The Effect of Video Analysis on Players' Self-Confidence and Result Poin in Penalty Shoot outs in Hockey

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.90300082

Received: 27 February 2025; Accepted: 03 March 2025; Published: 01 April 2025

ABSTRACT

The purpose of this study was to measure the level of self-confidence (SC) and analyze the level of success of hockey players in making efforts to score goals in a penalty shoot out (PSO) position after being given training using video analysis. The method used in this study was an experiment with one group pre-test & post-test as many as 6 meetings and a questionnaire to measure SC using the Trait Sport Confidence Inventory (TSCI). The subjects of the study were students who were members of the hockey student activity unit, Universitas Negeri Surabaya. Data analysis used a different test of the results of the pre-test and post-test studies. The results showed that the results of the t-test on the SC showed a number of .000 <0.05, which means that there is a significant difference between the player's SC in the pre-test and post-test and the results of the Wilcoxon Signed Ranks Test on the PSO showed a number of .011 <0.05, which means that there is a significant difference between the results of the player's PSO in the pre-test and post-test. The use of video analysis can provide in-depth visual feedback on player performance, opening up opportunities to improve tactical and technical understanding of technical or tactical errors made unconsciously. By capturing video from 3 different angles, players will be able to reflect on each series of shooting movements performed. The use of video analysis is effective in increasing the self-confidence and penalty shoot out results of hockey players.

Keywords: self-confidence, penalty shootout, video analysis, hockey

INTRODUCTION

Hockey is a game with a high level of body contact, so it requires many physical components to be trained to deal with it [1], [2]. Player kinematics and anthropometric attributes are important factors in hockey [3]. Anthropometric qualities need to be trained by increasing the dominant fitness factors in hockey, namely strength, balance, speed, agility, and endurance.

The techniques in hockey include ball-hitting techniques (hit, slap hit, push, tap, reverse hit, flick, scoop), ball-stopping techniques, ball-dribbling techniques (close dribble, loose dribble, Indian dribble), and ball-taking techniques (jab/poke tackle, one-handed tackle, block). A player's optimal performance is supported by physical qualities, mastery of techniques, and a strong mentality and self-confidence.

High self-confidence in every sport must be possessed by every athlete, both in individual and team sports [4].Self-confidence can be built from training, which has an impact on improving skills. This improvement will then provide self-confidence that a player will be able to perform well in a match. Not all players have stable self-confidence. When facing opponents who have a higher track record, a player will feel inferior about their abilities. Another factor that influences self-confidence is the venue. Home advantage in sports has long been established as an important factor in determining the outcome of a match. According to this phenomenon, the home team will win more matches and score more points than the away team. Home advantage is a very complex phenomenon that is influenced by many different factors. This is also one of the factors that influences player self-confidence [5].

In an effort to improve athletic performance, a thorough analysis of skilled performance that assesses the functionality of the player's characteristics is fundamental [6]. In general, hockey players are evaluated based on

statistical indicators, including goals, assists, points (number of goals and assists), and plus/minus statistics (difference between goals scored) [7]. Penalty corner kicks, long corner kicks, and free kicks will be awarded to the defending team for any defensive violation. These three activities are considered important in the game of hockey because they have the power to change the score of the game (Rabia & Iqbal, 2022; Rangasamy et al., 2020; Wali & Iqbal, 2022; Antonov et al., 2020).

In hockey, one of the crucial moments in the sport of hockey is the Penalty Shoot Out situation [12]. Penalty Shoot Out (PSO) which creates a disadvantage for the team that commits the violation that is defended [13]. One of the keys to a team's victory in a hockey game is to maximize the existing penalty corner kick opportunities as best as possible [14]. The success of a penalty depends on the correct push, stopping the ball outside the circle, analyzing the opponent's defensive pattern, and timing and accuracy when executing the penalty.

