

ASSESSMENT OF COMPETITIVE STATE ANXIETY USING THE COMPETITIVE STATE ANXIETY INVENTORY-2 AMONG INDONESIAN PENCAK SILAT ATHLETES

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Abstract

Competitive state anxiety is an important psychological factor associated with athletes' readiness and performance, particularly in martial arts competitions that require sustained concentration, emotional regulation, and rapid decision-making. Appropriate psychological assessment is therefore important for understanding athletes' anxiety conditions in competitive settings. This study aimed to assess competitive state anxiety using the Competitive State Anxiety Inventory-2 (CSAI-2) among Indonesian pencak silat athletes. Data were obtained from a quasi-experimental pre-test and post-test study involving 20 pencak silat athletes registered with the Indonesian Pencak Silat Association (IPSI) of North Sumatra, comprising 13 male and 7 female athletes. Competitive state anxiety was assessed using the CSAI-2 before and after a four-week psychological relaxation program. Descriptive statistics, including mean and standard deviation, were used to summarize CSAI-2 scores across the two measurement periods. The mean CSAI-2 score decreased from 19.85 ± 3.90 at pre-test to 12.90 ± 3.68 at post-test, indicating changes in competitive state anxiety scores during the study period. These findings provide preliminary evidence regarding the application of CSAI-2 for describing competitive state anxiety among Indonesian pencak silat athletes. The study also highlights the relevance of psychological assessment for understanding athletes' anxiety conditions and supporting psychological preparation in competitive sport settings.

Keywords. Competitive State Anxiety Inventory-2; Competitive Anxiety; Pencak Silat Athletes; Psychological Assessment; Sport Psychology.

INTRODUCTION

Competitive anxiety is recognized as an important psychological factor that influences athletes' preparation and performance in competitive environments (Chen et al., 2026). Unlike general anxiety, competitive anxiety emerges specifically in response to achievement-related situations, including evaluation pressure, expectations of success, and uncertainty regarding competition outcomes (Dominguez-Gonzalez, 2024). Athletes are required not only to demonstrate optimal physical and technical abilities but also to maintain psychological readiness when facing high-pressure situations (Gould, 2021; Tamminen, 2025). Excessive competitive anxiety may negatively influence attentional control, decision-making ability, confidence, and performance execution during (Aliberti, 2024; Gupta, 2023). Recent evidence indicates that competitive anxiety is closely associated with psychological factors such as stress perception, resilience, and achievement motivation, demonstrating the importance of psychological assessment in competitive sports settings (Chen et al., 2026; Gupta, 2023). Furthermore, psychological interventions targeting competitive anxiety have shown beneficial effects across different athlete populations, highlighting the relevance of identifying and monitoring anxiety conditions among athletes (Chen et al., 2026; Ong & Chua, 2021).

Pencak silat is a competitive martial art originating from Indonesia that requires complex interaction between physical ability, technical skills, tactical decision-making, and psychological readiness (Kaplánová, 2024). Unlike sports with limited physical interaction, pencak silat involves direct confrontation with opponents, rapid decision-making, and unpredictable match situations, which may increase psychological demands on athletes (Martin, 2021). Under competitive conditions, athletes must regulate emotional responses, maintain concentration, and manage pressure to achieve optimal performance (Almeida, 2022). Previous studies have indicated that anxiety and self-confidence are important psychological components influencing athletes' competitive readiness and performance outcomes. Among martial arts athletes, competitive anxiety has been associated with emotional regulation challenges and performance-related concerns, suggesting that psychological monitoring is essential in supporting athlete development (Aliberti, 2024). However, empirical evidence describing competitive state anxiety among Indonesian pencak silat athletes remains limited (Sumiyati et al., 2025).

