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Handball Shooting Technique Skills in the 2025 IHF Men's World Championship Final Denmark vs. Croatia

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ABSTRACT

Handball is a high-intensity team sport that requires the integration of advanced technical execution, tactical decision-making, and physical readiness. Among the various technical skills, shooting ability is a decisive factor influencing goal production and match outcomes, particularly at the elite international level. This study aims to analyze shooting technique skills in the final match of the 2025 IHF Men's World Championship between Denmark and Croatia, with specific focus on shooting types, success rates, and shooting areas. A quantitative descriptive research design was employed using systematic video-based match analysis. The data were collected through a structured observation sheet designed to record the frequency, type, location, and effectiveness of each shooting attempt performed by both teams. Descriptive statistical analysis was conducted by calculating frequencies and success percentages for each shooting category. The findings revealed that Denmark attempted 52 shots with an overall success rate of 62.54%, while Croatia executed 55 shots with a lower success rate of 47.27%. In terms of shooting technique, Denmark predominantly utilized the flying shoot (24 attempts), achieving a high effectiveness rate of 75%, whereas Croatia most frequently applied the jump shoot (23 attempts) with a relatively low success rate of 39.13%. Analysis of shooting areas indicated that the front zone was the most frequently used and most effective scoring area, with success rates of 63.63% for Denmark and 44% for Croatia. These results demonstrate that the flying shoot represents the most effective shooting technique in elite international handball competition. The study highlights that mastery of basic techniques, optimal timing, tactical awareness, and shooting accuracy are key determinants of scoring efficiency and team success. Therefore, coaches are encouraged to implement training programs that emphasize game-based shooting drills and systematic performance analysis to enhance shooting effectiveness in competitive matches.

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INTRODUCTION

Handball is a rapidly growing team sport globally, particularly in Europe, but remains relatively unknown and structurally unestablished in Indonesia. However, handball is

characterized by high dynamics, requiring a combination of physical, technical, and tactical abilities, as well as quick decision-making, in line with the demands of modern performance-based sports (Gorostiaga et al., 2018; Michalsik & Aagaard, 2015). The game involves two teams of seven players each, with the primary objective of scoring as many goals as possible through various organized attacks and quick transitions, while preventing the opponent from doing the same.

From a technical perspective, handball requires mastery of complex fundamental skills, such as running, jumping, catching, passing, dribbling, and shooting. Among these skills, shooting, or shooting technique, is a key determinant of offensive success because it directly correlates with goal scoring and the chance of victory (Wagner et al., 2014; Luteberget et al., 2018). The variety of shooting techniques such as the jump shot, flying shot, standing shot, fall shot, and reverse shot shows that the success of a shot is determined not only by strength, but also by timing, coordination, angle, opponent pressure, and the situational context of the match (Sibila et al., 2017; Anusopati, 2016).

However, in Indonesian coaching practice, shooting skill evaluation still tends to be subjective and based on visual observation, without the support of systematic, data-driven match analysis. This makes it difficult for coaches to identify patterns of shooting success and failure, whether in terms of technique, position, or game context. Yet, match analysis is a crucial tool in competitive sports for objectively understanding team and individual performance and providing a basis for designing more effective and specific training programs (O'Donoghue, 2015; Hughes & Bartlett, 2020).

With the increasing intensity and quality of international handball competition—as reflected in world championships and the Olympics—the need for a scientific approach to performance evaluation is becoming increasingly urgent. Without a data-based understanding of shooting effectiveness in matches, the development of Indonesian handball achievements has the potential to be left behind and unable to compete regionally or internationally.

Over the past decade, research on handball at the international level has shown significant progress, particularly in match analysis. Recent studies confirm that shooting effectiveness is significantly influenced by contextual variables such as player position, shooting distance, defensive pressure, game phase (set play vs. fast break), and fatigue (Wagner et al., 2014; Luteberget & Spencer, 2017; Karcher & Buchheit, 2014). This approach positions shooting not simply as a technical skill, but as the result of a complex interaction between individual abilities and the team's tactical system.

Research in Europe shows that elite world teams have higher shooting success rates because they are able to maximize high-percentage shots, such as shots from the six-meter area and in fast-break situations (Gómez et al., 2018; Ferrari et al., 2020). Furthermore, biomechanical studies reveal that jump shots with optimal arm angle and body rotation produce better ball speed and accuracy than other techniques under high-pressure conditions (Fieseler et al., 2019).