PSO is carried out to find the winner if the final score is the same until the end of the match. PSO is a situation where a player must face high pressure to execute a shot that can determine the outcome of the match. PSO requires an attacker to carry the ball one-on-one with the goalkeeper in a time of 8 seconds. In this context, psychological factors, especially self-confidence levels, are key aspects that can affect player performance. The results of field observations show that not all players are appointed as PSO executors. The coaches interviewed usually appoint a player who has good technical skills and good mental readiness to be the PSO taker.

The preparation of the athlete training process is based on the development of criteria for monitoring various indicators, characterizing the level of player readiness, and defining the relationship between indicators and their impact on training results [15]. The use of technology, especially video analysis, has become an integral part of modern sports coaching and applies sport science in its implementation. Sports research often requires recording human movements from an athlete. Human motion capture is the process of recording human movement and focuses on recording an athlete's body position [16].

The use of video analysis can provide in-depth visual feedback on player performance, opening up opportunities to improve tactical and technical understanding of technical or tactical errors made unconsciously. This study aims to identify and analyze the level of player confidence and success during PSO in hockey with the use of video analysis. By understanding the relationship between technical and psychological aspects, this study is expected to provide new insights into the development of holistic training strategies to improve athlete performance at critical moments such as PSO.

METHOD

The subjects of the study were 21 students who were members of the Student Activity Unit Hockey of Universitas Negeri Surabaya. The data collected was analyzed using a questionnaire to measure the level of self-confidence and a pre-test post-test to test the success rate of penalty shoot-outs. The data analysis technique used statistical testing of the average t-test before and after the player video analysis treatment was given. The collected data was analyzed using statistical testing of the average t-test before and after the training model, treatment was given to see whether there was an effect of providing video analysis on the player's PSO in the hockey game.

The basis for determining whether there is a difference in SC or PSO is:

1. If the Sig. (2-tailed) value <0.05, then there is a significant difference between the results of the player's SC or PSO in the pre-test and post-test.

2. If the Sig. (2-tailed) value >0.05, then there is no significant difference between the results of the player's SC or PSO in the pre-test and post-test.

The research procedure began with the implementation of a pre-test on the players. During the pre-test, the players filled out the SC questionnaire and performed PSO 3 times and recorded each player. This video was used as evaluation material for each player in the next training session for 4 meetings. The coaches used the same goalkeepers during the pre-test and post-test with relatively the same level of consistency to anticipate

PSO. Video capture with 3 points, namely the front camera position, the right diagonal camera and the left diagonal camera from the goalkeeper's point of view. Video recorder using Apple iPhone 15 Pro and Apple iPhone 16 Pro which have 48 MP ultrawide videocentric camera specs and a holder with a height of 1.5 meters. Players will analyze where their shortcomings lie when PSO is accompanied by a coach. At the 6th meeting, a post-test and self-confidence test were conducted. The self-confidence test used a questionnaire to measure self-confidence using the Trait Sport Confidence Inventory (TSCI) with a Cronbach alpha coefficient of .93 reliability and validity of .44 [17].

RESULT AND DISCUSSION

The PSO research data was processed using SPSS 25 with the following results:

Table 1 Statistics Penalty Shoot Out

	N	Mean	Std. Deviation	Minimum	Maximum
PSOPre-test	21	1.05	.590	0	2
PSOPost-test	21	1.43	.507	1	2

The results of the PSO statistical test from pre-test to post-test experienced an average increase.

The results of the data normality test are as follows:

Table 2 Tests of Normality

Tests of Normality							
	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Result	1	.342	21	.000	.757	21	.000
	2	.372	21	.000	.633	21	.000
a. Lilliefors Significance Correction							

The results of the normality test indicate that the data is not normally distributed with a sig. <0.05. Next, the Wilcoxon Signed-Rank Test was performed to compare the scores before and after the intervention in the same group.

