VÉDELEM TUDOMÁNY
KATASZTRÓFAVÉDELMI ONLINE TUDOMÁNYOS FOLYÓIRAT

Izabela Gabryelewicz, Patryk Krupa, Peter Pantya

SAFETY MANAGEMENT AND THE LEVEL OF CULTURE SAFETY BY AN EXAMPLE OF AN UNIFORMED SERVICE

Abstract

The following paper presents the results of a research on safety management and safety climate level in an uniformed service. The data from an example of an army unit located on Poland. The research has been carried out with the use of author's questionnaire to measure safety climate level. The results are presented by the means of Safety Culture Grid and there have been determined safety level indicators in various companies. The questions in the questionnaire are characterized by firm connection to designate of high safety culture. The results of the survey can be used in wide range. To diagnose safety state in the context of human behavior and consists detailed analysis of the results what allows to pinpoint weak and strong aspects of work safety in a special field, in an uniformed service, an army unit. This results by the survey enables one to undertake preventive and (or) repair actions adjusted to specific areas and worker groups.

Keywords: safety management, uniformed service, research, safety culture, human behavior

MUNKABIZTONSÁG KEZELÉSE ÉS A SZERVEZETI BIZTONSÁGI KULTÚRA EGY EGYENRUHÁS SZOLGÁLAT PÉLDÁJÁN KERESZTÜL

Absztakt

A cikk bemutatja egy, a biztonsági menedzsmenttel és a biztonsági kultúrával, klímával kapcsolatos kutatás eredményeit egy egyenruhás szervezetnél. Az adatok egy Lengyelországban található katonai egység példájából származnak. A kutatást a szerzők kérdőívének felhasználásával végezték a biztonsági szint mérésére. Az eredményeket az úgynevezett Biztonsági Kultúra Rács segítségével mutatjuk be, ez alapján a különböző

vállalatoknál meghatározásra kerültek a biztonsági szint mutatói. A kérdőívben szereplő kérdéseket a magas szintű biztonsági kultúra kijelölésével való szoros kapcsolat jellemzi. A felmérés eredményei széles körben felhasználhatók. A biztonsági állapot diagnosztizálása az emberi viselkedés összefüggésében, és az eredmények részletes elemzéséből áll, amely lehetővé teszi a munkabiztonság gyenge és erős aspektusainak pontos meghatározását egy speciális területen, egy egyenruhás szervezet, egy hadsereg egységénél. A felmérés eredményei lehetővé teszik, hogy megelőző és (vagy) javító intézkedéseket hajtsanak végre az adott területekhez és munkavállalói csoportokhoz igazítva.

Kulcsszavak: biztonságmenedzsment, egyenruhás szolgálat, kutatás, biztonsági kultúra, emberi viselkedés

1. INTRODUCTION

In the analysis of accidents usually technical, organizational and human factors are taken into account (Figure 1). Technical and organizational factors are quite easy to control in the terms of their quantity and quality. There are various guidelines in the form of standards, directives and legal rules. The problem are human factors, difficult to identify and quantify. How can one measure and present in a quantitative way values and norms that employees comply with? How can one define the level of awareness and employee's attitude towards Health and Safety regulations, Health and Safety services or employee's motivation for safe behaviors?

