

Emotional intelligence contributes to increased ranking in combat athletes with anxiety disorders

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Abstract:

Considering the performance, this research associated emotional intelligence and anxiety between ranked and non-ranked combat sports fighters. Our research investigated 920 reports, of which 476 were excluded because they presented incomplete data; therefore, the last sample was collected of 444 data reports of ranked ($n=235$, age: 23.5 ± 7.5 yrs.-old, time of practice: 15 ± 7.3 yrs.; training/week: 8.6 ± 4.5 hours) and non-ranked ($n=189$, age: 26.3 ± 1.2 yrs.-old, time of practice: 1.3 ± 6.6 yrs.; training/week: 4.6 ± 2.5 hours) fighters from different combat modalities. The emotional Intelligence Scale and Trait Meta-Mood Scale were analyzed with Mann-Whitney, and logistic regression analysis showed the dependence amongst ranking and psychological factors, $p \leq .05$. The main outcomes presented that non-ranked vs. ranked athletes were different in cognitive anxiety [$62(35; 87)$ vs. $53.5(29.3; 75.8)$], phobic anxiety [$20(6; 41)$ vs. $14(4; 32)$], total anxiety [$122(69; 186.5)$ vs. $101.8(57; 164.8)$] and self-regulation of emotional intelligence [$27(22; 32)$ vs. $30(25; 33)$]. The performance ranking model positively impacted emotional self-regulation and weekly training volume (Exp B – 1.420). Thus, coaches and fighters could develop psychological strategies, reducing cognitive and phobic anxiety and increasing emotional intelligence to improve the specific position in competition's seeds and, consequently, rank.

Key words: Mood State, Emotion, Martial Arts, Sport Psychology, Behavioral Sciences.

Introduction

Studies defined emotional intelligence as a person's inherent capability to self-regulate one's feelings, to recognize the emotions of others, and to use emotions and feeling as an ideal of one's behaviors and sentiments (Salovey et al., 1995). Emotional intelligence in combats is the ability to perceive, comprehend, and manage emotions that have to do with the empathy of oneself and others and to face various anxieties more effectively (Brandt et al., 2021; Fernández et al., 2019). Lstressful combat situations, such as competitions levels (Fernández et al., 2020). Psychological factors are associated with the probability of success in combat sports (Brandt et al., 2021). For instance, increased vigor and self-motivation scores are related to positive outcomes (Brandt et al., 2021). At the same time, high anxiety, depression, and mental confusion scores are associated with lower results (Brandt et al., 2021; Fernández et al., 2020). Despite the essential past contributions about emotional intelligence and anxiety in combat, no study to date has related the ranking with emotional intelligence and anxiety scores in combat athletes. This data could be essential to developing skills to improve athletes' performance and well-being.

Anxiety disorders are characterized by emotional responses associated with fear, apprehension, worry, and tension to an actual or perceived risk (Fernández et al., 2020). Anxiety conditions impact the general population at an estimated rate of ~11% (Rice et al., 2019), with broadly similar rates suggested among combat sports athletes (Capranica et al., 2017; Interdonato, Miarka, & Franchini, 2013; Terry & Slade, 1995) defined as those competing at state, national and international ranking levels (Fernández et al., 2020). Anxiety adjusts attentional networks, resulting in compromised executive function, stimulus processing, and information selection — all important domains for decision-making and tactical choices of females (Miarka et al., 2016) and male elite combat athletes (Soto et al., 2020).

Historically, combat sport is an environment where practitioners encourage themselves to achieve long-term aims through hard training and mental skills (Lim & O'Sullivan, 2016; Slimani et al., 2016). Combat sports have created their ranking list to categorize athletes according to championship performance and, through this, qualify fighters to participate in high-level championships (Julio et al., 2013). Furthermore, over the years, high-level athletes have been required to manage combat behaviors with precision in a stressful situation of hard training and competitive pressure (Teques et al., 2018); trying to increase their performance and ranking position, managing technical-tactical aspects (Tabben et al., 2018) or physiological factors (Ghoul et al., 2017). This situation comprises understanding and regulating their emotions and coaches, opponents, referees, spectators, and parents (Teques et al., 2018). In the context of leisure-time combat sports, people require high motivation levels to continue participation. Most combat sports involve some level of interpersonal interaction. In each case, the behavior might be governed, at least in part, by emotional intelligence (Petrides & Furnham, 2003).

