

State-trait anxiety and reduced emotional intelligence in combat sport athletes of different genders and competitive levels

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Abstract:

This study compared the emotional intelligence and state-trait anxiety between competitive level, gender and performance. For this, were measured 444 athletes (female n=171) from jiu-jitsu (n=142), judo (n=137), karate (n=57), kendo (n=63), taekwondo (n=25) and wrestling (n=20). We applied the Sport Competition Anxiety Test (SCAT) and Trait Meta-Mood Scale (TMMS-24). The results indicated that high-level female showed lower state anxiety than the low-level [14.0 (1.0; 36.0) vs. 20.0 (1.0; 58.0); p=0.03]. High-level showed lower values than intermediate (p=0.006) and lower-level (p=0.013). The 1st regression, the regulation dimension was the main variable to explain the level of competition for females (R²=0.046), in the 2nd model, the regulation dimension and state anxiety explained the level (R²=0.066). For males, trace anxiety explained the lower-level (R²=0.019). In conclusion, lower-level female athletes are more anxious than lower-level males, but in the domains of emotional intelligence, higher-level female showed a higher comprehension and perception than higher-level males.

Key Words: Sports Psychology; Martial Arts; Emotional Adjustment; Anxiety Disorders; Sports Medicine.

Introduction

Emotional intelligence (EI) is an essential component of combat sport competitors, as they require maximum effort accompanied by mental stress and physical exhaustion, and a lack of EI can affect many performance dimensions (Ghoul et al., 2017). There are three major conceptual models for emotional intelligence (Espinoza-Venegas, Sanhueza-Alvarado, Ramírez-Elizondo, & Sáez-Carrillo, 2015; Fernández-Berrocal, Extremera, & Ramos, 2004): a) Perception dimension: A transverse section of interrelated emotional and social competencies, abilities, and facilitators that influence intelligent behavior; b) Comprehensive dimension: A wide range of competencies and abilities that increase work performance; c) Regulation dimension: The ability to perceive, understand, manage and regulate one's emotions, as well as the emotions of others.

Combat sports are a high-intensity intermittent activity, characterized by complex skills and tactical key actions with short duration (Layton, 1993; Miarka, Brito, Dal Bello, & Amtmann, 2017; Tabben et al., 2015). Power for explosive attacks with integration of responses (Tabben, Miarka, Chamari, & Beneke, 2018), correct timing (Miarka et al., 2017), coordination (Tran & Voracek, 2016) and physical fitness (Coswig et al., 2018) are associated with a high competitive level in male and female athletes (James, Beckman, Kelly, & Haff, 2017). Athletes of different combat sports have been studied for competitive performance improvements over the past four decades (Callister, Callister, Fleck, & Dudley, 1990; Chaabène et al., 2014; Heller et al., 1998; Layton, 1993; Slimani, Miarka, Briki, & Cheour, 2016). However, there has been little attention given to prevalent psychological factors at each competitive level which may negatively contribute to the male and female performance in a singular manner.

There is consensus among experts that a negative mood state increases fatigue and anxiety, which can affect the performance of the combat athlete (Brandt et al., 2018). Anxiety effects have been an imminent concern on many studies which investigated performance of the athletes in karate (Terry & Slade, 1995), judo (Renden, Landman, Savelsbergh, & Oudejans, 2015), kendo (Choi et al., 2013), jiu-jitsu (Renden et al., 2015), taekwondo (Capranica et al., 2017) and wrestling (Gould, Eklund, Petlichkoff, Peterson, & Bump, 1991) championship tournaments. However, so far the effects of competitive levels on emotional intelligence and

anxiety variables approaching the particularities in female and male athletes in combat sports are not known. Preceding authors developed anxiety trait questionnaires that were specifically tailored to sports and denominated as the Sport Competition Anxiety Test (SCAT) (Martens, Vealey, & Burton, 1990). This questionnaire was used in karate (Terry & Slade, 1995) and judo with higher values for female than for male athletes (Interdonato, Miarka, & Franchini, 2013).

