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науке и технолошког развоја

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Stanimir Stojiljković, Radivoj Mandić and Nikola Majstorović

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**МЕЂУНАРОДНА НАУЧНА КОНФЕРENCIЈА
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PRE-COMPETITIVE ANXIETY OF SENIOR KARATE ATHLETES

Antonija Rupić¹; Hrvoje Karninčić¹; Gordan Drašinac²

¹ University of Split, Faculty of Kinesiology, Croatia

² University of Split, Department of Professional Studies, Croatia

Introduction

Karate is an ancient Japanese martial art based on punches and kicks. In a sports fight, opponents try to collect as many points as possible with blows in order to beat the opponent. In karate, punches must be controlled to avoid injury. Based on all of the above, karate belongs to the contact martial arts, and like other martial arts, has a high emotional component because the pressure of competition well as that of physical danger occurs.

Sports psychology is an applied branch of psychology in which psychological principles and techniques are applied within the framework of sports and exercise (R. H. Cox, Peranović, & Škevin, 2005). Psychological skills imply the ability to approach a situation of achievement with confidence and knowledge that the mind and body are ready for optimal performance. Some of them are innate traits of an athlete that enable and improve his likelihood of success in sports. Psychological skills that can greatly positively affect sports performance are precisely those that distinguish more successful athletes from their less successful ones (Galić, Protić, Žvan, & Kondrič, 2017).

Anxiety is defined as a complex unpleasant feeling of anxiety, fear, tension and insecurity accompanied by physiological reactions of the autonomic nervous system (Ksenija Bosnar & Balent, 2009). Any combination of the following five factors is responsible for increasing anxiety: threat to the person's ego, threat of injury, ambiguity, disruption of routine, and threat of negative social evaluation (R. H. Cox et al., 2005). Anxiety is divided into cognitive and somatic. The cognitive state of anxiety is a mental component of the state of anxiety caused by something such as fear of negative social evaluation, fear of failure and loss of self-esteem, and the somatic state of anxiety is a physical component of anxiety and reflects the perception of such physiological reactions such as rapid heartbeat, rapid breathing, muscle tension (R. H. Cox et al., 2005). Self-confidence is an assessment of our own abilities that we will be successful in performing various tasks (Ksenija Bosnar & Balent, 2009; Petz, 2020). Pre-competitive anxiety is the anxiety caused by a competition that is about to begin. Psychological pressures can trigger anxiety: one's own expectations, the expectations of coaches, family or the audience, fear of public appearances, fear of physical danger in contact and especially martial arts. Anxiety can significantly affect outcome (Kleine, 1990) and self-confidence is cited by many authors as a key characteristic for outcome (Bull, Shambrook, James, & Brooks, 2005; Thomas, Hanton, & Jones, 2002). A coach is a person who, in addition to physical preparation, also needs to mentally prepare his athletes: in setting goals, motivation, raising self-confidence, building a winning mentality (Ward, Sandstedt, Cox, & Beck, 2005). In order to be able to mentally prepare athletes, the coach should have information about the state of pre-competitive anxiety in that sport, in his team and ultimately with each competitor. Based on all the above, the aim of this paper is to determine the state of pre-competitive anxiety in Croatian karate players of senior age.

Methods

The sample consists of 64 senior karate fighter (age 20.9 ± 2.98), who participated in the national karate championship 2020. The sample includes 33 women and 31 men. The sample was divided into 10 subsamples: by age, gender, experience, body weight, and by competition success. A detailed description of the sample can be found in Table 2.

The sample of variables consisted of 3 variables obtained by a questionnaire for assessing precompetitive anxiety CSAI-2 (Martens, Burton, Vealey, Bump, & Smith, 1990). The questionnaire is also reliable on a sample of martial arts athletes (Hashim & Baghepour, 2016). In 1990, Martens et al. Created the Competitive State Anxiety Inventory (CSAI-2), based on a multidimensional theory of anxiety. CSAI-2 is a specific, multidimensional anxiety state questionnaire that measures somatic and cognitive anxiety states specific to sports as well as self-confidence. Cognitive anxiety is a mental component of anxiety caused by something such as fear of negative social evaluation, fear of failure and loss of self-esteem, and somatic anxiety is a physical component of anxiety and reflects the perception of such physiological reactions as rapid heartbeat, muscle tension (AE Cox, Ullrich-French, Madonia, & Witty, 2011).

