

EFFECT OF STRESS AND PSYCHOLOGICAL OVERLOAD AT WORK ON PERFORMANCE OF EMPLOYEES

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1 INTRODUCTION

Everyone's life is a process full of contradictions, which requires a solution of less or more complex load situations. They are milestones on our path through life. Their requirements test our adaptability, set demands on health, physical fitness and mental strength of each of us. The load situations are not generally undesirable because they contribute to the mobilization of psychic forces, encourage learning, exploring new routes, stimulate further development of human personality. It is interesting that nowadays, the psychic load belongs to the dominant loads at work. Repairing of a tragedy is more difficult than trying to preclude it by various preventive measures. In today's daily life, there are ever more stress factors, originating in the surrounding environment and work - noise, lack of time, interpersonal relationships at the workplace, shift work, impending job cuts, etc.. All these stressful situations negatively affect the physical and psychical well-being of people.

2 LEGISLATION IN THE AREA OF MENTAL WORKLOAD

The Decree of the Ministry of Health of the Slovak Republic no. 542/2007 on details of health protection against physical strain at work, mental workload and sensory load at work in § 2 section 1 defines:

a) the mental workload is a factor which represents the sum of all evaluable effects of work, working conditions and working environment, influencing cognitive, sensory and emotional processes of humans that affect it and induce a state of increased psychic stress and overload of psychophysiological functions

b) the psychic load is a factor acting adversely on the organism, requiring mental activity, mental processing and coping with the requirements and environmental impacts where:

1. environment means everything that surrounds man, including working environment, community ties, events and behavioral requirements,

2. environmental and work requirements are greater than the individual's mental prowess, his work potency,

3. there are distinguished three forms of mental load: sensory, mental, and emotional;

c) **sensory load** resulting from requirements for a peripheral sensory organs and their corresponding structures of the central nervous system,

d) the **mental load** resulting from the information processing requirements on the psychological and mental processes, namely attention, imagination, memory, thinking and decision making,

e) the **emotional load** resulting from requirements causing affective response,

f) the **psychosocial load** is a factor acting adversely on the organism, requiring mental activity, mental processing and coping with the requirements and environmental impacts resulting mainly from social processes and social ties, the interactions between individuals in groups, in the crowd, etc. [1]

3 STRESS AND LOAD

Stress and load are two quite frequently used terms. What do they actually mean? How to describe them? Are they synonyms or different terms? There are different opinions that seek to explain the problem of understanding stress and load. Universally applicable definitions are being searched. Křivohlavý summarizing several definitions of stress determined that "stress usually means the internal state of a person who is directly threatened by something, or such a threat is expected, while he/she considers that his/hers defense against the adverse effect is not strong enough." Our understanding of the stress will therefore adhere to this definition.

An important role in explaining the psychic load plays the interaction approach, which assumes:

a) critical for load assessment is the relationship of external impacts and internal conditions;

b) the load under the same objective conditions of the external environment on different humans and on the same man in different internal states is different.

To clarify the terminology, J. Daniel (1997) proposed to "reserve the concept of stress for physical stress, or the heavy psychic stress, while for medium and light psychic stress would be more appropriate concept of load. "

The related view has J. Timko (1986), by whom it is optimal to use the term "load" for physiological and psychic states induced by load situations, and the term "stress" for an extreme form of load induced by risk situations where integrity or even the existence of a living system is compromised. Thus, the term

"load" is used in current, somewhat challenging situations, while the term "stress" in extremely difficult situations.

What kinds of load do we know?

According to the nature of stimulus and primary response is possible to distinguish three types of load:

- Biological load (stress): factors are of physical, chemical or biological nature, the responses of an organism are primarily biological, psychic reactions are subsequent and secondary.
- Physical load (stress): the requirements deal primarily with muscle activity, the body acts as an energy source. The physiology of work recognizes dynamic work (the criterion is energy expenditure, muscle contraction and relaxation alters in less than 3 seconds), static work (the criterion is the proportion of maximum muscle contraction force, muscle contraction and relaxation takes more than 3 seconds) and work performed in the inappropriate body position.
- Psychic load (stress): the process of primarily psychic treatment and coping with the requirements of life and work situations. Physical reactions are secondary, triggered by psychological process.

What are the causes of the emerging load?

If we should rank the causes of the load according to the impact, prominent places would be taken by natural catastrophes and disasters such as earthquakes, floods, storms and other climatic or physical changes of external environment, followed by wars, events associated with the death of a close loved one, loss of life perspectives, with the disintegration of family, with health threats, status and place in our social environment, the loss of the job, time pressure, with risk activities performed with the knowledge of far-reaching consequences of faulty decisions and performance.

For clearer views in this area is a decisive moment to constantly explore the causes.

