

# Influence of Training Method and Concentration to The Accuracy of Short Service Backhand in Badminton

Oloan Victory Manurung  
Master Program in Sport Sciences  
Yogyakarta State University  
Yogyakarta, Indonesia  
victormanurung.vm12@gmail.com

Dimiyati  
Faculty of Sport Sciences  
Yogyakarta State University  
Yogyakarta, Indonesia  
dimiyati@uny.ac.id

**Abstract**—accuracy is a very important factor in badminton, especially in services, accuracy plays an important role in the determination of the success of a service. The purpose of this study was to determine the effect of mental training methods (internal and external imagery) and concentration on the accuracy of short service backhand. This research made use of experimental method through the application of 2x2 factorial design. The population in this study were 45 athletes of student activity unit (UKM) Yogyakarta State University (UNY). Purposive sampling technique was employed in this study and 24 people participated. Concentration test with grid concentration test were used as research instrument in this study. The result revealed that internal imagery mental training method was more significant at improving short service backhand rather than external imagery mental training method.

**Keywords**—accuracy, concentration, imagery

## I. INTRODUCTION

One of the famous sports is badminton and it can be played by anyone. Men, women, old and young can play this sport alone and outside the room. Badminton is a sport that is played by crossing the shuttlecock to the opponent's game area. In badminton there are several skills that must be mastered and they include 1) how to influence the racket, 2) footwork, 3) mastery of the blow, 4) stance.

One stroke technique that must be mastered by a badminton player is a serve because in the game of badminton, serve is the first shot to start a game [1]. Service in badminton sports consists of two kinds, namely (1) short service and (2) long service. Short service is defined here as a service blow that directs the shuttlecock near the net and landed as close as possible to the opponent service line. Short backhand service requires good concentration to make the service runs well [2]. Concentration is the ability of the athlete at maintaining his focus of attention on the relevant match environment [3]. In the game, concentration plays an important role at achieving maximum performance. Often, the failure of an athlete in a game is mostly due to the inability to concentrate during the game. Athletes who have a high level of concentration in general will have better achievement compared to athletes who have low concentration levels.

But in reality, badminton athletes often make mistakes at the time of service, particularly when making a backhand short service. Errors generally committed by the athlete is the shuttlecock not reaching the side of the opponent, shuttlecock netted, and in addition to these, athletes also often toss the ball high over the net so that the opponent can easily attack [4]. From the results of the Olympic semifinals in 2008 between Indonesia and China, it was discovered that the Indonesian pair managed to win with a rubber set. On the first set, the Indonesian pair suffered defeat with a score of 15-21 by making mistakes 7 times (33,33%) during service. Whereas, during the second set, the Indonesian pair managed to win with a score of 21-11 by making mistake just one 1 time (8.33%) when serving. Meanwhile in the third set, the Indonesian pair managed to win with a score of 23-21 where they made only 1 mistake in serving. It can be seen that the error of servicing in the sport of badminton affects the results obtained by the athlete.

To reduce the error, a blow technique needs to be carried out through various trainings,. The training can be either physical or mental. Presently, the portion of training between technical training and mental training is still not balanced, there are still many trainers who emphasize training on physical and technical aspects only but the mental aspects are not well catered for [5]. For a peak performance of an athlete, 80% is influenced by mental aspects while only 20% is influenced by other aspects, therefore, mental aspect must be planned and managed systematically [6]. Many felt that 70-90% of good appearance are affected by mental factors. Athletes who trained mentally well would be more skilled at dealing with emotional problems that come to them, because the atmosphere and condition of the athlete can change any time while playing on the field.

Mental training in sports are designed to bring about improved psychological work and skills in athletes. In mental training programs there are different types of training methods. Mental training include *imagery, vizualitation, mental rehearsal, symbolic rehearsal, and covert practice* [7]. Imagery is the cognitive process in the brain that is important in the process of implementing motion. Imagery mental training refers to the effort to create or repeat an experience in the brain. The method of imagery training is done so that the athlete is able to imagine himself and others during the performance of a movement technique. Athletes who do

imagery training certainly have a specific purpose and these include practicing to improve skills, developing strategies, preparing mentally, and so forth. [2] Athletes can use imagery in a lot of ways to improve their physical and psychological capabilities.