Data were statistically processed in the program Statistica 13 (StatsoftInc.). Descriptive statistics were calculated for all variables: arithmetic mean and standard deviation, as well as minimum and maximum result. The normality of data distribution was tested by the Kolmogorov-Smirnov test. For the purpose of checking the reliability of the questionnaire variables, cronbach's alpha and the average interparticle correlation were calculated. Differences between groups were tested by T-test.

All subjects completed the CSAI-2 questionnaire immediately prior to weighing. The answers to the questions are on the Likert scale from 1 - 5 (not at all - very much), filling in the questionnaire was voluntary and anonymous and the respondents were asked to answer thoughtfully and honestly.

Results

Table 1. Results of the Kolmogorov-Smirnov test for estimating the normality of data distribution for all three variables by all subsamples.

Variables	N	max D	K-S	N	max D	K-S	
		Medal			Without a medal		
Cognitive anxiety	33	0,14	p > .20	31	0,11	p > .20	
Somatic anxiety	33	0,20	p < ,15	31	0,10	p > .20	
Self-confidence	33	0,08	p > .20	31	0,10	p > .20	
		Female			Male		
Cognitive anxiety	33	0,14	p > .20	31	0,14	p > .20	
Somatic anxiety	33	0,12	p > .20	31	0,16	p > .20	
Self-confidence	33	0,13	p > .20	31	0,07	p > .20	
		Senior			Junior		
Cognitive anxiety	25	0,15	p > .20	39	0,12	p > .20	
Somatic anxiety	25	0,16	p > .20	39	0,20	p < ,10	
Self-confidence	25	0,12	p > .20	39	0,08	p > .20	
		Experienced			Less experienced		
Cognitive anxiety	38	0,09	p > .20	26	0,12	p > .20	
Somatic anxiety	38	0,19	p < ,15	26	0,13	p > .20	
Self-confidence	38	0,10	p > .20	26	0,14	p > .20	
		Light			Weighty		
Cognitive anxiety	29	0,09	p > .20	35	0,15	p > .20	
Somatic anxiety	29	0,11	p > .20	35	0,16	p > .20	
Self-confidence	29	0,13	p > .20	35	0,08	p > .20	

From Table 1 we can see that the Kolmogorov-Smirnov test did not determine the deviation from the normal data distribution in any of the subsamples.

Questionnaire reliability parameters: all questionnaire variables are reliable on this sample:

1. cognitive anxiety - cronbach's alpha 0.88, average Inter-Item Correlation 0.47

2. somatic anxiety - cronbach's alpha 0.79, average Inter-Item Correlation 0.29

3. self-confidence - cronbach's alpha 0.88, average Inter-Item Correlation 0.50

Table 2 descriptive statistical parameters describing the sample (arithmetic mean and standard deviation AS ± SD, minimum and maximum result min / max) for all analyzed groups, with differences between groups.

