

# **EFFECT OF PROGRESSIVE MUSCLE RELAXATION TRAINING ON COMPETITIVE ANXIETY OF MALE INTER-COLLEGIATE VOLLEYBALL PLAYERS**

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## **ABSTRACT:**

*The present study is mainly concerned with volleyball players who participated in the high level competition. Now days, the Game volleyball is becoming as a professional sport rather than the competitive sport. So the competitiveness among the volleyball players is growing up day by day with different color. Reason for such competitiveness arises naturally among the players, because of pressures such as equal competition, concern about fulfilling the expectation of their teachers, coaches, parents and peer group and personal needs. The present study investigated the effect of psychological skill training techniques such as progressive muscle relaxation on competitive anxiety. The three sub-scales of competitive anxiety were also examined; cognitive anxiety, somatic anxiety and self-confidence. The study consisted of 24 male volleyball players from PSG College of Arts and Science, Coimbatore. Their age ranged from 18 to 25 years. The Competitive State Anxiety Inventory-2 (CSAI-2), also developed by Martens, Vealey, & Burton (1990) were used. Subjects were randomly assigned to either a relaxation training experimental group, or a no relaxation training control group. Both the experimental groups were given training for 3 days a week and for 6 weeks in total. Paired t-tests were used to test the effect of treatment groups individually between pre and post –tests of all the groups on variables used in the present study. The result of the study reveals that there was significant difference in 0.05 levels of competitive anxiety among the male inter-collegiate volleyball players.*

**Key words:** Relaxation training, competitive anxiety

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## INTRODUCTION

The present study is mainly concerned with volleyball players who participated in the high level competition. Now days, the game volleyball is becoming as a professional sport rather than the competitive sport. So the competitiveness among the volleyball players is growing up day by day with different color. Reason for such competitiveness is arise naturally among the players, because of pressures such as equal competition, concern about fulfilling the expectation of their teachers, coaches, parents and peer group and personal needs. It leads to mental and physical stress. In high level stress, the player's vision may have to be narrow and could not understand the things around them. Hence having the high level stress, players are unable to show their real effort in matches though they are having the needed physical and mental resources. Hence the physical education teachers and coaches are in need to study the means and methods needed to face such competitive pressures whereby they can equip their players to perform well. As far as means and methods for high performance in sports are concerned, they are varied with the nature and type of competition such as low level competition and high level competition. In high level competition, sport is demanding high level mental toughness. Mental toughness of a player can be strengthened only through the implication of cognitive based training. Cognitive based training helps them to realize the nature of internal and external pressures whereby they can easily face the competitive pressures and to show their talents in time. Having this thirst, the investigator has impelled to study.

The impact of anxiety on sport performance has become an interest in the field of Sport Psychology within the last decade. Performance related anxiety, also referred to as competitive a-state anxiety composed of three states. The cognitive a-state is responsible for cognitive concerns such as worry and negative expectations about oneself or one's performance. The somatic a-

state accounts for autonomic arousal such as muscle tension and increased heart rate. High levels of either cognitive a-state or somatic a-state negatively effect state self-confidence. Overall, competitive a-state anxiety is defined as an emotional response to an unpleasant stimulus.

Typical responses to an anxiety provoking stimulus include: muscle tension, increased breathing, and decreased concentration. It has been suggested that athletes are prone to experience this negative emotion for two reasons. First, they frequently find themselves in situations in which others can assess their success or failure. Second, the degree of success achieved by an athlete is measurable by goals such as distance, scores, or time. Furthermore, an examination of sport competition literature exemplifies the causes of competitive a-state anxiety. Some of the commonly cited causes include fear of failure, ego threat/fear of evaluation, and poor preparation or lack of perceived physical readiness. Generally, both psychological and physiological ramifications reveal the athlete's response to anxiety.

In addition, studies have indicated that a reduction in competitive a-state anxiety may enhance athletic performance. Recently, the emphasis placed on the psychological aspect of athletics has exhibited psychological skill training to be equally important as physical training. Psychological skill training such as relaxation training can be used to lower both somatic anxiety and cognitive anxiety. Hence, such a training method can be implemented to reduce competitive anxiety and in turn, enhance athletic performance (Onestak, 1991). Moreover, relaxation techniques include: progressive muscle relaxation that is induced by instructions to tense and relax major muscle groups of the body; deep breathing which ensures calm respiration; and visualization techniques (Jacobson, 1938). The purpose of relaxation strategies is to allow the athlete to decrease anxiety prior to performance and in turn, reach his or her full athletic potential (Onestak, 1991).