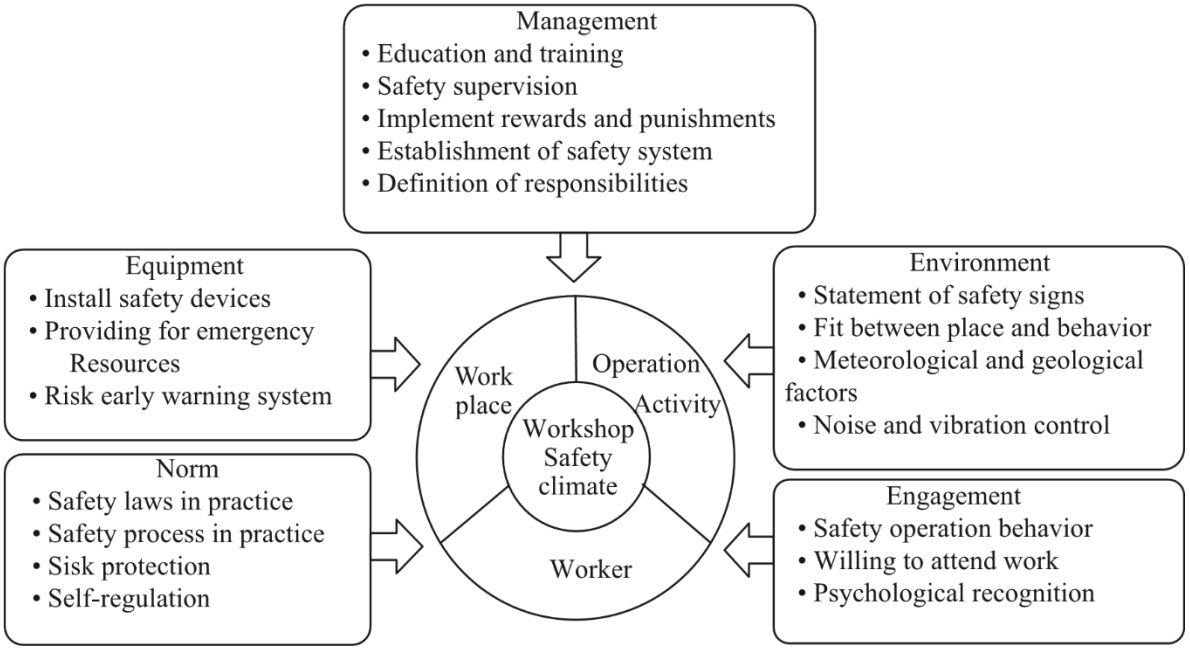

Figure 1 Conceptual framework of workshop safety climate [11]

One of methods to measure hidden manifestations of safety culture, the level of which has influence on work safety, are questionnaires aimed at measuring safety culture level. Such investigations are justified by the statistics of work accident causes. Irrespective of analysed industry it is assumed that the human factor is reason for 60 - 80% of accidents. [6]

2. RESEARCH METHOD

The research has been carried out with author's questionnaire devised by dr. eng. Izabela Gabryelewicz and prof. Edward Kowal from the University of Zielona Góra. The IT tools were developed by UZ (the University of Zielona Góra) employee Patryk Krupa. The developed application enables for fast, multi-directional analysis of the collected data. The developed application has an open form which can be expanded with additional applications [3]. The collected data comes from research carried out by Bartosz Czycz in his thesis, written under supervision of dr. eng. Izabela Gabryelewicz [1, 7, 8], Klaudia Kubicka in his thesis and Piotr

Flasza in his thesis, written under supervision Edward Kowal, prof. UZ. The research was carried out between 2015 and 2018. The research covered a three groups of soldiers:

- first group: 50 soldiers,
- second group: 85 soldiers,
- third group: 96 soldiers.

All the charts in the form of Safety Culture Grid include nine subject categories of safety culture. On the legs of the chart there is presented safety climate level in a given subject group. On the grid the values are presented in percentage scale. Each factor has assigned some value which then is marked on the grid [4]. The plan made by connecting single points gives information about percentage share of each factor in shaping safety culture level in a company. By counting the ratio of the whole grid to the area determined by the points marked on the the grid we get so called safety culture level indicator [2]. Determining this indicator allows to compare safety culture level with other companies or among researched employee groups, both within a company or a uniformed service as well as among various companies but with regard to similar employee groups. The uniformed services can be military units but also similar, law-enforcement units such as police or fire and rescue. [9, 10]

To be able to precisely choose methods that will allow to increase safety culture level, and thus to decrease the number of accidents and at the same time to increase the level of safety in a company there is required an analysis with regard to group of surveyed employees. Therefore, the following part of the paper presents safety climate level with regard to:

- total seniority,
- seniority in the researched workplace
- employee's education
- position held.

The results of the research end with a charts presenting general safety climate level.

3. RESEARCH RESULTS

The first researched factor that can influence safety climate level in a company was seniority. The research was carried out with regard to: total seniority and seniority in the current facility.

Total seniority

Figures 2 - 4 presents indicators of safety climate level with regard to total seniority. It shows very big diversity of the results. The lowest level of safety climate is shown by people with 3 to 5 years of service - the ratio is 0,38, 0,38 and 0,36. The highest level is presented by people with the longest time of service, over 20 years - the ratio is 0,65 and 0,44. This may indicate the need for additional motivational methods (training) for the group of people with 3 to 5 years of service.