Variables	Medal (n=33)		Without a medal(n=31)	
	AS±SD	min/max	AS±SD	min/max
weight	67,45±11,78	50,00/93,00	70,84±15,79	49,00/125,00
height	175,76±8,93	160,00/194,00	176,52±9,87	159,00/200,00
BMI	21,69±2,29	17,44/26,04	22,57±3,48	17,17/33,91
age	21,36±3,18	17,00/29,00	20,48±2,72	17,00/27,00
experience	13,85±3,43	7,00/22,00	13,13±2,86	7,00/20,00
placement	2,24±0,83*	1,00/3,00	6,10±1,19*	5,00/8,00
	Experienced (n=38)		Less experienced (n=26)	
	AS±SD	min/max	AS±SD	min/max
weight	71,63±15,31	52,00/125,00	65,38±10,63	49,00/93,00
height	177,63±9,03	160,00/200,00	173,92±9,50	159,00/194,00
BMI	22,53±3,31	17,17/33,91	21,52±2,20	17,44/26,17
age	21,89±2,75	18,00/29,00	19,54±2,77	17,00/28,00
experience	15,37±2,61*	11,00/22,00	10,77±1,42*	7,00/12,00
placement	4,03±2,31	1,00/8,00	4,23±2,05	2,00/8,00
	Junior (n=39)		Senior (n=25)	
	AS±SD	min/max	AS±SD	min/max
weight	62,72±8,97	49,00/84,00	73,18±14,96	53,00/125,00
height	172,28±8,53	159,00/194,00	178,59±9,08	160,00/200,00
BMI	21,05±1,81	17,44/24,78	22,80±3,32	17,17/33,91
age	18,16±0,75*	17,00/19,00	22,72±2,45*	20,00/29,00
experience	11,52±1,45	7,00/13,00	14,77±3,32	7,00/22,00
placement	4,32±2,14	1,00/8,00	3,97±2,24	1,00/8,00
	Light (n=29)		Weighty (n=35)	
	AS±SD	min/max	AS±SD	min/max
weight	59,38±5,48*	49,00/67,00	77,14±13,56*	63,00/125,00
height	171,31±6,72	159,00/182,00	180,11±9,38	160,00/200,00
BMI	20,23±1,39	17,17/23,34	23,69±2,96	19,75/33,91
age	20,17±2,67	17,00/29,00	21,57±3,10	17,00/28,00
experience	13,10±2,92	7,00/22,00	13,83±3,66	7,00/22,00
placement	3,93±2,22	1,00/8,00	4,26±2,19	1,00/8,00
	Male (n=31)		Female (n=33)	
	AS±SD	min/max	AS±SD	min/max
weight	77,06±14,85	57,00/125,00	61,61±7,22	49,00/78,00
height	182,03±7,96	170,00/200,00	170,58±6,81	159,00/183,00
BMI	23,12±3,27	19,26/33,91	21,18±2,25	17,17/26,17
age	21,35±3,09	17,00/28,00	20,55±2,85	17,00/29,00
experience	13,48±3,60	7,00/22,00	13,52±2,75	10,00/22,00
placement	4,06±2,14	1,00/8,00	4,15±2,27	1,00/8,00

Legend: statistically significant difference between groups older-younger in age $t = -9.02$, $p < 0.001$, experienced-less experienced in experience = 8.17, $p < 0.001$, lighter weight in weight $t = -6.61$, $pp < 0.001$ and medal – without a medal by placement $t = -15.08$, $p = 0.04$

From Table 2 we see that there is a statistically significant difference between the subsamples in the variable by which they are divided.

Table 3 group differences in cognitive, somatic anxiety and self-confidence (t-test)

	Cognitive AS±SD	Somatic AS±SD	Self-confidence AS±SD
All groups (n=64)	22.62±6.62	19.86±5.25	30.02±6.06
Senior (n=39)	21.67±7.24	20.46±6.04	30.69±6.36
Junior (n=25)	24.12±5.33	18.92±3.59	28.96±5.53
Male (n=31)	20.09±5.91*	18.39±4.66*	32.45±5.64*
Female (n=33)	25.00±6.46*	21.24±5.45*	27.72±5.61*
Light (n=29)	23.03±6.95	19.62±4.86	29.07±6.09
Weight (n=35)	22.29±6.43	20.06±5.61	30.80±6.01
Less experienced (n=26)	22.85±6.47	18.38±4.78	30.73±7.00
Experienced (n=38)	22.47±6.82	20.87±5.37	29.53±5.38
Medal (n=33)	20.33±6.59**	19.58±4.92	31.97±6.70**
Without a medal (n=31)	25.06±5.83**	20.16±5.63	27.94±4.55**

Legend: statistically significant difference between men and women: cognitive $t = 3.16$, $p < 0.01$; somatic $t = 2.24$, $p = 0.03$; self-confidence $t = -3.36$, $p < 0.01$. ** Statistically significant difference between medal winners and those who did not win a medal: cognitive $t = -3.03$, $p < 0.01$; self-confidence $t = 2.80$, $p = 0.01$.

