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Improved Free Kick Accuracy: Through Imagery Training And Concentration Of Soccer Players

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Abstract: *This study aims to 1) analyze the difference in the effect between internal imagery training and external imagery on the accuracy of free kicks of soccer players in terms of concentration, 2) analyze the difference in the effect between athletes who have high and low concentration on improving free kick accuracy, 3) analyze the interaction between internal imagery training and external imagery on free kick accuracy in terms of concentration. This type of research is an experiment with a 2 x 2 factorial design. The instrument used to measure concentration is the Grid Concentration Test, while free kick accuracy uses the free kick accuracy test. The data analysis technique used was two-way Anova. The results showed that: 1) There is a difference between internal imagery and external imagery training ($p = 0.045 < 0.05$), then the internal imagery training method is better than external imagery on the accuracy of free kicks of soccer players. 2) There is a difference between players with high concentration and low concentration ($p = 0.018 < 0.05$), and players with high concentration are better than players with low concentration on the accuracy of free kicks of soccer players. 3) There is an interaction between internal and external imaging with high and low concentration ($p = 0.000 < 0.05$). The group of players who have high concentration is more appropriate if trained with internal imagery. In contrast, the players in the low concentration group were better if trained with external imagery.*

Keywords: *Imagery, Concentration, Accuracy, Free Kick*

Introduction

Success in football matches is influenced by physical, technical, strategic, and mental factors. Football players must be continuously trained to achieve the highest achievements (Butler et al., 2021; Jonker et al., 2019). One aspect that supports soccer athletes' success is optimal mental toughness. The mental aspect is very important in the sport of football because mental toughness plays a crucial role in the success of a soccer athlete, especially considering the competitive dynamics and pressures in this sport (Murray et al., 2021). Accuracy techniques in free kicks in football are important because they can immediately score goals without passing (Wunderlich et al., 2021). Success utilizing high-accuracy free kicks can quickly change a match's outcome and create a tactical advantage. Critical situations near the penalty box often provide golden opportunities, and the ability to execute precision techniques can be decisive. Players who master this technique, such as Beckham or Ronaldo, are often the main weapons for the team. In addition to the immediate impact, success in a free kick can also have a huge psychological effect on one's team and opponents. Therefore, investment to maximize the technique of free kick accuracy is considered crucial in achieving victory in football matches (Browne et al., 2019; van Biemen et al., 2022).

Concentration focuses on something exclusive and undisturbed by irrelevant internal and external stimuli. Li et al. (2022) and Zhao & Dong (2022) state that internal stimuli are sensory and thought disorders such as fatigue, anxiety, and so on. External stimuli are distractions from the outside, such as cheers from the audience, boos from the audience, referee decision errors, and others. In global sports, concentration means the ability of athletes to focus on the competition for better performance. In the world of sports, concentration is the ability of athletes to focus on the competition for better performance, as stated by Oguntuase & Sun (2022); Chamorro et al. (2020) state that concentration is needed to achieve optimal performance, not only in shooting, archery, golf, tennis, and swimming but almost in all sports, including football. Based on the statement above, every sport requires good concentration for sports skills. Concentration skills implicitly lead to a specific task or action and are an indicator of proficiency in the achievement of the purpose of using held before and after treatment (Child & Shaw, 2020; Tienza-Valverde et al., 2023). Results of previous research (Fawver et al., 2020; Siekańska et al., 2021) show that the portion of training

between technical and mental training is still not balanced. Trainers who emphasize training more on the physical aspect and technique only but on the mental aspect are not given good training. As revealed (Dohme et al., 2019; Robin et al., 2019), mentally trained players will certainly be more skilled in overcoming emotional and mental dilemmas that come to them because the atmosphere and requirements of players when competing on the field can change at any time.

Based on observations in the field in July 2023 and information submitted by the Indonesian football coach, the level of accuracy of athletes' free kicks still needs to be higher. This is evidenced by the accuracy of the instrument of shooting the ball into the goal target in getting an average free kick result of 1; this value, when viewed in normative data, is the accuracy of the free kick included in the category of less. Even though the need for mental abilities plays a crucial role in achieving football achievements, football athletes with a good mentality can improve game performance on the field. One visualization exercise to improve the accuracy of a soccer player's free kick is mental imagery. Imagery practice is derived from experiences gained from seeing, feeling, and listening, but holistically, the experience occurs in the brain. Make it more obvious and related to the expression. Franklin (2022) and Pearson (2019) state that imagery happens to the brain. When doing imagery exercises, players must be able to concentrate so that the training goals are achieved optimally.