From a coaching perspective, the integration of video analysis and match statistics has been shown to improve the quality of feedback to athletes, accelerate technique correction, and enhance decision-making during matches (Carling et al., 2014; O'Donoghue, 2015). In fact,

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recent trends indicate the use of performance indicators and notational analysis as a basis for developing specific training models based on match needs (Hughes & Bartlett, 2020).

In contrast, national handball literature is still dominated by descriptive studies on basic techniques and game introduction, with limited empirical research based on match analysis. Studies specifically examining shooting effectiveness in the context of official competitions are still very limited, both in terms of quantity and depth of analysis. This indicates a gap between the development of handball science at the global level and its implementation in the Indonesian context.

Although international research has extensively addressed shooting effectiveness and performance analysis in handball, several relevant research gaps remain. First, most studies focus on professional leagues and national teams in developed European countries, so the generalizability of findings to developing country contexts, including Indonesia, is still limited (Gómez et al., 2018; Ferrari et al., 2020).

Second, national research tends not to systematically integrate match analysis to evaluate shooting skills in real-world competitive conditions. Shooting technique evaluations are often conducted in controlled training situations, which do not fully reflect the complexities of psychological pressure, physical fatigue, and tactical dynamics during matches (Limbong, 2020; Sibila et al., 2017).

Third, few studies link shooting analysis results to practical implications for training planning and coaching decision-making at the national level. Therefore, there is an urgent need for research that is not only descriptive, but also analytical and applicable, to bridge the gap between global theory and local Indonesian handball practice.

Based on these research problems and gaps, the objective of this study is to analyze the effectiveness of shooting techniques in competitive handball matches, by examining the types of shots, success rates, and the situational context in which the shots occur. This research is expected to provide an objective picture of effective and ineffective shooting patterns, as a basis for evaluating athlete and team performance.

The novelty of this research lies in: the application of data-based match analysis in the context of Indonesian handball; the focus on shooting as a key indicator of offensive performance in real-life competitive situations; and the presentation of practical implications that can be directly applied by coaches in designing training programs based on match requirements.

Therefore, this research is expected to contribute theoretically to enriching the national handball literature, while also practically supporting the improvement of the quality of coaching and performance in Indonesian handball towards regional and international competitive levels.

METHODS

This research employed a quantitative descriptive approach with a match performance analysis design. This quantitative descriptive approach was chosen because it allows researchers to objectively identify, measure, and describe shooting

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skill patterns through numerical data obtained from real-life match situations (O'Donoghue, 2015; Hughes & Bartlett, 2020). This method aligns with the view that performance analysis in modern team sports must be based on quantitative data to accurately represent the complexity of the game (Carling et al., 2014; Gómez et al., 2018).

Conceptually, quantitative descriptive research aims to describe the characteristics of a phenomenon without making inferential generalizations beyond the context of the observed data (Creswell & Creswell, 2018). In the context of competitive sports, this approach is widely used to evaluate the effectiveness of techniques, tactics, and key performance indicators at the elite competitive level (Wagner et al., 2014; Luteberget et al., 2018). Therefore, this method is deemed appropriate for analyzing shooting skills in the final match of the World Handball Championship.

Research Subjects and Objects

The subjects of this study were the two teams competing in the final of the 2025 IHF Men's World Championship: the national teams of Denmark and Croatia. Both teams were selected purposively because they represent the highest level of performance in world handball, thus reflecting international elite technical and tactical standards (Gorostiaga et al., 2018; Ferrari et al., 2020).

The research focused on shooting skills, including the number of shots, types of shooting techniques, and the success and failure rates of shots during the final match. This focus is based on empirical findings that shooting is a primary determinant of goal productivity and the final outcome of handball matches (Wagner et al., 2014; Sibila et al., 2017).

Research Instrument

The research instrument used was a structured observation sheet developed based on a literature review of handball performance analysis and previous studies on shooting technique classification (O'Donoghue, 2015; Gómez et al., 2018). The observation sheet was designed to systematically and consistently record each shooting event, thereby increasing the objectivity and reliability of the data (Hughes & Bartlett, 2020).

The shooting technique categories observed included: jump shot, flying shot, standing shot, fall shoot, reverse shoot, side shot, and penalty throw. This classification refers to international handball technique standards and has been widely used in elite performance research (Sibila et al., 2017; Fieseler et al., 2019). Each technique was recorded based on its outcome, namely a successful shot (goal) or an unsuccessful shot (non-goal).

To support the accuracy of the observations, this study utilized video footage of the Denmark vs. Croatia final match obtained from the official YouTube platform and international broadcast sources. Video analysis was conducted using a laptop, using replay and pause to ensure each shooting event was correctly identified. Using video as a secondary data source has been shown to increase the accuracy of performance analysis compared to direct observation alone (Carling et al., 2014; Luteberget & Spencer, 2017).