The assessment of competitive state anxiety requires appropriate psychological measurement instruments that can capture athletes' emotional responses in competitive situations (Bicalho, 2021). The Competitive State Anxiety Inventory-2 (CSAI-2) is one of the most widely used instruments in sport psychology research to assess competitive anxiety. The instrument was developed to measure the multidimensional characteristics of competitive anxiety, including cognitive anxiety, somatic anxiety, and self-confidence (Martens et al., 1990). Previous studies have applied CSAI-2 and CSAI-2R in various athletic populations to examine psychological responses before competition and their relationship with sport performance (Hatzigeorgiadis & Martinent, 2025). Recent studies continue to use CSAI-2-related instruments to evaluate competitive anxiety patterns among athletes, demonstrating its relevance as a psychological assessment tool in sports research (Lima et al., 2023; Putra & Guntoro, 2022).

Although competitive anxiety has been extensively investigated in different sports disciplines, evidence regarding competitive state anxiety among Indonesian pencak silat athletes remains insufficient (Lundqvist & Hassmén, 2005). Previous studies have mainly focused on the relationship between anxiety, confidence, coping strategies, and athletic performance, while studies describing competitive state anxiety using CSAI-2 measurements in pencak silat populations are still limited. This research gap is important because psychological characteristics may vary according to sport type, cultural background, competition demands, and athlete (Kegelaers, 2022; Lundqvist, 2023). Martial arts athletes may experience unique psychological challenges due to direct opponent confrontation and high-pressure decision-making during competition. Therefore, investigating competitive state anxiety using CSAI-2 among Indonesian pencak silat athletes may provide valuable information for sport psychology research and athlete psychological preparation (Lundqvist, 2023; Rice, 2022).

Therefore, this study aimed to assess competitive state anxiety using the Competitive State Anxiety Inventory-2 (CSAI-2) among Indonesian pencak silat athletes and describe changes in anxiety scores following psychological relaxation interventions. The findings are expected to contribute empirical information regarding the application of CSAI-2 in Indonesian martial arts athletes and provide insight into the importance of psychological assessment in competitive sports environments (Rice, 2022).

METHODS

Research Design

This study employed a quasi-experimental research design with a pre-test and post-test measurement approach (Sugiyono, 2015). The study was conducted to assess changes in competitive state anxiety among Indonesian pencak silat athletes using the Competitive State Anxiety Inventory-2 (CSAI-2) before and after psychological relaxation interventions (Cox et al., 2003; Martens et al., 1990).

The assessment was performed at two measurement points, including baseline measurement (*pre-test*) before intervention and follow-up measurement (*post-test*) after the intervention period. The CSAI-2 scores were used to describe changes in athletes' competitive state anxiety conditions. The study design followed the research procedure described in the doctoral dissertation, where competitive state anxiety was measured using CSAI-2 before and after the intervention period.

Participants

The participants in this study were 20 pencak silat athletes registered under the Indonesian Pencak Silat Association (Ikatan Pencak Silat Indonesia/IPSI) of North Sumatra. The study was conducted at the training facility of Pengprov IPSI Sumatera Utara. Participants were selected using purposive sampling based on predetermined inclusion criteria. The inclusion criteria included athletes aged between 13–23 years, body weight between 35–70 kg, previous experience participating in national-level competitions, ability to communicate effectively, and willingness to participate in the study. The final sample consisted of 13 male athletes (65%) and 7 female athletes (35%). The participants were divided into two intervention groups, consisting of the Deep Breathing Exercise group and Progressive Muscle Relaxation group, with each group consisting of 10 athletes.

Instrument

Competitive state anxiety was measured using the Competitive State Anxiety Inventory-2 (CSAI-2). CSAI-2 is a psychological assessment instrument commonly used in sport psychology research to evaluate athletes' anxiety conditions in competitive situations. In this study, CSAI-2 was administered to assess athletes' state anxiety conditions before and after the intervention period. The instrument was completed individually by each athlete following standardized instructions provided by the researcher. The measurement procedure involved preparing the CSAI-2 questionnaire, explaining the purpose and completion procedure to the athletes, and ensuring that each participant completed the questionnaire independently.