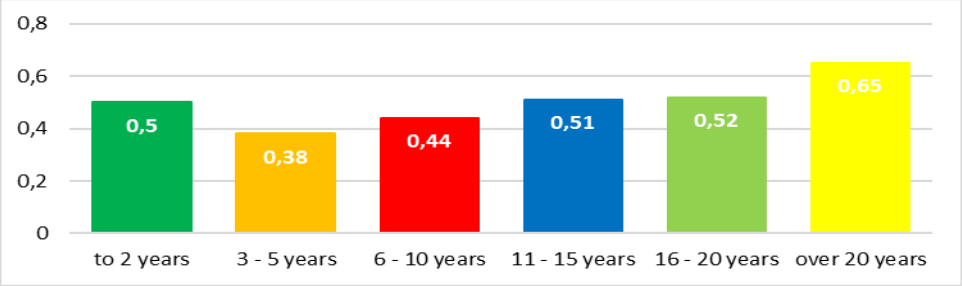

Figure 2 Ratio of safety climate level with regard to total seniority – first group

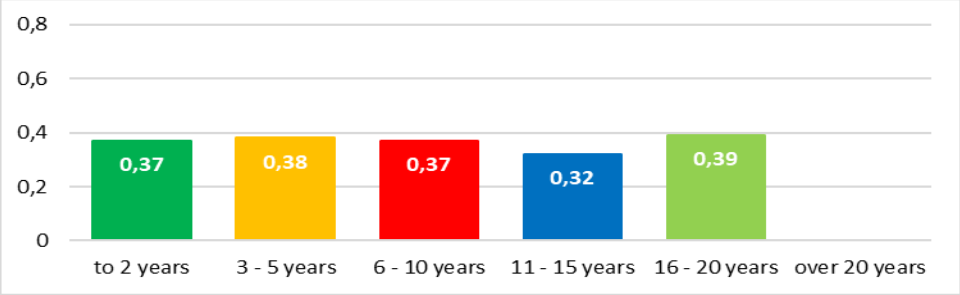

Figure 3 Ratio of safety climate level with regard to total seniority – second group

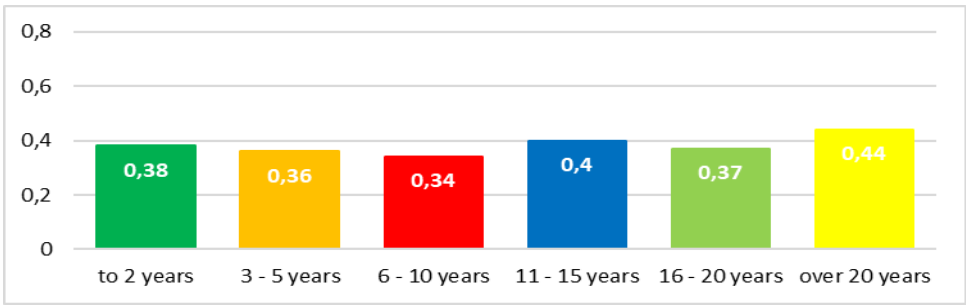

Figure 4 Ratio of safety climate level with regard to total seniority – third group

Figure 5 presents in the form of a Safety Culture Grid the level of safety with regard to total work experience in the researched facility. We can read from it the information in which subject group, which surveyed group of employees with regard to their total seniority requires corrective or repair actions. One can notice that workers with the shortest seniority show the lowest level of safety climate in the area - Motivation for safe behaviors. Employees with the longest seniority, despite generally high level of safety climate rate the lowest - Supervisors' attitude towards safety. It seems that employees with 3 to 5 years of service are the worst in each area.