Data Collection Procedure

Data collection was carried out through the following stages: (1) comprehensive observation of the final match recording; (2) recording each shooting event based on technique and shot outcome; and (3) re-verifying the data through repeated observations

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to minimize recording errors. This systematic observation approach aligns with recommendations from research on match analysis in elite team sports (O'Donoghue, 2015; Hughes & Bartlett, 2020).

Data Analysis Techniques

The data obtained were analyzed using descriptive statistics, presented in the form of frequency tables and percentages. This analysis aims to describe the distribution of successful and missed shots, as well as the tendencies of shooting techniques used by each team (Creswell & Creswell, 2018; Gómez et al., 2018).

The percentage calculation is performed using the following formula:

$$Percentage(\%) = \frac{A\ certain\ number\ of\ events}{Total\ number\ of\ specific\ events} x\ 100$$

The analysis results were used to identify the most dominant and effective shooting techniques for scoring goals in the final match. This approach aligns with international handball performance analysis practices, which emphasize quantitative data interpretation as the basis for technical evaluation and coaching decision-making (Wagner et al., 2014; Ferrari et al., 2020).

RESULTS AND DISCUSSION

Result

After reviewing the video of the 2025 IHF Men's World Championship final between Denmark and Croatia, researchers observed and recorded the number of shots taken by both teams. Through analyzing the match footage, the researchers obtained the following data and information.

Table 1.
Number of Successful and Unsuccessful Shootings from Team Denmark and Croatia in the Final Round.

Team	Total Shooting	Succeed	%	Fail	%
Denmark	52 times	32	62,54	20	37,46
Croatia	55 times	26	47,27	29	52,73

Table 1: Above: After reviewing the video of the 2025 IHF Men's World Championship final between Denmark and Croatia, researchers observed and recorded the number of shots taken by both teams. Through the analysis process of watching the match footage, researchers obtained the following data and information.

Table 2.
Danish Team Shooting Technique in the Final Round

Shooting Type	Total Shooting	Succeed	%	Fail	%
Flying Shoot	24	18	75%	6	25%
Jump Shoot	13	3	23,08%	10	76,92%
Standing Shoot	5	4	80%	1	20%
Side Shoot	0	0	0	0	0
Fall Shoot	2	1	50%	1	50%
Reverse Shoot	0	0	0	0	0
Penlaty	8	6	75%	2	25%
TOTAL	**52**	**32**		**20**	

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Based on Table 2, the Danish team attempted a total of 52 shots in the match against Croatia, consisting of 32 successful shots and 20 missed shots. The breakdown of successful shots includes: 18 flying shots with a success rate of 75%, 3 jump shots with a success rate of 23.08%, 4 standing shots with a success rate of 80%, 0 side shots with a success rate of 0%, 1 fall shot with a success rate of 50%, 0 reverse shots with a success rate of 0%, and 6 penalties with a success rate of 75%.

Meanwhile, of the 20 unsuccessful shots, the breakdown is as follows: 6 flying shots with a success rate of 25%, 10 jump shots with a success rate of 76.92%, 1 standing shot with a success rate of 20%, 0 side shots with a success rate of 0%, 1 fall shot with a success rate of 50%, 0 reverse shots with a success rate of 0%, and 2 penalties with a success rate of 25%.

Based on Table 2, it can be seen that the standing shot technique had the highest success rate, at 80%. Meanwhile, the highest failure rate came from the jump shot, with a score of 76.92%. The most frequently used technique was the flying shot, with a total of 24 attempts, while the side shot and reverse shot were not used at all, with 0 attempts.

Table 3.
Croatian Team Shooting Technique in the Final Round

Shooting Type	Total Shooting	Succeed	%	Fail	%
Flying Shoot	12	9	75%	3	25%
Jump Shoot	23	9	39,13%	14	60,87%
Standing Shoot	9	3	33.33%	6	66,67%
Side Shoot	0	0	0	0	0
Fall Shoot	6	1	16,66%	5	83,34%
Reverse Shoot	1	1	100%	0	0
Penlaty	4	3	75%	1	25%
Total	**55**	**26**		**29**	

Based on Table 3, the Croatian team attempted a total of 55 shots in the match against Denmark, consisting of 26 successful shots and 29 unsuccessful shots. The breakdown of successful shots includes: 9 flying shots with a success rate of 75%, 9 jump shots with a success rate of 39.13%, 3 standing shots with a success rate of 80%, 0 side shots with a success rate of 0%, 1 fall shot with a success rate of 16.66%, 1 reverse shot with a success rate of 100%, and 3 penalties with a success rate of 75%.