Mental imagery training is a form of exercise that can enhance the player's technique. Similar to what was expressed (Clark et al., 2022; Lin et al., 2021), mental imagery training is a technique instructors and sports psychologists often use to help improve athlete performance. The existing imagery perspective is based on the player's ability to imagine himself and others when performing a technique. In other words, in mental imagery exercises used according to one's original ability, the player presents a shadow of a free-kick technique in mind visualization. Imagery mental training in football can be done by presenting a shadow of himself doing a movement technique in his brain. For example, when using a free kick technique in football, the players can imagine themselves doing a free kick movement using their minds. As a result, the ball enters the goal net past the goalkeeper (Alkhawaldeh, 2023; Aziz & Bylbyl, 2019). This can prove the imagery exercise itself because, when doing a free kick with imagery, a player must imagine himself (visualization) in his mind (Schaper et al., 2020).

A soccer player doing a free kick can use it to see the post, goal net, and goalkeeper position and build human fort versus hearing and feeling. As a result, the ball goes into the opponent's goal. This goes hand in hand with using (Edensor et al., 2023; Gervis & Goldman, 2020), which confirms a simulation in the brain that can reinforce or describe free-kick movements. So far, fellow scouts only look at the player's technical and skill factors but never mental and psychological factors such as concentration, visualization and imagery skills, and attitude control. Therefore, the talent guide team or coach also needs to start looking at the mental factors of young players. Free kicks are crucial in a soccer match, especially if the team has a precise and lethal free-kick executioner. This situation means an opportunity to create a goal that can be utilized as much as possible, something that might happen so that the team will win the game. Based on the problems that have been described, this study aims to analyze the difference in the influence between internal imagery and external imagery training on the accuracy of free kicks of soccer players in terms of concentration.

Materials and Methods

Research Design

This research method was a quantitative approach. It was an experiment using a 2 x 2 factorial design. The design considers the possibility of moderator variables affecting the outcome's treatment (independent variable) (dependent variable). This experimental study used two groups that received different treatments, namely the provision of training.

Research Procedure

Data collection techniques in this study were tests and measurements. Before pretest and post-test measurements, the sample was measured in concentration to determine high and low concentrations. Trpkovici et al. (2023) measured concentration in this study using the Grid Concentration test with a validity value of 0.89 and a reliability value of 0.80. The instrument used to measure the accuracy of free kicks is a free kick test with a validity value of

0.89 and a reliability of 0.80. Treatment was carried out in six meetings, and three meetings were held in one week. This is based on the theory of Slimani et al. (2016) that image training aims to improve athletes' psychological ability, which is carried out in as many as six meetings and ends by taking a final test or post-test to measure the accuracy of free kicks using soccer to recognize the comparison of kick accuracy scores to recognize the comparison of free throw accuracy scores after treatment/treatment.

Research Participants

The population in this study was all young Indonesian soccer players, totaling 38 athletes, and the sample in this study amounted to 20 people. Purposive sampling was used in this study. The criteria in determining this sample include (1) specific 13-year-old Indonesian youth soccer players, (2) athletes who actively attend football schools, (3) players who are not sick, (4) willing to follow the imagery training process, (5) Able to follow all training model programs that have been prepared. The sample grouping was taken from players with a high concentration of 27% and players with a low concentration of 27% from the data that had been ranked. Based on this, a sample of 10 players with high and 10 with low concentrations was obtained, so the total sample was 20. This research has received approval from all samples who have filled out a statement of ability to become a research sample and have met the research code of ethics requirements.

Data Analysis

The data analysis method used in this study used the Two Anova test with the help of the SPSS 24 application at the significance level = 0.05. Next, the average treatment companion was compared using the Tukey test (Ferreira, 2020). Before using the Two Anova test, it is necessary to try prerequisite tests, including (1) normality test and (2) variant homogeneity test and hypothesis test.

