PSYCHOPHYSIOLOGICAL RESEARCH ON HIGH-RISK OCCUPATIONS IN THE NATIONAL SECURITY FIELD

Prof. Valeri Stoyanov, DSc., Dr. Anna Karadencheva, Dr. Rositsa Nedeva
Nikola Vaptsarov Naval Academy (Bulgaria)

Abstract: The present study introduces the results from psychophysiological research of environmental stressors and individual resilience among people with high-risk occupations in the national security field.

In order to identify the personal capabilities for sustainability and the main stressors in this professional area, the research was conducted through individual interviews and apparatus psychophysiological examination with Biofeedbeck methodology, which reports in real time the reaction of the autonomic nervous system under the influence of a certain stress factor.

The results show that the leading stressor in employees' activities is the experience of negative emotions, in the face of difficult and unpleasant interpersonal relationships in their work field.

By themselves, the results obtained design specific directions for educational and training improvement, related to the evolution of abilities for dealing with negative emotions on an individual level, and soft skills development in order to expand personal resilience on an organizational level.

Keywords: Biofeedback; leading stressors; national security

Employees working in the field of national security perform tasks that require both specific knowledge and skills, as well as highly developed stress resistance, accompanied by the ability to make rational decisions in a short time. Specialists who can be classified under this category of employees are military personnel, employees of the Ministry of Internal Affairs, State Security Service, military doctors, etc.

All the listed professions have several common characteristics:

clear hierarchical structure;

subordination compliance requirement;

assuming high responsibility;

completing tasks in a time deficit.

This article presents the results of a psychophysiological apparatus study of the leading stress factors in the activities of employees working in the field of national security. The purpose of the research is to find out which of all stressors has the strongest impact on the personality, and based on this, to outline an approach to improve training.

To achieve the goal, the following tasks are set:

Conducting a psycho-physiological apparatus study with representatives of the power structures.

Analysis of the obtained results.

Outline guidelines related to improving the training process in the direction of upgrading personal skills for stress resistance.

Research methodology

The psychophysiological study was conducted with a target group of twenty people (age group 30 – 45), using the Mind apparatus methodology Reflection for biological feedback Biofeedback, which reports in real time the reaction of the autonomic nervous system under the influence of a certain stress factor. The hardware test is carried out individually with each participant and complies with the necessary ethical requirements.

The persons examined are representatives of high-risk professions from government structures, as follows:

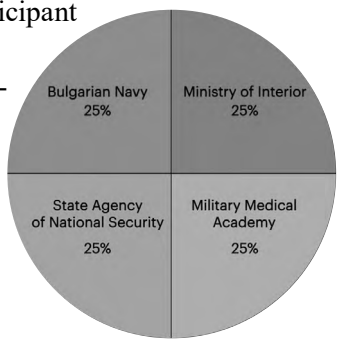

Figure 1. Percentage distribution of the surveyed persons by organizational affiliation

Theoretical framework of the study

Stress is caused by the impact of different types of stressors (Mednikarov 2008). It is important to note that the factors causing stress can be both external objective factors (illness, intoxication, etc.) and internal factors related to the experience of a certain emotion or even a thought. The human psyche does not distinguish between a real event and a thought one, they are experienced with the same force by the personality. The evaluation of the stressful event depends on the perception of the person - the same event is experienced differently by the people who participated in the event. Stressors can be short-term or long-term depending on their duration. For conducting the research with the apparatus methodology Mind reflection GSR short-term stressors are used, which allow in a limited period of time to determine the personal assessment of the severity of the stressors presented to the subject.