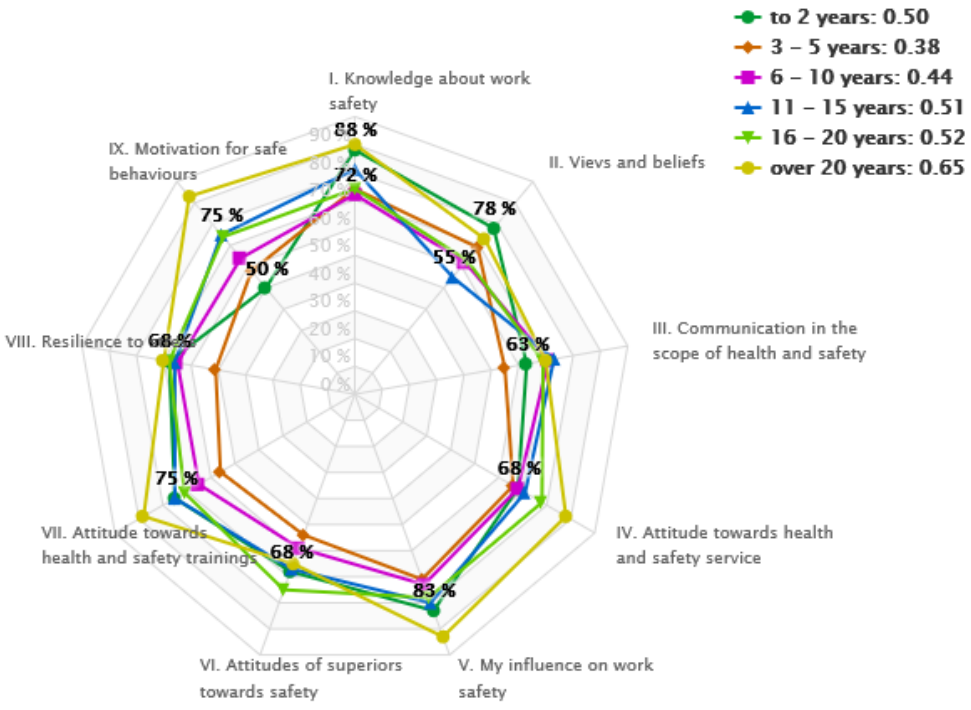

Figure 5. Safety climate level with regard to total seniority

Seniority in the researched workplace

Figures 6 - 8 presents indicators of safety climate level with regard to seniority in the studied workplace. The good thing is that there is an increase in safety climate level together with increasing seniority in the studied facility. This shows high impact of company culture on the general safety climate level presented by its workers. So as company culture influences the level of safety climate in a company, in the same way company climate (being a part of company culture) influences the level of safety climate on a given position. [5]

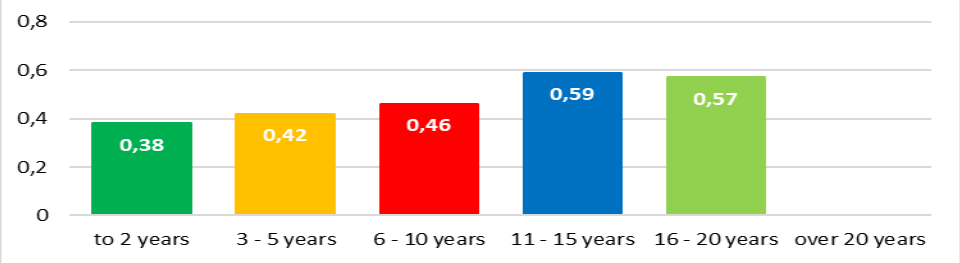

Figure 6. Safety level ratio with regard to seniority in the studied facility – first group

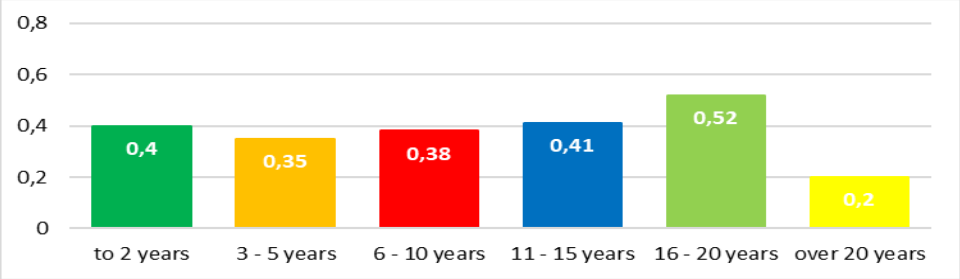

Figure 7. Safety level ratio with regard to seniority in the studied facility – second group

