



Effect Of Mental Skill Training Program On Mental Toughness & Pre-Competition Anxiety Of Male Mma Featherweight Fighters From Pune

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ABSTRACT

This study examined the effect of a 12-week Mental Skills Training Program (MSTP) on mental toughness and pre-competition anxiety among male MMA featherweight fighters from Pune. Mixed Martial Arts (MMA) is a demanding combat sport that requires both exceptional physical conditioning and psychological readiness. Although the importance of mental strength in combat sports is well established, systematic research on psychological interventions remains limited, particularly in India. An experimental pre-test post-test non-equivalent group design was used. 36 male MMA featherweight fighters (aged 18–25 years; weight category 57–65.8 kg) were purposively sampled from Ganimikawa MMA and Fitness Club, Pune, and divided into an experimental group (n = 18) and a control group (n = 18). The experimental group participated in a structured 12-week Mental skill training program, which included goal setting, imagery, self-talk, relaxation, visualisation, and focus training, conducted 3 days per week for 60 minutes per session. The control group continued with their regular training routine. Mental toughness was measured using the Sports Mental Toughness Questionnaire (SMTQ) developed by Sheard, Golby and van Wersch (2009), and pre-competition anxiety was measured using the Competitive State Anxiety Inventory-2 Revised (CSAI-2R) developed by Cox, Martens and Russell (2003). Data were analysed using descriptive statistics and an independent sample t-test in SPSS. The results showed considerable progress in mental toughness and a reduction in pre-competition anxiety in the experimental group compared to the control group. These findings highlight the importance of integrating mental skills training with physical conditioning in combat sports preparation.



Keywords: Mental Skills Training Program, Mental Toughness, Pre-Competition Anxiety, MMA, Featherweight Fighters, Combat Sports.

Introduction

Mixed Martial Arts (MMA) is a demanding combat sport that requires athletes to maintain both physical and psychological readiness. The intense nature of MMA exposes athletes to pressure, fatigue, injury risk, and the need for fast decision-making during competition. In addition to physical strength and technical skills, psychological attributes such as confidence, focus, and emotional control are critical for optimal performance. Mental toughness enables athletes to remain calm and determined under stress, whereas excessive pre-competition anxiety may impair concentration, confidence, and performance capability (Jones et al., 2002; Clough et al., 2002).

MMA fighters often experience nervousness and psychological pressure before competition due to uncertainty about fight results, performance expectations, and the risk of physical harm. These pressures may lead to self-doubt and diminish an athlete's ability to perform well in competitive situations. Mental Skills Training (MST), which includes techniques such as imagery, relaxation, goal-setting, and positive self-talk, has been shown to help athletes manage anxiety, increase emotional self-regulation, and develop a stronger competitive mindset. Previous research indicates that psychological skills training positively influences confidence, stress management, and athletic performance (Vealey, 2007; Birrer & Morgan, 2010).

Mental toughness and pre-competition anxiety are closely linked in combat sports, as athletes with greater mental toughness are typically more capable of coping with stress and competitive pressure. Consequently, mental preparation has become an integral part of sports training, particularly in physically and psychologically demanding sports such as MMA. Psychological training programs help athletes maintain mental readiness, emotional stability, and mental focus during competition, thereby improving overall performance (Golby & Sheard, 2004).

Mojtahedi et al. (2023) examined competitive anxiety levels of combat sports athletes and determined whether self-reported scores were associated with mental toughness and sportspersonship attitudes, and their findings indicated that mentally tough athletes reported lower cognitive and somatic anxiety along with higher self-confidence before competition, leading the authors to recommend structured mental toughness coaching within combat sports settings.



Although numerous studies have examined mental skills training and psychological variables in sports, studies specifically targeting MMA fighters remain limited. In the Indian context and within local competitions, few intervention programs have been evaluated. There is also a lack of combat-sport-specific evidence regarding the combined influence of mental skills training on both mental toughness and pre-competition anxiety. Most prior research has focused on team sports or other individual sports. This gap illustrates the need for research on psychological preparation in MMA.

