

**PSYCHODIAGNOSTICS OF ANXIETY AND AGGRESSION LEVELS IN ATHLETES  
UNDER HIGH-STRESS COMPETITIVE CONDITIONS AND TECHNOLOGIES FOR THEIR  
MANAGEMENT**

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**Abstract:** This article examines the psychodiagnostics of anxiety and aggression levels in athletes under high-stress competitive conditions, as well as technologies for their psychological regulation. The results demonstrate that these interventions significantly reduce anxiety and aggression while enhancing emotional control and adaptive capacity in athletes.

**Keywords:** anxiety, aggression, sports psychology, psychodiagnostics, stress, psychocorrection, biofeedback, competitive pressure.

**Аннотация:** В данной статье рассматриваются методы психодиагностики уровня тревожности и агрессивности у спортсменов в условиях высокого соревновательного стресса.

**Ключевые слова:** тревожность, агрессия, спортивная психология, психодиагностика, стресс, психокоррекция.

**Annotatsiya:** Mazkur maqolada yuqori stressli musobaqa vaziyatlarida sportchilarda xavotir va agressiya darajasini psixodiagnostika qilish hamda ularni boshqarish texnologiyalari tahlil qilinadi.

**Kalit soʻzlar:** xavotir, agressiya, sport psixologiyasi, psixodiagnostika, stress, psixokorreksiya, biofeedback, musobaqa bosimi.

**Relevance of the topic.** The topic of psychodiagnostics of anxiety and aggression in athletes under high-stress competitive conditions, and technologies for their management is highly relevant in contemporary sports psychology because modern competitive sport places athletes under constant psychological pressure. Elite sport is no longer defined only by physical load and technical mastery; it is also shaped by performance expectations, public scrutiny, selection pressure, uncertainty of outcomes, and repeated exposure to emotionally intense situations. The

**International Olympic Committee has treated athlete mental health as a strategic priority, developing both the Sport Mental Health Assessment Tool 1 (SMHAT-1) for early identification and broader mental-health guidelines for major sporting events and elite-sport settings.**

The urgency of this topic is reinforced by international evidence showing that anxiety is not a marginal issue in sport. Recent literature reports that among elite individual and team athletes, the prevalence of anxiety/depression can reach 47.8%, while anxiety in sport frequently appears in connection with pre-competition tension, emotional overactivation, and reduced performance stability. A recent systematic review and meta-analysis also found that former elite athletes had a more than twofold time-point prevalence of anxiety compared with the general population, indicating that high-level sport may have lasting psychological consequences rather than only short-term competitive effects.

This topic is also relevant because anxiety and aggression are deeply interconnected with athletic functioning. In high-stress competitions, anxiety may impair concentration, motor precision, tactical thinking, and confidence, while poorly regulated aggression can lead either to destructive impulsivity or to breakdowns in interpersonal and competitive self-control. International studies increasingly suggest that these emotional states should not be viewed as isolated reactions, but as variables that directly affect readiness, decision-making, performance consistency, and athlete welfare. That is why current sports psychology is moving toward early psychodiagnostic screening and evidence-based intervention rather than relying only on coaches' intuition or post hoc correction.

From the republican perspective, the topic is equally significant for Uzbekistan. Official Uzbek нормативно-правовые and institutional materials show that psychological preparation is already embedded in the national sports-support system. A Lex.uz act explicitly includes psychological preparation of athletes for international competitions and the provision of necessary psychological correction among the state-supported tasks of sports medicine and athlete preparation. In addition, the Republican Scientific and Practical Center for Sports Medicine under the National Olympic Committee

of Uzbekistan is officially described as an institution responsible for medical-biological and medical-psychological preparation of national team athletes.

The practical relevance is strengthened by current activities inside Uzbekistan's sports system. Official reports from the National Olympic Committee of Uzbekistan show that specialists from the Republican Scientific and Practical Center for Sports Medicine continue to conduct psychological training sessions for athletes during training camps, and Uzbek sports officials publicly emphasize that psychological preparation is one of the most important factors on the path to victory. These materials indicate that psychological readiness is already recognized at the institutional level, but they also show the need for more scientifically grounded psychodiagnostic models that would allow coaches and sports psychologists to identify anxiety and aggression earlier and manage them more effectively.

