

Comparison between Two Relaxation Methods On Competitive State Anxiety Among College Soccer Teams During Pre-Competition Stage

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ABSTRACT

Relaxation technique is one of the basic skills to reduce anxiety. There are many types of relaxation techniques. Each of them has a different effect on different players. The aim of this study was to compare the effects of two relaxation methods, “guided imagery relaxation with deep breathing” and “progressive muscular relaxation PMR with deep breathing”, on the CSAI-2 parameters in college soccer players at pre-competition stage among three teams from different local universities. In this study, six weeks of the two different mental relaxation methods were used during daily training (three days per week) for each team. Sixty nine college soccer players were assigned to three groups (n = 23) which were PMR, imagery, and control. The participants completed the test after six weeks of mental intervention and their state of anxiety was investigated using Competitive State Anxiety Inventory-2 questionnaire (CSAI-2). The data were analyzed using the one way ANOVA procedure to compare between the 3 groups (PMR, Imagery and control). The results showed that there were significant differences between CSAI-2 parameters among the different groups. The guided imagery relaxation method was more effective than the PMR relaxation method. This suggests that coaches can use the guided imagery relaxation method as a daily mental training program besides the physical training to reduce competitive anxiety among soccer players

Keywords: relaxation, anxiety, soccer players, CSAI-2

1. Introduction

People have been using relaxation techniques for many years. Relaxation techniques have been used in some Asian cultures and in many of the Eastern religions to promote meditative practices to control the mind and relax the body (Benson and Klipper, 1976).

Benson and Klipper (1976) also reported that yoga was part of Indian culture thousands of years ago to provide a higher level of brain control. Currently, yoga is considered to be one of the most important types of relaxation techniques.

In the medical field positive impacts on some diseases such as cardiovascular disease, hypertension and asthma were reported (Sangthong et al., 2004; Kellett and Mullan., 2002).

In relation to sports, Solberg et al. (2000) reported positive effects of relaxation in enhancing recovery from training, mitigating champion anxiety and improving performance. "Anxiety is a negative emotional state in which a person experiences a combination of nervousness, worry and fairness, and activation of the autonomic nervous system" (Ampofo-Boateng, 2009).

Anxiety is also "multidimensional in nature with cognitive and somatic responses. The cognitive anxiety is the mental component of anxiety, while somatic is the physical component of anxiety" (Cox, 2007).

Anxiety reflects a threat of negative evaluation or negative performance, and can manifest itself in all aspects of the competition from beginning to end. This implies that anxiety is one of the major problems facing players as well as the team (Murphy, 2005).

Researchers have tried to resolve problems of stress and anxiety in players by using different strategies .According to Ampofo-Boateng (2008) there are many strategies in sports for coping with stress and anxiety in elite athletes, including self talk, thought control, identification of symptoms, self-monitoring, stress inoculation training, and relaxation techniques.

It can therefore be concluded that researchers have found many strategies for elite athletes to cope with stress and anxiety and relaxation training is one of these techniques.Lau & McMain (2005) defined relaxation techniques as an integration of a variety of psychosomatic and cognitive-behaviour interventions to create balance between the mental and emotional functions of the mind and physical responses of the body in order to eliminate mental stress and physical tension.

Relaxation techniques can be divided into two categories: (1) The first includes techniques that focus on muscles to mind techniques, including breathing exercises and Jacobson's progressive muscular relaxation falls in this category; (2) The second category involves

techniques that work from mind to muscle, including meditation, autogenic and imagery approaches, each of which is unique, but have the same effect on physiological variables in the body. Procedures like progressive muscular relaxation techniques, autogenic, imagery and meditation will decrease oxygen consumption, heart rate and respiration (Stefano et al., 2001; Cox, 2007; Dusek et al., 2008).

In the present study two relaxation methods were investigated. The methods include both categories of progressive muscular relaxation (PMR) from muscle to mind category (guided imagery relaxation) and from mind to muscle category, and both relaxation methods were mixed with deep breathing.

Many studies have used relaxation techniques and the most widely used technique to reduce cognitive and somatic anxiety and elevating self confidence is PMR. Navaneethan and Rajan (2010) applied the PMR relaxation to reduce somatic and cognitive anxiety and increase self confidence among 24 male volleyball players, and observed that after six weeks of intervention there was a significant effect on competitive anxiety among the players. Gill et al. (2004) examined the multi process theory and investigated the effects of two relaxation techniques (PMR and meditation) on state of anxiety among 76 undergraduate university students and reported that both relaxation techniques were effective in reducing cognitive and somatic anxiety, and in elevating self-confidence.