Within the Indian context, comparable intervention-based research remains limited, despite growing interest in assessing athletes' mental toughness. Jain et al.(2020) psychometric validation study of the Psychological Performance Inventory among 76 elite Indian athletes concluded that elite Indian athletes' lack of success stems from an excessive focus on affective skills and a neglect of cognitive skills, and that balancing the two is key to improving mental toughness. Similarly, Battan's (2024) study of Indian wrestlers, drawing on a sample of national- and international-level competitors with at least five years of experience, examined how mental toughness distinguished medal-winning from non-medal-winning athletes, while comparative work among Indian judokas, boxers, and wrestlers at the school and university level has begun to map discipline-specific mental toughness profiles. These studies confirm that Indian sport psychology research has largely remained descriptive and comparative rather than interventional.

In this study, the male MMA featherweight fighters compete in one of the lightest and fastest-paced weight divisions in the sport, requiring them to manage intense physical demands alongside significant psychological pressure, as combat sports place sole responsibility for the outcome on the individual with no teammates to share it. Compounded by aggressive weight-cutting practices and the ever-present risk of injury, these fighters are especially susceptible to pre-competition anxiety, making psychological interventions such as mental skills training essential.

The main objective of this study is to examine the effect of a 12-week mental skills training program on mental toughness and pre-competition anxiety among male MMA featherweight fighters from Pune. Specifically, the study intends to determine whether such a program can increase mental toughness and reduce pre-competition anxiety in this population.

Despite increasing awareness of the importance of psychological preparation in sports, research specifically on MMA fighters, particularly in the Indian context and local competitions, remains scarce. Most existing studies have concentrated on team sports or other individual sports, resulting in a lack of combat-sport-specific evidence regarding mental toughness and pre-competition anxiety. Therefore, this study aimed



to assess the effect of a Mental Skills Training program on mental toughness and pre-competition anxiety among male MMA featherweight fighters from Pune, with the goal of understanding the role of psychological training in enhancing competitive readiness and emotional control.

Materials & Method

Method & Design

The study used an experimental method to examine the effect of a Mental Skills Training program on mental toughness and pre-competition anxiety among male MMA featherweight fighters. For this, a Pre-test Post-test Non-Equivalent Group Design was used.

Sample

Approximately 70-80 male MMA featherweight fighters (57–65.8 kg), aged 18-25 years, who regularly train and compete at 7-8 MMA clubs in Pune, were initially considered the population. Out of this population, 46 male MMA featherweight fighters (57–65.8 kg), aged 18–25 years, who regularly train and compete under Ganimikawa MMA and Fitness Club in Pune, were initially considered & Out of those 46, a total of 36 male MMA featherweight fighters were selected using a purposive sampling technique. Then the 36 fighters were further divided into two groups: an Experimental Group (n = 18) and a Control Group (n = 18).

Tools & Variables

To collect data for the study, standardised tools were used for both variables.

Mental Toughness was measured using the Sports Mental Toughness Questionnaire (SMTQ) developed by Sheard, Golby and van Wersch in 2009. The questionnaire consists of 14 items across three dimensions: Confidence, Constancy, and Control. Responses are recorded on a 4-point Likert scale ranging from 1 (Not at all true) to 4 (Very true). The total score ranges from 14 to 56, with higher scores indicating greater mental toughness and lower scores indicating lower mental toughness among athletes.

Pre-Competition Anxiety was measured using the Competitive State Anxiety Inventory-2 Revised (CSAI-2R) developed by Cox, Martens and Russell in 2003. The inventory contains 17 items measuring Cognitive Anxiety, Somatic Anxiety and Self-Confidence. Each item is rated on a 4-point scale from 1 (Not at all) to 4 (Very much so). Higher scores on the anxiety dimensions indicate greater pre-competition



anxiety, whereas higher scores on the self-confidence dimension reflect greater confidence before competition.

