Original Article

Effect Of Rational Emotive Behaviour Therapy (Rebt) With Endurance Training In Irrational Belief And Precompetitive Anxiety On Pistol Shooters

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Abstract

Shooters require comprehensive training including physical, mental and technical components for overall successful performance. There is a dearth of existing literature on multidisciplinary training. The aim of the present study is to find out the effect of Rational Emotive Behaviour Therapy along with strength training on elite level pistol shooters. The present study was a randomized controlled trial with 60 participants who were elite shooters from various shooting ranges of Punjab. Participants were divided into two groups (I and II) according to a computerized randomization table. The Experimental Group I underwent REBT training twice a week, Physical training thrice a week for 2 months and other group II followed strength and endurance training. The short general attitude belief scale (SGABS), and SCAT , Salivary cortisol collected on pre training (0 day) and post training (60th , 90th day) from participants of both groups. The data were analyzed with repeated measure one way ANOVA using SPSS version 20. The result shows that experimental group I has statistically significant reduction in SGABS score ($p \leq 0.00$), SCAT score ($p \leq 0.00$), Salivary cortisol ($p \leq 0.00$) relative to that of group II. The present study revealed that comprehensive training is more beneficial for reducing precompetitive anxiety pistol shooters.

Keywords: Rational emotive behaviour therapy, endurance training on shooters, irrational belief, anxiety of shooters, pistol shooting training, Psychotherapy for shooters

INTRODUCTION

Pistol shooting needs more precision activity which needs to be trained using scientific methods to meet the demand of fine motor activity. The shooters are technically trained but it seems inadequate to maintain a stable hold of the pistol, body and their mental stability during competitive hours. So that elite level shooters have more challenges, to maintain physical and mental health status with proper technical skill in task performance or to preserve their previous successful records. Competitive anxiety is one of the key factors for affecting successful performance. It affects performance by changes in cognitive and physiological mechanisms (1). Precompetitive anxiety is present in all levels of players like national, state level, but the level of anxiety varies depending on their experience in the competitive level. Furthermore, individual sports players like shooting players perceive more pre competitive anxiety than team sports players (2).

The neuroscience documented that if the individual is in a controlled competitive situation, and perceived as challenged, the active /proactive coping response is activated. This stimulates a rise in the plasma testosterone level and sufficient sympathetic nervous system response which sets a positive mood about the event; thus increasing the probability to successfully complete the task (victory). At the same time, if individuals perceive competitive situations as threatening or uncontrollable they may develop passive / reactive coping responses. This stimulates insufficient plasma testosterone and sympathetic nervous system activation and increases in plasma cortisol level accompanied by negative mood changes. This type of response increases the probability of defeat (3). If any techniques increase mental toughness, it also reduces sports related competitive anxiety. The randomized studies proved that music therapy and music therapy combined with mindfulness meditation therapy reduced the salivary cortisol which is a reliable marker of Pre Competition Stress in pistol shooters (4,5).

There are many influencing factors for precompetitive anxiety like irrational or negative belief, abnormal behavior about their performance. The mental skill training techniques should try to change the thinking process with rational belief of an individual otherwise they would remain at the same level of anxiety. There was a chance of unintended performance error or ironic error due to anxiety with negative or avoidable instruction of shooter under pressure (6).

For this purpose, recently sports psychology focused on a cognitive behavior approach which increases mental toughness in competitive and non-competitive situations. Rational emotive behaviour therapy (REBT) is one of the cognitive behaviour approaches in psychotherapy and it's developed by a clinical psychoanalyst Albert Ellis in 1950. REBT has irrational and rational belief as core beliefs which affect the behaviour response of an individual. There were studies conducted with REBT in various sport disciple like elite youth cricketers (7), football and Elite Soccer (8,9,10) one case study of an elite Archer (11), Paralympic Athletes (12), Squash (13), Triathletes (14), Golfers (15), and focused to reduce state and competitive anxiety and effectiveness was assessed through either interview or standard questionnaires or implemented in few participants. Further, previous studies were concerned about strength endurance training only on pistol shooters (16) or rifle shooters (17, 18). There was a lacuna in previous studies to prove effectiveness of REBT in an objective manner and no available literature of integrated training (REBT with endurance trainng) in elite pistol shooters. The aim of present study was to find out the effective of REBT along with endurance training on irrational belief and precompetitive anxiety in elite pistol shooters

METHODOLOGY

Sixty elite level pistol shooters from in and around Punjab of age group 18 -35 years, both males and females, participants who are cooperative and willing to participate in study and those who are not under any types of psychological training were included in the study with duly signed consent form. The present study is a randomized control trial in nature. This study was approved by the Institutional Ethics Committee of Punjabi University, Patiala. The subjects were divided into two groups (I & II) according to a computer generated randomization table. The outcome measures of pre competitive anxiety were sport competitive anxiety test, Short general attitude belief scale as a subjective tool and salivary cortisol level as objective measures used in this study.

