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The Effectiveness of Imagery Training on Anxiety Levels and Performance amongst Athletes in Archery

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ABSTRACT

Background: The psychological aspect of sports is one of the most important aspects as it is one of the factors that can increase the performance of athletes. Athletes who compete are often haunted by the fear that may lead to a fall in performance as they fail to perform at their optimal performance. One of the psychological trainings which are often used by athletes is imagery rehearsal. 60 athletes were divided into 2 groups, treatment group (Group Imagery) and Control Group. A 6 week with 3 sessions per week imagery training was given to the athletes in the treatment group. **Objective:** This study was aimed to assess the effect of imagery training program to the level of cognitive anxiety, somatic anxiety, self-confidence and achievement archery after undergoing imagery training program. **Results:** Based on previous studies using imagery training, the expected results in this study is athletes from the treatment group which were given imagery training will be able to reduce the level of anxiety and improve the performance of archery. **Conclusion:** Imagery training was found to reduce anxiety levels and improve performance in competing athletes. Athletes were emphasized to give full attention during the imagery training. The imagery training was based on the real images or situations of competition. Imagery training was also conducted with physical exercises to ensure the best performances of athletes were achieved.

INTRODUCTION

Fitness is defined as the condition that allows an individual to lead a perfect life and to deliver his tasks efficiently, and in turn produces useful contributions and services. Fitness consists of five components, which are physical, emotional, spiritual, intellectual, and social fitness. All the five components of fitness need to be adjusted and balanced in order for an individual to get on with his daily life. According to Kassim & Mokhtar (2016), physical fitness is a component that constitutes total fitness that is constantly being used in acting or in any order form of action. Kassim (2012) stated that the important of coaches requiring knowledge in the coaching process are important to build up the quality of fitness level using the norms of physical fitness. Kassim, M. & Isa, M.I (2015), noted that the athletes are engaged in a process of learning, which involves important aspects interpersonal and intrapersonal skills. This is supported by Kassim, M & Berahim, M.(2015), a conducive learning environment is also important, as well as giving them a reward if they achieve excellence.

Nowadays, in Malaysia the performances of our athletes are still below par compared to the world level athlete's performances. Only few sports such as squash, badminton, cycling and diving are capable to compete in the international level. Sports psychology is one of the factors that can influence the levels of anxiety experienced by an athlete in competition. High level of anxiety may impact the levels of several performances

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which may lead to negative results such as causing loss. Cox (2012) defined sport psychology as a science in which the principles of psychology are applied in a sport or exercise setting. Another definition by Anshel (2003) involves properly selecting and monitoring athletes so that each participant competes at his or her capacity.

Imagery training is also one of the techniques in sports psychology that was used by athletes to improve or manage anxiety and performance.

Literature Review:

Various psychological factors can influence the anxiety and performance levels. High anxiety levels and low self-confidence are some of the factors contributing to poor performance among athletes. Researches have shown that athletes who were experiencing high levels of anxiety cannot perform at their best and suffered a drop in performance. (Jurko, 2013).

Anxiety can influence athlete's emotional state and performances due to the physiological and behavioral distraction. (Badami and VaesMousari, 2010). Wann (1997) also stated that physiological influence of each individual varies in level and may influence the anxiety level and performance.

On the other hand, motor-based fitness refers to the muscle potential and the ability of an individual to carry out physical activity in terms of balance, agility, speed, power, reaction time and coordination. In addition, physical training is defined as training required to prepare players' respiratory, energy, and muscular systems physiologically from aerobic, anaerobic, and strength perspectives (Kassim,M & Ali, N.C.R, 2015). This is supported by Kassim, M; Azmir, H & Mokhtar, S.R (2014), fitness is defined as the condition that allows an individual to lead a perfect life and to deliver his tasks efficiently, and in turn produces useful contributions and services. fitness consists of five components, which are physical, emotional, spiritual, intellectual, and social fitnessConsequently, according to Kassim, M; Ahmad, S.K.S & Muda, B.B (2016) cardiovascular endurance is a most important component in the human physiology.

