

## Features of the relationship between the pre-start state and stress resistance in athletes of different qualifications

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### Abstract:

**Features of the relationship between pre-start state and stress resistance in athletes of different qualifications Purpose:** investigate the peculiarities of the relationship between the pre-start state and stress resistance in athletes of different qualifications engaged in fire and applied sports. **Materials and methods:** The study involved athletes engaged in fire and applied sports, with different qualifications, the number of 65 people. Appropriate psychodiagnostic techniques were used. The calculation of data was carried out by means of t-Student criterion, Spearman correlation coefficient  $r_s$ . **Results:** The pre-competitive state of sportsmen with high qualification has a direct correlation with such parameters of stress resistance and overcoming behavior as: "Neuropsychic stability" ( $p \leq 0.05$  by Spearman's  $r_s$  criterion), "Reaction to circumstances that a person cannot influence" ( $p \leq 0.05$ ), "Constructive ways of overcoming stress" ( $p \leq 0.05$ ), "Assertive actions" ( $p \leq 0.01$ ), "Entering into social contact" ( $p \leq 0.05$ ,  $p \leq 0.01$ ), "Search for social support" ( $p \leq 0.05$ ). An inverse correlation was also found with: "Propensity to complicate everything" ( $p \leq 0.05$ ), "Propensity to psychosomatic diseases" ( $p \leq 0.05$ ). The pre-competitive psychological state of sportsmen with low qualification has a direct correlation with such parameters of stress resistance and coping behavior as: "Reaction to circumstances that a person can not influence" ( $p \leq 0.05$ ), "Entering into social contact" ( $p \leq 0.05$ ), "The tendency to complicate everything" ( $p \leq 0.05$ ), "Propensity to psychosomatic diseases" ( $p \leq 0.05$ ), "Destructive ways of coping with stress" ( $p \leq 0.05$ ), "Cautious actions" ( $p \leq 0.05$ ), "Avoidance" ( $p \leq 0.05$ ), "Indirect actions" ( $p \leq 0.05$ ). An inverse correlation was also found with: "Neuropsychological stability" ( $p \leq 0.05$ ). **Conclusions:** The study of the peculiarities of the relationship between the pre-start state and stress resistance in sportsmen of different qualifications engaged in fire and applied sports showed that there is a correlation between the phenomena under analysis. The pre-competitive state of highly qualified athletes positively correlates with neuropsychic stability, stress resistance, and productive coping. The pre-starting state of athletes with low qualification correlates with the tendency to complicate everything, psychosomatic symptoms, destructive ways of coping with stress, aggressive behavior and the desire to avoid frustrating situations.

**Keywords:** sports activity, psychological state, stress, stress resistance, coping strategies.

### Introduction

Considerable attention is being paid worldwide to the psychological health of athletes in high-performance sports. The International Society of Sport Psychology seeks to expand this discourse and organize a discussion on the health and safety of sport activities (Afanasieva, Ilyina & Svitlichna, 2021; Schinke, Giffin, Cosh, Douglas, Rhind, & Harwood, 2021).

One of the important debatable issues is to increase the efficiency of sports activities without compromising the physical and psychological health of athletes. To solve this problem, it is relevant to consider the problem of pre-start state, reducing stress during the competition period, increasing stress resistance and performance of athletes.

The psychology of sport considers the pre-start state as an indicator of the athlete's readiness for the competition. The problem attracts the attention of researchers due to its great practical significance. Varieties of pre-start states depend on the level of training, qualification of the athlete, his experience in competitions, etc. Researchers note that skilled athletes have even more pronounced vegetative shifts, but they are combined with the balance of nervous processes, which allows you to quickly and effectively overcome stress, use self-regulation skills and maintain optimal performance (Halo, Khvalebo, & Turevskiy, 2015).

Numerous studies of domestic and foreign scientists have allowed to differentiate the pre-start state and to establish that it can manifest itself in such basic forms as: peculiarities of the processes in the cerebral cortex, vegetative reactions, psychological symptoms, on the basis of which the manifestation of each of the forms was called «State of combat readiness», «starting fever» and «starting apathy» (Kernas, 2014). Each of these pre-start states in a certain way affects the activity of the athlete during the competition, the achievement of sports results.

The pre-starting state is an acute experience of the sportsman's attitude to possible results of activity at a certain moment of time. In many cases, the athlete is in a stressful state, which is considered as a holistic psychophysiological state of mobilization of the functional reserves of the body to overcome extraordinary influences. Fatigue, mood disorders, lack of performance and gastrointestinal disorders are common among athletes during training and competition. Psychosocial and physical demands during intense exercise can initiate a stress response (Clark, & Mach, 2022).