Epstein distinguishes three types of stressors, depending on induced anxiety (according to Křivohlavý, 1994):

- a) biological stressors – threatening the life or existence of certain organs;
- b) stressors threatening our ability to cope with problems threatening assimilation capacity (the ability to absorb the new);
- c) the self-esteem threatening stressors.

What are the symptoms and consequences of load?

Life sometimes offers to each of us its bitter taste.

At least once, each of us had the feeling that we are at the bottom, that our power have left us, nothing goes well, we are fed up with everything.

Symptoms of stress:

1. Physiological signs of stress (migraine, palpitations, headache, etc.),
2. Emotional symptoms (excessive feelings of fatigue, sudden and significant changes in mood, increased irritability, anxiety, etc.),
3. Behavioral symptoms (excessive smoking, indecisiveness, impaired quality of work, feeling tired, etc.).

To these categories can be added other symptoms. Human individuality translates into inner life and behavior under the load – for some the load will show in the former for others in the latter. Impact effects on human are often disastrous. Therefore, we do everything to avoid stress. We are not always successful. It can affect our physical and mental health, relationships to other people, functioning in work and at home.

3.1 Causal dependence of stress

In the causal chain of stress, the stressor is at the beginning. Organism of the employee assesses the seriousness of stressor and on the basis of its ability to cope with stress arises the response to stress. It may be manifested in behavior, the psychic and physiological inner life, which causes the fluctuations in the performance of employee and in the safety and health at work.

The process of stress arising and following consequences take place in stages [Fig.1].

3.2 Workload

Workload or work stress represent a subset category of overall life load or stress, associated with working conditions in a broader sense. The workload has a direct effect on psychic and physiological functions of workers and influences the comfort and satisfaction of people in work. It is therefore imperative that the organizations take this fact into consideration and pay sufficient attention to improvement of the work environment, use of modern technologies, removal of dangerous places in the workplace, improving occupational safety and health at work and support of optimal working conditions.

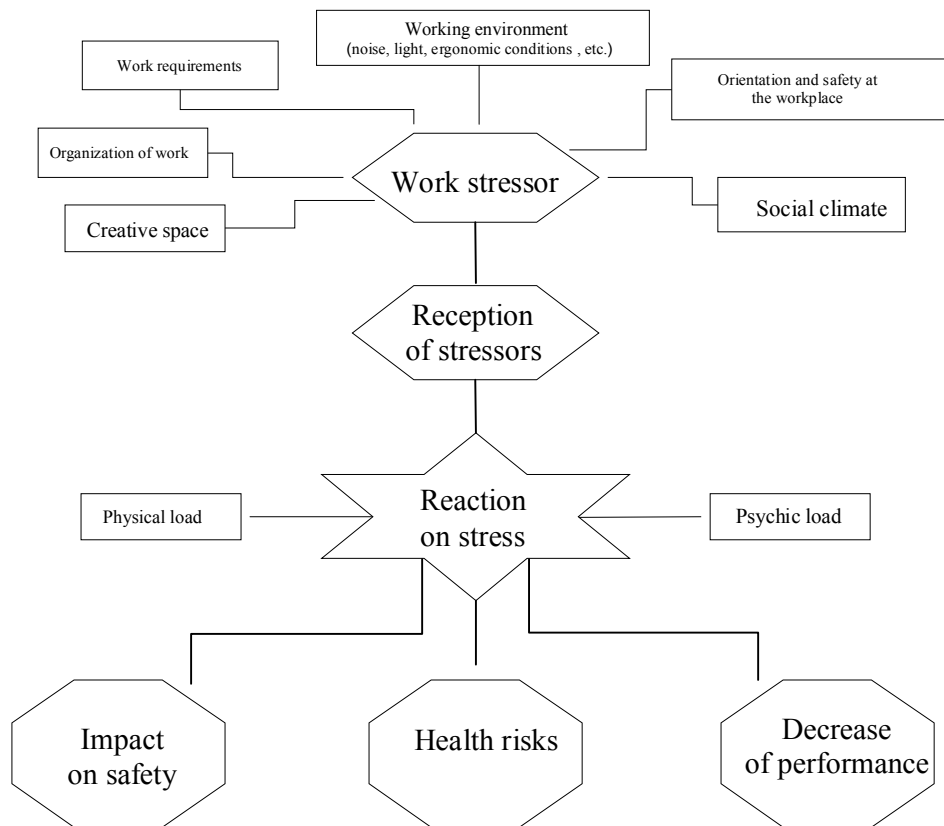


Figure 1. Causal dependence of stress and its effects [1]