In light of the abovementioned information, we hypothesize that there are significant differences in competitive levels of state-trait anxiety and in perceptual and comprehensive emotional intelligence of female and male combat athletes. In our second hypothesis, we believe that there is a prevalence of negative performance effects related to anxiety and emotional intelligence in male and female combat sport athletes. Therefore, this study aimed to: a) compare emotional intelligence and state-trait anxiety between levels in females and males; and b) verify the prevalence of negative performance effects related to anxiety and emotional intelligence.

Material & methods

Participants

The following inclusion criteria were applied: a) being ≥ 15 yrs. of age, b) to practice and compete in jiu-jitsu, judo, karate, kendo, taekwondo and wrestling (≥ 5 yrs.). 1,400 questionnaires were applied to carry out the study, of which 922 were returned, 476 were rejected because they presented incomplete information, therefore the final sample was composed of 444 athletes (female=171, male=273) from different combat sports (jiu-jitsu=142, judo=137, karate=57, kendo=63, taekwondo=25 and freestyle wrestling=20) of three levels (high level=57, intermediate=137 and lower level=142). Regarding the performance, the athletes were classified as: a) low (compete, but without regional medals; ♀=59 and ♂=126); b) medium (compete and have won regional and national medals; ♀=80 and ♂=112) and; c) high (they compete and were classified in the top 5 in the continental or world championships; ♀=33 and ♂=36).

Procedures

Study design

We performed a retrospective ex post-facto study in which state-trait anxiety and reduced emotional intelligence were analyzed according to competitive combat sport level. As dependent variables we used: emotional intelligence and state-trait anxiety; and as independent variables: performance level (low, medium and high) and gender (male and female). The measures were carried out in two situations: a) competitions when the athletes were in procedures of accreditation and weighing (24-h before the competition); and (b) during national competitions. All measurements were done by a single researcher; SCAT was applied first, followed by TMMS-24. The aims and risks were informed to the participants and they duly signed the Informed Consent Form. This protocol was approved by the Research Ethics Committee of the University in which it was performed.

Measurements

For anxiety measurement, we applied the Sport Competition Anxiety Test (SCAT) (Martens et al., 1990), which is a self-report questionnaire to determine an athlete's competitive trait anxiety, meaning his or her tendency to be nervous in the sports competition setting. The SCAT contains 15 items, 10 of which measure symptoms associated with anxiety, with 5 others that are not scored but included to reduce the likelihood of an internal response-set bias. The scores for the 10 items are added up to provide an overall measure, with a high score reflecting a higher tendency to experience competitive anxiety.

For mood, we applied the Trait Meta-Mood Scale (TMMS-24) (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) or Emotional Intelligence Scale translated into Spanish (Fernández-Berrocal et al., 2004). This inventory consists of 24 items that are subdivided into three subscales or dimensions: a) emotional perception; b) emotional comprehension; and c) emotional regulation. The score for each of these subscales is classified into three ranges. For the emotional perceived subscale, the middle score range (22 to 32 in male; 25 to 35 in female) indicates adequate emotional perception, and scores in the high (>33 in male; >36 in female) or low (<21 in male; <24 in female) range indicate that emotional perception should be improved. In contrast, for the comprehension subscale, scores in the low range indicate a need for improvement (<25 in male, <23 in female), those in the middle range (26 to 35 in male; 24 to 34 in female) indicate adequate comprehension, and those in the high range (>36 in male; >35 in female) indicate excellent emotional comprehension. Likewise, in the emotional regulation subscale, low scores (<23 in male and female) indicate the need for improvement, scores in the middle range (24 to 35 in male, and 24 to 34 in female) indicate adequate regulation, and high scores (>36 in male, >35 in female) indicate excellent emotional regulation. On the questionnaire, individuals must rate each of their responses on a Likert scale from one to five points to indicate their level of agreement. The total score is obtained by adding the responses from each sub-scale, each of which ranges from eight to 40 points.