A qualitative analysis of athletes' responses to the main sports stressors showed that the most frequently cited stressors were (a) injuries, (b) big moments/big games, (c) fitness/preparation, and (d) game time/start (Madrigal, & Robbins, 2020).

Researchers have also shown that stress reactivity involves interindividual differences in the ability to respond to a stressor. People physiologically react differently to sport-specific stressors depending on their level of sensation seeking (Frenkel, Heck, & Plessner, 2018).

Research results also indicate that pre-competition athletes face more performance-related stressors than those emanating from the organization, these observations emphasize that all the demands faced by athletes should be taken into account when preparing and implementing measures to cope with competition stress (Mellalieu, Neil, Hanton, & Fletcher, 2009).

Biochemical studies proved the dependence between resistance to sports loads, adaptation to them and hormonal parameters in blood serum. Various complexes of special pre-start exercises and mobilization massages have been developed, which are aimed at changing the biochemical indicators of blood in athletes. It was found that, depending on the various performed complexes, the results showed different levels and directions of changes in the level of cortisol and testosterone, the T/C index in the blood serum of athletes (Vynogradov, Osypenko, Ilyin, Vynogradova, & Rusanova 2021).

Studies of athletes engaged in extreme sports: skydiving, hang gliding, paragliding, microlighting, rock climbing have shown that they have a significantly higher level of stress. It has been proven that the structure of stress resistance of such athletes is balanced and determined by systemic willpower qualities: strength and stability; self-control of behavior and self-esteem; features of the nervous system, which are characterized by susceptibility to external events (Tukaiev et al., 2020).

Several studies have also been conducted in the field of mass sports, which are aimed at strengthening health, self-esteem and preventing bad habits. But high training loads and competition demands can cause changes in stress levels associated with sudden mood swings. Studies of certain parameters in athletes who participated in competitions and those who did not demonstrate that there is a difference between the pre-competitive and competitive periods for a group of participants according to stress variables, an intergroup difference during the competitive period in the level of depression; changes in anger levels were observed during the pre-competition and competition periods for the competition group, as well as during the recovery period, in addition, cheerfulness was significantly reduced in the competition group, confusion and global stress were also noted (D'Alpino et al., 2022).

Researchers studied the influence of physical exercise complexes and mobilization sports massage on the condition of athletes during pre-start training and determined their positive impact (Vynogradov et al., 2021).

On the basis of the study, it was established that both men and women who play team sports have a positive relationship with problem solving and social contact seeking psychological masculinity. The indicator of femininity was found to be associated with an avoidance-oriented style, which is characteristic of people who, in stressful situations, tend to avoid thoughts and feelings about a difficult situation (Bojkowski, Walczak, & Tomczak, 2020).

In this way, the analysis of modern researches of a problem of a pre-start state, stress and stress resistance showed the absence of researches of interrelation between these phenomena in sportsmen of different qualification. The urgency of such researches lies in that the results will allow to develop practical recommendations on optimization of pre-competitive states of sportsmen and increase of efficiency of sports activity for different categories of persons.

**Hypothesis of the study** was the assumption that there is a certain correlation between the pre-start state and stress resistance, the features of which depend on the qualification of the athlete, namely: the higher the qualification, the higher the level of stress resistance of the athlete and the more optimal is his pre-start state.

*The purpose is to investigate the peculiarities of the relationship between the pre-start state and stress resistance in athletes of different qualifications engaged in fire and applied sports.*

## Material and methods

*Participants.* The research involved athletes engaged in fire and applied sports aged 17-30 years (national teams of the National University of Civil Defence of Ukraine (Kharkiv), the Main Territorial Directorate of the SES in Kharkiv region), who have the sports qualification "master of sports of international class", "master of sports of Ukraine", "candidate for master of sports" and I and II adult categories - 65 people. All subjects were divided into 2 groups depending on their sports qualification. The 1st group included 30 people who have more than 3 years of experience in competitions at international and national levels, and a sports

category in fire and applied sports: master of sports of international class, master of sports of Ukraine and candidate for master of sports. The 2nd group included 35 people with less than 3 years of experience in national competitions and sports category: I and II adult. Participation in the study was voluntary, with official consent.

*Procedure / Test protocol / Skill test trial / Measure / Instruments.* The research was conducted in 2021 and included three stages: at the first stage, psychodiagnostic information was collected on the attitude of respondents to a particular competition, the level of competitive personal anxiety, neuropsychological stability, stress resistance and coping strategies, which was carried out immediately before a particular competition; at the second stage, a comparative analysis of indicators for all methods between groups of respondents was carried out; at the third stage, a correlation analysis of indicators of pre-competitive state.