Results

In this chapter, the results of the research and discussion will be discussed sequentially, including (1) research data, (2) analysis prerequisite tests, and (3) hypothesis tests. The hypothesis test will be presented sequentially, including (a) the disparity in the effect of internal imagery training methods and external imagery training methods on the accuracy of Free Kick in soccer athletes; (b) the difference in the effect of high concentration and low concentration on the accuracy of the free kick in soccer athletes (c) the interaction between the two training methods and concentration on the accuracy of the free kick of soccer players. The complete will be presented as follows:

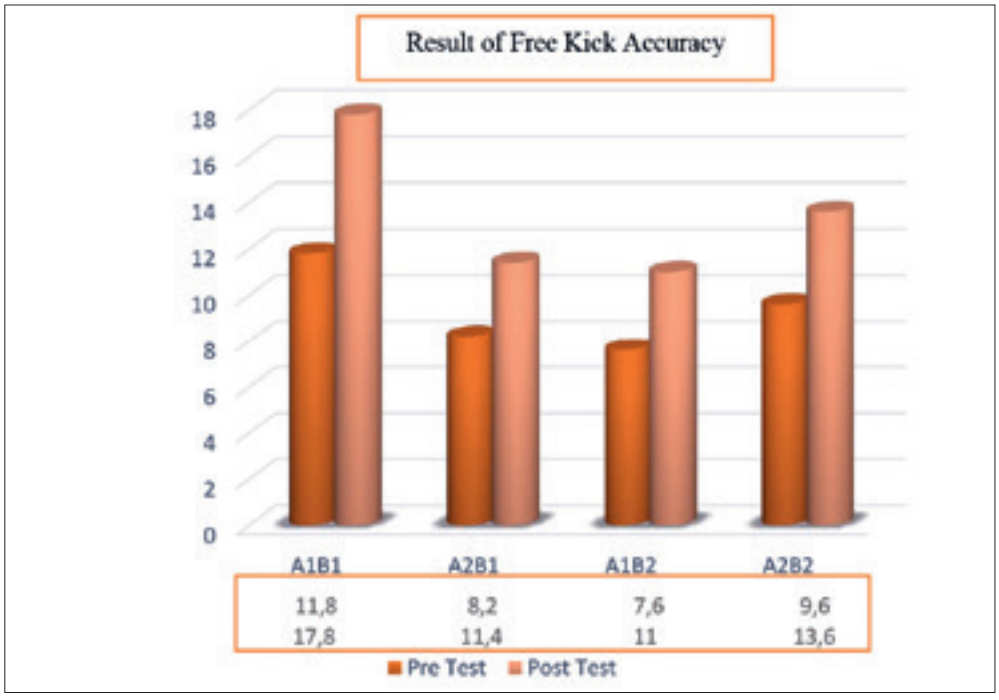

Figure 1. *Free Kick pretest and post-test histogram accuracy results*

Information:
A1B1: A highly concentrated group of players trained with internal imagery training methods
A2B1: A highly concentrated group of players trained with external imagery training methods
A1B2: The low-concentration group of players was trained with internal imagery training methods
A2B2: The low-concentration group of players was trained with external imagery training methods

Based on the bar chart image above, it shows that the accuracy of the free kick A1B1 group averaged pretest by 11.8 and faced an increase in post-test at 17.8, A2B1 group had an average pretest of 8.2 and faced an increase during the post-test of 11.4, group A1B2 averaged pretest of 7.6 and faced an increase in post-test by 11, The A2B2 group averaged a pretest of 9.6 and faced an increase in post-test of 13.6.

1. Prerequisite Test Results

a. Normality Test

The results of the data normality test conducted in each analysis group were carried out with the SPSS software program version 24.0 for Windows with a significance level of 5% or 0.05. More results are in the appendix. The summary of the data in Table 1 is as follows:

Table 1. *Normality Test*

Group	P	Significance	Information
Pretest A1BI	0.747	0.05	Usual
Post-test A1B1	0.086		Usual
Pretest A2B1	0.421		Usual
Post-test A2B1	0.814		Usual
Pretest A1B2	0.814		Usual
Posttest A1B2	0.967		Usual
PretestA2B2	0.492		Usual
Posttest A2B2	0.086		Usual

Based on statistical analysis, the normality test carried out on all pretest and post-test data on the accuracy of the free kick is obtained from the normality test data of the significance value of $p > 0.05$, which means that the data is normally distributed.

b. Homogeneity Test

The homogeneity test is carried out to test the equation of several samples, namely homogeneous or not. The homogeneity test tests the variance similarity between the pretest and post-test. The homogeneity test results are in Table 2 as follows:

Table 2. *Homogeneity Test*

F	df1	df2	Sig.
4.784	3	16	0.014

Based on statistical analysis of homogeneity tests carried out using the Levene Test, the calculation results obtained a significance value of $0.014 \geq 0.05$. This means that a data group has a homogeneous variance. Thus, populations have variance or homogeny in common.

c. Hypothesis Testing

Hypothesis testing in this study can be done based on the data analysis results and two-way ANOVA analysis interpretation. The sequence of the results of hypothesis testing is adjusted to the hypothesis formulated as follows.