Statistical analysis

Descriptive data is presented as median [25th percentile; 75th percentile] values and the Kruskal-Wallis and Dunn's post hoc test were performed to compare frequencies between groups. Furthermore, a regression analysis was used to verify the prevalence of anxiety and emotional intelligence variables in the reduction of

performance level. The significance level of $p \leq 0.05$ was used. All analyses were conducted using SPSS 20.0 for Windows.

Results

Descriptive analysis of anxiety and emotional intelligence of female combat athletes are shown in Figure 1. Female combat athletes demonstrated significant differences of state anxiety ($X^2=6.890$, $df=2$, $p=0.032$), while high-level athletes showed lower values than the low-level group ($p=0.030$). The analysis indicated a significant effect of SCAT ($X^2=10.610$, $df=2$, $p=0.005$), where high-level athletes showed lower values than intermediate ($p=0.006$) and low-level ($p=0.013$) groups. No effects on trace anxiety were observed ($p=0.094$).

Regarding emotional intelligence, comparisons demonstrated significant differences of the perception dimension ($X^2=7.255$, $df=2$, $p=0.027$), where high-level female athletes demonstrated lower values than intermediate level ($p=0.048$). The analysis indicated significant differences in the comprehension dimension ($X^2=6.073$, $df=2$, $p=0.048$) with higher values by high-level than low-level athletes ($p=0.044$). Significant differences were observed between levels when comparing the regulation dimension ($X^2=6.890$, $df=2$, $p=0.032$), where the high-level group showed higher values than low-level female athletes ($p=0.030$).