To achieve the purpose of the study, the following methods were used:

1. Theoretical: analysis of scientific literature, generalization of the information obtained, system analysis and interpretation of data.

2. Empirical methods: the method "Attitude to the future competition" by Y. L. Khanin is used to identify the peculiarities of the athlete's perception of the pre-competition situation and to predict his state before the responsible start. It consists of 28 questions (7 judgments for each component), to which the athlete must answer "yes" or "no". Usually the survey is conducted individually on a special form for recording answers. As a result, 4 indicators are obtained: "An indicator of self-confidence", "An indicator of perception and assessment of the capabilities of rivals", "An indicator of the desire to participate and the importance of the competition", "An indicator of the athlete's mirror self-esteem (that is, the athlete's subjective perception of the assessment of his capabilities by other people)". The maximum score for each indicator is 7, the minimum - 0 (Malkin, & Rogaleva, 2013).

The scale "Self-esteem of competitive personal anxiety" by Malkin V. R., Rogalova L. M. is used to study competitive personal anxiety. It provides an opportunity to get an idea of the possible reaction of the athlete to the situation of the competition, the general features of the emotional reaction and the tendency to it, but does not provide data on the level of anxiety at each competition. At the same time, the information obtained during the survey allows to predict the possibility of such conditions and take measures to prevent them. It consists of 15 statements that the athlete must evaluate according to the criteria: "Almost never" (1 point), "Sometimes" (2 points), "Often" (3 points). The scores are summed up. Low anxiety level is 10-15 points, medium - 16-23, high - 24-30 (Malkin, & Rogaleva, 2013).

The method "Prognosis" by Baranov Y. O. is designed to determine the level of neuropsychological stability (NPS), the risk of maladaptation in stress. It allows to identify individual signs of personality disorders, as well as to assess the likelihood of their development, manifestations in human behavior and activity. It consists of 84 questions to which the athlete must answer "yes" or "no". The analysis of answers allows to clarify the sincerity of answers, some biographical data, peculiarities of behavior and states of mental activity in different situations. Indicators by the method are obtained by summing up the positive and negative answers that coincide with the "key". Then the "raw" scores are converted into a 10-point score. High level of NPS is 10-9 points, average - 8-6, satisfactory - 5-3, unsatisfactory - 2-1 (Prokhorova, 2004).

"Test of self-assessment of stress resistance" by Cowan S. and Willianson G. is used to determine the level of stress resistance of the individual. It consists of 10 questions, each of which offers 5 answer options ("Never" - 0 points, "Almost never" - 1, "Sometimes" - 2, "Quite often" - 3, "Very often" - 4), from which the respondent must choose the one that best suits his individual characteristics. The results are processed by calculating the sum of points received by the examinee on all questions of the test. Stress resistance is determined in accordance with the "key" depending on the age of the respondent (Cohen, & Willianson, 2005).

Questionnaire "Strategies for coping with stressful situations (SACS)" S. Hobfall in the adaptation of Vodopianova N., Starchenkova O. allows to explore the strategies and models of coping behavior (stress coping behavior) as types of human personality reactions to overcome stressful situations. The respondent is offered 54 statements about his behavior in tense (stressful) situations. He/she has to evaluate what he/she usually does in such cases. To do this, he/she should put on the answer sheet the number from 1 to 5 that best describes his/her typical actions. If the statement fully describes his/her actions or experiences, then a 5 should be placed next to the question number (the answer is "yes, quite correct"). If the statement does not fit at all, then you need to put 1 (the answer is "no, it is not true at all").

According to the "key", the sum of points for each line is calculated, which reflects the degree of preference of a particular model of behavior in a difficult (stressful) situation. As a result of the survey, you can get indicators for nine models of behavior (coping strategies): 1. assertive actions. 2. entering into social contact. 3. Search for social support. 4. Cautious actions. 5. Impulsive actions. 6. Avoidance. 7. Manipulative (indirect) actions. 8. Antisocial actions. 9. Aggressive actions. Based on Hobfall's multi-axial model of stress coping behavior, the questionnaire allows to determine the dominant strategy of behavior, its direction (constructive or destructive) and individual activity in stressful situations (Vodopyanova, & Starchenkova, 2003).

3. Methods of mathematical statistics: 1). To check the sample for normality of data distribution - Kolmogorov-Smirnov test. Checking the sample for normality of distribution showed that all levels of significance exceed the threshold of 5%, so we have reason to accept the hypothesis of normal distribution of the studied sample. The results are presented in Table 1.