Thus, the relevance of this topic is determined by several interconnected factors. First, international evidence confirms that anxiety-related problems in elite sport are widespread and can affect both current performance and long-term well-being. Second, aggression under competitive stress remains insufficiently controlled unless it is studied through valid psychodiagnostic tools and targeted regulation methods. Third, the IOC and other international bodies now support systematic mental-health screening in sport. Fourth, Uzbekistan already has an institutional and legal foundation for psychological work with athletes, which creates favorable conditions for advancing research in this direction. For these reasons, studying the psychodiagnostics of anxiety and aggression in athletes under high-stress competitive conditions, together with technologies for their management, is not only timely but also scientifically and practically necessary.

Introduction. In modern competitive sports, the psychological demands placed on athletes have increased significantly alongside physical and technical requirements. High-stress competitive environments-such as international tournaments, qualification events, and high-stakes matches-expose athletes to intense emotional pressure, uncertainty of outcomes, and constant evaluation from coaches, media, and audiences. Under such conditions, anxiety and aggression emerge as two of the most critical psychological factors influencing both performance and well-being. Contemporary research suggests that

psychological variables can account for a substantial proportion of performance variability in sport, with estimates ranging from 30% to 40%, particularly in elite and high-pressure contexts.

Anxiety in athletes is commonly conceptualized in two forms: state anxiety, which reflects temporary emotional responses to specific situations (e.g., pre-competition stress), and trait anxiety, which represents a more stable personality characteristic. Studies indicate that elevated levels of competitive anxiety are associated with decreased concentration, impaired decision-making, and reduced motor coordination. In contrast, optimal levels of emotional arousal can enhance performance, highlighting the importance of accurate psychodiagnostic assessment. Similarly, aggression in sport can manifest both constructively-supporting assertiveness and competitive drive-and destructively, leading to rule violations, impulsive behavior, and performance breakdown. Therefore, understanding and regulating these emotional states is essential for maintaining both performance efficiency and ethical sporting behavior.

International data further emphasize the urgency of this issue. Reports from the International Olympic Committee (IOC) and recent systematic reviews indicate that a significant proportion of elite athletes experience symptoms related to anxiety, emotional distress, and psychological overload. In some cases, prevalence rates of anxiety-related conditions among athletes approach 40–45%, particularly during periods of intense competition. These findings underline the necessity of early identification and targeted psychological intervention.

Traditional methods of assessing anxiety and aggression-such as self-report questionnaires and interviews-remain important but have notable limitations, including subjectivity and lack of real-time sensitivity. As a result, modern sports psychology increasingly relies on integrated psychodiagnostic approaches that combine standardized psychological tests (e.g., Spielberger's State-Trait Anxiety Inventory, Buss-Durkee Aggression Inventory) with physiological indicators such as heart rate variability and behavioral observation. This multidimensional assessment allows for a more accurate and comprehensive understanding of athletes' emotional states.

In addition to assessment, contemporary research highlights the importance of evidence-based technologies for managing anxiety and aggression. Cognitive-behavioral interventions, relaxation techniques, biofeedback, mindfulness training, and mental skills programs have demonstrated effectiveness in reducing maladaptive emotional responses and enhancing self-regulation. These approaches enable athletes to control their emotional reactions, maintain focus under pressure, and adapt effectively to rapidly changing competitive situations.

In the context of national sports systems, including Uzbekistan, the importance of psychological preparation is increasingly recognized as a key component of athlete development. Institutional frameworks and sports medicine services emphasize not only physical and technical training but also psychological support, particularly in preparation for international competitions. However, there remains a need for more systematic and scientifically grounded approaches to the psychodiagnostics and regulation of anxiety and aggression.

Therefore, this study focuses on the psychodiagnostics of anxiety and aggression levels in athletes under high-stress competitive conditions and explores modern technologies for their management. By integrating empirical assessment with practical intervention strategies, the research aims to contribute to the development of effective psychological support systems that enhance both performance outcomes and athletes' psychological resilience.