Procedure

The research procedure consisted of three main stages: baseline assessment, intervention period, and post-intervention assessment. First, all participants completed the CSAI-2 questionnaire as a baseline measurement (*pre-test*) to identify their initial competitive state anxiety levels. The CSAI-2 assessment was conducted before the implementation of

psychological relaxation training. Second, participants received psychological relaxation interventions consisting of Deep Breathing Exercise (DBE) and Progressive Muscle Relaxation (PMR). The interventions were conducted according to standardized protocols established in the research design.

The DBE intervention was performed with 20 repetitions within approximately 5 minutes per session, while PMR was conducted for approximately 15–20 minutes per session. Both interventions were implemented for four weeks with a frequency of three sessions per week, resulting in 12 intervention sessions.

Third, after completing the intervention period, participants completed the CSAI-2 questionnaire again as a post-test measurement to evaluate changes in competitive state anxiety scores.

Data Analysis

Data analysis was performed using descriptive statistical analysis to describe competitive state anxiety characteristics among Indonesian pencak silat athletes. The analysis included calculation of the mean and standard deviation (SD) of CSAI-2 scores before and after the intervention period. Changes in competitive state anxiety were evaluated by comparing CSAI-2 scores between pre-test and post-test measurements. The descriptive analysis was presented for overall participants and intervention groups to provide an overview of changes in competitive state anxiety conditions. The statistical approach was selected to describe the application of CSAI-2 in assessing psychological changes among pencak silat athletes.

RESULTS

Characteristics of Participants

The study involved 20 pencak silat athletes registered under the Indonesian Pencak Silat Association (IPSI) of North Sumatra. Participant characteristics were described based on gender, age distribution, and intervention group allocation. Among the participants, 13 athletes were male (65.0%) and 7 athletes were female (35.0%). Regarding intervention group distribution, participants were equally allocated into two groups, consisting of 10 athletes (50.0%) in the Deep Breathing Exercise (DBE) group and 10 athletes (50.0%) in the Progressive Muscle Relaxation (PMR) group. The age distribution consisted of three categories. Eight athletes (40.0%) were aged 10–14 years, six athletes (30.0%) were aged 15–17 years, and six athletes (30.0%) were aged 20–24 years. These characteristics indicate that the participants represented adolescent to young adult pencak silat athletes.

Table 1 Characteristics of Participants

Characteristics	n	Percentage (%)
Gender		
Male	13	65.0
Female	7	35.0
Age group (years)		
10–14	8	40.0
15–17	6	30.0
20–24	6	30.0
Intervention group		
Deep Breathing Exercise	10	50.0
Progressive Muscle Relaxation	10	50.0

Competitive State Anxiety Scores Based on CSAI-2

Competitive state anxiety was assessed using the Competitive State Anxiety Inventory-2 (CSAI-2) at two measurement points: before the intervention (*pre-test*) and after the intervention period (*post-test*). The descriptive analysis showed a decrease in the mean CSAI-2 score following the study period. The mean CSAI-2 score decreased from 19.85 ± 3.90 at pre-test to 12.90 ± 3.68 at post-test. This reduction indicates that CSAI-2 was able to capture changes in competitive state anxiety among Indonesian pencak silat athletes during the study period. The findings provide descriptive information regarding the psychological condition of athletes before and after the intervention period.

Table 2 Competitive State Anxiety Scores Based on CSAI-2

Measurement	Mean $\pm$ SD
Pre-test	19.85 ± 3.90
Post-test	12.90 ± 3.68

Changes in CSAI-2 Scores by Intervention Group

Changes in CSAI-2 scores were further described according to the intervention groups to illustrate the pattern of competitive state anxiety changes among participants. The results showed that athletes in the Deep Breathing Exercise (DBE) group demonstrated a mean reduction of 4.30 ± 2.21 points in CSAI-2 scores. Meanwhile, athletes in the Progressive Muscle Relaxation (PMR) group showed a mean reduction of 9.60 ± 3.24 points. These findings describe the observed changes in competitive state anxiety scores within each intervention group. In the present article, these changes are presented as descriptive findings regarding CSAI-2 measurement patterns among pencak silat athletes. The comparative effectiveness of DBE and PMR as psychological interventions will be addressed separately in another analysis.