**Table 1. Indicators of normality of data distribution in the sample**

N	30	35
Average	3,90	4,72
Dispersions	2,09	1,98
Temp	1,77	
< 0,05	1,96	

2). To compare the indicators obtained using psychodiagnostic methods, the Student's t-test for independent samples was chosen. The legitimacy of this criterion is confirmed by the results of calculations according to the Kolmogorov-Smirnov criterion (see Table 1). 3. Spearman's correlation coefficient  $r_s$  was used to find the relationship between the indicators.

### Results

The peculiarities of the perception of the pre-competition situation and the state of athletes of different qualifications before the start were studied using the method "Attitude to the upcoming competition" by Khanin Y.L., the results are shown in Table 2.

**Table 2. Indicators of attitude to the competition in athletes of different qualifications (in points)**

Indications	1 group n=30	2 group n=35	t	p-level
Confidence in yourself	1,8±0,7	2,6±1,0	1,2	>0,05
Perception and assessment of opponents capabilities	3,1±1,1	4,9±1,7	2,5	≤0,05
Desire to participate and the importance of the competition	4,5±1,6	5,3±1,9	1,1	>0,05
Mirror self-esteem of the athlete	1,7±0,6	3,2±1,1	2,1	≤0,05

Significant differences were obtained in the indicators of respondents on the scales "Perception and assessment of the capabilities of rivals" ( $p \leq 0.05$  by Student's criterion), "Mirror self-esteem of the athlete" ( $p \leq 0.05$ ) - on both scales the indicators are higher in the subjects of the 2nd group, that is, in athletes with lower qualifications. This indicates that this group of respondents evaluate rivals as persons with high capabilities and readiness for competition, feel anxious about their ability to achieve higher results. At the same time, they estimate their own capabilities lower than highly qualified athletes.

It should be noted that athletes of both groups before the competition feel confident in their own abilities to succeed, the reality of performing competitive tasks, have a desire to participate in the competition, which has personal significance for them.

For the research of competitive personal anxiety the scale "Self-esteem of competitive personal anxiety" by Malkin V.R., Rogalova L.M. was used, the results of testing are shown in table 3.

**Table 3. Indicators of competitive personal anxiety in athletes of different qualifications (in points)**

Scale	1 group n=30	2 group n=35	t	p-level
Competitive personality anxiety	11,3±3,9	17,5±5,8	2,3	≤0,05

Significant differences between the indicators of respondents on the scale "Self-assessment of competitive personal anxiety" ( $p \leq 0.05$  according to Student's criterion) were obtained, the indicators are higher in the subjects of the 2nd group, that is, in sportsmen with lower qualifications. The data indicate that sportsmen with lower qualification before the competition feel anxiety, excitement, nervous to a greater extent than sportsmen with high qualification.

To study the level of neuropsychic stability the method "Prognosis" by Baranov Y. O. was used, the results are presented in table 4.

**Table 4. Indicators of the level of neuropsychic stability of athletes with different qualifications (in points)**

Scale	1 group n=30	2 group n=35	t	p-level
Neuro-psychological stability	4,5±1,6	6,3±2,2	2,2	≤0,05

The results indicate that with the accumulation of experience in professional sports activities, the neuropsychological stability of the individual significantly increases. Significant differences in the indicators of athletes with different qualifications were obtained ( $p \leq 0.05$  by Student's criterion). Neuropsychic stability is an integral set of innate (biologically determined) and acquired personal qualities, mobilization resources and reserve psychophysiological capabilities of the organism, which ensure optimal functioning of the individual in adverse conditions of the professional environment.

The level of individual danger, the degree of severity of the task and the time allotted for its implementation, the duration of the stressful effect and a number of other factors determine the speed and depth of decompensation, the severity of neuropsychic instability.

Further the research of stress resistance of sportsmen with different qualification was carried out with the help of the "Test of self-assessment of stress resistance" by S. Cohen and G. Williamson. The obtained results are presented in table 5.

**Table 5. Indicators of self-assessment of stress resistance of sportsmen with different qualifications (in points)**

Scale	1 group n=30	2 group n=35	t	p-level
1. Reaction to circumstances that a person cannot influence	22,4±7,6	31,8±10,7	2,2	≤0,05
2. The tendency to complicate everything unnecessarily	20,3±6,9	29,7±10,1	2,2	≤0,05
3. Predisposition to psychosomatic diseases	23,6±8,1	37,5±12,6	2,4	≤0,05
4. Destructive ways of overcoming stress	24,3±8,2	31,9±10,8	2,1	≤0,05
5. Constructive ways of overcoming stress	29,6±10,0	18,3±6,6	2,3	≤0,05
Resistance to stress	38,4±12,9	61,3±20,5	3,2	≤0,01

The obtained results indicate that significant differences were obtained in all diagnostic indicators of the two groups of subjects. According to the first scale, which determines an increased reaction to circumstances that a person cannot influence, the indicators are significantly higher in the subjects of group 2 ( $p \leq 0.05$ ) than in the subjects of group 1. This means that athletes with lower qualifications are more likely to be frustrated in situations that are or may go out of their control. This is a stress factor for them, because they take all the responsibility on themselves, often even "overdoing it", seeing the cause of failure only in themselves and their own actions. Such attribution of responsibility can be considered as an indicator of the maturity of the individual, that is, his/her readiness to make decisions in various spheres of life and to take responsibility for them, to control his/her behavior and feelings. But, on the other hand, it increases the level of tension and the likelihood of developing distress.