Results of a focus group interview

As a result of the conducted interview and discussion during the work with a focus group, the following main stressors were identified (Figure 2):

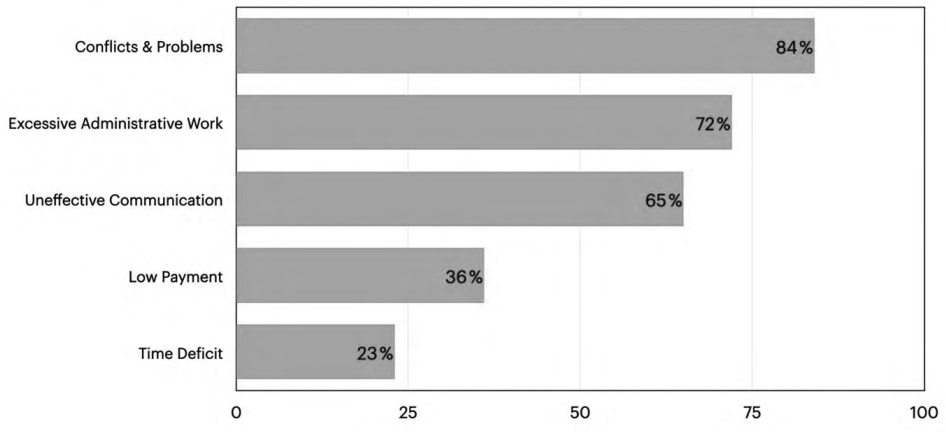

Figure 2. Main causes of high stress levels among security workers

The stressors presented above related to the work environment can generally be divided into two main categories: administrative and arising from working with people. The former are a product of the organizational structure, and the latter of developed skills related to communication and conflict resolution.

Emotional tension has a strong influence on the psychological workload, and therefore the interviewed persons indicate that the quality of interpersonal communication in the workplace has the greatest weight, and these results are also confirmed by a psychophysiological study (Biofeedback).

The hardware research is carried out with the biological feedback system, using the Mind Reflection hardware methodology. Through sensors placed on the fingers of the leading hand using the skin-galvanic reaction, the impact of each stressor is tracked in real time (Khann 2009). The results are reflected in the received stress profile of the individual examined. The study involved 20 volunteers practicing professions with a high degree of risk to the life and health of the person.

Method of conducting the research

Biofeedback tracks the impact of stressors on the subject and his or her ability to recover, and enables stress management skills to be diagnosed and trained (Khazan 2013). Providing controlled environment is important for the research being conducted and ensures comparability of the results obtained. The study is conducted in a classroom, with normal lighting and an air temperature of 20° – 22° C. The subject is familiarized with the purpose of the study. The delivery of the various stimulus-stressors is carried out in accordance with a precise algorithm[1].

The following instructions are given sequentially:

• Stressor 1: cognitive load. The volunteer performs calculations out loud on a task submitted by the experimenter – 2 min.

Restorative rest – 2 min.

• Stressor 2 – noise. Sounds are played that are considered unpleasant and stressful.

Restorative rest – 2 min.

• Stesor 3 - Strub ‘s test , aimed at measuring the ability to make decisions in a time deficit - 2 min.

Restorative rest – 2 min.

• Stressor 4 – an emotional experience shared by the volunteer and associated with negative emotions.

• Waiting for the examined person to recover and announcing:

End of research.

• The data is being recorded.

Results of the conducted research:

When ranking the obtained results and comparing the indicators of the individual stress profiles, it was found that the leading stressor is the emotional experience. In second place is decision-making in a time deficit. It is interest-

ing to note that sensory auditory stimuli do not significantly affect the level of stress. The cognitive load associated with quickly comprehending information and switching attention does not have a significant impact on the level of stress. The figure below shows the stressor score distribution.