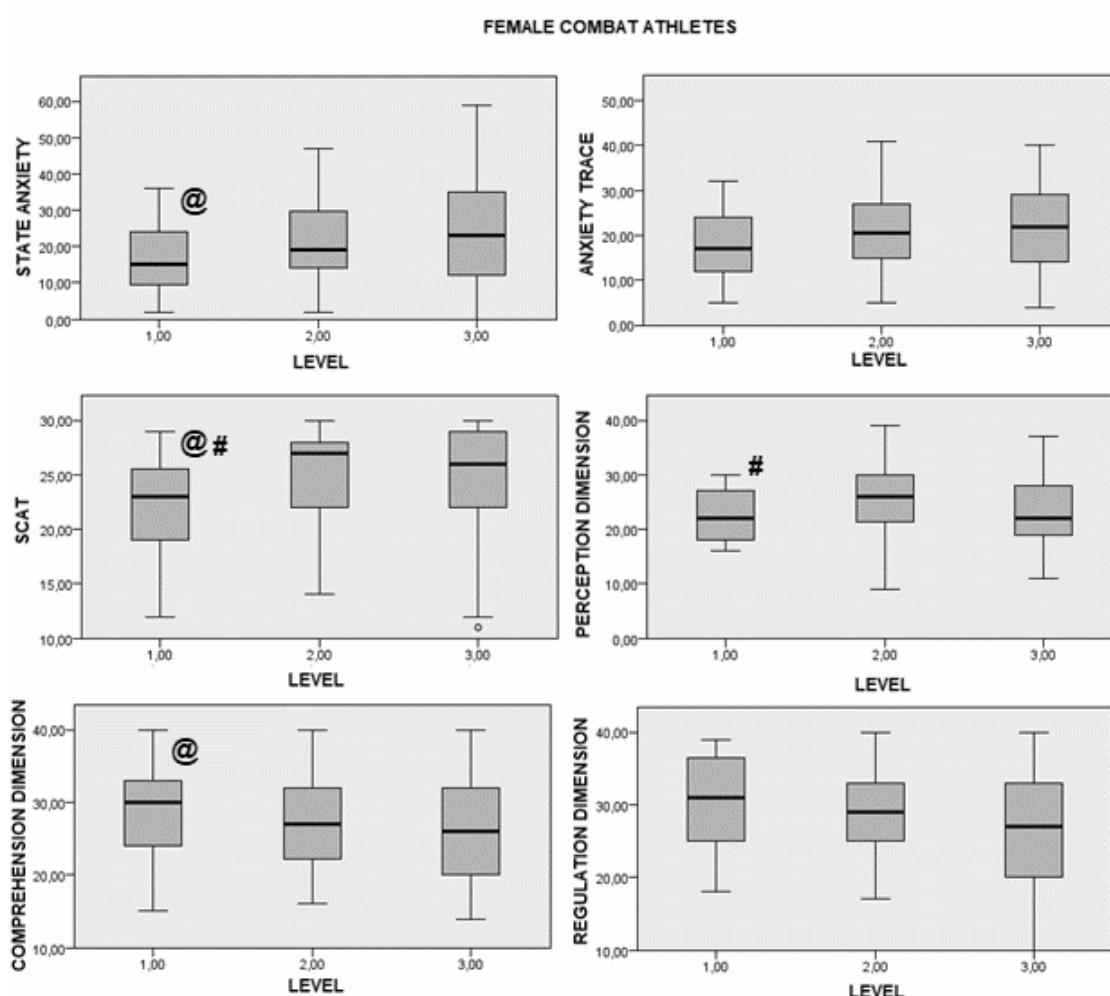


Figure 1. Box-plots of anxiety and emotional intelligence of female combat athletes by median and interquartile (1st quartile and 3rd quartile). # significant difference of intermediate-level male group and @ significant difference of low-level male group, $p \leq 0.05$.

A descriptive analysis of anxiety and emotional intelligence of male combat athletes is presented in Figure 2. Male combat athletes demonstrated significant differences of trace anxiety ($X^2=7.468$, $df=2$, $p=0.024$), where high-level athletes showed lower values than the low-level group ($p=0.024$). No effects of state anxiety ($p=0.45$) and SCAT ($p=0.226$) were observed. Regarding emotional intelligence, comparisons demonstrated significant differences in the regulation dimension ($X^2=6.908$, $df=2$, $p=0.032$), where high-level male athletes demonstrated higher values than low-level athletes ($p=0.034$). No effects were observed when comparing the perception ($p=0.67$) and comprehension ($p=0.345$) dimensions of male combat levels.