According to the second scale, which shows the tendency to complicate everything unnecessarily, the results are also significantly higher in the subjects of the 2nd group ( $p \leq 0.05$ ) than in the subjects of the 1st group. This suggests that athletes with lower qualifications have a tendency to complicate everything, some concern and pessimism in the perception of reality. They are more worried about the future, waiting for failure. It can be argued that this feature is a stress factor.

On the third scale, which determines the predisposition to psychosomatic diseases, the indicators are also significantly higher in the subjects of the 2nd group ( $p \leq 0.05$ ) than in the subjects of the 1st group. Psychosomatic diseases are diseases in the development of which psychological factors, including psychological stress, play a leading role. Psychosomatic diseases are the result of stress caused by long-term and insurmountable psychological traumas. In addition to psychosomatic diseases, there are borderline conditions, which are defined as the initial stages of the development of distress, arising from prolonged exposure to various stressors and characterized by uncomfortable somatic disorders. But it should be noted that the indicators of the subjects of the 1st group are approaching the upper limit of the norm, which may indicate the development of psychosomatic disorders in the future.

On the fourth scale, which determines the presence of destructive ways of coping with stress, the indicators are also significantly higher in the subjects of the 2nd group ( $p \leq 0.05$ ) than in the subjects of the 1st group. If a person is exposed to constant pressure of various stressors for a long time and cannot solve the problem, the normal psyche begins to fail, which is expressed in inadequate, destructive behavior. Then the defense mechanisms of the psyche are activated, which protect the nervous system from destruction. Non-constructive ways of coping with stress are those that do not lead to a reduction in stress levels for a long time. One of two common and ineffective reactions to stress occurs: aggression or anxiety. Feeling of anxiety, nervousness interferes with normal adaptation to life. The more anxiety, the more trouble, discomfort and pain. Strong and prolonged anxiety leads to diseases.

On the fifth scale, which determines the presence of constructive ways to cope with stress, the indicators are significantly higher in the subjects of the 1st group ( $p \leq 0.05$ ) than in the subjects of the 2nd group. That is sportsmen with higher qualification use effective ways of struggle and overcoming stress. Constructive ways of dealing with stress include walks, reading, music, hobbies, communication with friends, children, family, pets, etc.

In this way, the study showed that athletes with low qualifications have a significantly increased level of stress and psychosomatic disorders, the use of non-constructive methods of coping with stress, and a significantly reduced overall level of stress resistance.

Further, a study of coping strategies used by athletes with different qualifications in stressful situations was conducted using the questionnaire "Strategies for coping with stressful situations (SACS)" Hobfall S. This research allows to allocate the basic models of behavior which demonstrate the researched in tense, stressful situations. The results are presented in Table 6.

**Table 6. Indicators of strategies for overcoming stressful situations in athletes with different qualifications (in points)**

Subscales	1 group n=30	2 group n=35	t	p-level
Assertive actions	23,7±8,1	18,5±6,3	2,4	≤0,05
Entering into social contact	25,3±8,6	17,8±6,1	2,6	≤0,05
Search for social support	23,7±8,1	18,6±6,3	2,4	≤0,05
Cautious actions	15,8±5,4	22,5±7,7	2,8	≤0,01
Impulsive actions	14,3±4,9	15,7±5,3	1,3	>0,05
Avoidance actions	10,4±3,6	17,7±6,0	2,8	≤0,01
Indirect actions	7,7±2,7	18,4±6,3	2,9	≤0,01
Antisocial actions	8,5±3,0	10,4±3,6	1,5	>0,05
Aggressive actions	14,5±5,1	16,7±5,7	1,5	>0,05

The results of the study show that the subjects of the 1st group more often choose productive models of coping with stressful situations, which is expressed in higher rates of assertive (confident) behavior, entering into social contacts, seeking social support and in lower rates of aggressive and antisocial actions. They prefer to consider crisis situations as a new experience useful for future life and professional career. Their behavioral patterns are characterized by activity, prosociality and flexibility.

