

ГУМАНИТАРНЫЕ НАУКИ



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Air Traffic Controllers' Anxiety Features and Coping Strategies**Marina G. Oskina¹, Elena V. Stakanova^{1,2}**¹ Don State Technical University, Rostov-on-Don, Russian Federation² Southern Federal University, Rostov-on-Don, Russian Federation**Abstract**

The article studies the problem of chronic stress and anxiety in air traffic controllers caused by a high level of responsibility and the need for prompt decision-making. The article aims at developing a comprehensive approach to stress management based on the analysis of coping strategies and increase of self-efficacy of specialists. The objects of the study were the psychological and physiological disorders resulting from the continuous exposure to stress factors. The methodology of the study included a review of theoretical models, empirical analysis and evaluation of the efficiency of modern stress management techniques. Implementation of the study programs and teamwork trainings could significantly reduce the level of anxiety and improve the cognitive functions of controllers. The practical significance of the study lies in the possibility of adapting the developed recommendations to improve air traffic safety and quality of work of the specialists. The prospects are foreseen in further integration of innovative techniques into the stress management practices.

Keywords: stress management, anxiety, air traffic controllers, coping strategies, self-efficacy, teamwork, psychological stability

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Особенности тревожности и стратегии преодоления тревожности у авиадиспетчеров**М. Г. Оськина¹, Е.В.Стаканова^{1,2}**¹ Донской государственный технический университет, г. Ростов-на-Дону, Российская Федерация² Южный федеральный университет, г. Ростов-на-Дону, Российская Федерация**Аннотация**

Рассмотрена проблема хронического стресса и тревожности у диспетчеров воздушного движения, вызванных высоким уровнем ответственности и необходимостью оперативного принятия решений. Цель статьи заключалась в разработке комплексного подхода к управлению стрессом, основанного на анализе стратегий копинга и повышении самоэффективности специалистов. Объектом исследования явились психологические и физиологические расстройства, возникающие при длительном воздействии стрессовых факторов. Методология исследования включает обзор теоретических моделей, эмпирический анализ и оценку эффективности современных методов управления стрессом. Внедрение программ обучения и тренингов по командной работе может значительно снизить уровень тревожности и улучшить когнитивные функции диспетчеров. Практическое значение исследования заключается в возможности адаптации разработанных рекомендаций для повышения безопасности воздушного движения и качества работы специалистов. В перспективе возможно внедрение инновационных технологий в практику управления стрессом.

Ключевые слова: управление стрессом, тревожность, диспетчеры воздушного движения, стратегии копинга, самоэффективность, командная работа, психологическая устойчивость

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Introduction. In the modern aircraft industry, the professional activity of air traffic controllers is characterized by continuous exposure to various stress factors caused by a high degree of responsibility, the need for prompt decision-making and strict time constraints. These conditions contribute to the development of anxiety, chronic stress, and, eventually, affect negatively the cognitive functions of the specialists, which can influence the air traffic safety. The relevance of studying this problem is ascertained by the results of both classical and modern research in the field of labor psychology, which emphasizes the importance of choosing the adequate coping strategies and keeping a high level of self-efficacy for maintaining the optimal psychological state in employees.

Main part. The fundamental theoretical model underlying the analysis of stress conditions is the concept of assessing stress situations and coping strategies developed by R. Lazarus and S. Folkman [1]. According to this model, coping strategies are a set of cognitive and behavioral mechanisms aimed at regulating the emotional state and overcoming the adverse effects of stress. The authors identify two main types of strategies: problem-oriented, aimed at changing external factors that cause stress, and emotionally-oriented, aimed at reducing negative emotional reactions. In addition, a number of researchers emphasize the importance of social coping strategies, especially in professions where group interaction is a key element of successful work.