However, contrary to the predictions of the multi-process theory, there were no significant differences between the techniques. In another study, Haney and Colleen (2004) used the PMR in a six week stress management program among 47 female athletes and observed positive effects in reducing trait anxiety.

The second relaxation technique which was used in this study was guided imagery relaxation. It is a mental process often used in relaxation actions with athletes for the purpose of controlling anxiety before competition, lessen mal-adaptive behaviour, balance negative thoughts as well as to enhance concentration and focus (Watanabe et al., 2006; Peluso et al., 2005).

Past research has shown that the best effects of guided imagery are reached when guided imagery is initiated at the relaxation stage and then slowly applied to the desired visualization effects and imageries (Morris et al., 2005).

Watanabe et al. (2006) tested relaxation induced by short concentration, and guided imagery and abdomen breathing among 148 participants who visualized images of rising sun, relaxed landscapes, pleasant meetings with people, and shining healing lights. The results revealed

positive psychological and physiological effects that reduced stress and generated mental and emotional stability of participants.

Pavlidou and Doganis (2008) tested the mental intervention program to reduce anxiety among swimming athletes, and observed that there was a significant increase in performance and confidence in the experimental group after the nine-week intervention, but with no significant change in cognitive and somatic anxiety when compared to the control group.

The third relaxation technique involved mixing of deep breathing exercise with PMR and relaxation imagery. This exercise properly relaxes and facilitates performance by increasing the amount of oxygen in the blood. This transports more energy to the muscles and facilitates the removal of waste products (Williams, 2006).

Deep breathing usually triggers a relaxation response and is the basis for a variety of breathing exercises. Some coaches and sport psychologists have applied deep breathing exercises in the performance of skills such as gymnastic and figure skating routines (Williams, 2006).

Williams (2006) also reported positive effects of deep breathing on the human body, including relaxation, reduced tension, and increased oxygen in the bloodstream. Deep breathing exercises can also reduce anxiety and create a sense of control over one's body, which can lead to increased confidence and readiness for the completion of an upcoming task (Williams, 2006).

Brandyn and Ostrow (2007) had shown the effects of pre-shot routine and deep breathing interventions among youth tennis players, comprising of six male and female tennis players of ages 9–11, who completed the Children's Form of the Competitive State Anxiety Inventory-2. Deep breathing and pre shot routine was most effective in improving serving performance among the participants.

Competitive state anxiety inventory-2 (CSAI-2) questionnaire has been widely used to determine somatic anxiety, cognitive anxiety and self confidence among athletes (Esfahani & Gheze-Soflu, 2010; Kramar, 2008; Thomas et. al., 2004; Mcquown, 2001).

The aim of the present study was to evaluate the effectiveness of relaxation techniques in reducing the pre-competitive anxiety level among football players and to establish that mental training can complement physical training.

2. Methodology

2.1 Participants

Sixty nine soccer players of ages 18-25 were chosen from three local university teams. All teams were participants in the local IPT league.

2.2 Instruments and measurement

The competitive anxiety was determined using the Competitive State Anxiety Inventory-2 (CSAI-2) developed by Martens et al. (1990) this questionnaire was chosen because it measures somatic anxiety, cognitive anxiety and self-confidence among the players in pre-competitive anxiety.

The CSAI-2 consists of 27 items, and is designed to measure existing states of cognitive anxiety (nine items), somatic anxiety (nine items), and the state of self-confidence (nine items) in athletes before competitions. The scale ranging from “1= not at all” to “4 = very much so” in a competitive setting, with scores starting from the lowest 9 to highest 36, and for somatic and cognitive anxiety the value of 9 is the lowest point of anxiety and 36 is the highest point of anxiety, while for self-confidence the value of 36 represents the highest point of self-confidence (Martens et al., 1990).

The relaxation process was facilitated by a CD recording which was validated in a pilot study. The recorded relaxation script followed that of Bourne (1995) and Benjamin (1994).

2.3 Procedure

Permission to conduct the study was obtained from the relevant authorities, including the management of the sport centre of the respective universities and the coaches of each team. The study protocol was approved by the UiTM Research Ethics Committee (Human) on the 30th of December (Reference: 600-RM-I5/1/6).

Two weeks prior to the experiment, participants were notified about the six weeks program of study, and during the same week a pilot testing session on both relaxation methods using the audio CD (on PMR with deep breathing and imagery with deep breathing) was held, Also the general information and CSAI-2 questionnaire translation was presented to all participants.