For the subjects of the 2nd group more characteristic were the strategy of passivity (cautious actions, avoidance - withdrawal from solving problems), antisocial strategy (rigid, dogmatic, cynical, inhumane actions), aggressive strategy (pressure, refusal to find alternative solutions, confrontation, rivalry, etc.) They often show social timidity (uncertainty), and at the same time their behavior in problem situations is more antisocial and aggressive towards others. Probably, the latter is a compensatory mechanism to overcome internal discomfort or psychological complexes of self-doubt and negativism towards others.

Preference for non-constructive behavioral strategies is a risk of emotional burnout and professional destruction. Individuals who prefer constructive models of coping behaviour are distinguished by higher professional adaptation, a tendency to higher neuropsychological stability, and are more satisfied with the quality of their own life (subjective well-being) than those who more often use non-constructive behavioural models and psychological defence. In this way, the degree of expressiveness of constructive coping strategies is the most important resource of adaptation and resilience to environmental stressors.

The study showed that athletes with higher qualifications are stress-resistant, they use constructive means of combating and overcoming stress, coping strategies. Sportsmen with low qualification have a higher level of stress, lower stress resistance; in stressful situations they often use non-constructive means of coping.

Further the correlation analysis of indicators of a pre-competition condition and neuropsychic stability, stress resistance and strategies of overcoming of stressful situations separately in each group of the investigated was carried out, the results of which are shown in tables 7-8.

**Table 7. Indicators of the relationship between indicators of pre-competition state and neuropsychological stability, stress resistance and strategies for overcoming stressful situations in highly qualified athletes**

Scales	Confidence in yourself	Perception and assessment of opponents' capabilities	Desire to participate and importance of the competition	Mirror self-esteem of the athlete	Competitive personality anxiety
Neuro-psyhic stability	,402*	,387*	,391*	,152	-,432*
Reaction to circumstances that a person cannot influence	,447*	,418*	,073	,142	,063
The tendency to complicate everything	-,379*	,152	,059	,081	,105
Predisposition to psychosomatic diseases	-,428*	,091	,006	,074	,118
Destructive ways of overcoming stress	-,425*	,042	,104	,077	,100
Constructive ways to overcome stress	,514**	,113	,482**	,051	-,115
Assertive actions	,447*	,096	,391*	,137	-,072
Entering into social contact	,380*	,467*	,428*	,561**	-,016
Search for social support	,422*	,396*	,455*	,477**	-,123
Cautious actions	,054	,009	,103	,056	,093
Impulsive actions	,165	,128	,073	,085	,079
Avoidance actions	,029	,066	,127	,106	,421*
Indirect actions	-,096	,172	,058	,117	,397*
Antisocial actions	-,054	-,389*	-,427*	,074	,142
Aggressive actions	-,059	-,436*	,068	,093	,062

Note: \*p ≤ 0.05, \*\*p ≤ 0.01 by Spearman r<sub>s</sub> test.

In this way, the pre-competitive psychological state of highly qualified sportsmen has a direct correlation with such parameters of stress resistance and coping behavior as: "Neuropsychic stability" ( $p \leq 0.05$  by Spearman's  $r_s$  criterion), "Reaction to circumstances that a person cannot influence" ( $p \leq 0.05$ ), "Constructive ways of overcoming stress" ( $p \leq 0.05$ ), "Assertive actions" ( $p \leq 0.01$ ), "Entering into social contact" ( $p \leq 0.05$ ,  $p \leq 0.01$ ), "Search for social support" ( $p \leq 0.05$ ). An inverse correlation was also found with: "The tendency to complicate everything" ( $p \leq 0.05$ ), "The tendency to psychosomatic diseases" ( $p \leq 0.05$ ).

Competitive personal anxiety of highly qualified sportsmen has a direct correlation with such parameters of stress resistance and coping behavior as: "Avoidance" ( $p \leq 0.05$ ), "Indirect actions" ( $p \leq 0.05$ ) and inverse correlation with: "Neuropsychological stability" ( $p \leq 0.05$ ).

