

## COMPARATIVE ANALYSIS AND EVALUATION OF OCCUPATIONAL STRESS IN CONTROL ACTIVITIES

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### Summary

Psychosocial factors (PSF) are leading among the new risks and modern challenges in providing safe and healthy conditions at work. Due to the high mental strain, inspectors are at highest risk for stress at work. The aim of the present study was to make a comparative analysis of PSFs in control activities, rate them and investigate subjective perception of stress at work. Two exhaustive cross-sectional studies were conducted consecutively, involving 338 and 355 inspectors, respectively, working at two organizations with control activities. The inspectors were men and women aged from 24 to 70. The statistical processing of data utilized the SPSS software version 17, at a significance level of  $p < 0.05$ . A number of common characteristics were found in the activities, the composition and structure of different groups of government staff: the number of women was greater (58% и 62.6%), with people over 40 years of age prevailing (67.3% и 70.9%), and the group with specialized work experience of 6 to 10 years comprised the greatest number of people. We found reliable differences in the answers concerning task requirements and activity organization. Rating PSF, one of the groups of inspectors placed "insufficient time to perform the check-up" in the first place, whereas the other one reported "conflicts while performing the check-up". PSFs exert an influence on the cognitive functions of inspectors, change their behaviour and emotional reactions and result in more frequent complaints of health deterioration. We found difference in the subjective stress perception depending on gender, age and duration of work experience as an inspector.

**Key words:** psychosocial factors, professional stress, early manifestation, labour inspectors, construction activities inspectors

### Introduction

Work-related stress is among the biggest challenges Europe is facing in the area of health and safety. It affects approximately one in four workers and the surveys show that 50-60% of all lost working days bear a relation to stress. That is a huge loss in view of the human suffering and impaired efficiency [1-3].

People experience stress when they feel a

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misbalance between the demands placed on them and the resources they have at hand to respond to these demands.

Although stress is a psychological phenomenon, it also affects people's physical health. Very often, the psychosocial factors (PSF) at work are the reason for that. The PSF are leading among the new risks and modern challenges in securing safety and health of workers [4]. Due to the high mental stress, an inspector's job is among the occupations with the highest risk for occurrence of work-related stress in effect of PSF.

In the available literature announcements can be found, that give practical examples how to combat stress [5, 6]. With an appropriate approach, workers and employees may be protected against stress. However, to select the right approach, it is necessary to identify the PSF at work and to evaluate the workers' perception of stress in the four main areas of impact [7].

The goal of the present study is to make a comparative analysis of the results from identifying the leading PSF in control activities, ranking them in importance and studying the workers' perception of the stress at work.

## Material and Methods

Two detailed transversal studies were conducted consecutively in the General Labour Inspectorate Executive Agency (GLIEA) and the National Construction Control Directorate (NCCD), covering respectively 545 and 355 inspectors aged 24-66, both male and female. The direct group inquiry was developed on the basis of the standard BDS EN ISO 10075 'Ergonomic principles related to mental workload' [8]. Questions were included that were related to identification of the PSF at work and subjective assessment of the impact of mental workload.

The statistical processing of data was made with SPSS software, version 17, at significance level for the null hypothesis  $p < 0.05$ .

## Results

The groups investigated in both organizations were predominantly women: 58% in the GLIEA and 62.6% in the NCCD, respectively. Most of them were over 40 years of age: 67.3% in the GLIEA and 70.9% in the NCCD. The group with specialized work experience ranging from 6 to 10

years was the most numerous (Figure 1).

The leading PSFs identified, ranked by significance, are listed below:

- Task requirements
  - high concentration at work
  - work under conditions of time deficit
  - numerous contacts and conflicts
- Social and organizational factors:
  - insufficient provision of information
  - favoritism
- Physical work environment
  - ergonomic problems
  - hazards in the sites of control

When ranking the PSFs, the inspectors of the GLIEA placed 'insufficient time to make the inspection' first. The inspectors of the NCCD ranked 'conflicts during inspection' first, and second – the negative attitude towards the inspector, respectively, towards the institution.

The responses of the inspectors from both organisations were aggregated and processed statistically.

Table 1 shows the correlations between the replies concerning the PSFs (social and organisational factors, task requirements and physical work environment) and the self-assessment of the respondent inspectors as regards their impact on the cognitive functions of the central nervous system (C), the behavioural changes (B), in the emotional manifestations (E) and the health condition.