Sport competitive anxiety test (SCAT) contains 15 questions out of which five are mock questions which help to avoid internal bias, the remaining 10 questions focus on competitive anxiety. The subject response was rated as 3 point scale (rarely, sometimes and often) in each question. A score of less than 17 indicates a low level of anxiety, 17 to 24 was average level of anxiety, and more than 24 a high level of anxiety. SCAT has good internal consistency ($r = 0.95 \sim 0.97$) and test retest reliability ($r = 0.73 \sim 0.88$) by Martens et al., 1990 (19).

The mental skill was assessed in this study with Short general attitude belief scale (SGABS) by Lindner et al., 1999 which helps assess the percentage of irrational belief (negative beliefs) of an individual. The Shortened General Attitudes and Beliefs Scale (SGABS) consists of 26 items forming eight subscales in which 4 items referred for rationality, remaining 22 items referred to irrationality. In irrationality subscales are demand for fairness (four items), need for achievement (four items), need for approval (three items), need for comfort (four items), self-depreciation (four items), other-depreciation (three items). The participants were marked on each of 26 statements on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The subscales of irrational scores were added and the result is presented with percentage (20). The SGABS has high test-retest reliability criterion, construct, concurrent, convergent, and discriminate reliability (21) and internal reliability of Cronbach's alpha coefficient values (0 .77 to 0.95) across the three time-points. (9).

Cortisol is synthesized by the adrenal cortex. It's a type of glucocorticoid, which can be assessed by plasma, salivary, and urinary testing. It is also a reliable biomarker, indicating the hypothalamus-pituitary-adrenal (HPA) axis functions. When in a competitive situation, HPA axis level is activated and results in an increase in cortisol level. At the time of completion of the competition, cortisol level comes down to the normal level. The salivary cortisol is a non-invasive, reliable method to assess cortisol level of the body (22).

PROCEDURE

The baseline assessment of short general attitude belief scale (SGABS), sports competitive anxiety test (SCAT) were collected. The participants were instructed to avoid consuming tea, coffee and any other beverage 12 hours before saliva samples. The participants were instructed to rinse the mouth with water to remove any particles from the mouth 10 minutes before saliva collection. The shooters sat on a comfortable chair with hand rests and were allowed to rest for five minutes, then they opened the mouth and were allowed to collect saliva on the floor of the mouth. The examiner collected 2ml saliva in a polypropylene tube with filler. The sample tubes were labeled, sealed in an icebox within 30 minutes. The samples were sent to the laboratory within 2 hours stored less than 15 centigrade. The saliva was analyzed with Salimetric salivary cortisol kit.

Group I participants underwent one to one REBT counseling 2 sessions / week for 8 weeks amounting to a total of 16 sessions. In the first three sessions they worked to find out their target problem and associated emotional behaviour. Next two sessions were conducted as an education phase to make them understand the ABC framework of the REBT model. Further two sessions were focused on using the ABC model, facilitating the shooters for identifying irrational belief (iB), its adversity event (A) and consequences(C) of irrational belief due to adversity events and reframing the target problem. The eighth to eleventh session was considered a disputation phase, in that it focuses on targeted irrational belief and helps inform the shooters about consequences of their belief. Followed by a session, the author helped them to find rational

alternative beliefs on the same situation. The next two sessions were focused on promoting rational belief practice with cognitive and behavioural home assignments (reading, writing about rational behaviour). The fifteenth and sixteenth sessions were reinforcement to share their experience after using rational beliefs during competitive situation and assessment of home assignments along with shooters specific isotonic exercises for upper limb (23) and push-up exercises for upper limb endurance training In the standard push-up position, subjects raised the body by straightening the elbows and then lowered the body until the chin touched the mat / upper arm parallel to the floor, without allowing the stomach to touch the mat and then returned to the starting position. The maximum number of push-ups performed consecutively without rest were counted. The test was stopped when the subjects were unable to maintain the appropriate technique for two repetitions, with special emphasis on maintaining neutral positioning of the lumbar spine through the test **(**24**).** This standard pushups practice for trice in a week up to 24 sessions.

The Experimental group II followed ongoing regular practice along with shooter specific isotonic exercises for upper limb only.

RESULT

The data were analyzed with descriptive statistics and inferential statistics with repeated measure one way ANOVA within the group. The physical characteristics of participants of the present study. The mean age of participants of REBT and strength /endurance training group (Group I), strength /endurance training group (group II) are 21.44 ± 4.6, 20.24 ± 3.5 respectively. The mean BMI of Group I, II are 22.34 ± 2.9, 23.2 ± 4.4 respectively. The heart rate of participants of Group I, II are 85.7 ± 14.2, 89.52 ± 10.1 respectively. The Systolic Blood Pressure of participants of Group A, B are 122.4 ± 8.64 and 119 ± 9.8 respectively. The Diastolic Blood Pressure of participants of Group A, B are 79.07 ± 4.72 and 77.6 ± 7.08 respectively. The physical characteristics of pistol shooters were similar in both groups at the baseline assessments. The within group findings of Short General Attitude belief scale (SGABS) results showed significant difference (p. < 0.05) in group I but in group II showed non-significant difference (p > 0.001) (Table 1). The SCAT showed a significant difference (p = 0.000) in group I. However, experimental group II showed a non-significant difference (p > 0.001) (Table 2)**.** As for salivary cortisol, the within group analysis revealed that there was a significant difference (p < 0.001) in REBT along with group I but in other group results showed non-significant difference measures of salivary cortisol (p >0.001) (Table 3).