The physical health, strategy and tactical are important aspects in sport. In order to be successful, athletes must make sure their physical and mental health are fit. Mental toughness and self-confidence from the physiological perspective are needed to confront anxiety for competition. (Norsilawati, 2006). Cox (2007) also stated that anxiety is the emotions which exist from the physiological reflection of stress. The subjective feelings bring the discomfort to whoever facing it and may influence their performance in the games.

Martens (1997) stated that as the event or competition progresses from start to finish, the anxiety level will produce different level on anxiety to the athletes. He also stated that the anxiety level is low in the early stages of competition and the anxiety level will get higher as the event progresses, for example high level of anxiety in the final round. The anxiety level may cause the athletes to react nervously and uncontrollably which can result poor performance and a drop of their ability to perform to optimum level.

Anxiety is divided into two: cognitive anxiety and somatic anxiety. Cognitive anxiety involves the mental components and refers to the cognitive process of the active mind evaluating each situation. Somatic anxiety is the effect of cognitive anxiety on the physiological aspect of an individual. Somatic anxiety will cause higher heart rate, sweating, stomach tenses, hard and stiff muscles and dry mouth and throat causing the individual to be uncomfortable and loosing moods. Then, the athletes become angry, afraid, feeling less self-confident and athlete's performance will also be affected and reduced (Shaharuddin, 2001).

Imagery training programme is one of the programmes to reduce the anxiety and improve athlete performance (Taylor, Gould and Rolo, 2008). Imagery training can be divided into three, that are audio training, video training and script training. Athlete who were given the exposure of the imagery training will learn to overcome fear and to improve the performance.

Imagery training is a process of storing and re-imagining a physical task. The imagery can be either past or future physical task. Mental imagery involves the use of most if not all five senses (smell, eyesight, hearing, taste and touch). This means that in the imagery, the practitioner will try to feel all the senses in his or her mind (Morris, 2005).

Hale, *et al*. (2005) stated that imagery training is the use of all the senses to record or re-record the physical experience in your mind. It is a technique to mentally visualize a physical task without doing the actual physical activity. Hall (1997) also refers imagery to the use of all the senses to create an experience in the mind. Through mental reimagining of physical activity, a person should try to feel the experience using most if not all senses.

Basically athletes have the necessary imagery skills but the coach needs to reveal imagery skills training to the athletes first. Usually coaches will conduct the skills using video footage of a match that took place from various teams or athletes as an example. From the footage, the athletes can identify and learn the required skills. The coach will also emphasize the best way to imagine the required skills. The imagery training will affect the athlete by facilitating his movement as he has been practicing the movements in his head for many times. Athletes who believe in the effectiveness of imagery during training will gain more benefits from the imagery

training during competition compared those who have doubts of the effectiveness of the imagery training (Mohamad Zaaba *et al*, 2011).

Yusoff and Fauzee (2002) stated that imagery training is supposed to be included in the training program for each athlete to improve performance in competitions. Imagery training can also be used to relax tenses muscles before performing a task. For example, while archers are aiming at the target, the muscles will get stiff and tense. After thinking or doing the imagery of what action need to be taken in order to hit the target, the athlete's muscles will start to relax as his anxiety drops. The imagery in the athlete's mind should include how to maintain and how to hold the bow and how to focus on hitting the target.

If imagery was not taught or introduced to the athletes by coaches, these athletes will likely to feel more nervous and more anxious and this can affect their performance. In this case, it will cause the arrow not hitting the target. Therefore, the coach should train his athletes on how to use imagery in the training sessions and this imagery should be used in the competition.

According to Khafidz and Fauzee (2004), to acquire or to enhance the higher ability of imagery, an athlete must be in a state that is always willing and thinking of ways to perform at the best performance. In this way, athletes will be able to figure out how imagery can function when facing critical moments during a match. Imagery exercise requires practice and a dedicated program. It needs to be done in a systematic way to get a good result. There are various ways and approaches that may be used by coaches to sharpen and use imagery skills to athletes by suitability and comfortability of each athlete.