Table 3 Changes in CSAI-2 Scores by Intervention Group

Intervention Group	Δ CSAI-2 Mean $\pm$ SD
Deep Breathing Exercise (DBE)	4.30 ± 2.21
Progressive Muscle Relaxation (PMR)	9.60 ± 3.24

DISCUSSION

This study aimed to assess competitive state anxiety using the Competitive State Anxiety Inventory-2 (CSAI-2) among Indonesian pencak silat athletes. The findings showed that the mean CSAI-2 score decreased from 19.85 ± 3.90 at pre-test to 12.90 ± 3.68 at post-test, indicating changes in athletes' competitive state anxiety during the study period. These findings demonstrate that CSAI-2 was able to capture variations in athletes' psychological conditions within a competitive sport context. In high-performance sports, understanding competitive anxiety is essential because athletes' psychological states may influence concentration, emotional regulation, decision-making, and performance readiness (Chen et al., 2026; Dominguez-Gonzalez, 2024; Kaplanova, 2024).

Interpretation of CSAI-2 Scores among Pencak Silat Athletes

Competitive state anxiety represents a temporary psychological response that occurs when athletes face competitive demands, performance evaluation, and uncertainty regarding competition outcomes. Unlike trait anxiety, which reflects a relatively stable tendency to experience anxiety, state anxiety fluctuates according to situational factors, including competition pressure, environmental demands, and perceived threats (Martens et al., 1990).

The decrease in CSAI-2 scores observed in this study reflects changes in athletes' perceived competitive anxiety conditions during the research period. In martial arts such as pencak silat, athletes experience unique psychological demands because competitions involve direct physical confrontation, rapid decision-making, and continuous adaptation to opponents' actions. These characteristics may increase psychological pressure and require effective emotional regulation strategies (Aliberti, 2024; Almeida, 2022; Bicalho, 2021).

Recent research has demonstrated that competitive anxiety is associated with multiple psychological factors, including competitive stress, psychological resilience, and achievement motivation. Athletes with higher psychological resilience tend to demonstrate better emotional regulation when facing competitive pressure, whereas excessive anxiety may negatively influence psychological readiness (Bicalho, 2021; Chen et al., 2026).

Therefore, assessing competitive state anxiety provides valuable information regarding athletes' psychological responses in demanding competitive environments. The current findings support the importance of monitoring competitive anxiety among pencak silat athletes. The CSAI-2 scores provide quantitative information regarding athletes' psychological conditions and may assist researchers and practitioners in identifying anxiety patterns during sport preparation.

The Importance of Measuring Competitive State Anxiety in Sports

Psychological assessment has become an essential component of sports science because physical and technical abilities alone do not fully determine athletic performance. Athletes must also maintain psychological stability, emotional control, and cognitive readiness when facing competitive situations. Therefore, reliable assessment of competitive anxiety is necessary to understand athletes' mental conditions and develop appropriate psychological support programs (Bicalho, 2021; Schinke et al., 2024).

The Competitive State Anxiety Inventory-2 (CSAI-2) is one of the most widely applied instruments in sport psychology research for assessing competitive anxiety. The instrument evaluates multidimensional aspects of competitive anxiety, including cognitive anxiety, somatic anxiety, and self-confidence (Martens et al., 1990). This multidimensional approach allows researchers to obtain a more comprehensive understanding of athletes' psychological responses before competition (Cox et al., 2003).