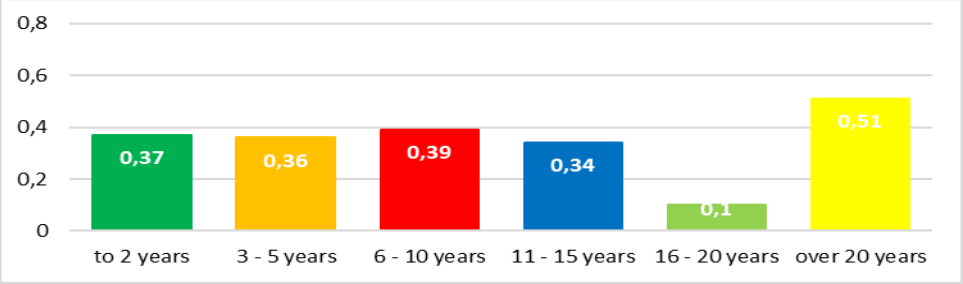

Figure 8. Safety level ratio with regard to seniority in the studied facility – third group

Figure 9 shows safety culture level with regard to seniority in the current facility with regard to each subject group. The lowest level (irrespective of seniority) we get in the area - Values and beliefs. Despite generally high level of safety climate in the studied facility, on the level of

personal beliefs employees show a fatalistic attitude. This is problematic, since to be able to efficiently introduce rules of safe work, employees should be convinced about validity and effectiveness of undertaken actions.

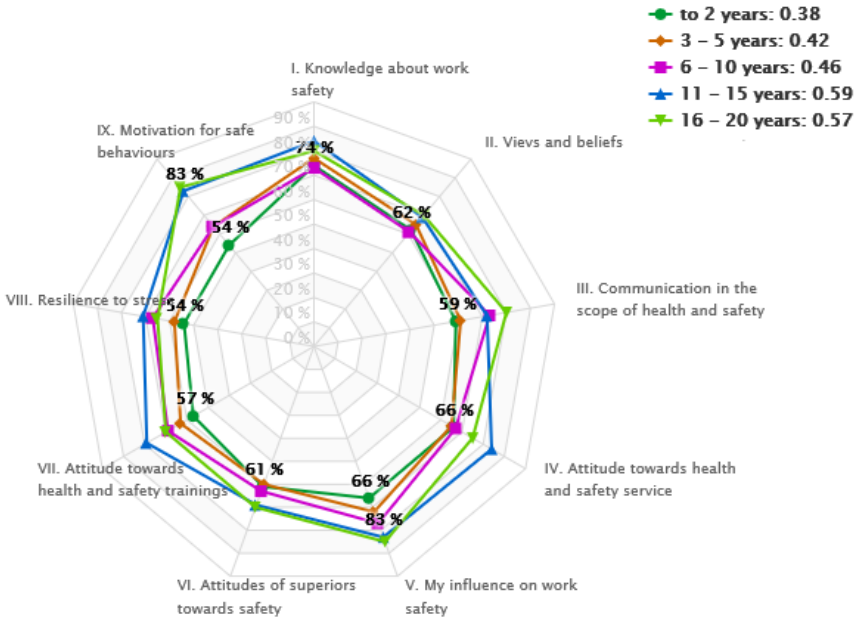

Figure 9. Safety climate level with regard to seniority in a given facility

Further factors which were taken into account in the research on safety climate level were: employee's age, his/her education, sex and position held.

Employee's education

Figure 10 presents safety climate level with regard to education. Indicators of safety climate are on similar level. Irrespective of the level of education, the lowest level of safety climate appears to be in the group of questions regarding - Values and beliefs. The questions from this group referred to personal beliefs of an employee about safety issues. From the low results in this group one can infer that the employees are not fully convinced about possibility of safe work and they think that health and safety rules make their work harder. They are also convinced about the relationship between safe behavior and remuneration.