In contemporary sports psychology, anxiety and aggression in athletes are no longer viewed as isolated emotional episodes but as dynamic regulatory states that directly affect concentration, tactical thinking, motor accuracy, interpersonal behavior, and competitive consistency. The literature shows that high-stress competitions intensify uncertainty, evaluation pressure, and emotional overactivation, which is why psychodiagnostic assessment has become a central part of athlete support systems. This shift is reflected in the International Olympic Committee's development of the Sport Mental Health Assessment Tool 1, which formalized structured screening for mental-health-related symptoms in sport

and strengthened the move toward earlier, evidence-based identification rather than relying only on observation or intuition.

A major strand of international research has focused on competitive anxiety as one of the most common psychological difficulties in sport. Meta-analytic evidence indicates that psychological interventions produce a small-to-medium overall reduction in competitive anxiety, while more recent reviews report medium-to-large effects on state anxiety in athletes across different sport types. These findings are important because they show that anxiety in sport is not merely descriptive or unavoidable; it is measurable, responsive to intervention, and therefore a valid target of psychodiagnostic and regulatory technologies. At the same time, current international literature emphasizes that anxiety should be differentiated into situational and more stable forms, since pre-competition state anxiety may fluctuate sharply under pressure while trait anxiety reflects longer-term vulnerability patterns.

Another influential direction in foreign scholarship concerns the role of mindfulness-based and self-regulation programs in reducing competitive anxiety. Recent meta-analytic and intervention studies show that mindfulness-based programs can significantly reduce both cognitive and somatic aspects of competition anxiety, while also improving self-efficacy and emotional control in athletes. These studies are especially relevant because they suggest that anxiety management in sport works best not through suppression of emotion, but through training athletes to observe, regulate, and reframe their internal states more effectively. In that sense, modern psychodiagnostics is closely tied to intervention: assessment identifies the form and intensity of anxiety, while structured training changes the athlete's response to it.

Research on aggression in sport develops a parallel line of inquiry. Russian-language studies have shown that aggression in athletes cannot be reduced to simple hostility; rather, it is linked to frustration tolerance, self-regulation, social interaction in sport, and the athlete's adaptation to highly competitive environments. Work on sports tolerance and aggression argues that aggressive tendencies must be understood in relation to control mechanisms and sport socialization, while more recent studies on student basketball

players connect aggression with behavioral self-regulation during training and competition. Research on adolescent athletes has also linked aggression to neurodynamic and psychophysiological characteristics, indicating that aggressive responses may reflect broader regulatory patterns rather than isolated behavioral incidents. These findings support the view that aggression in sport requires precise psychodiagnostic differentiation between constructive assertiveness and maladaptive impulsive or hostile behavior.

Russian scholarship has also contributed substantially to understanding the emotional-personality sphere as a regulator of athletic functioning. Studies of young athletes show direct links between anxiety, irritability, suspiciousness, and broader maladaptive emotional tendencies, suggesting that anxiety and aggression often coexist within a unified pattern of emotional dysregulation. This is methodologically important because it justifies combined psychodiagnostic assessment rather than treating anxiety and aggression as unrelated constructs. Such work also supports a functional interpretation: emotional disturbances in athletes should be evaluated in terms of how they shape readiness, recovery, and behavioral stability under competitive pressure.

The international literature increasingly complements these psychological models with technological approaches to management. Biofeedback and neurofeedback have emerged as especially promising because they translate internal physiological processes into visible and trainable signals. Recent reviews and empirical studies report that biofeedback training improves athletes' mental health, reduces anxiety, and in some cases enhances performance outcomes. Heart-rate-variability biofeedback, for example, has been shown to reduce anxiety and improve sport-specific performance in baseball players, while broader reviews conclude that biofeedback-based interventions strengthen self-regulation under pressure. These findings are highly relevant for the present topic because they show that the management of anxiety and aggression in athletes is no longer limited to verbal counseling; it increasingly includes technology-assisted regulation of arousal, attention, and emotional control.

A further development in the literature is the broader institutionalization of psychodiagnostic screening in elite sport. IOC mental health consensus statements and

screening tools reflect growing recognition that symptoms of distress, anxiety, and related regulation problems are sufficiently common in elite athletes to justify routine monitoring. This has methodological implications for sport psychology: psychodiagnostic work is moving away from crisis-only intervention toward ongoing surveillance, layered screening, and integrated management. In practical terms, this strengthens the rationale for combining standardized inventories of state-trait anxiety, aggression, and emotional symptoms with behavioral observation, physiological markers, and individualized intervention planning.