One week before the actual experimentation, a meeting was held with participants from each group with their coaches to instruct and educate them on the experimental procedure involved in this study.

During experimentation the two treatment groups went through the six weeks relaxation methods training program by listening to and following the audio relaxation CD for 20 min

per day for three days per week before they started their daily training with the team. The objective was to reduce stress anxiety before competition.

The two treatment groups adopted the relaxation techniques in the comfort of an air-condition room, while sitting on comfortable chairs in their respective stadium. The control group did not follow any relaxation method over the six week period, but continued their daily training like all participants in this study, while the other two groups listened to the audio CD and performed the relaxation procedure before the regular daily training.

A randomized complete group design was used to enable comparison between the two experimental groups and the control group, and determine which of the treatments (deep breathing with PMR or deep breathing with imagery) was more effective in reducing the competitive state anxiety. Each group was provided with 2 assistants, sport science undergraduate students, who had the necessary experience on how to apply the relaxation methods and how to control the subject. The assistants helped supervise the entire procedure.

2.4 Measurement

The Competitive State Anxiety Inventory-2 (CSAI-2) questionnaire designed to examine the players somatic anxiety, cognitive anxiety and self confidence in pre-competition stage, employs a system of scoring with the lowest 9 to the highest value of 36. For somatic and cognitive anxiety a score of 9 represents the lowest point of anxiety and a score of 36 represents the highest point of anxiety, whereas in the self confidence a score of 36 represents the highest point of self-confidence. The questionnaire required about 5 min to answer all the questions and it was given to the players one time three hours before the competition.

2.5 Data analyzing

All data were analyzed using SPSS software (SPSS V19, IBM Inc.). Data were checked, explored and descriptive statistics was obtained for each variable. All continuous variables were expressed as means with standard deviation. Frequencies and percentages were derived for categorical variables. Comparison between groups was carried out using the one way ANOVA procedure.

3. Result

The experiment involved two relaxation methods over a six weeks relaxation training program among college soccer players. The experiment was designed to reduce competitive anxiety among the players during the pre-competition stage.

The first hypothesis in this study was that there is no significant difference between all groups (PMR, Imagery and control) in the test on somatic anxiety parameters between the players during pre-competition stage. The results for somatic anxiety between all groups were in agreement with this first hypothesis. The results showed no significant differences between all groups (Table 1, Figure 1)

The second hypothesis for this study was that there is no significant difference between all groups in the test on cognitive anxiety parameters during pre-competition stage. The data for cognitive anxiety however was not in agreement with this hypothesis. There was a significant difference ($P < 0.05$) between the Imagery group ($M = 21.96$, $SD = 3.535$) and the Control group ($M = 25.52$, $SD = 4.187$). On the other hand there was no significant difference for somatic anxiety parameters between the PMR group ($M = 24.13$, $SD = 2.241$) and the Control group (Table 2, figure 2).

The third hypothesis of this study was that there is no significant difference between all groups (PMR, Imagery and control) in the test on self confidence parameters during pre-competition stage

The results for cognitive anxiety were not in agreement with this hypothesis. It was shown that there was a significant difference ($P < 0.05$) between the PMR group ($M = 21.09$, $SD = 3.541$) and the Imagery group ($M = 24.39$, $SD = 3.602$). However, there was no significant difference ($P < 0.05$) between the PMR group and the control group ($M = 22.22$, $SD = 5.213$). There was also no significant difference between the Imagery group and the Control group ($P < 0.05$) (Table 3, Figure 3).

Table 1 Somatic anxiety between treatment groups at three hours before the game

Variables	n	Mean anxiety score (SD)	F-statistic ^a (df)	P-value
PMR	23	21.83(3.822)	0.576 (2;66)	.083 ^a
Imagery	23	24.13(3.094)		
Control	23	23.57(3.786)		

^a: one-Way ANOVA test.

Somatic anxiety parameter ($P > 0.05$)

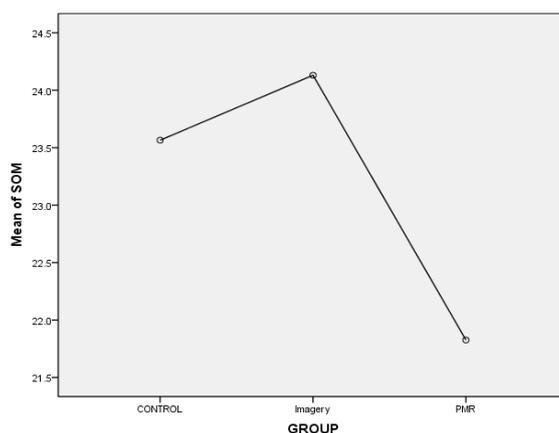


Figure 1 Somatic anxiety between treatment groups at three hours before the game.