The independent variable was the 12-week Mental Skills Training Program. Control variables included the fighters' age (18–25 years) and weight category (57–65.8 kg). Extraneous variables included stress, lifestyle changes, behavioural changes, hereditary diseases, personality traits, and diet.

Procedure

Based on the researcher's own training experience in MMA, which enabled the researcher to contact a fellow coach for this study, all required permissions were obtained before administration. 36 male MMA featherweight fighters were divided into two equal groups: Experimental Group ($n = 18$) and Control Group ($n = 18$). Pre-tests were conducted for both groups using the SMTQ and CSAI-2R before implementing the program. The 12-week Mental Skills Training Program was then administered to the experimental group only, 3 days per week, with each session lasting 60 minutes. The sessions incorporated psychological techniques such as goal setting, imagery, self-talk, relaxation, visualisation, and focus training. The control group continued with their usual daily training routine. Post-tests were carried out using the same tools for both groups. The pre-test and post-test data were statistically analysed using Descriptive and Inferential Statistics in SPSS. Conclusions were drawn, and report writing was done.

Results

The results of the study examined the effect of the Mental Skills Training Program on mental toughness and pre-competition anxiety among male MMA featherweight fighters. Pre-test and post-test scores for both the experimental and control groups are compared using descriptive statistics (mean, standard deviation, and standard error of the mean) and an inferential analysis with an independent-samples t-test. The results show the magnitude of change in both dependent variables, mental toughness (measured via SMTQ) and pre-competition anxiety (measured via CSAI-2R) for each group, thereby enabling an evaluation of the program's effectiveness.



Table No. 1 : Descriptive Statistics of Mental Toughness (MT) & Pre-Competition Anxiety (PCA) of Experimental & Control Groups of Pre-test & Post-test Scores

GROUPS		MT		PCA	
		PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
Experimental (N = 18)	Mean	33.00	38.39	51.22	42.78
	Std. Error of Mean	0.54	0.62	0.62	0.67
	Std. Deviation	2.30	2.64	2.62	2.84
Control (N = 18)	Mean	33.06	33.67	50.94	52.94
	Std. Error of Mean	0.54	0.56	0.54	0.54
	Std. Deviation	2.29	2.38	2.29	2.29

As shown in Table No. 1, the Experimental group had a Pre-test mean score of 33.00 (SD = 2.301) and a Post-test mean score of 38.39 (SD = 2.638) in Mental Toughness, whereas the Control group had mean scores of 33.06 (SD = 2.287) and 33.67 (SD = 2.376), respectively. In Pre-Competition Anxiety, the Experimental group had a Pre-test mean score of 51.22 (SD = 2.625) and a Post-test mean score of 42.78 (SD = 2.84), while the Control group showed mean scores of 50.94 (SD = 2.289) and 52.39 (SD = 2.29).

Table No. 2 : Descriptive Statistics of Change in Performance (CIP) of Mental Toughness (MT) & Pre-Competition Anxiety (PCA) of Experimental & Control Groups

GROUPS		CIP (MT)	CIP (PCA)
Experimental (N = 18)	Mean	5.39	8.44
	Std. Error of Mean	0.16	0.12
	Std. Deviation	0.70	0.51
Control (N = 18)	Mean	0.61	-2.00
	Std. Error of Mean	0.12	0.00
	Std. Deviation	0.50	0.00

As shown in Table no. 2, the experimental group showed a higher change in Mental Toughness and a greater reduction in Pre-Competition Anxiety than the control group. The mean change in Mental Toughness for the Experimental group was 5.39 (SD =



0.698), while the Control group showed a smaller change of 0.61 (SD = 0.502). Similarly, the Experimental group showed a decrease in Pre-Competition Anxiety with a mean change of 8.44 (SD = 0.511), whereas the Control group showed an increase of -2.00 (SD = 0.00).