Emotional intelligence was described as a popular area of sports research during the 1990s and has since emerged as an essential construct, as the ability to perceive, monitor, employ, and manage emotions within oneself and in others (Laborde, Dosseville, & Allen, 2016). Psychological skills and emotional intelligence as a mediating and regulating factor and organizer can improve athletic performance (Kajbafnezhad et al., 2012). Perhaps, the attractiveness of emotional intelligence emerged from the consolidation that construct was more significant than intelligence quotient for performance (Moran & Weiss, 2006). Since then, emotions studies have distinguished a part of successful high sports performance and physical activity practices, mainly to regulate athletes' emotions (Brandt et al., 2021).

Despite such eminent worry, combat practices that originally got philosophical characteristics were hypothetical to assist practitioners and high-level competitors in the ability to regulate one's emotions, such as self-control inhibitory control, thoughts, and behavior in the face of mood states (Cassell et al., 2018), impulses and anxieties (Castro-Sánchez et al., 2018). However, no research has observed how emotional intelligence contributes to combat sports performance and could help athletes with anxiety disorders.

A critical understanding of emotional intelligence concepts' operationalization in combat sports environments is essential to practicing who points to control the anxiety, aiming the application of evidence-based interventions that improve performance. This self-control related to anxiety points has few investigations in combat practices and fighters who are competitors in different levels (Fernández et al., 2019; Fernández et al., 2020). In a randomized controlled trial, Jansen et al. (2017) verified the effects of karate and mindfulness-based stress reduction interventions on cognitive functioning and well-being. These authors demonstrated that both techniques could have minor training demand impacts concerning the assessed emotional and cognitive factors (Jansen et al., 2017).

The first hypothesis indicates that those ranked fighters, who perform combats and have better performance, could reveal higher emotional intelligence and lower anxiety scores than non-ranked fighters. The second hypothesis concerns anxiety difference; ranked fighters present lower anxiety levels than non-ranked fighters. Therefore, considering the performance, this research verified the impact of emotional intelligence and anxiety between ranked and non-ranked combat sports fighters.

Method

Study design

This descriptive and documental study verified the impact of anxiety factors and emotional intelligence according to competitive ranking in fighters. Present data was collected at the Francisco de Vitoria University and the Technical University of Madrid. To achieve our purpose, the following dependent variables we use: emotional intelligence and anxiety reports of national and international fighters, as independent: athlete ranking (ranked and non-ranked) reported at the project. The present documentary and descriptive study guaranteed confidentiality and anonymity by replacing the fighters' IDs. According to the WMA Declaration of Helsinki, there are no ethical problems in exploring documental data.

Sample

Our research investigated 920 reports, of which 476 were excluded because they presented incomplete data; therefore, the last sample was collected of 444 data reports of ranked ($n = 235$, age: 23.5 ± 7.5 yrs.-old, time of practice: 15 ± 7.3 yrs.; training/week: 8.6 ± 4.5 hours) and non-ranked ($n = 189$, age: 26.3 ± 1.2 yrs.-old, time of practice: 1.3 ± 6.6 yrs.; training/week: 4.6 ± 2.5 hours) fighters from different combats (Jiu-jitsu = 142, judo = 137, karate = 57, kendo = 63, taekwondo = 25, and wrestling = 20). The data had to be from national or international fighters competing at the national and international ranks and with more than 60 months of constant practice.

