The Effect of Imagery and Concentration Training on Smash Accuracy

Vistor Syapri Maulana [1], Guntur[1]
[1]*Sport Science Department, Postgraduate Faculty, Universitas Negeri Yogyakarta, Indonesia*

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Abstract: This study aims to examine: (1) different impacts of internal and external imagery training methods on smash accuracy; (2) different impacts of high and low concentrations on smash accuracy; and (3) the interaction between training methods (internal and external imagery) and concentration (high and low) on smash accuracy. This research method uses a 2 x 2 factorial. This study employed the modified Laveage smash accuracy test and the data were analysed using ANAVA. This study can be concluded that (1) there is a significant difference between the internal imagery training method and the external imagery training method on the accuracy of the smash, (2) there is a significant difference between players who have high concentration and low concentration on smash accuracy, (3) there is a significant interaction between the imagery training method (internal and external) and concentration (high and low) on smash accuracy

1 INTRODUCTION

Volleyball is a team sport that each team consists of six people in 9 square meter field that is separated by a net. One technique in volleyball game is smash (Viera, 2000).

The basic technique of smash is very preferred by volleyball players or athletes, since this technique is very artistic in volleyball, which requires a player to pass the ball on the net, by the possible highest jump to be able to pass the block and enter the target enemy defense area. This technique requires good skill and also precise accuracy where a volleyball player must be able to quickly determine the direction of the ball so as not to be blocked by the opponent. It also requires a technique to avoid the ball to enter in his own area (not over the net), and to direct the ball to the opponent's field area. This demands ingenuity as well as the experience of an athlete. Smash is a technique that has complex movement which consists of: (1) prefix steps, (2) repulsion to jump, (3) ball hit when floating in the air and, (4) landing after hitting the ball (Kemal, 2013). Difficulties experienced by a volleyball player in mastering this technique consist of problems of timing the ball/ the point when the ball will be smashed, the position of the hand when the ball is subjected, the distance of the hand hit to the net, the smash step, and so on (Suhadi & Sujarwo, 2009).

Many players did not concentrate well when they were practicing smash in terms of the range of motion and purpose of the smash. Players did not optimize time while practicing concentration and aiming to the target.

They just did the smash technique as they want and did not maximize time to concentrate on the series of movements and direction of the smash target. As a result, the player did not get a correct smash motion automation series. This has an impact when they were in a competition. There were many players fail to do the smash technique when competing and they had low accuracy. This happened because a set of motion that was prepared inappropriately leads them to loose concentration on the target direction.

Mental training that is beneficial to improve performance in psychological terms has never been given. Thus, the player's psychological aspects will be trained by the mental imagery training method. Mental imagery training methods in practicing smash technique are still less familiar. The trainers prefer to use the drilling method.

Inconsistency of the success rate and the low smash accuracy when practicing and competing indicates that the player's concentrationhas not been established and is not yet stable. Meanwhile, the

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quality of the smash technique performed by each player is quite well. This happens because the level of attention and concentration decreases or the players aredisturbed when there are several stimuli that appear within the same time (Sukadiyanto, 2006). A mental training program needs to be conducted as an effort to improve the player's concentration in smashing and its accuracy.

There are two types of perspectives or views, namely internal imagery perspective and external imagery perspective (Wienberg & Gould, 2007). Further explanation states that the implementation of both training types requires mentoring. Associated models of external perspective imagery requires an external stimulus in the form of video or images that aim to help players being concentrate on a smash technique. It is expected that the existence of mental training through the method of imagery internal perspective and imagery external perspective will be able to help volleyball players improving concentration in performing smash techniques with a high degree of accuracy

2 RESEARCH METHOD

2.1 Research Type

This research is an experimental method using a 2x2 factorial design. Sudjana (2009: 49) states that factorial experiment is a design that can treat two or more independent variables at the same time. This attempt is intended to see the effect of each independent variable separately and simultaneously on the dependent variable due to the interaction of several variables.

2.2 Population and Research Samples

The population in this study consists of 37 players of volleyball extracurricular participants at SMK Muhammadiyah Salaman.

From the total players who meet the sampling criteria, the concentration test were being conducted to classify players who have high and low concentration. After the concentration test was performed, the rank was arranged based on players' concentration from the highest to the lowest score. The next step was determining the percentage, which resulted in 27% of the players got high score and 27% of the players got low score.

2.3 Research Instrument

Data collection instrument in this study was a smash accuracy test from Laveage (1933) that was modified by the Sports Science Faculty (FIK) Lecturer Research Team (Putut Marhaento, et al). This test aims to measure the ability of the smash in relation to the smash accuracy using a hard ball to a specific target.

2.4 Data Analysis Technique

The data were analysed using SPSS 20 by two-way ANAVA at a significance level of 0.05. Considering that the analysis of research data is carried out using ANAVA, it is necessary to conduct prerequisite tests which include: (1) normality test, (2) variant homogeneity test and hypothesis test.