The benefits of using imagery training include (1) improving concentration, (2) improving confidence, (3) controlling emotional response, (4) improving skills training, (5) developing strategies, (6) coping with pain, (7) preparation for competition, and (8) overcoming the problems of motion. [2] Mental imagery training has two perspectives and they are internal perspective of imagery and external perspective of imagery.

Imagery's internal perspective is the athlete's ability to create a shadow in the mind of the athlete based on the experience or memory of the shadow. In a badminton sport, especially in short service strokes, the athlete can apply this internal perspective imagery by imagining himself performing the correct service movement and seeing the shuttlecock fly as thinly as possible from the net and landing as close to the opponent's service line as possible. In the execution of internal mental imagery training, athletes use a script as guide. Imagery's external perspective is the athlete's ability to conjure up images based on a third-person perspective. In badminton, especially in making a short service stroke, athlete can apply imagery external perspective so as to imagine himself making a stroke short service correctly by seeing someone else do it, either through video or an example of a better person [8]. The development of mental imagery training can be done through a program called the PETTLEP program and some other supporting theories. The PETTLEP program consists of the *physical, environment, task, timing, learning, emotion, and perspective* [9]. Mental imagery trainings were done for 5-6 times [10]. During this process, the athlete's imagery does not stop at the visualization process alone but it is also applied in the real world. This means that after the completion of their visualization, athletes were asked to practice what they visualize in the real world. In this study the athletes performed a short real service backhand movement and there was evaluation of the difficulties by the coach.

## II. METHOD

### A. Types of research

This study is an experimental study with the aim of finding the relationship between the independent variables and the dependent variable with the use of 2x2 factorial design [11]. Factorial design is a modification of the actual experimental design using variables that have effects on the outcome. The treatment in this study were treated with internal mental imagery training method as well as external mental imagery training method. The attributive variables in this study were high and low concentration levels of athletes. The researchers' conduct of the study design are described in more detail in Table 1 as follows:

TABLE I. FACTORIAL DESIGN TABLE 2 x 2

Training Methods (A) Concentration (B)	High Concentration (B1)	Low Concentrations (B2)
<i>Internal imagery</i> (A1)	A1B1	A1B2
<i>External imagery</i> (A2)	A2B1	A2B2

Explanation:

- A1B1: Internal imagery training group that has a high concentration level.
- A1B2: Internal imagery training group that has a low concentration level.
- A2B1: External imagery training group that has a high concentration level.
- A2B2: External imagery training group that has a low concentration level.

### B. Time and Place of Study

The study was conducted at the Yogyakarta State University Badminton Hall. The study time was adjusted to the training schedule of 4 weeks with frequency of 2 times a week with the training schedule held on Tuesday, and Friday.

### C. Population and Sample

Population in this research was made of 45 athletes of Student Activity Unit at State University of Yogyakarta. The sampling technique used was purposive sampling with a total sample of 24 people.

### D. Data Collection Techniques and Instruments

The data gathering techniques used in the study was pretest posttest. This technique involves carrying out test before the experiment and carrying out another test after the whole experiment. The instrument used in this study was the concentration of "grid concentration test" which was used in measuring the concentration of athletes. Service accuracy test was used to measure the level of accuracy of the backhand short service by the Badminton athletes.

### E. Data analysis technique

SPSS 20 application for windows was the technique used in analyzing the data for this research work. Hypothesis testing was carried out using two-way analysis of variance (ANOVA) at 5% or 0.05 significance level.

## III. RESULT AND DISCUSSION

This research was conducted at the Yogyakarta State University Badminton Student Activity Unit (UKM). The number of samples in this study were 24 athletes which were divided into 4 groups. These groups include high concentrations treated using internal imagery training methods (A1B1), high concentrations treated using external imagery training methods (A2B1), low concentration athletes treated using internal imagery training methods (A1B2), and athletes with low concentration groups treated using external imagery training methods (A2B2).