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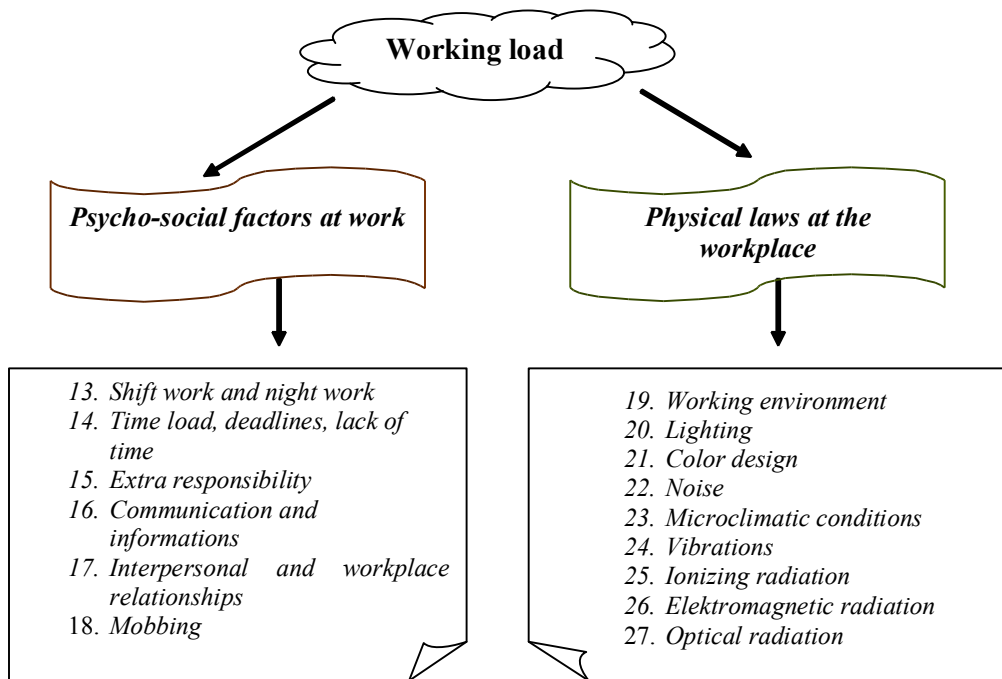


Figure 2. Distribution of workload

4 FORMULATION OF THE STUDIED PROBLEM

The research of given issues took place in a service organization, which operates on the market of information and telecommunication technologies for some time, already. It is one of the leading companies providing advanced telecommunications services in Slovakia. It was studied how the employees themselves assess the subjective mental load at work in ten characteristics: the intensity of work and time pressure, forced pace of work, monotony, concentration distorting effects, social interactions, personal risk, the risk of endangering own health and the others, shift work, the work environment, physical discomfort. In research, we focused on how the manager perceives mental overload of employees in terms of working conditions level.

4.1 Research method

The participants of the research were employees of the unnamed studied company. The sample consisted of 84 persons (24 men and 60 women). The average age was 28.3 years (22 yr - 55 yr). Each participant was given a test, which represented a method for assessing mental workload in terms of working conditions level. The questionnaire has high validity and reliability, whereas it

was standardized and its reliability was confirmed also by our sample. The testing was anonymous.

The method we used in the evaluation and testing:

- **The method for assessing mental workload in terms of working conditions level**

This method is intended as a basic screening tool of preventive occupational medicine for evaluation of mental workload in terms of working conditions level, that can affect the health of employees and their well-being. It assesses mental workload in 4 stages (a, b, c, d) according to 10 work characteristics and environment: the intensity of work and time pressure, forced pace of work, monotony, concentration distorting effects, social interactions, material and organizational responsibility, the risk of endangering own life and health or the others, shift work, the work environment, physical discomfort and other sources of load.

4.2 Processing of results, analysis

Studied hypothesis was qualitatively verified by analysis of a questionnaire filled out by manager of the studied company. The manager assessed the load on employees in ten categories, choosing among four levels of load. The results of this analysis can not be generalized, of course, but they are very useful to compare the perception of load among managers and employees. Ultimately, the expectations of management may be one of the main sources of load for employees.