Measurements

The present study used emotional intelligence measurement data from the Trait Meta-Mood Scale (TMMS-24) (Salovey et al., 1995). This instrument was translated into Spanish (Fernández-Berrocal et al.,

2004). This inventory contains 24 divided into three dimensions: i) emotional comprehension, ii) Emotional self-perception, and iii) emotional regulation. The final scores of subscales have three levels, Figure 1.

Factors	Men	Women	Classification
Emotional perception	=21	=24	Inadequate
	22-32	25-35	Adequate
	=33	=36	Excellent
Emotional comprehension	=25	=23	Inadequate
	26-35	24-34	Adequate
	=36	=35	Excellent
Emotional regulation	=23	=23	Inadequate
	24-35	24-34	Adequate
	=36	=35	Excellent

Figure 1. TMMS-24 subscales and scores with respective classifications.

In the questionnaire, persons must rate each of their answers on a Likert scale with a range of 1-5 scores, indicating their level of agreement. The total score was obtained using the responses from each sub-scale – with a range of 8-40 scores. Concerning anxiety measurements, present research used the ISRA, an inventory of situations and anxiety responses evaluates motor, cognitive and physiological and a total. ISRA examines other four aspects: interpersonal anxiety (F-II), anxiety previously the assessment (FI), phobic anxiety (F-III) and once anxiety habitual and daily situations (FIV) (Fernández et al., 2019; Tobal and Cano-Vindel, 2002). The present research used the original survey and score of the ISRA, containing 224 questions in an open condition - each item was answered on a Likert scale with a range of 1-5 scores.

Statistics

Our study realized the inferential and descriptive analysis using SPSS (2.0 for Windows). Descriptive data demonstrated median – μ - (25th percent.; 75th percent) values. Furthermore, Mann-Whitney (U) compared ranked and non-ranked groups in anxiety and emotional intelligence frequencies. Hedges (g) verified the effect size of statistical analysis. Moreover, a logistic regression tested the effects of anxiety and emotional intelligence on the dichotomous group (ranked vs. non-ranked). All statistical analyses used a significance level of $p \leq .05$.

Results

Descriptive statistical analysis of years-old, years of training, hours per week, multidimensional anxiety, and emotional intelligence are shown in Table 1, separated by non-ranked and ranked athletes.

Table 1. Analysis of anxiety multidimensional factors and emotional intelligence by non-ranked and ranked athletes.

Variables	Non-ranked	Ranked	Statistical Inferences			
	μ (25 th ; 75 th)	μ (25 th ; 75 th)	U	Z _{score}	Sig.	g
Years-old	24.0 (17.0; 35.0)	21.0 (17.3; 28.0)	21,593.0	-1.840	.066	.09
Experience*	8.0 (6.0; 12.0)^a	14.0 (1.0; 2.0)	13,75.0	-7.721	$\leq .001$	.37
Hours/week	4.0 (3.0; 5.0)^a	8.0 (5.0; 1.0)	9,636.0	-1.851	$\leq .001$	.51
ISRA C	62.0 (35.0; 87.0)^a	53.5 (29.3; 75.8)	20,541.0	-2.625	.009	.12
ISRA M	28.0 (13.0; 53.0)	26.0 (1.0; 49.8)	22,301.0	-1.308	.191	.06
ISRA P	3.0 (13.5; 54.5)	26.0 (12.0; 48.0)	22,021.5	-1.517	.129	.07
ISRA T	122.0 (69.0; 186.5)^a	101.8 (57.0; 164.8)	21,266.5	-2.082	.037	.10
F-I	56.0 (27.0; 82.5)	49.5 (27.3; 76.0)	22,266.0	-1.334	.182	.06
F-II	12.0 (5.0; 25.0)	1.0 (5.0; 21.0)	21,652.0	-1.795	.073	.09
F-III	2.0 (6.0; 41.0) ^a	14.0 (4.0; 32.0)	20,765.5	-2.458	.014	.12
F-IV	8.0 (3.0; 17.0)	6.0 (2.0; 16.0)	22,42.0	-1.221	.222	.06
IE-1	22.0 (17.5; 27.0)	23.0 (19.0; 28.0)	21,812.0	-1.676	.094	.08
IE-2	27.0 (22.0; 32.0)	28.0 (23.0; 32.0)	22,186.5	-1.396	.163	.07
IE-3	27.0 (22.0; 32.0)^a	3.0 (25.0; 33.0)	19,413.5	-3.472	.001	.16