Table No. 3 : *Inferential Statistics of Change in Performance in Mental Toughness (MT) & Pre-Competition Anxiety (PCA) of Experimental & Control Groups*

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Change in Performance (MT)	Equal variances assumed	3.19	0.08	23.59	34.00	0.00	4.78	0.20
	Equal variances not assumed			23.59	30.87	0.00	4.78	0.20
Change in Performance (PCA)	Equal variances assumed	1360.00	0.00	86.66	34.00	0.00	10.44	0.12
	Equal variances not assumed			86.66	17.00	0.00	10.44	0.12

As shown in Table no. 3, significant differences were observed in both groups for Mental Toughness and Pre-Competition Anxiety, with the experimental group showing greater improvement in Mental Toughness and reduction in Pre-Competition Anxiety than the control group. An Independent samples t-test was used to compare the mean change in performance between the experimental and control groups. For Mental Toughness, Levene's test showed $F = 3.194$ with $p = 0.16$, indicating equal variances were assumed. The mean difference between groups was 4.778 with a calculated t-value of 23.587 ($df = 34$), showing a significant effect ($p = 0.01$). Similarly, for Pre-Competition Anxiety, Levene's test showed $F = 1360.00$ with $p = 0.01$, indicating equal variances not assumed. The mean difference was 10.444 with a calculated t-value of 86.664 ($df = 30$), also indicating a significant effect ($p = 0.01$).



Discussion

The findings of the present study showed a significant improvement in Mental Toughness among the experimental group following the 12-week Mental Skills Training program. The significance value obtained under Equal Variances Assumed indicated that the intervention positively influenced the psychological strength, confidence, and emotional control of the MMA fighters. Similarly, a significant reduction was observed in Pre-Competition Anxiety. Since the Levene's Test value for Pre-Competition Anxiety was less than 0.05, the Equal Variances Not Assumed values were considered for interpretation, which also showed statistically significant results. These results show that the Mental Skills Training program was effective in improving psychological readiness and reducing competitive stress among male MMA featherweight fighters.

The present findings are supported by earlier research in sports psychology and combat sports. Gucciardi et al. (2015) reported that mentally tough athletes are capable of keeping consistent performance under pressure and challenging situations. Similarly, Birrer and Morgan (2010) highlighted that psychological skills training programs involving relaxation, imagery, goal setting and self-talk significantly improve athletes' mental preparedness and competitive performance. The improvement in mental toughness observed in the present study may be attributed to the systematic psychological intervention provided throughout the 12-week training period. In addition, Golby and Sheard (2004) found that athletes with higher mental toughness reported lowered stress levels and better coping strategies, which strongly supports the reduction in Pre-Competition Anxiety observed in this study.

The reduction in anxiety levels is also supported by the findings of Hardy (1996), who suggested that excessive cognitive anxiety negatively affects concentration, decision-making and technical execution during competition. By relaxation techniques, breathing exercises and positive self-talk, the fighters in the present study may have developed better emotional self-regulation and self-confidence before competition. Likewise, Martens, Vealey, and Burton (1990) explained that psychological preparation plays an important role in managing competitive anxiety and enhancing athletic confidence.

However, some contradictory results have also been reported in the literature. Certain studies have suggested that psychological skills training might not consistently produce significant gains when the intervention duration is short or when athletes already possess high levels of competitive experience and psychological adaptation. Some researchers have also reported that anxiety may not always impair performance, as



moderate arousal may sometimes elevate alertness and motivation during competition. Although these contrasting findings, the results of the present study demonstrated positive outcomes, possibly due to the regulated nature of the intervention and the specific psychological demands of MMA competition.

Overall, the study's results show that Mental Skills Training plays a major role in improving mental toughness and reducing pre-competition anxiety among MMA fighters. The study further emphasises that psychological preparation should be systematically integrated with physical training in combat sports, particularly in MMA, in which athletes are continuously exposed to both physical and mental pressure during competition.

Conclusion

The findings of the study indicate that the mental skills training program increased mental toughness and reduced pre-competition anxiety among male MMA featherweight fighters from Pune. And the study showed that psychological training is an essential element of mental preparation for MMA fighters.

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