Previous research explored the effect of various relaxation training techniques on competitive a-state anxiety and performance. Anshel and Porter (1996), Bethany and Forrest (1998), and Savey and Beital (1997) have demonstrated further collective evidence that the application of psychological skill training programs can reduce competitive a-state anxiety as well as improve athletic performance. For example, Bethany and Forrest (1998) found that visuo-motor behavioral rehearsal, when employed by athletes can decrease stress and state anxiety. In support of this finding, Anshel and Porter (1996) also found that athletes who employed stress management techniques expressed better athletic performance. Future research may extend the examination and see exactly which sub-scale, somatic anxiety, cognitive anxiety and self-confidence is most effected by the psychological skill training.

In consideration of the previous evidence that psychological skill training can reduce competitive anxiety, the present study will further investigate the impact of progressive muscle relaxation, a type of psychological skill training, on a-state competitive anxiety with an emphasis on the three sub-levels of competitive anxiety. Cognitive anxiety, somatic anxiety and state self-confidence will be examined. It will be beneficial to test if in fact, psychological skill training such as relaxation training lowers competitive anxiety and if so, which of the three sub-scales are most effected.

Moreover, the present study will examine competitive anxiety and the impact of relaxation training. The variable being manipulated is the relaxation training, which is defined as progressive muscle relaxation. Progressive muscle relaxation generates relaxation by systematically progressing through skeletal muscles. The variables being measured are the subject's trait anxiety level, competitive anxiety level and the three sub-levels of state anxiety: somatic anxiety, cognitive anxiety, and state self-confidence.

## METHODS

The purpose of the study was to find out the effect of progressive muscle relaxation training on competitive anxiety of male inter-collegiate volleyball players. To achieve the purpose of the study twenty four male volleyball players were selected from PSG College of Arts and Science, Coimbatore. Their age was ranged from 18 to 25 years. The purpose of the present study was explained to them clearly where by their consent to serve as samples were obtained. The present study is an experimental one and to test the effects of varied forms of intervening strategies, the care was taken in distributing the samples to each experimental group. For this, the selected samples (N=24) were divided into two equal groups. Group I was considered as Progressive Relaxation Training Group (PRTG) in which they underwent progressive muscle relaxation practices. Group II was considered as control group they are doing the regular physical & skill practice. The experimental group were given training for 3 days a week and for 6 weeks in total.

## RESEARCH INSTRUMENT

### TOOL USED IN THE STUDY

#### *Competitive Sport Anxiety Inventory - 2*

Competitive state anxiety was assessed by using the Competitive State Anxiety Inventory - 2 (CSAI-2, Martens et al. 1990) which is a self report, psychometric state anxiety inventory, consisting of 27 items. The CSAI-2 normally takes less then five minutes to complete and was administered ten minutes before competition and practice session. Before allowing subjects to begin completing the CSAI-2, instructions were explained, and researchers ensured that all instructions were completely understood. State anxiety was measured by the Competitive State Anxiety Inventory - 2 (CSAI - 2) (Martens et al 1990). The CSAI - 2

assess two components of state anxiety, cognitive worry and somatic anxiety, and a related constructs self-confidence.

The CSAI - 2 contains 9 items that represent each sub - scale. Thus, each sub - scale has a range from 9 to 36. Higher scores on cognitive and somatic anxiety indicate higher levels of anxiety whereas higher scores on self - confidence sub - scale correspond to higher levels of self-confidence (Martens et al. 1990 and McKay et al. 1997).

### **Description of CSAI-2**

The CSAI was revised to develop a sport -specific inventory that measured the cognitive and somatic components of A-state. The CSAI -2 was originally constructed to include subscales to measure not only cognitive state anxiety and somatic anxiety but also fear of physical harm and generalized anxiety. The development of the CSAI-2 as a sport-specific measure of multidimensional A-state followed a systematic Psychometric process. The CSAI-2 is an A-state inventory designed to measure existing state of cognitive state anxiety, somatic state anxiety, and state of self confidence in competitive situations,. The CSAI-2 was constructed primarily as research tool. It was administered three hour before competition. When administering the CSAI-2, it was recommended that the title on the form given to the subjects to be Illinois self-evaluation questionnaire. This technique helps to reduce the bias to the inventory. In addition antisocial instructions given by author of CSAI-2 was committed to memory and orally communicated with conviction to the respondents. Before allowing subjects to begin completing the CSAI-2 it was made sure that whether the instructions are completely understood and particularly that responses should be based on how the respondent feels at the moment.