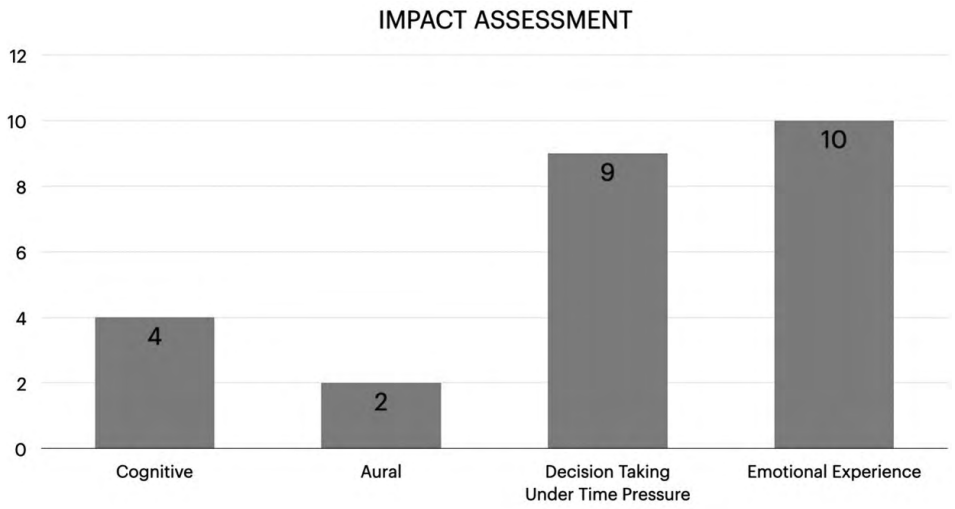

Figure 3. Distribution of individual assessment of stressors among national security personnel

The following conclusions can be drawn from the conducted research:

Interacting with people as part of the job duties of national security officials has the greatest impact on the stress level. Emotional experiences related to the performance of daily tasks are reflected on a psychological and physical level.

Making decisions in a time deficit is part of the job requirement. Despite the great burden on the psyche, this type of stressor is not experienced so deeply and for a long time by the persons studied.

Emotional experiences leave a lasting and deep imprint on the psychic level. This is confirmed by the conducted apparatus studies, where the main negative experiences are in the last month, but the impact reported on the stress level remains the highest at the time of the study.

Both conducted studies show that negative emotions are a leading stressor in the activities of those working in the field of national security. There is an urgent need to conduct training related to the development of soft skills aimed at interpersonal communication, self-control, conflict resolution skills and stress regulation abilities. Employees in law enforcement structures are subjected to a high mental load

caused by the experience of a number of negative emotions, primarily related to interpersonal relationships in the workplace. They express problems in communication, inability to cope with stress and effective resolution of conflicts. Improving the well-being of national security personnel requires the development of individual-level stress management skills, improved communication skills, and assertive conflict resolution. The greatest asset of any organization is its specialists, the introduction and implementation of programs related to the improvement and development of competences in the field of emotion management will lead to the optimization of the social-psychological climate and will solve a particularly painful problem with the departure of specialists.

NOTES

1. National Library of Medicine. [Online]. https://www.ncbi.nlm.nih.gov/.

2. STAVREV, D.; NIKOLOVA, P.; NEDEVA, R.; ZHEKOVA, V.; RAYNOVA, V.; MOSKOVA, M., 2023. *Collection of Algorithms for the Study of Maritime Professionals*. Varna: Medical University.

3. GRANCHAROVA, V.; LUTZKANOVA, S., 2019. Predizvikatelstva pred suvremennoto morsko obrazovanie. *Izvestia, SY-Varna*, pp. 30 – 39. ISSN 1314-3379.

4. KALINOV, K., 2016. *Organizatsionna kultura.* Varna: Dangrafik.

REFERENCES

KHANN, I., 2009. *Psychophysiological Stress Assessment Using Biofeedback*. National Library of Medicine. doi: 10.3791/1443

KHAZAN, I., 2013. *The clinical handbook of Biofeedback*. Hoboken, New Jersey: Wiley–Blackwell.

MEDNIKAROV, B., 2008. *Zashtita na morskiq suverenitet*. Varna: Voenno izdatelstvo. [in Bulgarian].

STOYANOV, V., 2020. *Upravlenie na stresa v organizaciqta. Psihologicheski I ypravlenski rakyrsi*. Varna: Steno. [in Bulgarian].

Prof. Valeri Stoyanov, DSc.
ORCID iD: 0000-0003-0531-6103

Dr. Rositsa Nedeva
ORCID iD: 0000-0002-0543-1331

Dr. Anna Karadencheva

Nikola Vaptsarov Naval Academy
73, Vasil Drumev St.
9002 Varna, Bulgaria
E-mail: v.stoyanov@nvna.eu
E-mail: rmladenova@mail.bg
E-mail: a.karadencheva@nvna.eu