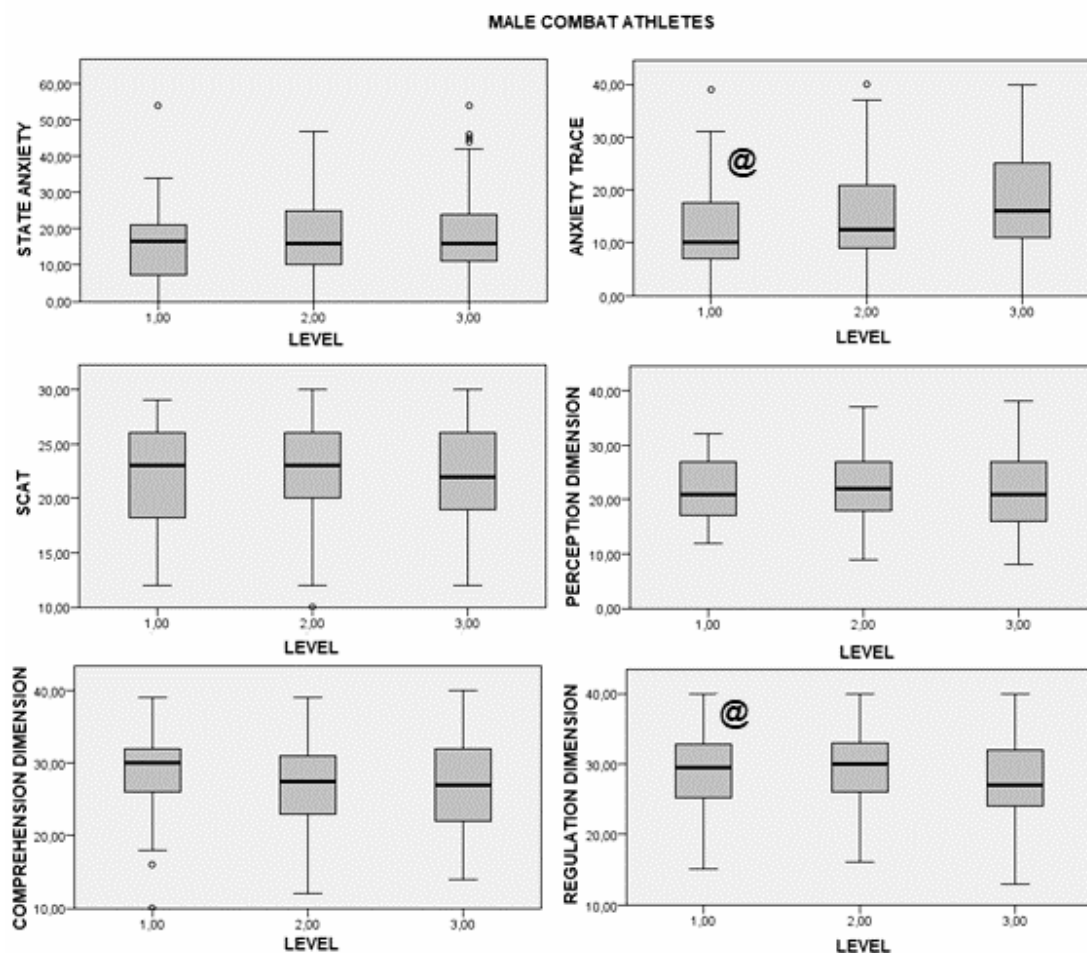


Figure 2. Box-plots of anxiety and emotional intelligence of male combat athletes by median and interquartile (1st quartile and 3rd quartile). Note: @significant difference of low-level male group, $p \leq 0.05$.

The regression analysis (Table 1) demonstrated two significant models for female combat athletes of low levels, with the first model with the regulation dimension as the main variable to explain low-level ($F(1,171)=9.199$, $p=0.003$, $R^2=0.046$, Std. Error of the estimate = 0.7) and the second model with two main variables being the regulation dimension and state anxiety ($F(1,171)=7.079$, $p \leq 0.001$, $R^2=0.066$, Std. Error of the estimate = 0.69). Meanwhile, male combat athletes only demonstrated one model that explained low-level associated with trace anxiety ($F(1,273)=6.193$, $p=0.013$; $R^2=0.019$, Std. Error of the estimate = 0.69).

Table 1. Regression analysis of anxiety and emotional intelligence, which contributes to the reduction of the competitive level in female and male combat athletes.

Model	Unstandardized Coef.		Stand. Coef. Beta	t	Sig.	95% C.I. for B (Lower; Upper)
	B	S. E				
Female						
1 (Constant)	2.844	.235		12.118	.0001	(2.381; 3.308)
Regulation dimension	-.024	.008	-.227	-3.033	.003	(-.040; -.009)
2 (Constant)	2.569	.264		9.720	.0001	(2.047; 3.091)
Regulation dimension	-.022	.008	-.204	-2.726	.007	(-.038; -.006)
State anxiety	.010	.004	.163	2.181	.031	(.001; .018)
Male						
1 (Constant)	2.150	.083		25.935	.0001	(1.987; 2.313)
Anxiety Trace	.011	.004	.149	2.489	.013	(.002; .020)