The results of the study show that (1) there is a difference of influence between internal imagery mental training method and external imagery mental training method towards short service backhand, (2) there is a difference between athletes

having high and low concentration level on short backhand service, and (3) interaction exists between internal mental training methods, external imagery and level of concentration of the accuracy of short service backhand.

The pretest and posttest results of the short serve backhand service are shown in the table below.

TABLE II. PRETEST AND POST TEST OF SHORT SERVE BACKHAND SERVICE

A1B1		A2B1	
PRE	POST	PRE	POST
56	62	56	60
52	63	57	61
53	64	50	58
54	67	52	58
54	63	53	59
54	64	49	55
A1B2		A2B2	
PRE	POST	PRE	POST
44	52	49	55
45	53	45	53
47	54	48	54
45	52	47	54
45	55	46	55
43	52	42	52

TABLE III. THE DIFFERENCE IN INFLUENCE BETWEEN THE TWO TYPES OF TRAINING.

Source	Type III sum of squares	df	Mean Square	F	Sig
Training Method	30.375	1	30.375	11.873	0,003

From the table above, it can be discovered that the significance value is  $0.003 \leq 0.05$ . Therefore, it can be deduced that there is a difference of influence between the two types of mental training. In this study, mental imagery training methods have a positive impact on the accuracy of short service backhand. This study also found that internal mental imagery training method has better impact of improvement on the accuracy of short service backhand. [11] shows that internal mental imagery training are more useful than external imagery mental training if it is used as a training model to develop movement techniques and to develop strategies. So, it can be concluded that internal mental training imagery has more influence than external imagery mental training.

TABLE IV. DIFFERENCE IN CONCENTRATION LEVEL

Source	Type III sum of squares	df	Mean Square	F	Sig
Concentration	360.375	1	360.375	140.863	000

From the table above, it can be seen that the significance value is  $0.000 \leq 0.05$ . This means that difference exists in influence between athletes who have high concentration level and the ones with low concentration on short service backhand service. [2] shows that concentration is very important for an athlete perform well on the field. The main component of concentration is the athlete's ability to focus on a particular thing and not be distracted by internal stimulant or external stimulant, in other words a high-concentrated athlete finds it easier to focus on a thing or task assigned to him than an athlete with a low concentration level.

TABLE V. INTERACTION TABLE

Source	Type III sum of squares	df	Mean Square	F	Sig
Training* Concentration	57.042	1	57.042	22.296	0,000

From the test results shown on Table. 5, it can be seen that the value of significance is  $0.000 \leq 0.05$ . This means that there is an interaction between the internal mental imagery training methods, external mental training imagery and concentration on the accuracy of short service backhand.

#### IV. CONCLUSION AND RECOMMENDATION

##### A. Conclusion

Based on the results and analysis of this research, it can be concluded that there are significant differences between internal imagery training methods and external imagery training methods on improving the accuracy of badminton athletes. Therefore, the use of internal imagery training has a better effect on improving the accuracy of badminton athlete services. On the other hand, there is an influence between high and low concentration categories on increasing the accuracy of badminton athlete services. It can also be concluded that someone who has a high level of concentration gives a better influence than someone who has a low concentration level in increasing the accuracy of short service backhand for badminton athletes. With respect to the method and concentration of interaction, there is an interaction between the two training methods and concentration on increasing the accuracy of the short service backhand for badminton athletes. Therefore, there is a significant interaction between the two training methods (internal imagery training and external imagery) and concentration (high and low) on increasing the accuracy of short service backhand for badminton athletes.

##### B. Recommendation

Based on the results noted earlier, the following are recommended:

1. Coaches can use internal mental imagery training methods to improve the accuracy of short service backhand.
2. There should be further expansion of the intended use of mental imagery training methods.

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