PETTLEP Imagery Training Model which was introduced by Homes and Collins (2001), uses seven elements as guidelines to facilitate imagery training. The elements are Physical, Environment, Task, Time, Learning, Emotion and Perspective. PETTLEP has been used by researchers and it can improve athlete's performance (Wright and Smith, 2009). Examples of each PETTLEP element for archery are as follows.

Physical - Physical refers to athlete visualizing the physical characteristic of the competition such as body posture, dress that will be worn in competition, the equipment used and the body is ready to participate in the event.

Environment - Athlete imagines he is in the real game environment. There are several ways suggested such as the use of video, audio and script.

Task - refers to the action to be performed by the athlete in a sporting event. In archery the athlete is visualizing the actual action of holding the bow and drawing the arrow while aiming at the 'target bat'.

Time - Time refers to the actual time to perform a task. In archery, it refers to the actual time from drawing the arrow from the quiver until the arrow hits the target bat.

Learning - Learning refers to the appropriate content of imagery training to the skill level of the athlete. The learning process and content of imagery training must be constantly renewed so that the skill level increases.

Emotions - Emotions refers to real emotions one feels when performing a particular task or skill in a game or during training.

Perspective - Perspective refers to the viewpoint of how the athlete imagines himself doing a skill or task. The images was imagined by athletes can be internal or external perspective. The internal perspective is as an athlete see himself perform tasks or skills by using his own eyes. External perspective is as if when the athlete sees himself in a video or in a television.

A study conducted by Mohsen Afrouzeh, Mehdi Sohrabi, Hamid Reza Taheri, Farshad Gorge and Cliff Mallet (2013) used PETTLEP model on 36 athletes. They have divided the athletes into two groups, namely imagery PETTLEP and control groups. Athletes who have had experience in between six to eight months were randomly selected. The training session was held thrice a week for seven weeks of in which the group was given PETTLEP imagery training for 15 minutes before 30 minutes of training skills while the control group was only given training skills for 30 minutes. Results showed that exercise imagery based PETTLEP were more effective when combined with physical exercise. The study found that one of the reasons why imagery based PETTLEP is more effective was because the training emphasizes on the environmental factors. Imagery training group based PETTLEP can do imagery exercises as if they were in real competition environment even if they are not in real situations.

Imagery training is to ensure an increase in physical performance, set aside the negative things that might arise during the competition and shortens the recovery period in the event of injury athletes, stated Murad and Turgay (2013), Weinberg and Gould (2003), Roberts, Callow, Hardy Markland and Briger (2008).

Murad and Turgay (2013) have indicated that there are three types of exercises that use imagery that are:

1. a psychological method that can improve performance, reduce stress, reduce anxiety, improve motivation and reduce depression.
2. a method that can be used for recovery after injury, which can speed up the recovery process by supporting the on-going treatment.
3. a method of psychology that can enhance the positive things like focus, concentration, goal orientation, stimulus control, self-confidence, motivation and communication skills.

Studies conducted by Murad and Turgay (2013), which aimed to determine the increase in the performance of athletes during training and competition was conducted on male athletes in Turkey. The subject was chosen randomly and was an active athlete in sports but never trained imagery. The procedure of imagery training was conducted on 120 athletes participating in football, basketball, volleyball, judo, diving, weightlifting, snowboarding, tennis, swimming and bodybuilding. Imagery training was conducted three days a week for 90 days, in which every training session lasted for 30 minutes. The study found a significant relationship of imagery training which improved the athlete's performance after post test results. This study has demonstrated that imagery training can improve the performance of athletes in various sports. Archery is an individual sport that was found suitable for imagery training to enhance performance and reduce anxiety of the athletes.