Discussion

Psychological factors can affect the performance of combat sport athletes (Brandt et al., 2018; Matsumoto, Takeuchi, Nakajima, & Iida, 2000). Therefore, this study compared the emotional intelligence and state-trait anxiety between levels in females and males; furthermore, we verified the prevalence of negative performance effects related with anxiety and emotional intelligence. The main results confirm the first hypothesis, indicating significant differences with gender particularities of competitive levels of state-trait anxiety, where low-level female presented higher state anxiety while low-level male athletes showed higher trait anxiety. For emotional intelligence we observed the prevalence of emotional dimensions between levels of each gender, where higher-level males showed higher emotional regulation property than lower-level, while higher-

level females demonstrated increased comprehensive and perception dimension of emotional intelligence. Lastly, our regression analysis showed the prevalence of high state anxiety and low regulation emotional dimension associated negatively with female performance, while trait anxiety is negatively related with male performance. In line with our results, Matsumoto et al. (2000) observed that elite and non-elite combat athletes show differences in anxiety and mood that result in a competitive advantage for elite. Recently, Tahtinen and Kristjansdottir (2018) observed gender differences regarding the anxiety and depression behaviors in athletes; however, we did not find investigations that performed these analyses in combat sport athletes. Understanding gender differences and the competitive level of athletes can help coaches and psychologists give specific attention to the athlete. In fact, female combat athletes, tend to seek help from a psychologist when manifesting symptoms of depression, while male fighters avoid help (Tahtinen & Kristjansdottir, 2018).

Emotional intelligence has been widely measured in several populations, with the TMMS-24 generally being the most applied instrument (Baudry, Grynberg, Dassonneville, Lelorain, & Christophe, 2018). However, to the best of our knowledge the TMMS-24 was used herein to measure level differences in emotional perception, comprehensive and regulation dimension set shifting ability in combat sports for the first time. Emotional intelligence is strongly linked with anxiety levels, where athletes with lower emotional intelligence tend to be more anxious (Castro-Sánchez, Zurita-Ortega, Chacón-Cuberos, López-Gutiérrez, & Zafra-Santos, 2018). Our data showed that a lower competition level and a higher total anxiety in male athletes was not associated with anxiety and emotional perception, while high-level female athletes demonstrated higher perception and comprehension dimensions. Although this study demonstrated that higher-level females were related to a generalized mechanism of emotion regulation. The control and regulation of emotional aspects are preponderant in combat sports performance, since lower emotional control are observed in individual than in team sports (Castro-Sánchez et al., 2018; Tahtinen & Kristjansdottir, 2018). Regarding emotional intelligence differences between level groups, our regression analysis demonstrated that state anxiety and low emotional regulation property negatively affects female performance, while trait anxiety negatively affects male performance. The TMMS-24 of the high-level group demonstrated ~30% less total anxiety in female athletes and ~10% more perception and comprehension in females, while ~10% more emotional regulation than the low-level group was shown in males. These results suggest that sports psychology interventions are different for each gender. Male need a chronic intervention, while female need acute interventions, reducing state anxiety and increasing emotional self-regulation. We believe that chronic and specific treatment should be developed to improve emotional control in combat athletes. Along these lines, Glass, Spears, Perskaudas, and Kaufman (2018) observed that six sessions of mental training (mindful) resulted in a lower anxiety and depression index in college athletes. Our findings demonstrated that emotional intelligence and expertise are associated in combat sports as anxiety reduction, especially cognitive anxiety, is associated with negative thoughts, poor concentration, fear and loss of confidence. Recently, a study showed a positive association between religious beliefs with competitive anxiety judo athletes (Moghadam, Tojari, & Khodayari, 2015). Although such settings have higher external validity, the variables of interest are more difficult to control and measure than in a laboratory environment. Our study ensured that participants were of the same age range; even so, it is important to point out a limitation for non-comparisons between combat outcomes during championships. Preceding research indicated that better performance during judo championship was associated with significantly lower levels of cognitive anxiety or higher levels of confidence (Filaire, Maso, Sagnol, Ferrand, & Lac, 2001).

Conclusions

Based on the aims of the present research, the applied methods, limitations and results, we can conclude that: a) we observed differences regarding emotional intelligence and state-trait anxiety between genders. Lower-level female fighters are more anxious than male, but in the domains of emotional intelligence, high-level females showed a higher ability in comprehension and perception; and b) more anxious females tended to present a lower control of emotions, which negatively affects competitive performance.

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