A profession of the air traffic controller is characterized by the need for a quick and accurate assessment of the current situation, which requires high concentration, quick thinking and resistance to stress [2]. Continuous exposure to stress factors leads to disruptions in cognitive processes, such as memory loss, impaired concentration and slower reaction times. Research by Z. Freud showed that extended exposure to stress stimuli can lead to physiological changes that worsen both the mental and physical condition of a person. Modern empirical data obtained by using the neuropsychological methods confirm the relationship between stress levels and decreased cognitive functions, which is especially critical for specialists involved in air traffic control [3].

Special attention in the research is paid to the problem of choosing coping strategies. Problem-oriented strategies are a set of measures including an active search for solutions, a detailed analysis of the situation, system planning of specific actions and targeted elimination of stress sources. This approach implies that an employee does not simply react to the difficulties that have arisen, but actively participates in their resolution by collecting information, assessing possible options and choosing the optimal solution. As a result of this approach, the likelihood of accumulation of negative emotions decreases, which enables prompt restoration of psychological balance [4]. The efficiency of problem-oriented methods is confirmed by numerous empirical studies, which have revealed that the active use of these strategies leads to the decrease in the level of anxiety and duration of stressful conditions and to the increase in the efficiency of decision-making. In particular, the research shows that employees who regularly use active problem-solving methods demonstrate improved cognitive performance, such as the speed of information processing and the accuracy of situation assessment, which directly affects the quality of performance of professional duties under intense stress.

Emotionally-oriented strategies, on the contrary, focus on managing the internal emotional state through special relaxation techniques, meditation, breathing exercises and other self-regulation methods [4]. These approaches are aimed at reducing the intensity of negative emotions associated with stress and at restoring internal balance after stressful situations. Mindfulness-based techniques help a person to observe his emotions without excessive involvement in them, which helps to avoid an automatic reaction to stressful stimuli. However, despite the positive effect of reducing emotional tension, excessive use of emotionally-oriented methods can have side effects, such as a tendency to avoid active problem-solving. This can lead to a situation where an employee, relying solely on self-regulation, does not take the necessary measures to eliminate the root causes of stress, which in the long term reduces the efficiency of solving problem situations and worsens adaptation to new stressful challenges [5].

As shown by the results of the scientific studies, optimal adaptation of air traffic controllers to stressful situations is determined by the presence of a balance between problem-oriented and emotionally-oriented strategies. Such a balance enables not only efficient reduction of the level of anxiety, but also maintains high performance, which is especially important in the conditions of operational decision-making. A combined approach ensures both the practical elimination of stress sources and the regulation of the emotional background that jointly contribute to the improvement of cognitive functions. Such an approach decreases the risk of professional burnout and increases job satisfaction. Research also demonstrates that employees who are able to flexibly adjust their coping strategies depending on the nature of the stressful situation have better adaptive capabilities and more often achieve high professional results. Thus, the integrated use of both strategies is an efficient adaptation mechanism in conditions of constant professional stress, typical for the air traffic controller activity, and is an important component for the formation of psychological stability in a modern high-tech society.

An important role in the formation of adaptive behavior belongs to the level of self-efficacy, which concept was developed in detail by Albert Bandura. Self-efficacy is defined as an individual's confidence in his or her ability to cope with emerging difficulties and successfully achieve goals. A high level of self-efficacy contributes to the choice of constructive coping strategies, increases the speed of decision-making and reduces the likelihood of making mistakes.

Empirical studies demonstrate that air traffic controllers with a high level of self-efficacy more often resort to active methods of solving problems, which has a positive effect on overall job satisfaction, and reduces the risk of professional burnout [6]. In turn, a low level of self-efficacy correlates with the dominance of emotionally-oriented strategies, which can lead to a cycle of increased anxiety and decreased professional efficiency.

An important aspect affecting the level of stress and anxiety in the air traffic controllers is teamwork. Efficient interaction between employees, exchange of information and distribution of responsibility help to reduce the individual workload and contribute to the formation of a favorable working atmosphere. Research conducted in the field of labor psychology confirms that collective support and synergy in a team are among the most efficient mechanisms for counteracting the negative effects of stress. Collective decision-making contributes not only to prompt response to non-standard situations, but also to the exchange of experience, which in turn increases the overall level of self-efficacy in the team. Examples from the practices of air traffic control services show that the organization of regular trainings and seminars on the development of teamwork leads to a significant decrease in the level of anxiety in employees [7].