1. This is a hypothesis about the difference in the effect of internal imagery and external imagery training methods on the accuracy of the free kick.

The first hypothesis states, "There is a significant difference in the effect between internal imagery training methods and external imagery training methods on the accuracy of free kicks in football players." The obtained data are in Table 3.

Table 3. *Test Results between Internal and External Imagery Training Methods on Increasing Free Kick*

Source	Type III sum of squares	Df	Mean square	F	Sig
Method Exercise	18.050	1	18.050	4.719	0.045

From the results of the Two Anova Table 3 test above, it can be seen that the significance value of p is 0.045. Ho is rejected since the significance value of p is 0.045 < 0.05. Thus, there is a significant difference in the influence of the internal and external imagery training methods on the accuracy of the free kick in soccer players. Based on the analysis results, the internal imagery training method is higher (good) with a post-test average of 16.00 compared to the external imagery exercise method with a post-test average of 14.00. This means that the research hypothesis that states a significant difference in the effect of internal and external imagery training methods on the accuracy of free kicks in soccer players has been proven.

2. The difference in the effect of high concentration and low concentration on the accuracy of the free kick.

The second hypothesis reads, «There is a significant difference in the effect of high and low-concentration players on the accuracy of free kicks in football players. The calculation results are presented in Table 4 as follows.

Table 4.Test *Results Difference in high and low concentration on free kick accuracy*

Source	Type III sum of squares	Df	Mean square	F	Sig
Concentration	26.450	1	26.450	6.915	0.018

From the results of the ANOVA test in Table 4 above, it can be seen that the significance value of p is 0.018. Ho is rejected since the significance value of p is 0.018 > 0.05. Based on this, there is a significant difference in the influence of players with high and low concentrations on the accuracy of free kicks in football players. Based on the analysis results, players with high concentration are higher (good) with an average post-test value of 20.00 compared to players with low concentration with an average post-test value of 14.00. This means that the research hypothesis has been proven that there is a significant difference in the effect of players with high and low concentrations on the accuracy of free kicks in football players.

3. Interaction between imagery practice methods and concentration on the accuracy of the free kick

The third hypothesis reads, "There is a significant interaction between imagery training methods (internal imagery and external imagery training methods) and concentration (high and low) on the accuracy of free kicks in football players. The results of the calculation are in Table 5 as follows.

Table 5. *Anova Test results in the interaction between imagery training methods (internal and external) with concentration (high and low)*

Source	Type III sum of squares	Df	Mean square	F	Sig
Exercise methods and Concentration	101.250	1	101.250	26.471	0.000

From the results of the ANOVA test in Table 5 above, it can be seen that there is a significance value of p of 0.000. Therefore, the significance value of p is 0.000 < 0.05, meaning Ho is rejected. Based on this, the hypothesis that states a significant interaction between imagery training methods (internal and external imagery training methods) and concentration (high and low) on the accuracy of free kicks in soccer players has been proven.

After being tested, there is an interaction between imagery training methods (internal imagery and external imagery training methods) and concentration (high and low) on the accuracy of free kicks in football players. Therefore, further tests should be conducted using the Tukey test. Further test results can be seen in Table 6 below:

Table 6. *Summary of Post-Hock Test Results*

Group	Interaction	Std, Error	Sig,
A1B1	A1B2	1.25985	.002
	A2B1	1.25985	.001
	A2B2	1.25985	.071
A1B2	A1B1	1.25985	.002
	A1B2	1.25985	.978
	A2B2	1.25985	.490
A2B1	A1B1	1.25985	.001
	A1B2	1.25985	.978
	A2B2	1.25985	.278
A2B2	A1B1	1.25985	.071
	A2B1	1.25985	.490
	A1B2	1.25985	.278

Indicates that the pairs of partners who have significantly different interactions or partners are: (1) A1B1-A1B2, (2) A1B1- A2B1, (3) A1B1-A2B2, (4) A2B1-A1B1, (5) A2B1-A2B2, (6) A1B2-A1B1, (7) A1B2-A2B2, (8) A2B2A1B1, (9) A2B2-A2B1, and (10) A2B2-A1B2.