Table 2 Cognitive anxiety between treatment groups at three hours before the competition

Variables	n	Mean anxiety score (SD)	F-statistic ^a (df)	P-value
PMR	23	24.13(2.341)	0.273 (2;66)	.003 ^b
Imagery	23	21.96(3.535)		
Control	23	25.52(4.187)		

^b: the mean cognitive anxiety score between players who took imagery relaxation methods compared to the control group was significantly different by post-hoc test Bonferroni's procedures.

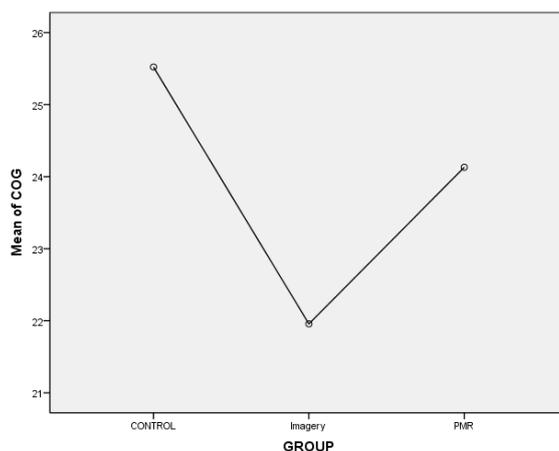


Figure 2 Cognitive anxiety between treatment groups at three hours before the competition

Table 3 Self confidence between treatment groups three hours before the competition

Variables	n	Mean self confidence score (SD)	F-statistic (df)	P-value
PMR	23	21.09 (3.541)	3.693 (2;66)	.030 ^b
Imagery	23	4.39(3.602)		
Control	23	22.22(5.213)		

^b: mean for self confidence score between players who took guided imagery relaxation method and PMR group was significantly different by post-hoc test bonferroni's procedure.

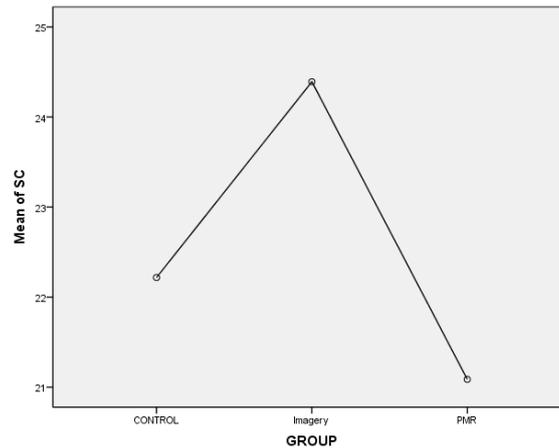


Figure 3 Self confidence between treatment groups at three hours before the competition

4. Discussion

The results of this study on somatic anxiety showed that there was no significant effect of treatments after six weeks mental training intervention. The results are in agreement with the first null hypothesis, which states that there is no significant difference between all groups (PMR, imagery and control) in the test on somatic anxiety parameters during pre-competition stage. There was no significant effect of relaxation methods on the somatic anxiety among soccer players.

These findings are in agreement with several past reports in the literature (Mellalieu et al., 2009; Pavlidou and Doganis, 2008; Page et al., 1999; Vadoa et al., 1997) which also indicated no effect of PMR and guided Imagery relaxation on athletes after a specific period of mental intervention.

Navaneethan and Rajan (2010) reported significant effect of PMR relaxation training in reducing somatic anxiety among members of a volleyball team. However, they did not apply the PMR relaxation at pre-competition stage.

According to Martens et al. (1990), based on the multi-dimensional theory, the somatic anxiety will increase before an event, in addition to other factors that make players anxious. Gill et al. (2004) also investigated and reported significant effect of PMR in reducing somatic anxiety among 76 undergraduate university students between 17-29 years of age. The reason the study was significant in reducing somatic anxiety was attributed to the age of the subjects in the study. However, similar age groups with more experience respond differently (Gill et al., 2004).

Cumming et al. (2007) reported that Imagery can reduce somatic anxiety after the mental training intervention period. They applied the guided imagery relaxation intervention on 41 males and females from many individual games (such as dance, equestrian, golf, judo, rowing, squash, tennis, gymnastics, swimming, badminton, athletics, fencing). According to Murphy (2005) the anxiety level is different between games and also between individual and team games. In the present study the imagery relaxation training was applied to college soccer teams, and hence may explain the differences in response compared to the study by Cumming et al. (2007).