**Scoring the CSAI-2**

The CSAI - 2 is scored by computing a separate total for each of the three subscales with scores ranging from a low of 9 to a high of 36. The higher the score, the greater the cognitive or somatic. A-state or the greater the state self-confidence. Total score for the inventory is not computed.

The cognitive state anxiety is scored by totaling the responses for the following 9 items 1, 4, 7, 10, 13, 16, 19, 22 and 25. The somatic state anxiety subscale is scored by adding the responses to the following 9 items: 2, 5, 8, 11, 14, 17, 20, 23 and 26. Scoring for item 14 must be reversed in calculating the score for the somatic state anxiety subscale as indicated below:

1	=	4
2	=	3
3	=	2
4	=	1

The state self-confidence subscale is scored by adding the following items 3, 6, 9, 12, 15, 18, 21, 24, and 27. Inventories that are missing no more than one response per subscale can still be scored, but any inventory in which two or more items from any one subscale are emitted should be invalidated. To obtain subscale scores when an item has been omitted, compute the mean item score for the eight answered items, multiply this value by 9, and then round the product to the nearest whole number.

**Reliability of Data**

The reliability of data was ensured by establishing the instrument reliability, tester reliability, tester competency, and reliability of tests.

**Instrument Reliability**

The instruments used in this study were stop watches and measuring tape which were used to gather data for this study were obtained from standard firms. Data were collected thrice by using the said instruments. On all occasions, the measurements showed

the same reading, and therefore the instruments were considered reliable.

### **Tester Competency and Reliability of Tests**

To ensure that the investigator was well versed with the techniques of conducting the tests, the investigator had a number of practice sessions in testing procedure. The reliability of the data was established through test and retest method.

Tester reliability was established by a test process whereby a consistency of results was obtained by product moment correlation. The data collected from a randomly selected sample of ten subjects in test was correlated with the data taken by the expert and coefficient of correlation thus obtained is presented in Table 1. Since very high correlations from .806 to .897 were obtained for the variables, the competency of the tester to administer the test was accepted. The intraclass correlation coefficient obtained from selected criterion variables were presented in Table-1

**Table-1**  
**INTRACLAS CORRELATION CO-EFFICIENT VALUES ON**  
**SELECTED CRITERION VARIABLES**

SI.NO	CRITERION VARIABLES	COEFFICIENT OF CORRELATIONS
<b>COMPETITIVE SPORT ANXIETY INVENTORY-2</b>		
	a) cognitive anxiety	.897
	b) somatic anxiety	.860
	c) self confidence	.806

### **Progressive relaxation Training**

The volleyball players were comfortable with the breathing technique. It is systematic technique developed by Jacobson. A volleyball player is asked to inhale and tense a specific muscle

group for approximately 7 – 10 seconds followed by releasing them for 15 – 20 seconds. The volleyball player then exhales and releases the tension from the specified muscle group, concentrating on the feelings of relaxation. This procedure is repeated for a number of muscle groups with each group begin tensed and relaxed three times. The muscle groups used with the volleyball team are listed below:

The Muscle groups used in the Progressive Relaxation Exercise

<b>Muscle Group</b>	<b>Instructions</b>
Hand	Clench your left hand and feet the tension relax and let hand hang loosely. Same for right hand.
Wrists	Bend hand back, hyper extending your wrists relax.
Upper arms	Bend elbow towards your shoulders and tense biceps muscle relax.
Shoulders	Bring shoulders up toward yours ears. Relax, let your shoulders drop down.
Forehead	Wrinkle your forehead, raise your eyebrows relax.
Eyes	Close your eyes tightly relax.
Jaws	Clench your jaws tightly relax.
Tongue	Press your tongue against the roof of your mouth relax.
Mouth	Press your lips together tightly relax.

Neck	Turn your head so that your chin is over your right shoulder. Straighten and relax.
Neck and Jaws	Bend your head forward, pressing your chin against your chest. Straighten and relax.
Chest	Take a deep breath and hold it for 5 seconds, slowly exhale and relax.
Abdomen	Tighten your stomach muscles relax.
Back	Arch your back relax.
Thighs	Stretch your legs in front of you. Tighten your thigh muscles relax.
Hamstrings	Push your heels down into floor, tighten your hamstring muscles relax.
Calves	Point your toes toward your head relax.
Feet	Curl your toes toward the bottom of your feet relax.