Note: ISRA C = Cognitive anxiety, ISRA M = Motor anxiety, ISRA P = Physiological anxiety, F-I = Anxiety before the evaluation, F-II = Interpersonal anxiety, F-III = Phobic anxiety, F-IV = Anxiety before daily and habitual situation; ISRA T = Total anxiety; IE-1 = Emotional self-perception, IE-2 = Emotional self-

*comprehension, and IE-3 = Emotional self-regulation. μ = median, 25th = 1st quartile, 75th = 3rd quartile. U = Mann-Whitney; Sig. = P-value; ES = effect size. $a p \leq .05$ versus Ranked. * = data showed in years.*

Ranked athletes showed a higher median of experience and hour of training and a lower median for cognitive, phobic, total anxiety, and emotional comprehension.

Table 2. Logistic regression between anxiety multidimensional factors and emotional intelligence, by ranking performance.

Variables included in the model	β	S.E.	Wald	DF	Sig.	Exp (B)	95% C.I. for EXP (B)	
							Lower	Upper
Years-old	-.094	.017	29.092	1	$\leq .001$	.910	.880	.942
Experience	.123	.021	34.268	1	$\leq .001$	1.131	1.085	1.179
Hours per day	.351	.047	55.072	1	$\leq .001$	1.420	1.294	1.558
ISRA C	.004	.016	.059	1	.808	1.004	.973	1.036
ISRA M	.011	.018	.384	1	.535	1.011	.976	1.047
ISRA P	.012	.018	.481	1	.488	1.012	.978	1.048
ISRA T	-.009	.015	.382	1	.537	.991	.962	1.020
F-I	.011	.010	1.183	1	.277	1.011	.992	1.030
F-II	-.012	.018	.411	1	.521	.988	.953	1.025
F-III	-.020	.010	3.725	1	.054	.980	.960	1.000
F-IV	.016	.017	.855	1	.355	1.016	.983	1.050
IE-1	-.001	.021	.003	1	.953	.999	.958	1.041
IE-2	-.023	.023	.989	1	.320	.977	.933	1.023
IE-3	.087	.024	13.697	1	$\leq .001$	1.091	1.042	1.142
Constant	-2.834	.948	8.945	1	.003	.059		

Note: ISRA C = Cognitive anxiety, ISRA M = Motor anxiety, ISRA P = Physiological anxiety, F-I = Anxiety before the evaluation, F-II = Interpersonal anxiety, F-III = Phobic anxiety, F-IV = Anxiety before daily and habitual situation; ISRA T = Total anxiety; IE-1 = Emotional self-perception, IE-2 = Emotional self-comprehension, and IE-3 = Emotional self-regulation. μ = median, 25th = 1st quartile, 75th = 3rd quartile. U = Mann-Whitney; Sig. = P-value; ES = effect size; β = regression coefficient; S.E. = standard error; DF = degrees of freedom; Sig = p value, EXP (B) = Exponentiation of B; C.I. = confidence interval.

Table 2 shows a logistic regression analysis to determine the interaction between emotional intelligence, multidimensional anxiety, and ranking performance. The regression analysis indicated that an R² of .491 indicated a moderate relationship with the model. The performance ranking probability was 78.7% (82.3% for ranked versus 73.5% for non-ranked). The performance ranking probability model showed a significant effect ($p < .001$) for hours per day of training, experience (years of combat practice), self-regulation dimension of emotional intelligence, and years old, negatively, with higher ODD for weekly training volume (Exp B = 1.420).