The second parameter in this study was cognitive anxiety, and the results for this parameter after six weeks mental intervention showed that there were significant differences ($P > 0.05$) between the Imagery and Control groups. Differences between the PMR and the Imagery group, and also between PMR and the Control group were not significant. These findings indicate that the guided Imagery relaxation with breathing had a greater positive effect on the soccer players at pre-competitive stage than PMR relaxation with deep breathing.

The significant positive effect of guided Imagery relaxation on cognitive anxiety of athletes is in agreement with several other reports (Parnabas and Mahamood, 2011; Hale and Whitehouse, 1998).

Kramar (2008) observed no significant effect of the imagery relaxation on cognitive anxiety of athletes. However, they applied the relaxation techniques for 8 weeks without any deep breathing, but suggested that deep breathing is very important to reduce stress among players.

In the present study deep breathing relaxation was applied 10 times before and after the guided imagery relaxation, which probably made the relaxation more effective, and hence may explain the difference between this study and that of Kramar (2008).

The last parameters in the CSAI-2 questionnaire evaluated self confidence among the soccer players, and the results showed there was a significant difference between the Imagery group and PMR group, but there were no significant differences between the Imagery and Control group and also between the PMR and the Control group.

Hanton et al. (2004) had shown that correlations between pre-competitive anxiety and self-confidence reveal that players usually had low self confidence before a championship.

In conclusion the self confidence parameters indicated that the guided Imagery relaxation method increased self confidence among the soccer players, while the PMR relaxation method did not have any effect on self confidence among the soccer players.

This finding is in agreement with numerous other studies which showed that the guided Imagery training had a positive effect and increased self confidence of athletes (Parnabas and Mahamood, 2011; Pavlidou and Doganis, 2008; Cumming et al., 2007; Monsma and Overby, 2004; Fletcher and Hanton, 2001; Hale and Whitehouse, 1998; Vadoa et al., 1997).

Williams (2006) also indicated that deep breathing exercises can reduce anxiety and create a sense of control over one's body, which can lead to increased confidence and readiness for the completion of an upcoming task.

In the present study deep breathing exercises were applied ten times before and after the guided Imagery relaxation, which probably made the relaxation training more effective.

Page et al. (1999) observed that guided Imagery relaxation did not have any effect in increasing the self confidence among female swimmers, but it must be noted that the guided Imagery relaxation was applied without the breathing exercise.

The results of the present study showed that there was a significant difference between PMR and the imagery group, with PMR group having less confidence than the Imagery group. As there was no significant difference between the PMR and the Control group, it can be conclude that the PMR relaxation did not have any effect in increasing self confidence among the soccer players.

Navaneethan and Rajan (2010) observed a significant effect of PMR relaxation training after mental intervention period in elevating self confidence among volley ball players, but it must be noted that they did not apply the PMR relaxation at pre-competition stage.

Lim (2008) demonstrated that self confidence was decreased gradually (over 2 weeks, one week, one day, one hour) before an event in two different competitions. However, the factors for subjects to be under pressure and anxiety were not present in the study by Navaneethan and Rajan (2010). Hence, the differences in the results observed between these two studies.

In conclusion the present study revealed that guided Imagery relaxation had positive effects and reduced cognitive anxiety, and elevated self confidence of the college soccer players three hours before the game. The PMR relaxation method on the other hand did not have any effect on CSAI-2 perimeters (somatic anxiety, cognitive anxiety or self-confidence).

Finally, coaches should be aware of the importance of the psychological state of the players and to deal with and control their mental state using psychological strategies. Coaches will benefit by making the Imagery relaxation method a part of the daily team training program.

The PMR relaxation method in this study however, did not show positive effects in reducing the psychological perimeters. It is therefore recommended that further studies on the PMR relaxation method be considered. Further studies should consider increasing the mental intervention period to more than six weeks or increasing the frequency of training per week, or a combination of relaxation techniques to reduce the psychological perimeters at the pre-competitive stage.

Mental state using psychological strategies. Coaches will benefit from the results of the current study. The Imagery relaxation method should be made a part of the daily team training program. The PMR relaxation method in this study however, did not show positive effects in reducing the psychological perimeters.

It is therefore recommended that further studies on the PMR relaxation method should consider increasing the mental intervention period to more than six weeks or increase the frequency of training per week, and also consider a combination of relaxation techniques to reduce the psychological perimeters at the pre- competitive stage.

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