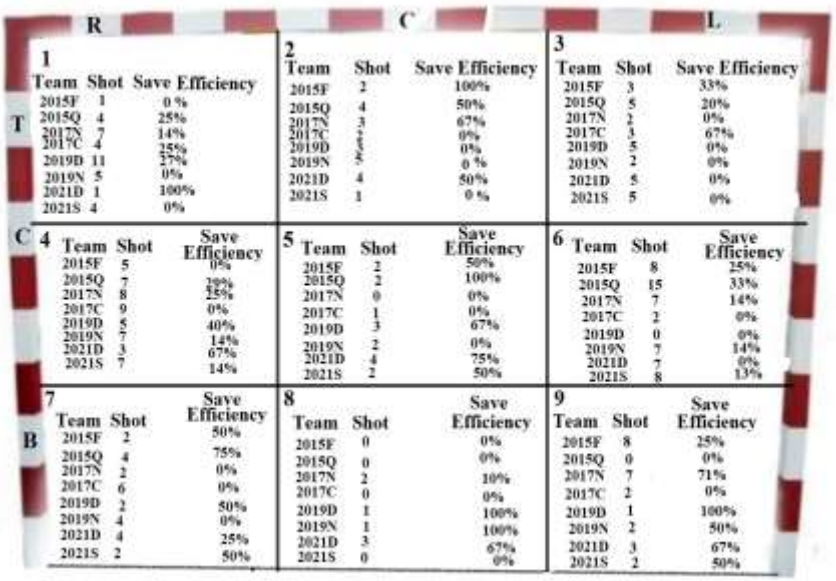
FIGURE –II : FIGURE –II : TOTAL NUMBER OF PLAYING POSITION ZONE–WISE SHOTS SUCCESSFUL SAVE EFFICIENCY



GOAL POST ZONE – WISE GOALKEEPER PERFORMANCE ANALYSING EFFICIENCY

The Goal Post Explain that 2015FG was Z -1TRC 0 % of Goalkeeper Shots Save Efficiency, Z-2TC 100 % of Goalkeeper Shots Save Efficiency, Z-3TLC 33 % of Goalkeeper Shots Save Efficiency, Z-4CR 0 % of Goalkeeper Shots Save Efficiency, Z-5CC 50 % of Goalkeeper Shots Save Efficiency, Z-6CL 25 % of Goalkeeper Shots Save Efficiency, Z-7BRC 50 % of Goalkeeper Shots Save Efficiency, Z-8BC 0 % of Goalkeeper Shots Save Efficiency and Z-9BLC 25% of Goalkeeper Shots Save Efficiency. The 2015QG was Z -1TRC 25 % of Goalkeeper Shots Save Efficiency, Z-2TC 50 % of Goalkeeper Shots Save Efficiency, Z-3TLC 20 % of Goalkeeper Shots Save Efficiency, Z-4CR 29 % of Goalkeeper Shots Save Efficiency, Z-5CC 100 % of Goalkeeper Shots Save Efficiency, Z-6CL 33 % of Goalkeeper Shots Save Efficiency, Z-7BRC 75 % of Goalkeeper Shots Save Efficiency, Z-8BC 0 % of Goalkeeper Shots Save Efficiency and Z-9BLC 0 % of Goalkeeper Shots Save Efficiency. The 2017NG was Z -1TRC 14 % of Goalkeeper Shots Save Efficiency, Z-2TC 67 % of Goalkeeper Shots Save Efficiency, Z-3TLC 0 % of Goalkeeper Shots Save Efficiency, Z-4CR 25 % of Goalkeeper Shots Save Efficiency, Z-5CC 0 % of Goalkeeper Shots Save Efficiency, Z-6CL 14 % of Goalkeeper Shots Save Efficiency, Z-7BRC 0 % of Goalkeeper Shots Save Efficiency, Z-8BC 10 % of Goalkeeper Shots Save Efficiency and Z-9BLC 71% of Goalkeeper Shots Save Efficiency. The 2017CG was Z -1TRC 25 % of Goalkeeper Shots Save Efficiency, Z-2TC 0 % of Goalkeeper Shots Save Efficiency, Z-3TLC 67 % of Goalkeeper Shots Save Efficiency, Z-4CR 0 % of Goalkeeper Shots Save Efficiency, Z-5CC 0 % of Goalkeeper