Discussion

A growing body of evidence indicates that emotional intelligence has an imperative role in high-level combat sports (Solanki & Lane, 2010). To the best of our author's knowledge, it is the first study that examined anxiety, experience, weekly training, and emotional intelligence with ranking performance. The main results verified significant differences between combat sports athletes non-ranked and ranked. Non-ranked fighters presented higher scores of cognitive and total anxieties than ranked participants. The regression analysis demonstrated that weekly training volume, experience, and emotional intelligence were the better predictors to increase the chance to be on an international ranking list.

In our regression, Wald's criterion and effect size showed that the self-regulation dimension of emotional intelligence, experience, and daily training volume seems to be the best variables for the ranking list athletes. The analysis of the ODDS obtained in the logistic model indicated that daily training volume, with 42% of better probability (calculated by ODDS) as the best approach to increase the athletes' chance to be included in the ranking list. TMMS-24 of the ranked group demonstrated ~20% less total anxiety and ~10% more regulation than the non-ranked group. This data showed that emotional intelligence and rank performance are associated in combat modalities, as anxiety reduction, mainly cognitive anxiety, is related to negative thoughts, fear, poor attention, and loss of self-confidence.

Present research demonstrated higher cognitive anxiety in non-ranked athletes than ranked; past investigation also demonstrated higher standards of cognitive anxiety in taekwondo, judo, and kendo (Fernández et al., 2019). Past research demonstrated that better outcomes in judo tournaments were associated with lower cognitive anxiety and higher self-confidence (Filaire et al., 2001). Authors also specified that significantly higher post-combat scores emerged for anger or hostility and depression or dejection, whereas the reverse was observed for vigor or mental activity (Chiodo et al., 2011). Fernández et al. (2020) demonstrated a larger effect size of anxiety and differences between genders. Women showed about 35% more anxiety than men in combat modalities and about 30% less cognitive anxiety, characterized by indecision, confusion, negative thoughts, poor attention,

irritability, and other harmful aspects. Furthermore, female fighters demonstrated about 60% more motor and physiological anxieties than male fighters (Fernández et al., 2020). Recently, an investigation presented a positive relationship between spiritual beliefs with competitive anxiety in judo (Moghadam et al., 2015).

The advantage of the present research with emotional intelligence and anxiety large data is that researchers could detect developments or changes in psychological aspects over a ranking increase. Our study ensured that fighters were of a similar age; even so, it is vital to point out a limitation for non-comparisons between the specific ranking list of each combat. While such settings have external validity, the interest factors are more interesting to control and measure than in a laboratory setting. We agree that a past investigation indicated that better performance during judo championships was associated with significantly lower levels of cognitive anxiety or higher self-confidence (Fernández et al., 2020; Matsumoto et al., 2000). Our results are in line and demonstrated a regression analysis model of anxiety significantly negatively associated with ranked performance.

Conclusion

Our study showed a challenge for health professionals who work with combat sports: the need to apply techniques to reduce anxiety and improve the emotional intelligence of non-ranked combat sports athletes. The present research revealed crucial and original differences between ranked and non-ranked athletes, which showed that non-ranked athletes could not maintain lower levels of cognitive anxiety. At the same time, the ranking list group demonstrated a self-regulation emotional dimension, with a significant increase in the performance probability. The logistic model has a practical application with about 80% of the power to rank performance probability prediction. Present research highlights cognitive and phobic anxiety, mainly phobic anxiety, which could reduce the probability (i.e., negative coefficient Beta) in the ranking list by about 10% (calculated by ODDS). Thus, coaches and athletes can develop psychological strategies to reduce anxiety levels and increase self-regulation, like progressive muscle relaxation, staying in the present moment, challenging self-talk, breathing strategies, and others for specific situations. These results could be associated with the extensive information of combat sports physiology to support emotional and cognitive preparation for tournaments, considering psychological discriminations of ranked and non-ranked athletes. Future studies should develop probability models considering the motivation factors contributing to better performance.

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