The breakdown of unsuccessful shots is as follows: 3 flying shots with a success rate of 25%, 14 jump shots with a success rate of 60.87%, 6 standing shots with a success rate of 66.67%, 0 side shots with a success rate of 0%, 5 fall shots with a success rate of 83.34%, 0 reverse shots with a success rate of 0%, and 1 penalty with a success rate of 25%.

Based on Table 3, the reverse shot technique had the highest success rate, with a 100% success rate. The drop shot technique had the highest failure rate, with a failure rate of 83.34%. The jump shot was the most frequently used technique, with a total of 23 attempts, while the side shot was not used at all in this match.

In this study, shooting areas or positions were divided into five categories: front, front left wing, rear left wing, front right wing, and rear right wing.

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Table 4.
Danish team shooting areas

Shooting Type	Total Shooting	Succeed	%	Fail	%
Front	22	14	63,63	8	36,37
Left front wing	9	5	55,55	4	44,45
Left wing	6	3	50	3	50
Rear	9	5	55,55	4	44,45
Right wing	6	5	83,33	1	16,67
Front	52	33		18	

The table shows the distribution of the Danish team's shooting positions. In the front area, Denmark recorded 14 successful shots (63.63%) and 8 failed shots (36.37%). From the front left wing, the team successfully made 5 shots (55.55%) and failed 4 shots (44.45%). At the back left wing position, the number of successful and failed shots was the same, namely 3 times each or 50%. At the front right wing position, Denmark recorded 5 successful shots with a percentage of 55.55% and 4 failed shots with a percentage of 44.45%. Meanwhile, from the back right wing position, the team successfully made 5 shots (83.33%) and only experienced 1 failure (16.67%).

Table 5.
Croatian team shooting areas

Shooting Type	Total Shooting	Succeed	%	Fail	%
Front	22	14	63,63	8	36,37
Left front wing	9	5	55,55	4	44,45
Left wing	6	3	50	3	50
Rear	9	5	55,55	4	44,45
Right wing	6	5	83,33	1	16,67
Front	52	33		18	
Total	**55**	**26**		**29**	

Referring to the percentage calculation results in Table 5, the distribution pattern of the Croatian team's shooting positions can be seen. From the front area, the team recorded 12 successful shots (44%) and 15 unsuccessful attempts (56%). On the left front wing, Croatia achieved 3 successes (42.85%) and 4 failures (57.15%). On the left rear wing position, the team only recorded 1 success with a percentage of 25%, while the failure reached 3 times or 75%. From the right front wing position, Croatia successfully made 8 shots (53.33%) and failed 7 times (46.67%). Meanwhile, from the right rear wing, Croatia recorded 2 successful shots with a success rate of 100%, with no failures, so the failure percentage is 0%.

Discussion

A recording of the 2025 IHF Men's World Championship final between Denmark and Croatia shows that a team's goal-scoring success is largely determined by the effectiveness of their shooting technique in a real-life match. This finding reinforces the view that shooting is the most crucial offensive skill in handball, contributing directly to the score and the final outcome of the match (Wagner et al., 2014; Gómez et al., 2018). Denmark's 33–26 victory reflected not only their superior final score but also their efficiency in capitalizing on shooting opportunities compared to Croatia.

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Quantitatively, Denmark demonstrated a higher shooting success rate (63.34%) than Croatia (47.27%). This difference confirms that finishing quality is a key differentiator in elite-level matches, as reported in various international handball performance analysis studies (Luteberget et al., 2018; Ferrari et al., 2020). With a total of 107 shooting attempts from both teams, this data demonstrates a high level of attack, but Denmark's effectiveness in converting chances into goals was far more optimal.

In terms of technique, Denmark predominantly used the flying shot with a success rate of 75%, while Croatia relied more frequently on the jump shot with a relatively low effectiveness (39.13%). This finding aligns with research by Sibila et al. (2017) and Fieseler et al. (2019), which stated that the flying shot provides biomechanical and tactical advantages because players can shoot from angles that are more difficult for goalkeepers to reach. Furthermore, the flying shot often occurs in fast transition situations and fast breaks, which empirically have a higher probability of success than organized attacks under tight defensive pressure (Gómez et al., 2018; Gorostiaga et al., 2018).