**Table 8. Indicators of the relationship between indicators of pre-competition state and neuropsychological stability, stress resistance and strategies for overcoming stressful situations in low-skilled athletes**

Scales	Confidence in yourself	Perception and assessment of opponents' capabilities	Desire to participate and importance of the competition	Mirror self-esteem of the athlete	Competitive personality anxiety
Neuro-psyhic stability	,151	-,386*	-,068	-,372*	-,410*
Reaction to circumstances that a person cannot influence	,080	,356*	,403*	,289	,391*
The tendency to complicate everything	,074	,362*	,399*	,262	,417*
Predisposition to psychosomatic diseases	,054	,412*	,386*	,281	,387*
Destructive ways of overcoming stress	,054	,405*	,332*	,263	,421*
Constructive ways to overcome stress	,186	,073	-,132	-,106	-,210
Assertive actions	,091	,118	-,082	,108	-,032
Entering into social contact	,377*	,210	-,043	-,176	-,075
Search for social support	,242	,076	,025	,109	-,176
Cautious actions	,066	,365*	,352*	,076	,105
Impulsive actions	-,077	,063	,075	,125	,127
Avoidance actions	-,104	,384*	,245	,368*	,117
Indirect actions	-,069	,371*	,385*	,417*	,452**
Antisocial actions	-,079	,184	,251	,195	,396*
Aggressive actions	-,086	,218	,076	,227	,119

Note: \* $p \leq 0.05$ , \*\* $p \leq 0.01$  by Spearman  $r_s$  test.

The pre-competitive psychological state of sportsmen with low qualification has a direct correlation with such parameters of stress resistance and coping behavior as: "Reaction to circumstances that a person can not influence" ( $p \leq 0.05$ ), "Entering into social contact" ( $p \leq 0.05$ ), "The tendency to complicate everything" ( $p \leq 0.05$ ), "Propensity to psychosomatic diseases" ( $p \leq 0.05$ ), "Destructive ways of coping with stress" ( $p \leq 0.05$ ), "Cautious actions" ( $p \leq 0.05$ ), "Avoidance" ( $p \leq 0.05$ ), "Indirect actions" ( $p \leq 0.05$ ). An inverse correlation was also found with: "Neuropsychological stability" ( $p \leq 0.05$ ).

Competitive personal anxiety of sportsmen with low qualification has a direct correlation with such parameters of stress resistance and coping behavior as: "Reaction to circumstances that a person can not influence" ( $p \leq 0.05$ ), "The tendency to complicate everything" ( $p \leq 0.05$ ), "The tendency to psychosomatic diseases" ( $p \leq 0.05$ ), "Destructive ways of overcoming stress" ( $p \leq 0.05$ ), "Indirect actions" ( $p \leq 0.05$ ), "Antisocial actions" ( $p \leq 0.05$ ) and inverse correlation with: "Neuropsychological stability" ( $p \leq 0.05$ ).

### Discussion

The study of the peculiarities of the relationship between the pre-competitive state, neuropsychological stability, stress resistance, coping strategies allows us to state that certain patterns of dependence of these phenomena on the level of qualification of the athlete have been revealed. High qualification shows a correlation with neuropsychic stability and stress resistance, productive coping, the ability to master anxiety and excitement in the pre-start time.

It should be noted that the conducted research has an independent character, so there are no results that would be similar to those obtained by us. But modern sports psychology has a large number of studies related to the study of pre-competitive states, stress resistance, means of overcoming stress in athletes of different ages, qualifications, sports, countries, etc. Some of the results of these studies indirectly confirm the relevance and reliability of our data and their interpretation.

Previous studies have shown that athletes with higher levels of self-confidence tend to demonstrate lower levels of pre-competition anxiety (Pineda-Espejel, López-Walle, & Tomás, 2015; Pineda-Espejel, Alarcón, López-Ruiz, & Trejo, 2017).

Also, studies have found that psychological fatigue of athletes negatively affects the results of the competition. The analysis of the results of the study revealed a predictable relationship between psychological fatigue and changes in behavior such as: detachment, decreased motivation and enthusiasm, increased emotional manifestations and immersion deep into oneself. Deterioration of concentration, discipline and attention to detail are also signs of psychological fatigue. Researchers believe that the causes of psychological fatigue are: combination of study and work; repetitive tasks; concentration on a particular sport, reasoning about it; instability of the environment; interaction with the media, etc. Experience and personal characteristics are factors that determine the individual susceptibility of the athlete (Russell, Jenkins, Rynne, Halson, & Kelly, 2019).

The results of the meta-analysis confirmed the existence of a correlation between athletes' stress and burnout. The authors revealed the correlation between stress and a decrease in the feeling of satisfaction from the task, achievement of the result, the goal. Special attention is paid to the fact that this correlation does not depend on the age of athletes and the level of competition (Lin, Lu, Chen, & Hsu, 2021).

With the help of a series of linear regressions it is shown that there is an inverse correlation between sports stress and self-efficacy. The study determined that social support does not mitigate the relationship between stress and self-efficacy, and self-efficacy partially mediates the relationship between stress and sport performance (Raalte, & Posther, 2019).

Multilevel analyses have shown that daily sport-related stress (SSDS) on negative emotions of shame, guilt, and training motivation is associated with more negative self-conscious emotions and reduced training motivation. Moreover, self-compassion attenuated the effect of SSDS on shame and did not correlate with exercise motivation (Röthlin, Horvath, Messerli, Krieger, Berger, & Birrer, 2022).