Analyzing the results from the evaluation of the indicators for morbidity with temporary incapacity for work, we found no significant difference between the GLIEA and the NCCD. The average number of days lost due to temporary incapacity for work for the GLIEA was 11.6, and for the NCCD it was 10.7 days per employee.

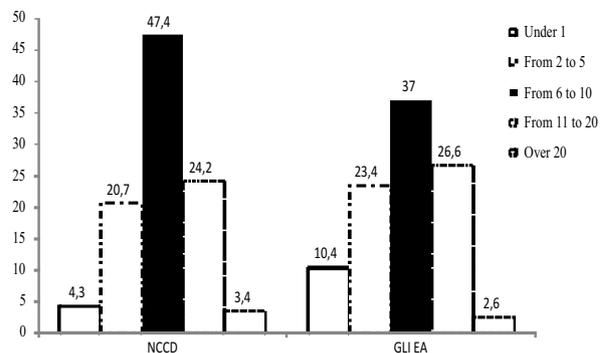


Figure 1. Distribution by length of service in the NCCD and the GLIEA

**Table 1.** Correlations between PSFs and respondents' self-assessment of their impact, by groups of PSFs

	Organizational factors		Task requirements		Factors of the work environment	
	r	P	r	P	r	P
Assessment of C	0.387	<0.001	0.559	<0.001	0.343	<0.001
Assessment of E	0.438	<0.001	0.535	<0.001	0.339	<0.001
Assessment of B	0.400	<0.001	0.533	<0.001	0.327	<0.001
Assessment of S	0.314	<0.001	0.487	<0.001	0.378	<0.001

Indications: the cognitive functions of the central nervous system (C), the behavioural changes (B), in the emotional manifestations (E) and the health condition (S)

**Table 2.** Snapshot of ill-health

Diseases of the cardiovascular system	Registered in 178 employees of the GLI EA - 37.6%*	Registered in 104 employees of the NCCD – 27.9% *
Diseases of the musculoskeletal system	Registered in 80 employees of the GLI EA – 18.8% *	Registered in 54 employees of the NCCD – 14.5% *
Diseases of the nervous system	Registered in 46 employees of the GLI EA – 9.7% *	Registered in 42 employees of the NCCD – 11.3% *

Note: 473 officials of the GLI EA against 373 in the NCCD were examined; \* p<0.05

## Discussion

We found many common characteristics in the activity, staff and structure of the groups of employees in the GLI EA and the NCCD. The inspectors of the said organisations exercise control on behalf of the state in relation to the observance of labour legislation, working conditions [8, 9] and regulations on construction.

The criteria in formation of the subgroups by gender, age and length of service in the GLI EA and the NCCD were selected on the basis of data from the literature. It is known that sex and age have an impact on perception of stress [10-12]. Besides, factors, such as length of service, qualification, training and experience, are important for coping with the responsibilities of an inspector. The shorter service (below 5 years) and the lack of experience in inspection may cause tension in control activities.

Identifying the PSFs, we found reliable differences in favour of the NCCD in the answers, related to task requirements and the organization of control activities.

In varying degrees, with no significant difference in the responses of the inspectors from both organisations, the PSFs and work-related tension were shown to have an impact on cognitive functions, changed the behaviour and the emotional reactions and caused higher frequency of complaints related to ill-health.

The inquiry on the perception of occupational stress covers questions, related to changes in the cognitive functions, the emotional reactions, changes in the behaviour and the nature of the psychosomatic (health) complains [8]. The strongest correlation was established with PSFs, related to the task requirements and risk perception. The task requirements are known to have most pronounced influence on the cognitive functions [13]. The social and organisational factors had the most expressed influence on the inspectors' behaviour.

The physical conditions in the working environment bear a most pronounced relation to the complaints of health changes [7, 13]. These correlation coefficients may be discussed as direct clues to which groups of factors the recommendations in the development of the program for optimization of the working conditions and reduction of work-related stress shall be attributed [1, 2].

## Conclusion

The approach for evaluation of the PSFs in the control activity and investigation of their impact on the staff, performing the said activity, has been developed on the basis of the standard BDS EN ISO 10075 'Ergonomic principles related to mental workload', implemented in the practice of the Occupational Health Service [2].

Comparative analysis of the results from the approach we developed was used to identify the leading PSFs in control activities, to rank them by significance and to study the perception of work-related stress. The analysis enabled us to verify the said approach and to propose it to the stakeholders to use it.

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