



The Effect Of Physical Fatigue On Football Referee's Decision Making

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Abstract

The role of the referee is very important, especially in professional football. Wrong decisions may have a profound impact on the outcome of the match. Research is needed to find out the aspects that influence referee decisions. This research aims to determine the effect of fatigue experienced by referees on decision-making. This research used an experimental method with 16 football referees as the sample. The research instrument was a video test of soccer referee decision-making from UEFA 2022. The results of this research show a significant influence of fatigue experienced by referees on decision-making. Fatigue experienced by referees interferes with referees in making decisions.

Keywords: *soccer referee, physical fatigue, referee's decision.*

INTRODUCTION

Football is the most popular sport in the world and is played by men and women, children and adults with varying skill levels. Football is common among people with different backgrounds and ancestry, a bridge connecting economic, political, cultural, and religious levels (Luxbacher, 2013). Football performance depends on various factors such as technical/biomechanical, tactical, mental, and physiological areas. In team sports in the open field, such as football, several roles must be fulfilled, such as players, coaches, and referees (Catteeuw et al., 2009; Bennike, Wikman, & Ottesen, 2014; Nurcahyo et al., 2021). A football match will only take place with a referee in a football match called a referee. In every football match, the role of the referee is very important, especially in professional football. A wrong decision may profoundly influence the match's outcome (Castagna et al., 2017; Syafi'i & Setiawan, 2019).



Many possibilities cause the referee's performance to be less than optimal in officiating a match. One of the causes of referee performance not being optimal on the field could be declining physical condition. Referees not in prime condition when officiating matches certainly experience problems displaying their best performance. Decreased physical condition can cause a referee to tire quickly. Fatigue will continue to increase while work performance will decline (Purwata, 2015; Giriwijoyo, 2020)). It indicates that the fatigue experienced will interfere with a person's performance. If a referee experiences fatigue, his concentration level will also decrease, making it very likely that he will make mistakes in decision-making. To ensure that football matches run well and correctly, referees and assistant referees combine high-speed running activities with low-intensity activities during the match (Castagna et al., 2007).

Several incidents on the field show that mistakes made by referees often occur in the final minutes of matches. That moment is the most crucial time in a match. Referee errors are common when deciding on an incident from a distance of 11–15 m (Mallo et al., 2012). Mistakes that arise may have a big impact on the match's outcome. In the 2021 Indonesian league, problems have arisen several times due to mistakes made by the referee in the final minutes, which directly impacted the match result. By that minute, referees are generally tired because they have been carrying out their work duties for approximately 80-90 minutes and have covered a distance of 8-10 km.

Currently, minimal research still examines aspects of physical fatigue experienced by referees. Researchers are currently still more interested in studying aspects that influence athlete performance. Based on the problem phenomena above and the lack of research on the influence of physical fatigue on football referee decision-making, researchers need to find out how fatigue influences football referee decision-making.

METHOD

The method used in this research is an experimental method involving 16 football referees. The referees first conduct an initial decision-making test using the UEFA Referee Video Test 2022. The test carried out by the referee consists of 20 videos about what decisions the referee will make from each incident in the video. After obtaining data about the initial test, the referee is given intervention.

The intervention was physical activity through a bleep test until the samples felt tired. To detect fatigue experienced by referees, researchers used the Forerunner 935 smartwatch, which was produced in 2017 by Garmin, a watch manufacturer from the United States. This watch is used to control the referees' pulse during physical activity. After carrying out maximum physical activity with the pulse rate measured on the watch, the referees perform a decision-making test as a post-test. The results obtained from the pre-test and post-test were then calculated statistically using the paired sample t-test to see whether the referees experienced an influence of fatigue on their decision-making.

RESULT

After carrying out a series of tests and providing physical activity interventions to provide a fatigue effect on the football referees sampled in this research, the data needed in this research was obtained. The data obtained was based on preliminary and final tests by researchers on 16 football referees, as shown in Table 1.