3 RESEARCH RESULT

The first hypothesis states "There was a significant difference between the internal imagery training method and the external imagery training method on smash accuracy". The analysis results are presented as follows:

Table 1: ANAVA results of the internal imagery and external imagery training method

Source	*df*	*Mean Square*	*F*	*Sig*
Training method	1	7,200	5,143	0,038

From the ANAVA test results, it can be seen that the significance value of p is 0.038. Since the significance value 0.038 <0.05, it means that H_o is rejected. Thus there is a significant between the internal imagery training method and the external imagery training method on smash accuracy. Based on the analysis, the results of the internal imagery training method is higher (good) with an average post-test score of 38.5 compared to the results of external imagery exercise method with an average post-test score of 37.3. It implies that there is a significant difference of the internal imagery training method and the external imagery training method on smash accuracy, has been proven.

The second hypothesis states "There was a significant difference in the effect of players who have high concentration and low concentration on smash accuracy the ". The results are as follows:

Table 2: ANAVA results differences in concentration from high and low to smash accuracy

Source	*df*	*Mean Square*	*F*	*Sig*
Concentration	1	39,200	28,00	0,000

From the ANAVA test results shown in the table above, it can be seen that the significance value of p is 0,000. Since the significance value of p is 0,000 <0.05, it means that H_o is rejected. Based on the result, it means that there are significant differences between players who have high concentration and low concentration on smash accuracy. Based on the results of the analysis, it turns out that players who have high concentration have higher score with an average post-test score 39.3 compared to players who have low concentration with an average post-test score 36.5. This means that the research hypothesis stating that there are significant differences between players who have high concentration and low concentration on the smash accuracy, has been proven.

The third hypothesis states that there is a significant interaction between the types of imagery training method (internal imagery and the external imagery exercise method) and level of concentration (high and low) on the smash accuracy. The results are presented as follows:

Table 3: ANAVA interaction results

Source	*df*	*Mean Square*	*F*	*Sig*
Concentration training method	1	245,00	175,00	0,000

From the ANAVA test results in Table 3, it is clear that the significance value of p is 0,000. Since the significance value of p 0,000 <0.05, it means that H_o is rejected. Thus, the hypothesis stating that there is a significant interaction between the types of imagery training method (internal imagery and the external imagery training method) and level of concentration (high and low) on the smash accuracy, has been proven.

4 DISCUSSION

Internal imagery training methods have been proven to be more effective inincreasing smash accuracy and players' concentration when performing smash. This is in line with the theory that imagery training can improve player performance (Olsson, 2008). Mental training activates peripheral activities, which provide afferent information to the motor cortex and functions to strengthen motor programs (Halgren, Dale, Sereno, & Tootell, 1999). They further stated that with the development of neuroimaging technology, researchers can test various imagery theories. During mental training, the same neuromotor pathways was involved in carrying out certain physical motor task activities (Kosslyn, Ganis, & Thompson, 2001). Motoric program in the motor cortex, which is responsible for movement, is then strengthened as a result of nerve pathways during mental imagery training. As a result, mental imagery can assist in practicing skills by increasing appropriate coordination patterns and by priming the appropriate motor neurons of the muscles needed to carry out certain motor tasks.

Concentration has an important role in influencing a technique or the results of a sports competition. Attention and concentration are often interpreted similarly even though they have different definitions. Attention is a process of direct awareness of the information (stimuli) received to decide an action (response) (Sukadiyanto, 2006). Whereas, concentration is a person's ability to focus attention on the selected excitement (one object) in a certain time. Concentration is very important for a player in performing on the field. The main component of concentration is the ability to focus the attention on a certain thing and is not interrupted by internal stimuli or irrelevant external stimuli (Schmid & Peper in Satidarma, 2000).

From the results of the interaction, it appears that the two factors show significant interactions. The results of this study show that there are significant differenceswithin each group as a result of different treatment,.

After trained by internal imagery training methods, volleyball players who have high

concentration will get better results than those who do not. Conversely, players who have low concentration will get better results if they were trained with the external imagery training method. This can happen because the implementation of internal imagery exercises can improve the athlete's concentration, thus it will be more effective to be applied for the players who have high concentration. The internal imagery training method will be more effective to be applied for the players who have high concentration, since it will be easier to focus on the targets when striking a smash. From this statement, it can be concluded that the effectiveness applied to improve smash accuracy was influenced by the players' concentration level. Thus, exercises applied must be adjusted to the players' abilities and characters so that they can achieve optimal results.

5 CONCLUSIONS

Based on the results above, several conclusions were derived. There was a significant difference between the internal imagery training method and the external imagery training method on smash accuracy. The internal imagery training method is better than the external imagery one in terms of smash accuracy.

Besides, there was a significant difference of high concentration and low concentration on smash accuracy. Players who are highly concentrated on the game are better than those who have low concentration to perform smash accuracy.

There is a significant interaction between types of imagery training methods (internal imagery and external imagery) and players' concentration level (high and low) on smash accuracy.

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