## RESULTS

The study was designed to find out the effects of progressive muscle relaxation training on competitive anxiety of male inter-collegiate volleyball players. The objective framed in the present study to test the data collected on variables: cognitive anxiety, somatic anxiety and self confidence. As one of the objectives of the present study was to test the effects of progressive muscle relaxation training on competitive anxiety, the initial test means and final test means were tested treatment wise by using the paired sample t-test. SPSS 13.0 statistical package.

**TABLE-1**  
**Significance of Mean Gains / Losses between Pre and Post Test**  
**of Progressive Relaxation Training (PRTG) on Competitive**  
**Anxiety of Volleyball Players**

Variables	Pre-test Mean	Post-test Mean	Mean Diff.	Standard Error Mean	't'-ratio
Cognitive Anxiety	21.50	20.08	1.42	.148	9.53*
Somatic Anxiety	22.08	20.50	1.58	.148	10.65*
Self Confidence	21.25	22.75	-1.50	.151	9.95*

\* Significance at 0.05 level

Table - 1 indicates that the obtained 't' ratios were: 9.53 for cognitive anxiety, 10.65 for somatic anxiety, 9.95 for self confidence. The obtained 't' ratios on competitive anxiety. When compared with the critical value of 2.201 for degrees of freedom of 111 it was found that the mean gains and mean losses statistically significant. Resulting of these confirm that six week practice of progressive relaxation training produced a significant improvement in cognitive anxiety (1.42;  $p < 0.05$ ), somatic anxiety (1.58;  $p < 0.05$ ), self confidence (-1.50;  $p < 0.05$ ), statistically significant and explained its effect positively.

**Bar diagram showing that the pre test and post test means of progressive relaxation training group on competitive anxiety**

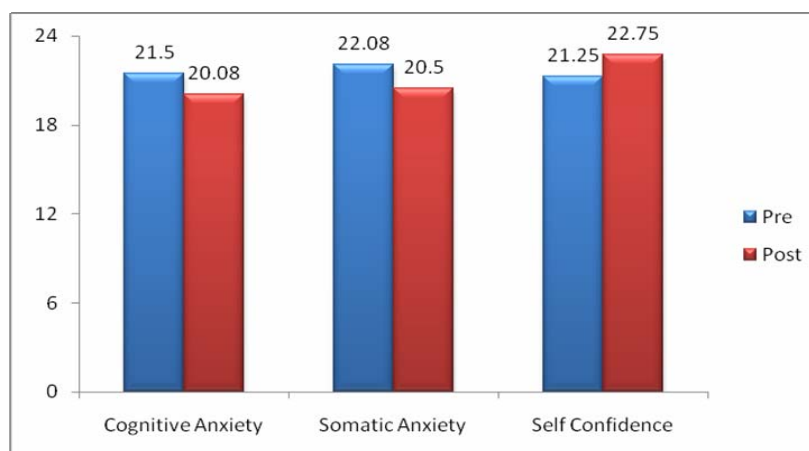


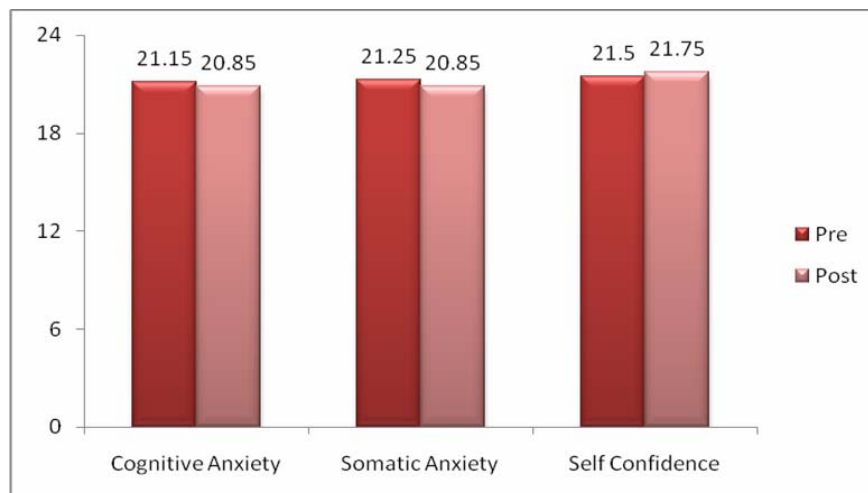
TABLE-2

**Significance of Mean Gains / Losses between Pre and Post Test of Control Group on Competitive Anxiety of Volleyball Players**