Discussion

The review of the results of this study shares further understanding, overriding the results of the analysis of the information that has been submitted. Sourced from hypothesis testing creates three groups of analytical discussions: 1) There is a significant difference in influence between the main factors of the study; 2) The difference in influence between football players who have high concentration and low concentration on the accuracy of free kicks of football players; 3) There is a meaningful interaction between the main factors in the form of 2 aspects of interaction. A review of the results of the analysis can be further described as follows:

The difference in the effect of internal imagery and external imagery training methods on free kicks is accuracy

From testing the first hypothesis, it is known that the internal imagery mental training method and the external imagery method have significant differences in enhancing the accuracy of the free kick. This study found that the mental imagery training method positively impacted the accuracy of the free kick. It is reinforced by the results of the study by Shafie et al. (2023), which state that there is a significant difference in imagery method training on gymnastics skills. This is in line with the theory of Martin et al. (2022), which states that imagery training can enhance the performance of athletes or players.

In this study, it is known that the internal imagery mental training method has a better impact on increasing the accuracy of the free kick. It goes hand in hand with the opinions of Dekkers et al. (2022), which state that internal imagery mental exercises are more beneficial than external imagery mental exercises. According to Blair et al. (2018), internal mental imagery exercises higher on shaping psychological responses. This psychological response can form higher endorphin hormones, resulting in a calmer and more comfortable impact on athletes or players in carrying out their duties. According to some theories above, internal imagery mental exercises have many advantages over

external imagery exercises. The internal imagery method exercise has an advantage, which is higher in increasing the player's psychological response; besides that, the internal imagery mental exercise is simpler and maximizes the player's movement experience (Ramadhan et al., 2024). With several advantages, internal imagery mental training is more influential in enhancing player performance.

The effect of high concentration and low concentration on free kick accuracy

The analysis results show that players use high concentration ability more (good) than players with low concentration ability on the accuracy of free kicks in soccer players. Concentration on this has a crucial role in influencing a technique performed or the result of the origin of a sports match (Farina & Cei, 2019). Attention and concentration are often interpreted the same, even though they have different definitions. Halkiopoulos et al. (2022) state that concentration is the process of personal awareness of an issue (stimulus) received to decide an action (response). Concentration is a person's ability to focus on a selected stimulus (one object) in an exclusive moment. According to Pappalardo et al. (2019), concentration means that a player must display performance on the field. The main component of concentration is the ability to focus attention on something exclusive and not be distracted by internal or irrelevant external stimuli. This is by research conducted by Lirio-Piñar et al. (2023), which states a significant difference between the concentration level and the accuracy of shooting petanque sports.

Interaction between Training Method (Internal imagery and External Imagery) and Concentration (High and Low)

Imagery ability is the ability to conceptualize motor performance (Fortes et al., 2019; Kim et al., 2017). Imagery states are more effective. Suppose the individual has higher imagery ability. Individuals with high concentration skills provide higher motor performance improvements than those with low concentration skills using imagery exercises Navarro et al., (2018). Based on what will happen as a result of this study, there is a significant disparity between training methods (internal imagery and external imagery training methods) and concentration (high and low) on the accuracy of free kicks in soccer players. The form of the relationship appears that the primary factors of the study in the form of 2 factors show a significant interaction. As a result of this study, internal and external methods have significant differences. Soccer players with high and low concentrations will get better results than players trained with external imagery training methods.

Based on the theory of its implementation, internal imagery training will increase the concentration of players. As a result, it will be more effective if applied to players with high concentration. Players with high concentration will be more effective using the internal imagery training method because it will be simpler to focus on the target aimed at when doing a free kick. The statement's origin can be concluded that the high and low concentration of the player determines the effectiveness applied to increase the accuracy of the free kick. Thus, the exercise must be adapted to the player's ability to achieve the optimal result.

Conclusion

Based on the results of the research and the results of data analysis that has been carried out, the following conclusions were obtained: 1) There is a significant difference in influence between the internal image training method and the external image training method on the accuracy of free kicks in soccer players. The internal image training method is better than the external image training on free throw accuracy in basketball players. 2) There is a significant difference in the effect of high and low concentrations on the accuracy of free kicks in soccer players. Players with high concentration are better than those with low concentration on free throw accuracy in soccer players. 3) There is a significant interaction between satellite imagery training methods (internal imagery and external imagery) and concentration (high and low) on free throw accuracy in soccer players.

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Conflict of Interest

The authors declare no conflict of interest.

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