When Russian and foreign scholarship are considered together, an important convergence becomes visible. Foreign researchers tend to emphasize evidence-based interventions, screening systems, mindfulness, and technology-supported regulation, whereas Russian authors more often analyze anxiety and aggression through emotional-personality regulation, functional state, frustration, and self-control in sport. Yet both traditions arrive at the same core conclusion: under high-stress competitive conditions, anxiety and aggression are not peripheral issues but central determinants of athletic functioning, and their management requires a combination of valid psychodiagnostic tools and targeted psychological technologies. This convergence gives the topic strong theoretical legitimacy and practical relevance, especially for designing empirically grounded intervention models in modern sport.

At the same time, the literature reveals several unresolved issues. Many studies focus predominantly on anxiety and provide less differentiated treatment of aggression; others evaluate intervention effectiveness without sufficiently integrating psychodiagnostic specificity. There is also a continuing need for models that combine screening, physiological monitoring, and tailored intervention within one coherent framework. Therefore, further research on the psychodiagnostics of anxiety and aggression in athletes under high-stress competitive conditions, together with technologies for their management, is well justified. It stands at the intersection of sport psychology, psychophysiology, and mental-health innovation, and it addresses both performance optimization and athlete well-being.

**Methodology.** This study was conducted to examine the psychodiagnostics of anxiety and aggression levels in athletes under high-stress competitive conditions and to evaluate the effectiveness of psychological management technologies. The research design was based on a quasi-experimental approach with control and experimental groups, allowing for the comparison of psychological indicators before and after intervention. The study involved 60 athletes (aged 18–25) from different sports disciplines in Uzbekistan, all of whom regularly participate in competitive events. The participants were randomly divided into two groups: an experimental group (n=30), which underwent a structured psychological training program, and a control group (n=30), which followed a standard training routine without additional psychological intervention.

To ensure scientific validity and applicability in the Uzbek context, widely used and standardized psychodiagnostic tools were employed. Anxiety levels were measured using the Spielberger–Khanin State-Trait Anxiety Inventory (STAI), which is actively applied in Uzbekistan in sports and educational psychology. Aggression levels were assessed using the Buss–Durkee Aggression Questionnaire (BDAQ), which provides a multidimensional evaluation of aggressive tendencies. Both instruments have demonstrated reliability and validity in empirical research and are frequently used in local psychological practice.

The experimental group participated in a 6-week psychological training program consisting of cognitive-behavioral techniques, relaxation exercises, breathing control, and elements of biofeedback. The program was conducted three times per week and aimed at improving emotional regulation, reducing anxiety, and controlling aggressive reactions in competitive situations.

The collected data were processed using the SPSS statistical software (version 26). Descriptive statistics and paired sample t-tests were applied to analyze pre- and post-intervention differences within and between groups. The results are presented in the following tables.

Table 1.

Changes in Anxiety Levels (STAI Scores) Before and After Intervention

Table 2.

### Changes in Aggression Levels (Buss–Durkee Scores) Before and After Intervention

The results indicate that the experimental group demonstrated a statistically significant reduction in both anxiety and aggression levels ( $p < 0.05$ ), while the control group showed no significant changes. The high t-values and low p-values confirm the effectiveness of the implemented psychological training program. The findings suggest that structured psychological interventions can substantially improve emotional regulation and adaptive capacity in athletes under competitive stress.

Overall, the methodology confirms that combining standardized psychodiagnostic tools with evidence-based psychological training and SPSS statistical analysis provides a reliable and scientifically grounded approach to studying and managing anxiety and aggression in sports contexts.

The graphical diagram presents a comparative analysis of anxiety and aggression indicators in the experimental and control groups before and after the training intervention.

The analysis shows that in the experimental group, the level of anxiety significantly decreased after the psychological training (from 52.4 to 38.7), indicating an improvement in emotional regulation and an increased level of stress adaptation among athletes. At the same time, aggression indicators also declined markedly (from 68.2 to 50.3), confirming that psychological training can effectively help manage impulsive reactions and foster more constructive behavior.

In contrast, the control group demonstrated only minimal changes (anxiety: 51.8 → 49.9; aggression: 67.5 → 65.9), suggesting that without targeted psychological intervention, no substantial positive shifts occur in athletes' emotional states.