Training Program Imagery Practice in Mind (PIM) is an imagery training program introduced by Mazlan (2014). It focuses on mental training of athletes in each training session. PIM is a combination between Model PETTLEP, physical exercise, and the use of the senses. PETTLEP model was introduced by Holmes and Collins (2001), which composed of seven elements to facilitate the imagery training. Each letter of the acronym PETTLEP give its own purposes such as Physical, Environment, Task, Time, Learning, Emotions and Perspective.

Mazlan (2014) in his study of golf athletes on 42 players (21 PIM group, 21 control group) had between one and three years in the sport of golf. Distribution of athletes into PIM imagery training group and the control group was made randomly. Every athlete in PIM training group was given ten times imagery and physical training, while athletes from the control group only did physical training as much as ten times. PIM Group was given a script to memorize during training imagery; this script can be modified based on the suitability and current capability of the athlete. PIM training courses were carried out for six weeks with three sessions per week. PIM training sessions ran for 24 minutes, which include ten times of 12 minutes PIM imagery training and ten times of 12 minutes Physical Training. Each putting into the hole (holes in). The results showed significant difference between PIM imagery training group and the control group as the PIM group scored higher.

Each athlete was given a general script for Imagery Training. Common script can be changed by athletes to meet the personal needs of the athletes themselves, with guidance from researchers. Then, athletes are required to memorize the script with the help of audio assistance, namely voice recorder. Athletes will do imagery exercises as much as ten times after hearing the script that has been recorded. After the expiry of all the imagery exercises, athletes would also do ten times of physical exercise. Both types of training (imagery and physical) need to be done in the same session for each workout. Results showed that athletes from PIM imagery training group got better results than the control group.

Problem Statement:

Anxiety in sport is one of the factors that affect the performance of athletes in a particular sport. Among the concerns are valid cognitive and somatic (Grossbard et. al, 2008). Athlete's ability to cope with stress and anxiety is important in sports competition as the two factors are believed to affect the performance (Ani Mazlina et. al., 2007).

Archery is an individual sport where competing athletes do not require body contact with the opponents. Athletes should be able to achieve the best performance even if they have small body size because body contact does not requre in the competition events. However archery performance is not so encouraging. This is because the athletes will feel the pressure when the real competitions approaching due to fears and anxiety although trainings were being done. Many athletes will experience anxiety that will cause and increase or decrease performance in real matches (Parnabas. V and Yahaya, 2010).

PETTLEP imagery training program has proven to be successful and PIM performance-enhancing individual sports like golf. PIM training program focuses on mental training to improve athletes' performance and increase the level of self-confidence (Mazlan, 2014, 2015). However PETTLEP imagery and PIM have not been tested against archers. So, it is natural to use the PETTLEP imagery training program and PIM on archery to identify the extent of its effectiveness in improving the performance and addressing the concerns of athletes during the competition.

Research Objective:

This study was aimed to assess the effect of imagery training program to the level of cognitive anxiety, somatic anxiety, self-confidence and achievement archery after undergoing imagery training program.

Methodology:

This study is a quasi-experimental design that applies the pre-test and post-test (Pretest-Posttest Nonequivalent Comparison). The subject will be distributed to two study groups, the experimental group (treatment group) and control group (control group). The main purpose of using quasi-experimental study was to evaluate the changes resulting from the intervention carried out on whether the change in the experimental

group was better than the control group. The Table 1 below is a quasi-experimental design pre-test and post-test used in this study (Shadish, Cook & Campbell, 2002).

Table 1: Quasi-Experimental Design.

NR	E	O1	X	O2
NR	C	O1	-X	O2

Note:
NR: The sample in the group that are not selected at random
E: Experimental group
C: Control group
O1: Pretest
O2: Post test
X: Intervention
-X: No intervention

The study will also use the questionnaire Competitive State Anxiety Inventory-2 (SCAI-2) that was introduced by Martens (1990) to determine the level of subjects' anxiety. The subjects selected in the treatment group will receive training in imagery and physical training for six weeks, three times a week, while subjects in the control group will practice physically only for six weeks (three times weekly). Training for six weeks is sufficient to assess the effectiveness of imagery training given to research subjects (Mazlan, 2014; Smith, Wright, Allsopp & Westhead, 2007; Shadish, Cook & Campbell, 2002; Bell, Orr, Blomquist & Cain 1995. In test pre, all subjects are required to answer a questionnaire CSAI-2 and taken the archery test, the CSAI-2 score and archery test score will be recorded. After 6 weeks of imagery training, the post test will be conducted to determine the level of anxiety and assess the performance of archery athletes.