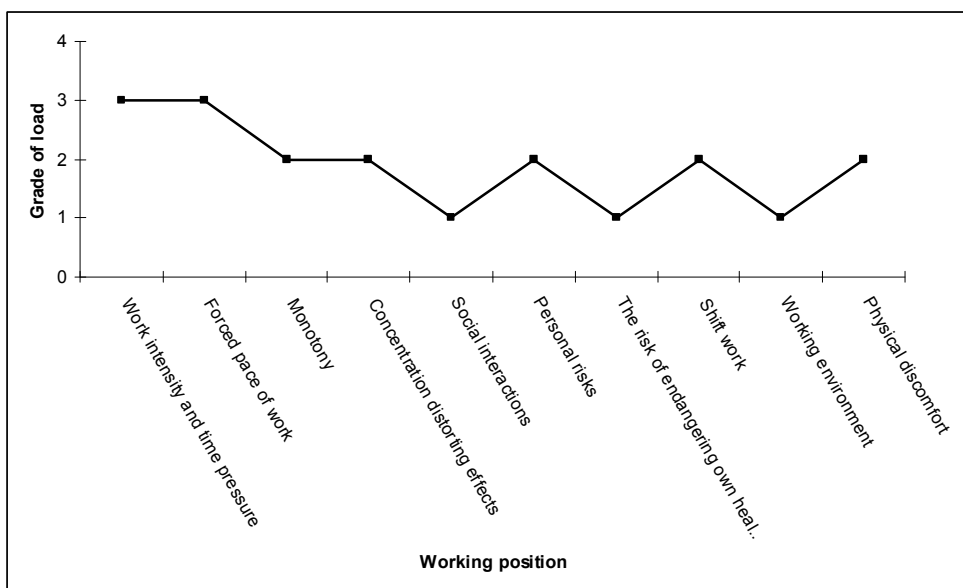


Fig. 3 Assessment of employee mental load by manager with regard to working conditions (Note: 1 – grade a, 2 – grade b, 3 – grade c, 4 – grade d)

The psychosocial loads were evaluated by the manager as follows:

1.1. *Load – intensity of work and time pressure: **the grade c*** – very intensive work with limited breaks, not allowing sufficient regeneration during the operation, which translates as overloading of information processing capacity, decision making under time constraints. Sensory and mental activity leads to rapid onset of fatigue, after max. 4 hours of work the activity must be interrupted. Overloading of attention at maximum use of sensory capacity, attention could not be lifted from monitored events. Tasks with regular daily occurrence of peak load at given time with duration up to 2 hours.

2.2. *The load – forced pace of work: **grade c*** - the pace and rhythm of activities are given by machine mechanism, but it is not hard subordination to machine rhythm, the worker has some freedom. Time to perform the operation need not to be strictly adhered to. Workers may leave their place for a short period of time.

3.3. *The load – monotony: **grade b*** – work with brief and temporary presence of repetitive actions or tasks. Performing of the alternating monotonous tasks.

4.4. *Effects impairing concentration: **grade b*** – interference occur to a lesser extent than in *grade c* (nonconstant disturbance and interruption of activities requiring a high concentration, but occurring every day), occasionally, not every day.

5.5. *Social interaction: **grade a*** – high likelihood and frequency of interpersonal conflicts.

The exercise of professional activities lies in influencing and guiding the behavior of persons that violate the social standards of conduct or require a special care.

6.6. *Personal risks: **grade b*** – increased (versus normal), responsibility for the partial economic and moral values. Decision-making mostly in near certainty situations. Limited amount of personal risk for the consequences of own behavior. Operational management and provision of work under normal conditions.

7.7. *The risk of endangering own health and others: **grade a*** – work without the risk of accidents and without risk to the health for others.

8.8. *Shift work: **grade b*** – irregular distribution of working hours during the day, divided shifts, waiting periods, prolonged shifts. Permanent work in the afternoon shift only.

9.9. *Working environment: **grade a*** – work without discomfort conditions.

10.10. *Physical discomfort: **grade b*** – work of 3rd category in terms of physical load, working position, microclimatic conditions.

Work with personal protective equipment slightly limiting the movement of limbs, visual field or hearing.

Hypokinesia: Continuous work in a sitting position with minimal physical activity.

The result of psychosocial loads assessment by manager falls into the category No. 2, where indicators of factors to which employees are exposed do not exceed given limits, but it is possible that at this level of exposure, adverse effects will affect the well-being of more sensitive subjects.

5 CONCLUSION

Currently it is very important to address and pay necessary attention to the psychological load on the working environment. High exposure to stress factors was not expected, given the subjective view of the manager. Excessively high load on employees would show unacceptable working conditions in the organization. The load to low would on the other hand testify about the insufficient labor deployment.

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REFERENCES

- [1] BALÁŽIKOVÁ, Michaela: Vplyv stresu na výkonnosť zamestnancov. In: Aktuálne otázky bezpečnosti práce : 21. medzinárodná konferencia BOZP : 3. - 5. 11. 2008, Štrbské Pleso. Košice : TU, 2008. s. 214-217. ISBN 978-80-553-0100-6.
- [2] Křivohlavý, J.: Jak zvládat stres. Praha: Grada Avicenum, 1994.
- [3] Kulhavy, M.: Zvýšenie výkonnosti zamestnancov minimalizovaním pracovného stresu, dizertačná práca, 2005
- [4] Vyhláška MZ SR č. 542/2007 Z. z. o podrobnostiach o ochrane zdravia pred fyzickou záťažou pri práci, psychickou pracovnou záťažou a senzorickou záťažou pri práci.

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