A study in the context of extreme sports found a relationship between risk attitudes, perceived control, self-enhancement, event perception, and re-patronage intention through the lens of boundary work theory and cognitive adaptation. The result was a theoretical model of multiple moderated mediation that provides insight into what motivates athletes to be loyal to extreme sport events. The authors tested the model and found that risk taking leads to feelings of self-enhancement, especially when athletes feel in control of the risks they face. Self-enhancement, in turn, leads to re-patronage intention, especially when athletes have a positive perception of the event (Raggiotto, & Scarpi, 2020).

The results of another study showed that in athletes, mindfulness is negatively related to stress and positively related to developmental orientation. In addition, perceived stress is positively related to performance orientation and fully mediates the relationship between mindfulness and performance orientation. The results of this study emphasize the importance of perceived stress in goal achievement (Lee, 2020).

In another study, support was found to be positively related to athletes' perceived satisfaction with competition performance. These results suggest that higher levels of stressors are associated with poorer perceptions of having the necessary resources to cope with competitive stressors, while, conversely, higher team and cultural stressors do not necessarily harm athletes' perceptions of their own resources to cope with competitive stressors and demands (Tamminen, Sabiston, & Crocker, 2019).

The data of numerous studies of the problem of sportsmen's stress and its connection with the pre-competitive state facilitate the transition to the next discursive topic - the organization of psychoprophylactic and psychocorrective measures in order to optimize the emotional state of sportsmen in the training and competitive periods.

## Conclusions

The study of the peculiarities of the relationship between the pre-start state and stress resistance in athletes of different qualifications engaged in fire and applied sports showed that there is a correlation between the phenomena under analysis. Highly qualified athletes have a higher level of neuropsychological stability, stress resistance than athletes with lower qualifications. They use a greater number of productive coping strategies. Their pre-starting state is characterized by confidence in their own abilities, optimal level of anxiety, awareness of the personal significance of the competition, respect for rivals. Pre-competitive state positively correlates with neuro-psychic stability, stress resistance, productive coping. Increased pre-start anxiety leads to the use of avoidance strategies and indirect actions.

Athletes with lower qualifications have insufficient formation of self-regulatory mechanisms, which is manifested in uncertainty in their own abilities in the pre-start time, overestimation of the resources of rivals, increased competitive anxiety and personal significance of the competition, the use of unproductive coping strategies. The pre-start state correlates with the tendency to complicate everything, psychosomatic symptoms, destructive ways of coping with stress, aggressive behavior and the desire to avoid frustrating situations. This category of athletes needs in-depth psychological support in order to optimize the pre-start state and the level of stress associated with sports activities. This is the prospect of further research of this scientific problem.

One of the means of improving the pre-competition condition of athletes is learning self-regulation, which contributes to sports achievements; formation of the psychological structure of sports activity; achieving an



optimal psychological state at competitions; realization of potential; recovery of mental capacity after training and competitions; increasing resistance to the influence of stress factors. Mastering self-regulation involves the development of relaxation, calming and mobilization skills using psycho-regulatory training techniques. Training of self-regulation involves several components: mobilization - setting for maximum activation of resources at competitions; soothing – optimizing the psychological state before the start and after the competition; concentrative - training the athlete in concentration and composure; social - development of independence and depriving the athlete of dependence on other people; realistic - formation of a focus on adequate assessment of one's abilities and setting realistically achievable goals in sports; renewable - setting for optimization after the athlete's competitive condition. The complex part of training self-regulation of athletes is based on the simultaneous use of psychological techniques, pedagogical discussions and physical means: massage, physical exercises, etc.

Psychological preparation occupies a special place in modern sports. An athlete can be well physically and technically prepared, successfully perform and show high results in preliminary starts, but not be able to adjust and perform decently in the main competitions. In order to fully realize their physical, technical and tactical abilities, skills and abilities, to reveal reserve capabilities as a mandatory element of competitive activity, any athlete needs to constantly prepare psychologically for competitive starts. Psychological preparation of athletes for competitions is an important and mandatory element of training and training. Correct planning of psychological preparation helps to improve the pre-start condition, reduce the impact of stress factors and increase the level of psychological readiness for competitions.

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**Authors' Contribution:**

AFANASIEVA NATALIA - Study design; Data collection; Statistical analysis, Manuscript Preparation

ILINA YULIYA - Data collection; Statistical analysis; Manuscript Preparation

SVITLYCHNA NATALIYA - Data collection; Statistical analysis; Manuscript Preparation; Funds Collection

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