Sampling:

Sampling method to be used is purposive sampling and is based on the assessment of researchers whose research subjects were chosen appropriately and should be capable of producing data. The subjects chosen consisted of men's archery athletes aged between 13 and 16 years old of from one of the archers club. The number of subjects involved in the study was based on a sample Size Determinant Table introduced by Cohen (1988), which depends on three factors: an alpha value, power and size effects. The level of significant alpha value to 0.05, the power to effect size 0.8 and 0.8, which aims to compare between the two groups of subjects that is needed is a total of 26 (Cohen, 1988). In a study to be carried out, the presence of factors was taken into account by the researchers. The researcher has added four other subjects, bringing the total number of 30. Quasi-Experimental study involving experimental group and the control group brought the total number of subjects over 60 people.

This study used the instrument in the form of a questionnaire Competitive State Anxiety Inventory-2 (CSAI-2) that was introduced by Martens, *et al*., (1990). CSAI-2 is the instrument concerns while designed to measure the level of cognitive anxiety, somatic and self-confidence to face any competitions. CSAI-2 purpose-built as a research tool, and is useful as a diagnostic for clinical purposes. Through a study of 35 college students and 22 male athletes were wrestling co-efficiency Alpha were between 0.79 to 0.90 (Marten et. al., 1990). The questionnaire CSAI-2 is shaped self-administrating which can be administered either singly or in groups.

CSAI-2 form questionnaire containing 27 items, situations or questions in which each item is given a score according to the response chosen by the subject. CSAI-2 is divided into three sub-scales of 9 questions to measure cognitive anxiety CSAI, 9 questions to measure somatic anxiety CSAI and 9 questions to measure self-esteem. It used a four-point Likert Scale scores from "Not At All" to "Very Often". The score for question 14 should be reversed order (ie 1 = 4, 2 = 3, 3 = 2 and 4 = 1).

CSAI-2 contains 27 items or questions where each question is given a score according to the response chosen by the subject. To determine the overall anxiety, all 27 questions have to be aggregated. Examples of the calculations are shown in Table 2.

Table 2: Score Range for Measuring Overall Anxiety Level Overview.

Anxiety level	Composite Score
Low	27 – 54
Medium	55 – 81
High	82 – 108

To obtain score subscales concern CSAI-2, all sub-scale should be calculated based on nine questions of each sub-scale. The scores for each scale is the lowest starting with nine and the highest is 36. The higher the

cognitive and somatic anxiety score are, the greater the level of anxiety or confidence level will be. The range of scores to gauge the level of anxiety over the CSAI-2 is as follows:

Table 3: Score Range for Measuring Level Sub Anxiety Scale.

Anxiety level	Composite Score
Low	9 – 18
Medium	19 – 27
High	28 - 36

Expected Results:

Based on previous studies using imagery training, the expected results in this study is the athletes from the treatment group were given training imagery will be able to reduce the level of anxiety and improve the performance of archery.

Conclusion:

Imagery training was effective in improving sports performance because it can reduce levels of competitive anxiety (Parnabas, 2015) and this finding was supported by Mazlan (2015). However, the athletes must also undergo physical training to achieve the best competitive performance. The effectiveness of physical exercises in improving performance was also supported by Kok, Omar-Fauzee and Jim (2010).

Imagery training was found to reduce anxiety levels and improve performance in competing athletes. Athletes were emphasized to give full attention during the imagery training. The imagery training was based on the real images or situations of competition. Imagery training was also conducted with physical exercises to ensure the best performances of athletes achieved.

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