Conversely, the high failure rate of the jump shot—especially in Croatia—indicates that although this technique is most commonly used in handball, its effectiveness is highly dependent on the quality of execution, the timing of the jump, and pressure from the defender (Wagner et al., 2014; Karcher & Buchheit, 2014). Research data shows that the jump shot was the technique with the highest failure rate in both teams, with 76.92% failures in Denmark and 60.87% in Croatia. This reinforces the findings of Ramos et al. (2019) that poor finishing ability in high-pressure situations is a major factor in low goal productivity.

In addition to technical aspects, psychological factors also play a significant role in shooting success. Repeated goal failures can potentially lower a player's confidence and impact decision-making in subsequent offensive phases (Gould & Maynard, 2017). In this context, Denmark demonstrated greater mental stability, reflected in consistent shooting effectiveness throughout the match. This finding aligns with Rose's (2013) view, although more recent literature confirms that mental toughness is a key characteristic of elite athletes in maintaining performance under competitive pressure (Cowden et al., 2016; Gucciardi et al., 2017).

Analysis of shooting locations revealed that the front area was the most dominant attacking zone for both teams. Denmark recorded a 63.63% success rate from this area, while Croatia achieved only 44%. This finding is consistent with research by Gómez et al. (2018) and Ferrari et al. (2020) stated that shots from the mid-forward area particularly around the 6-9 meter line have a significant contribution to goal scoring, especially when supported by movement off the ball and good team coordination. The difference in effectiveness between Denmark and Croatia in the same area suggests that the quality of execution and tactical decisions are more important than simply the volume of chances.

From a physiological perspective, an athlete's physical condition is the primary foundation for producing powerful and accurate shots. This research corroborates the findings of Ilham Nur Ardian (2018) and Michalsik and Aagaard (2015), which emphasized

that arm muscle strength, core muscle strength, and leg explosiveness play a significant role in shooting quality, particularly in jump and flying shots. Increased fatigue during a match results in decreased ball speed and shot accuracy, particularly in the second half (Luteberget & Spencer, 2017; Buchheit et al., 2016).

In addition to individual factors, the training methods employed by coaches also influence shooting effectiveness in matches. Rufan et al. (2020) and Ferrari et al. (2020) emphasized that game-based shooting drills are more effective than isolated technique training. Denmark's success can be interpreted as the result of a training system that emphasizes the integration of technique, tactics, and decision-making under high-pressure conditions—an approach that has now become standard in elite European handball development (Gorostiaga et al., 2018; Hughes & Bartlett, 2020).

Overall, this discussion suggests that Denmark's success in the 2025 IHF Men's World Championship final will be determined not only by the number of shooting opportunities, but primarily by the effectiveness of technique, the selection of appropriate shot types, mental stability, physical condition, and the quality of the team's training system and tactics. These findings underscore the importance of data-driven performance analysis as a basis for evaluating and developing handball development, especially for developing countries like Indonesia.

CONCLUSION

Mastery of basic techniques is the foundation of modern handball, as every phase of the game—both offense and defense—depends on the quality of individual and collective technique execution. Among the various basic techniques, such as passing, catching, dribbling, feinting, and shooting, shooting is the most crucial because it directly relates to goal scoring and the final outcome of the match. The ability to execute powerful, accurate, and situationally appropriate shots has proven to be the key differentiating factor between teams with high offensive effectiveness and those that are less productive.

Based on an analysis of the 2025 IHF Men's World Championship final match between Denmark and Croatia, this study showed that Denmark significantly excelled in shooting effectiveness, winning the match with a score of 33–26. The study's findings revealed that the flying shot was the most effective goal-scoring technique, with a success rate of 75% for both teams. Denmark utilized this technique more optimally than Croatia, consistently converting chances into points. Conversely, the jump shot was recorded as the technique with the highest failure rate for both teams, indicating that, despite its frequent use, this technique is highly difficult and is heavily influenced by game pressure and execution quality.

Furthermore, the front of the court was the most dominant shooting location, yet Denmark's effectiveness from this area was higher than Croatia's. This finding confirms that shooting success is determined not only by the shooting location, but also by the selection of the right technique, physical condition, and decision-making in match

situations. Practically, the results of this study can serve as a reference for coaches to design more specific, targeted, and match-analysis-based shooting training programs, particularly in improving the effectiveness of jump shooting techniques and optimizing opportunities from the front of the court.

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Finally, the author hopes that the results of this research will make a tangible contribution to the development of sports coaching science, particularly in the analysis of handball performance and the improvement of shooting skills. They also hope that they will serve as a reference for coaches, researchers, and sports practitioners in their efforts to improve the quality of handball coaching and performance in the future.

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