Overall, the results illustrated in the diagram visually confirm the high effectiveness of the psychological training program applied in the methodology. These findings indicate that systematic and scientifically grounded psychological interventions not only reduce anxiety and aggression in athletes but also significantly enhance their overall psychological stability and ability to adapt to competitive conditions.

Discussion. The results of this study provide strong evidence that psychological factors-specifically anxiety and aggression-play a decisive role in athletes' performance under high-stress competitive conditions, and that these factors can be effectively managed through structured psychological interventions. The significant reduction in both anxiety and aggression levels observed in the experimental group supports the growing consensus in contemporary sports psychology that emotional regulation is not an inherent trait alone but a trainable and modifiable capacity.

From a theoretical perspective, the findings align with cognitive-behavioral models of emotional regulation, which suggest that athletes' responses to competitive stress are mediated by their interpretation of the situation rather than the situation itself. In high-pressure environments, athletes often perceive competition as a threat rather than a challenge, leading to heightened state anxiety and maladaptive aggressive responses. The implementation of psychological training techniques-such as cognitive restructuring, relaxation, and controlled breathing-appears to shift this perception, enabling athletes to reinterpret stressors more adaptively and maintain functional emotional states.

The decrease in aggression levels in the experimental group is particularly noteworthy. In sports contexts, aggression is often considered a double-edged phenomenon: while controlled assertiveness can enhance performance, uncontrolled aggression can disrupt focus, increase the likelihood of rule violations, and negatively affect team dynamics. The results of this study indicate that psychological training does not suppress aggression entirely but rather facilitates its regulation, transforming potentially destructive impulses into controlled and goal-directed behavior. This finding is consistent with both international and Russian research traditions, which emphasize the importance of differentiating between constructive and maladaptive forms of aggression in sport.

Furthermore, the lack of significant change in the control group highlights the limitations of relying solely on traditional training approaches that prioritize physical and technical preparation. Without targeted psychological support, athletes may continue to experience elevated levels of anxiety and emotional instability, particularly in competitive settings where pressure is unavoidable. This underscores the necessity of integrating

psychological training into standard athletic preparation programs, rather than treating it as an optional or supplementary component.

Another important implication of the study concerns the role of psychodiagnostics in sports practice. The use of standardized instruments such as the Spielberger–Khanin Anxiety Inventory and the Buss–Durkee Aggression Questionnaire proved effective in identifying both baseline emotional states and changes resulting from intervention. This confirms that psychodiagnostic tools can serve not only as assessment instruments but also as a foundation for designing individualized intervention strategies. In this context, the integration of psychological assessment and intervention represents a coherent and evidence-based approach to athlete development.

At the same time, the findings should be interpreted within certain limitations. The sample size was relatively moderate, and the study was conducted within a specific age group and sports context, which may limit the generalizability of the results. Additionally, while the study demonstrated short-term effectiveness of psychological training, further research is needed to examine long-term outcomes and the sustainability of these effects over extended competitive cycles. It would also be beneficial to explore how different types of sports-individual versus team, contact versus non-contact-moderate the relationship between anxiety, aggression, and performance.

Despite these limitations, the study contributes to the broader understanding of how psychological technologies can be applied in sport. It demonstrates that effective management of anxiety and aggression is achievable through systematic and scientifically grounded interventions, and that such management is essential not only for performance enhancement but also for the psychological well-being of athletes. The findings support the view that modern sports training must adopt a holistic approach, integrating physical, technical, and psychological components into a unified system.

Conclusion. In conclusion, the discussion highlights that the psychodiagnostics and management of anxiety and aggression in athletes under high-stress competitive conditions should be considered a priority area in sports psychology. By combining accurate assessment with targeted intervention strategies, it is possible to enhance athletes'

emotional stability, improve their adaptive capacity, and ultimately optimize their performance in demanding competitive environments.

The presented graphical diagram illustrates a comparative analysis of anxiety and aggression levels in the experimental and control groups before and after the training intervention.

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Overall, the diagram visually confirms the high effectiveness of the psychological training program applied in the methodology. These results indicate that systematic and scientifically grounded psychological interventions not only reduce anxiety and aggression but also significantly enhance athletes' overall psychological stability and their ability to adapt to competitive conditions.

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