Table 1: Comparison of Short General Attitude belief scale (SGABS) variable within the both group from Baseline to 90th day

Variable	Experimental Group I (30)				Experimental Group II (30)			
SGABS	**Mean ± SD**	**SE**	**F**	**Sig**	**Mean ± SD**	**SE**	**F**	**Sig**
Baseline	60.85 ± 12.45	2.39	6.239	0.006	66.70 ± 7.99	1.53	0.055	0.947
60th day	51.52 ± 11.02	2.12			67.15 ± 9.85	1.89		
90th day	46.29 ± 15.06	2.89			67.37 ± 9.36	1.80		

SGABS = Short General Attitude belief scale**, n** = Number of participants**; SD** = Standard Deviation**; SE** = Standard Error**; F** = Mean of the within group variances**; Significance** = < 0.001. The Mean score is significant at the .05 level.

Table 2: Comparison of Sports competitive anxiety test (SCAT) variable within the both groups from Baseline to 90th day.

Variable	Experimental Group I (30)				Experimental Group II (30)			
SCAT	**Mean ± SD**	**SE**	**F**	**Sig**	**Mean ± SD**	**SE**	**F**	**Sig**
Baseline	20.89 ± 3.56	0.68	26.976	0.000	20.78 ± 3.67	0.707	2.646	0.091
60th day	16.3 ± 2.84	0.55			21.85 ± 3.42	0.657		
90th day	14.07 ± 3.26	0.63			22.85 ± 3.72	0.716		

SCAT = Sports competitive anxiety test**, n** = Number of participants**; SD** = Standard Deviation**; SE** = Standard Error**; F** = Mean of the within group variances**; Significance** = < 0.001. The Mean score is significant at the .05 level.

Table 3: Comparison of salivary cortisol (SC) variable within the both group from Baseline to 90th day

Variable	Experimental Group I (30)				Experimental Group II (30)			
SC(µg /dL)	**Mean ± SD**	**SE**	**F**	**Sig**	**Mean ± SD**	**SE**	**F**	**Sig**
Baseline	1.11 ± 0.18	0.04	62.342	0.000	1.04 ± 0.02	0.04	0.106	0.900
60th day	0.85 ± 0.13	0.03			1.05 ± 0.18	0.03		
90th day	0.77 ± 0.11	0.02			1.05 ± 0.17	0.03		

SC = Salivary cortisol**, n** = Number of participants**; SD** = Standard Deviation**; SE** = Standard Error**; F** = Mean of the within group variances; **Significance** = < 0.001. The Mean score is significant at the .05 level.

DISCUSSION

The current study data analysis noticed that there was gradual reduction of irrational belief, sport competitive anxiety test score and salivary cortisol level in experimental group I in comparison with experimental group II. The irrational beliefs were reduced 60.85 ± 12.45 to 46.29 ± 15.06 in experimental group I. The Rational Emotive Behavioral Therapy along

with strength and endurance training proved reduced scores as compared to other groups. The previous studies support that REBT training had reduced irrational belief among athletes (9, 15). Another study by Ahmadzadeh et al 2019, reported that neuro linguistic programmes enhance shooters' performance score and mental fitness (25).

The author noticed that there was a gradual reduction of mean salivary cortisol level in experimental group I as per within the group analysis. The results show that salivary cortisol levels reduction in experimental group I was more relative to group II score especially in the follow up period. Cortisol level is positively correlated with stress. Mental training acts on reducing the stress and thereby having an impact on salivary cortisol level (26). A few studies found similar findings showing that psychological training like meditation, music therapy, mental training had an effect on the HPA axis and reduced cortisol level in players. (5, 26).

In this study, REBT along with strength endurance training group I have statistically significant reduction of SCAT within group analysis as compared to group II. Similar results were reported by Subathra et al., 2021(27), they agreed that the impact of mental training has reduced aggression and competitive anxiety among volleyball players. Interestingly, a study noticed that plyometric training, circuit training have an impact on practical training and improvement in sports competitive anxiety scores in school children (28). The study result was not supports the present study result of strength and endurance training and also has some an impact on changes in competitive anxiety**.**

In the present study, we noticed that experimental group I, physical ability and shooting score were improved in post training in comparison with pre training. The limitations of this study were less number of participants and not categories experiences of shooter in shooting. In future, present study will be conducted to find correlation of pistol shooting performance and pre competitive anxiety level in elite level shooters or correlation with upper limb endurance training and pistol shooting performance.

CONCLUSION:

The study found an improvement to control the precompetitive anxiety and irrational beliefs in rational emotive behaviour therapy along with a strength and endurance training group than strength and endurance training group of elite pistol shooters. There is a need focused training of physical and psychological training on professional pistol shooters for their successive performance and need more research in comprehensive training on shooters.

Author contributions

All three authors made a substantial contribution to the information and material submitted, and they have read and approved the final version of the manuscript.

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Declarations of Interest

None.

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