Shots Save Efficiency, Z-6CL 0 % of Goalkeeper Shots Save Efficiency, Z-7BRC 0 % of Goalkeeper Shots Save Efficiency, Z-8BC 0 % of Goalkeeper Shots Save Efficiency and Z-9BLC 0 % of Goalkeeper Shots Save Efficiency. The 2019DG was Z -1TRC 27 % of Goalkeeper Shots Save Efficiency, Z-2TC 0 % of Goalkeeper Shots Save Efficiency, Z-3TLC 0 % of Goalkeeper Shots Save Efficiency, Z-4CR 40 % of Goalkeeper Shots Save Efficiency, Z-5CC 67 % of Goalkeeper Shots Save Efficiency, Z-6CL 0 % of Goalkeeper Shots Save Efficiency, Z-7BRC 50 % of Goalkeeper Shots Save Efficiency, Z-8BC 100 % of Goalkeeper Shots Save Efficiency and Z-9BLC 100% of Goalkeeper Shots Save Efficiency. The 2019NG was Z -1TRC 0 % of Goalkeeper Shots Save Efficiency, Z-2TC 0 % of Goalkeeper Shots Save Efficiency, Z-3TLC 0 % of Goalkeeper Shots Save Efficiency, Z-4CR 14 % of Goalkeeper Shots Save Efficiency, Z-5CC 0 % of Goalkeeper Shots Save Efficiency, Z-6CL 14 % of Goalkeeper Shots Save Efficiency, Z-7BRC 0 % of Goalkeeper Shots Save Efficiency, Z-8BC 100 % of Goalkeeper Shots Save Efficiency and Z-9BLC 50% of Goalkeeper Shots Save Efficiency. The 2021DG was Z -1TRC 100 % of Goalkeeper Shots Save Efficiency, Z-2TC 50 % of Goalkeeper Shots Save Efficiency, Z-3TLC 0 % of Goalkeeper Shots Save Efficiency, Z-4CR 67 % of Goalkeeper Shots Save Efficiency, Z-5CC 75 % of Goalkeeper Shots Save Efficiency, Z-6CL 0 % of Goalkeeper Shots Save Efficiency, Z-7BRC 25 % of Goalkeeper Shots Save Efficiency, Z-8BC 67 % of Goalkeeper Shots Save Efficiency and Z-9BLC 67 % of Goalkeeper Shots Save Efficiency. The 2021SG was Z -1TRC 0 % of Goalkeeper Shots Save Efficiency, Z-2TC 0 % of Goalkeeper Shots Save Efficiency, Z-3TLC 0 % of Goalkeeper Shots Save Efficiency, Z-4CR 14 % of Goalkeeper Shots Save Efficiency, Z-5CC 50 % of Goalkeeper Shots Save Efficiency, Z-6CL 13 % of Goalkeeper Shots Save Efficiency, Z-7BRC 50 % of Goalkeeper Shots Save Efficiency, Z-8BC 0 % of Goalkeeper Shots Save Efficiency and Z-9BLC 50 % of Goalkeeper Shots Save Efficiency.



(GOALPOST)

Conclusion

The study was conducted on a sample of four different Handball world championship final matches taken from a total of eight teams the basic notational analysis variables 6-MLS is the 2019 Denmark Goalkeeper's best performance and 9-MLS is the 2021 Denmark Goalkeeper was a wonderful performance camber to other teams. the 7-MT Penalty Shot is a 2019 Croatia and 2021 Sweden Goalkeepers is the same level of performance is the best performance of the analysis and LRS is a very less than amount of players only attempt the all the matches. FBS is the very less-than-saving possibility this type of shot is without defence shots maximum goalkeeper doesn't save these shots. RS is the one in two players who only attempt the entire match so the analysis results very less 2017 Norway and 2019

Denmark Goalkeepers successful save efficiency in the analysis. BS is the only team that attempt the shots these unexpected shot. BBS is the after saving the ball rebound the ball attempt the shots very less than saving possibility. The playing position zone–wise shots performance analysis efficiency 2015 Qatar Goalkeeper is the very good successful efficiency camper to the other analysis teams this types of analysis easily understand successful shooting aria. The Goal Post zone–wise analysis is a very good analysis in the performance analysis easily understand the Goal Keeper weakest and strongest zone of the goal aria (Goal Post) this analysis before getting the knowledge of strength and weakness of the Goalkeepers. This analysis before predicting the match results.

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