Previous studies have continued to apply CSAI-2 and CSAI-2R in various athletic populations because these instruments provide important information regarding anxiety responses in competitive settings (Lundqvist, 2023). For example, research involving different sports populations has demonstrated that competitive anxiety levels vary depending on sport characteristics, competitive experience, and individual psychological factors (Lima et al., 2023). These findings emphasize the importance of selecting appropriate psychological assessment tools that are sensitive to specific athletic contexts. In the context of Indonesian pencak silat, the application of CSAI-2 provides an opportunity to describe

competitive anxiety characteristics in a martial arts population that has received limited attention in previous research. Understanding these psychological characteristics may contribute to the development of more targeted psychological preparation programs for pencak silat athletes.

Comparison with Previous Studies

The present findings are consistent with previous research indicating that competitive anxiety is a common psychological phenomenon among athletes across different sports disciplines (Lundqvist, 2023). Previous studies have reported that athletes experience fluctuations in anxiety levels depending on competition demands, perceived pressure, and psychological preparation (Ong & Chua, 2021).

Ong and Chua (2021) reported that psychological interventions can contribute to the management of competitive anxiety among athletes. Their meta-analysis demonstrated the importance of psychological approaches in addressing anxiety-related problems in sport environments. Although the present study does not primarily evaluate intervention effectiveness, the observed changes in CSAI-2 scores highlight the sensitivity of this instrument in describing changes in athletes' anxiety conditions (Ong & Chua, 2021).

Similarly, Lima et al. (2023) reported variations in competitive state anxiety among athletes based on competitive level and sport characteristics. These findings support the assumption that anxiety responses are context-dependent and may differ across sports populations. The current study extends previous evidence by providing information regarding competitive state anxiety among Indonesian pencak silat athletes, a population that has been less represented in sport psychology research.

Research among martial arts athletes has also emphasized the importance of psychological factors in competitive performance. Martial arts require not only physical skills but also emotional regulation, attentional control, and psychological readiness. Therefore, measuring competitive anxiety in pencak silat athletes provides important information for understanding the psychological demands of this sport (Tamminen, 2025).

Implications of CSAI-2 Application in Pencak Silat Athletes

The findings of this study indicate that CSAI-2 can be applied as a practical psychological assessment tool to describe competitive state anxiety among Indonesian pencak silat athletes. The instrument provides measurable information regarding athletes' anxiety conditions and may support coaches, sport psychologists, and researchers in monitoring psychological readiness (Gould, 2021; Schinke et al., 2024).

From an applied perspective, regular assessment of competitive anxiety may help identify athletes who require additional psychological support before competition. Early identification of anxiety conditions may facilitate the development of individualized psychological preparation programs based on athletes' specific (Birrer, 2022;

Lailiyah, 2022). Furthermore, this study contributes preliminary evidence regarding the use of CSAI-2 in Indonesian pencak silat athletes. However, future studies should involve larger samples from different regions and competitive levels to provide broader evidence regarding competitive anxiety patterns in Indonesian martial arts populations.

Additional research may also examine the relationship between CSAI-2 dimensions and other psychological factors, such as resilience, self-confidence, coping strategies, and competitive performance (Walter, 2022).

CONCLUSION

This study provides an overview of competitive state anxiety among Indonesian pencak silat athletes using the Competitive State Anxiety Inventory-2 (CSAI-2). The findings indicate that CSAI-2 can be applied as a practical psychological assessment instrument for describing competitive anxiety characteristics among athletes in a martial arts context.

The CSAI-2 measurements provide information regarding athletes' competitive state anxiety conditions, highlighting the importance of psychological assessment in understanding athletes' mental readiness and supporting psychological preparation in competitive sports. The application of CSAI-2 in Indonesian pencak silat athletes contributes preliminary evidence regarding competitive anxiety patterns within this specific athletic population.

Future studies involving larger samples, athletes from different competitive levels, and broader cultural contexts are recommended to further examine the psychometric characteristics of CSAI-2 and investigate the relationship between competitive state anxiety and other psychological factors associated with athletic performance.

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