From Table two we see that there is a statistically significant difference in cognitive anxiety and self-confidence between men and women in all three analyzed variables, between those who won a medal and those who did not. There are no statistically significant differences between groups different in age, experience, and body weight.

Discussion

In this research, no differences were found between competitors different in age, experience or between karate players different in weight categories. Research in martial arts reports that a smaller number of competitors at the extremes of the categories, for example in the lightest and heaviest weight category, a smaller number of fighters come out (Baić, Karninčić, & Šprem, 2014). This means that the winner in these categories will have fewer fights until the finals. Theoretically, they should have less pressure than a middleweight fighter who has a significant higher number of fights in one competition. As in this research, the fighters were divided into two weight categories, we can assume that there were no significant differences in the researched psychological parameters due to the fact that in both groups there are extreme karate fighters. In future research, groups should be divided into three groups, light, medium and heavy, in order to determine whether a smaller number of matches also have a lower psychological pressure. The older group is on average slightly older than 4 years (18.16 ± 0.75 younger and 22.72 ± 2.45 older).

Even earlier research in martial arts did not report age as an important factor but experience (Slaćanac, Karninčić, & Baić, 2017). Theoretically, someone can go to the first competition in old age and at the same time belong to the group of older and inexperienced. The non-existence of differences in anxiety between younger and older can be explained by the fact that all fighters have over 10 years of experience. If we analyze the groups different according to experience, we see that the less experienced train 10.77 ± 1.42 and the more experienced 15.37 ± 2.61 . For less experienced fighters in this competition, we can say that they are inexperienced with almost 10 years of training experience. Differences between them and more experienced fighters in psychological characteristics have been confirmed in previous research (Slaćanac et al., 2017). However, the difference in experience between these groups is much larger and homogeneity is lower.

We can conclude that there are no differences in the analyzed psychological variables between groups different in age or experience due to the high homogeneity of the sample to the question of experience.

Men compared to female karate fighter before the competition were significantly lower in somatic and cognitive anxiety and significantly higher in self-confidence. In this case, both groups have the same experience and are similar ages, so we can assume that it is because of gender differences. A significant difference between the sexes in somatic anxiety and self-confidence was confirmed in a sample of athletes in individual sports (Beno, 2019).

Men are more prone to martial arts and gender stereotypes suggest that martial arts are not for women (Crnjac, Brekalo, & Šilić, 2013). Women have a significantly less positive attitude towards martial arts (K Bosnar, Sertić, & Prot, 1999), women appeared in some martial arts quite late (Karninčić, Penjak, & Čavala, 2016). The gender differences expressed in sports are even greater when it comes to martial arts and we can assume that the differences in the measured psychological characteristics were due to gender stereotypes.

Successful fighters are less anxious with more confidence. Similar results were obtained in a sample of basketball and volleyball players where success was associated with lower somatic anxiety and higher self-esteem (Kais & Raudsepp, 2005).

Malaysian authors found significantly better moods in the competition conditions in a sample of 109 karate fighter (Wong, Thung, Pieter, 2006). Successful fighters are usually experienced and they know their opponents well in the competitions and can predict the outcomes of the fights well because they have met each opponent on several occasions. We can assume that this is the main reason for low anxiety and high levels of self-confidence. Along with this rule, it is important to note that gender roles play an important role in pre-competitive anxiety and self-confidence.

Conclusion

A better understanding of the condition of the karate fighter before the competition is very important for the coach. Special psychological preparation before the fight is necessary in some cases. Special psychological preparation before the fight is necessary in some cases. In order for a coach to know which fighters need special mental preparation, he/she should better know the psychological structure in his/her sport. This research showed that in senior karate in Croatia, women and less successful fighters cope worse with the pressures before the fight. Interestingly, experience has not proven to be an important factor in terms of self-confidence and anxiety although other research in martial arts has confirmed this. We can assume that the reason is that both more and less experienced fighters had over 10 years of experience. Future research should divide respondents into several groups in terms of weight categories and experiences in order to get a better picture of the state of pre-competitive anxiety in karate.

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