The following are the results of the Wilcoxon test:

Table 3 Uji Wilcoxon Signed-Rank Test

		N	Mean Rank	Sum of Ranks
PSOPost - PSOPre	Negative Ranks	1[a]	5.50	5.50
	Positive Ranks	9[b]	5.50	49.50
	Ties	11[c]		
	Total	21		
a. PSOPost < PSOPre				
b. PSOPost > PSOPre				
c. PSOPost = PSOPre				

In the table, the negative rank is 1a, which states that the player who experienced a decrease in point scores from the PSO pre-test and post-test is 1 person. Positive rank 9b states that the players who experienced an increase in point scores from the PSO pre-test and post-test are 9 people. Ties states that the players who experienced the same point scores from the PSO pre-test and post-test are 11 people.

The following are the test statistics from the Wilcoxon Signed Ranks Test values:

Table 4 Wilcoxon Signed-Rank Test Statistics

Test Statistics[a]	
	PSOPost - PSOPre
Z	-2.530[b]
Asymp. Sig. (2-tailed)	.011
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

The test results show a figure of .011 <0.05, which means there is a significant difference between the PSO results of players in the pre-test and post-test.

The data from the self-confidence research were processed with SPSS 25 with the following results:

Table 5 Statistics Self Convidence

	N	Minimum	Maximum	Mean	Std. Deviation
SCPre	21	6.1	8.5	7.057	.6013
SCPost	21	6.8	8.9	7.952	.6161
Valid N (listwise)	21				

The results of the SC statistical test from pre-test to post-test experienced an average increase.

The result of normality test are follows:

Table 6. Normality Test SC

Tests of Normality							
	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
SC	1	.142	21	.200*	.957	21	.463
	2	.212	21	.015	.922	21	.095
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

The results of the normality test indicate that the data is normally distributed with a sig.> 0.05. Furthermore, a t-test difference test was conducted to compare the scores before and after the intervention in the same group. The following are the results of the t-test:

Table 7 Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	SCPre - SCPost	-.8952	.5590	.1220	-1.1497	-.6408	-7.339	20	.000

The results of the t-test showed a figure of .000 <0.05, which means that there is a significant difference between the SC of players in the pre-test and post-test.

A good performance by a hockey player is highly dependent on his mastery and ability of basic skills, positional play, tactics, strategy, and discipline on the field [18]. The use of video analysis is one way to improve basic PSO skills in hockey in a guided manner. The results of using video analysis will be useful for identifying errors and analysing their causes to suggest various ways of analysis and self-analysis of technical movements [19]. Video capture with 3 points, namely the front camera position, the right diagonal camera and the left diagonal camera from the goalkeeper's perspective. By capturing video from 3 different angles, players will be able to reflect on each series of shooting movements performed.

Positions under pressure require the athlete's capacity to perform at their best during high-risk or stressful situations [20]. This is one of the statements related to PSO that requires the ability to control the self of players who execute PSO. Players who take part in executing PSO can be said to be successful so as not to disappoint themselves and the team. Confidence is the key for a player to be able to perform at their best. In video observation, the coach emphasizes the technical movements and how to maximize shooting by reflecting on the angle of the PSO, the type of grip used and the timing.

Self-confidence is the belief in one's own abilities, so that one does not feel anxious when performing and has a sense of freedom in doing what one wants and a sense of responsibility for the decisions and actions taken [21]. Self-confidence needs to be integrated into a psychological training program provided in an integrated manner by the coach [22].

Self-confidence needs to be built with the right portion in athletes. Self-confidence can improve or, conversely, hinder an athlete's performance [23]. Self-confidence can improve performance because, with self-confidence, players are not inferior and will enjoy the game or match. On the other hand, players who are too confident will easily be careless because they assume that their opponent's abilities are not higher. The role of a coach is very important in organising and positioning players to remain on high alert when facing opponents.

CONCLUSION

The conclusion of this study is that the results of the t-test on SC show a number of .000 which means there is a significant difference between the SC of players in the pre-test and post-test and the results of the Wilcoxon Signed Ranks Test on PSO show a number of .011 which means there is a significant difference between the results of the PSO of players in the pre-test and post-test. The use of video analysis is declared effective in increasing the confidence and PSO results of hockey players.

ACKNOWLEDGMENT

Thank you for the funding provided by Surabaya State University and to the hockey athlete respondents who were willing to participate in this study.

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