Table 1. Referee Decision Test

Pengambilan Keputusan	N	Minimum	Maximum	Mean	Std. Deviation
Pre Test	16	30	70	54.06	9.67
Post Test	16	35	60	48.43	7.46

Table 1 shows the results of the decision-making test via the UEFA video test during the pre-test and post-test. From the pre-test results, the lowest score obtained by the referees was 30, and the highest score was 70 out of a total maximum score of 100. Meanwhile, the average score in the pre-test was 54.06. The decision-making test results data was obtained from the post-test results, with the highest score being 60 and the lowest score being 35, while the average score on the post-test was 48.43. The data in Table 1 shows a difference in the average of the pre-test and post-test, where the post-test score is lower than the post-test score. It shows the influence of the fatigue intervention on the referee's decision-making. However, further tests need to be carried out to determine the significance of the fatigue felt by the referees.

Before carrying out a significance test, it is necessary to carry out a preliminary test to see whether the data we obtain is normally distributed or not. After carrying out the normality test, the results (Table 2) show that the pre-test and post-test data are normally

distributed. It can be noticed from the pre-test significance value, 0.253, and the post-test value, 0.465. The pre-test and post-test have a significance value greater than 0.05, so both data are declared normally distributed.

Table 2. Normality test

	Shapiro-Wilk		
	Statistic	Df	Sig.
PRE-TEST	.931	16	.253
POST-TEST	.948	16	.465

Table 3. Paired Samples Test

		Mean	Std. Deviation	Sig. (2-tailed)
Pair 1	PRE TEST - POST TEST	5.62500	6.29153	.003

After knowing that the data obtained was normally distributed, a significance test was carried out using the paired sample test to determine the effect of physical fatigue on the decision-making of football referees. In Table 3, the data obtained after the paired sample test shows a significance value of 0.003. The value obtained is smaller than 0.05, so it can be concluded that physical fatigue significantly influences football referees' decision-making.

DISCUSSION

The results of this study show a significant influence of physical fatigue on football referee decision-making. In line with several studies conducted on athletes in several sports, physical fatigue can interfere with sports performance. In football, physical fatigue can interfere with skill performance throughout the match (Russel et al., 2011; Herdiles & Komarudin, 2017). The fatigue that occurs in football referees is almost the same as in football athletes because referees have almost the same power range as players in the midfield position. Even in modern football, a referee can cover a distance of 10-12 km in one match (Castillo et al., 2016).

The decline in referee performance in making decisions due to physical fatigue is related to concentration, so it is difficult for referees to make the right decisions, even though the referee must be able to make the right decision in a relatively short time. Fatigue is a complex thing. This phenomenon is defined as a reduced capacity for maximum performance (Knicker et al., 2011) and the inability to complete tasks that have

been achieved quickly (Halson, 2014). When playing a real match, the referee must be close to every incident on the field to make the right decision.

Fatigue experienced by the referee will certainly reduce the referee's speed in moving closer to the incident scene, which will also affect the accuracy of the decisions made by a football referee, identical to the fatigue that occurs in athletes. More specifically, there is a decrease in the speed and accuracy of skills caused by perceived fatigue (Kellis et al., 2006).

This study also found that the decline in performance experienced by athletes did not appear too striking when viewed from the average difference. It is possible because the referees are already tired even though the pulse rate monitored via the smartwatch is not optimal. In fact, in a real soccer referee match, the referee has to travel 7.5 to 11.5 km in one match, with an average heart rate intensity of 85 – 95 HRmax (Mallo et al., 2009). It can certainly be a consideration for further research so that more sophisticated real-time tools to monitor pulse rates can be used.

Physical activity interventions that are more appropriate to the referee's physical activity during the match are also needed, with a duration adjusted to the duration of the referee's physical activity on the field. Another thing that is no less important is that future research can use a larger sample of referees to obtain a wide variety of data, which can deepen the research results later.

CONCLUSION

This research shows the impact of physical fatigue experienced by football referees on the decisions taken by these referees. The main finding is that the aspect of fatigue experienced by referees in this study is that physical fatigue significantly influences football referees' decision-making. It proves that a referee must be able to maintain his condition to remain in top condition during the match so that fatigue does not easily occur when the referee is in the match.

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