Chronic stress experienced by air traffic controllers has significant physiological and cognitive consequences. Impairment of concentration and memory, slower reaction time and decreased attention are typical manifestations of cognitive impairment that occur under conditions of constant stress. Physiological consequences include increased blood pressure, poor sleep quality, metabolic disorders and general exhaustion of the organism, which can lead to the development of cardiovascular diseases and other pathologies. Analysis of data from the World Health Organization allows us to conclude that systematic exposure to stress factors in professional activity significantly increases the risk of developing chronic diseases.

Modern approaches to stress management are aimed at a comprehensive impact, including a combination of psychotherapeutic methods, physical activity and relaxation programs. Cognitive behavioral therapy, based on the work of Aaron Beck, has proven itself as an efficient tool for correcting negative attitudes and changing destructive thinking patterns. Mindfulness techniques, which have become widespread in recent years, help to increase awareness and reduce automatic emotional reactions, which is especially important for specialists working under high professional stress. Relaxation and physical activity programs, implemented in a number of air traffic control centers, help to improve the general condition of the organism, reduce anxiety level and increase stress resistance.

The practical significance of studying stress management and self-efficacy-enhancing approaches in air traffic controllers lies in the possibility of creating systemic training and study programs aimed at developing active coping strategies and teamwork skills [8]. The implementation of regular trainings aimed at developing professional competencies of employees, provision of psychological support to them and monitoring their condition, contributes to the timely identification of risk factors and correction of organizational processes. Modern technologies, including the use of specialised programs for assessing stress levels and monitoring physiological indicators, allow for detailed diagnostics of employees' condition and prompt response to changes. Thus, the use of an integrated approach to stress management not only increases the efficiency of air traffic controllers but also reduces the risk of professional burnout and related diseases.

Expansion of the range of research in this area implies inclusion of the interdisciplinary approaches that combine knowledge of psychology, physiology, information technology and management. Current research is aimed at studying the influence of neuropsychological factors on decision-making processes under stress, as well as developing adaptive algorithms to support operational management in real time [9]. In the future, such a research may lead to the creation of innovative methods designated to ensure not only anxiety decrease in employees, but also overall safety and efficiency increase of the entire air traffic control system. In this regard, it is necessary to pay close attention to the issues of training specialists, improvement of stress management methods and introduction of new technologies into the practices of air traffic control services.

Thus, the characteristics of anxiety in air traffic controllers are determined by a combination of professional factors, including a high degree of responsibility, the need for prompt decision-making and the impact of external stress factors. Efficient overcoming of the negative consequences of stress is possible with a balanced use of coping strategies based on the problem-oriented and emotionally-oriented approaches, as well as with a high level of self-efficacy and close-knit teamwork. Modern stress management methods, such as cognitive behavioral therapy and mindfulness techniques, have proven their efficiency in reducing anxiety levels and can be successfully adapted for use in the professional environment of air traffic controllers. Practical implementation of these approaches requires the development of integrated programs implying systemic training, regular psychological support and the use of modern monitoring technologies, which will ensure high efficiency of specialists and reduce the risks associated with professional burnout.

Conclusion. It should be noted that a comprehensive study of anxiety factors and coping strategies in air traffic controllers is an important area in modern labor psychology. The validity of using both traditional and innovative stress management methods is confirmed by numerous empirical studies, which allows us to recommend the development and implementation of systemic programs to improve the psychological stability of air traffic control specialists. Prospects

for further research involve the integration of interdisciplinary approaches aimed at improving the quality of air traffic controllers' work, enhancing their psychological state and ensuring air traffic safety. Moreover, research in this area will contribute not only to increasing the efficiency of professional activity, but also to improving the quality of life of workers, which is of great social and economic importance.

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