Variables	Pre-test Mean	Post-test Mean	Mean Diff.	Standard Error Mean	't'-ratio
Cognitive Anxiety	21.15	20.85	0.30	.923	1.45
Somatic Anxiety	21.25	20.85	0.40	.233	1.71
Self Confidence	21.50	21.75	-0.25	.910	1.22

Table - 2 indicates that the obtained 't' ratios were: 1.45 for cognitive anxiety, 1.71 for somatic anxiety, 1.22 for self confidence. The obtained 't' ratios on competitive anxiety. When compared with the critical value of 2.201 for degrees of freedom of 111 it was found that the mean gains and mean losses statistically not significant. Resulting of these confirm that so it was found that the control group did not show significant improvement in cognitive anxiety (0.30;  $p>0.05$ ), somatic anxiety (0.40;  $p>0.05$ ), self confidence (-0.25;  $p>0.05$ ), statistically not significant.

**Bar diagram showing that the pre test and post test means of control group on competitive anxiety**



## DISCUSSION ON FINDINGS

The purpose of the present study was to examine if progressive muscle relaxation decreased competitive anxiety, and if so, which of the three sub-scales: cognitive anxiety, somatic anxiety, and self-confidence were most effected by the training. The only statistically significant effects found between the experimental group and the control group occurred on the cognitive anxiety, somatic anxiety and self confidence sub-scale of competitive anxiety. The competitive anxiety of the subjects was tested first producing no statistical significant effects between the experimental and control group. Although, previous research suggests that various relaxation training techniques, including progressive muscle relaxation, decrease full-scale competitive a-state anxiety (Bethany & Forrest, 1998), the results of the present study did not confirm these observations. The Competitive State Anxiety Inventory (CSAI-2) (Martens, Vealey, & Burton, 1990) produced no statistical significance for the overall a-state anxiety levels between the relaxation training experimental group (group 1) and the no training control group (group 2). However, the mean scores of trait and state for group I exhibited a greater decrease from competitive anxiety. There are several reasons for the lack of statistical significance between the groups. Originally, the subject pool contained 24 subjects. Other limitations of the present study pertained to a restricted form of psychological skill training.

The findings of this case are supported with the theoretical construct of Jacobson (1938). According to him Progressive muscle relaxing of various muscle groups although the exercise is a relaxation technique, we start with anxiety because most individuals find it easier to go from a tensed state to a relaxed state then they muscles. Progressing from a tensed state to relaxation also helps to develop the ability to recognize and differentiate the feelings of tension and relaxation in the muscles. Relaxation

improves alertness and awareness in such a way that the performance will be maximized. In short, learning to hang loose in all situations is taking one giant step towards playing at consistently high levels at or near potential performance.

## CONCLUSION

From the results of comparative effect among the progressive relaxation training, and control group on criterion variables, it was concluded that players belong to progressive relaxation training is performed better in cognitive anxiety, somatic anxiety and self confidence as compared to control group.

## REFERENCES

1. Anshel, M., & Porter, A. (1996). Self-regulatory characteristics of competitive swimmers as a function of skill level and gender. *Journal of Sport Behavior*, 1 2), 91.
2. Bethany, L., & Forrest, S. (1998). Effects of self-administered visuo-motor behavioral rehearsal on sport performance of collegiate athletes. *Journal of Sport Behavior*, 21(2), 206.
3. Broucek, M., & Bartholomew, J. (1993). The effects of relaxation with a warning cue on pain and tolerance. - *Journal of Sport Behavior*, 16(4), 239.
4. Fisher, C., & Zwart, E. (1982). Psychological analysis of athletes' anxiety responses. *Journal of Sport Psychology*, 4, 139-158.
5. Jacobson, E., (1938). *Progressive relaxation*. Chicago, IL: University of Chicago.
6. Martens, Vealey, & Burton (1990). *Competitive State Anxiety Inventory-2 (CSAI-2)*. Champaign, IL: Human Kinetics Publishers.
7. Onestak, D. (1991). The effects of progressive relaxation, mental practice and hypnosis on athletic performance: A review. *Journal of SM Behavior*, 1 4), 247.