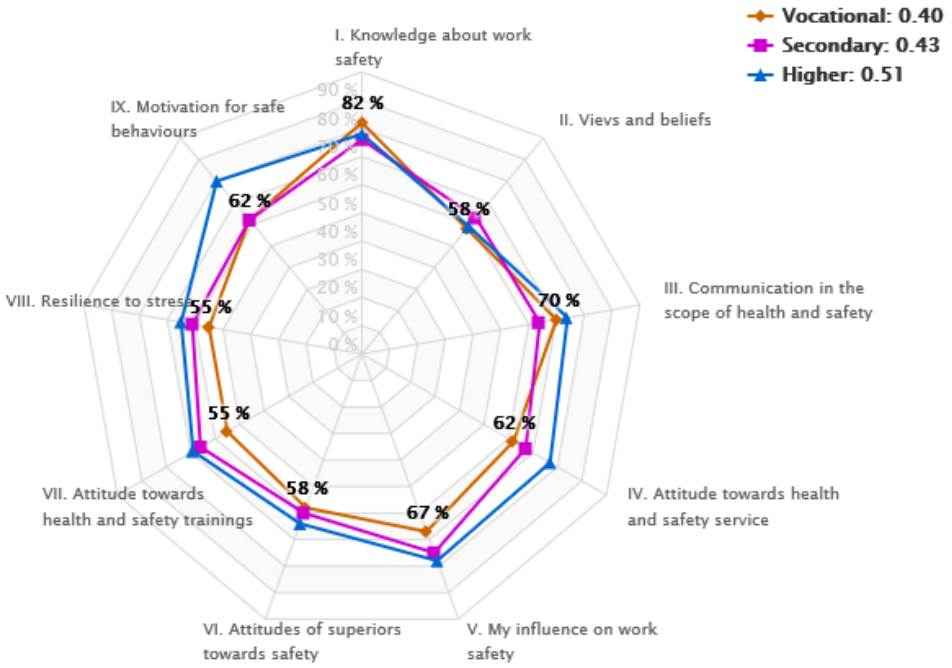

Figure 10. Safety climate level with regard to education

General level of safety climate

The general level of safety climate is shown on figures 11 - 13. It is visible that the highest level of safety climate is in the area - Knowledge of Health and Safety in the facility (77%) and in area - My influence on safety (76%). This speaks well about organized trainings and courses in the field of Health and Safety, and well conducted informational campaign about safe behaviors and applying good practices in the field of work safety.

The researched facility shows the lowest safety climate level in category - Supervisor's attitude towards safety (62%), Resistance to stress (63%) and, with exactly the same result in the category - Values and beliefs.

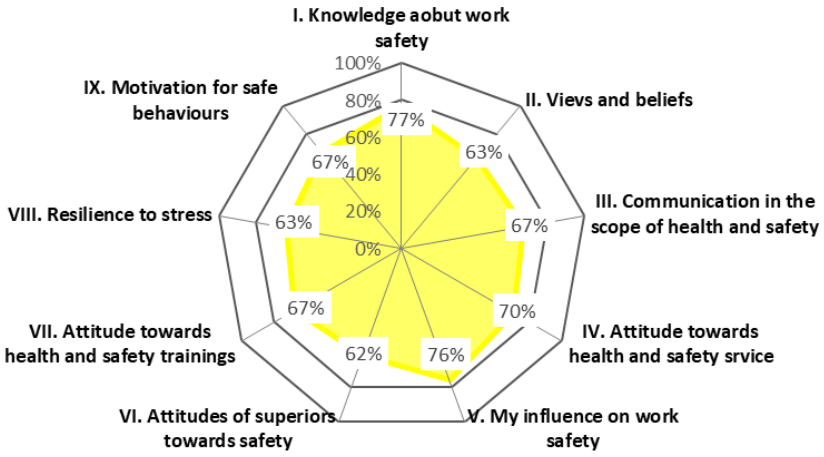

Figure 11. Overall safety climate level in an Army unit – first group

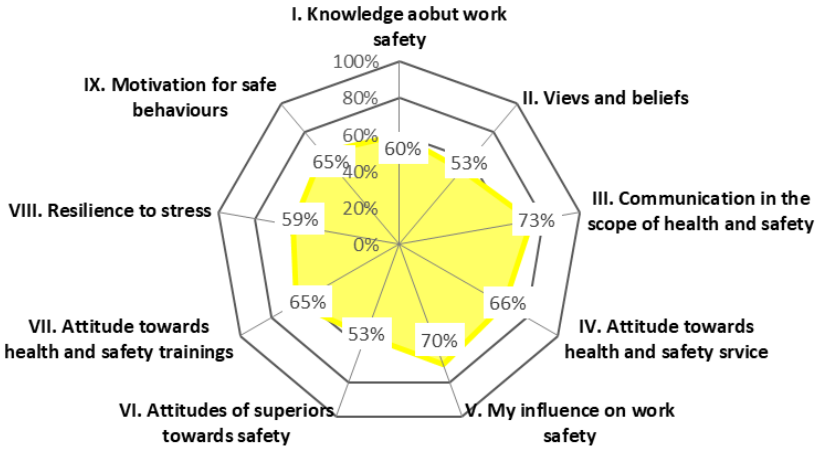

Figure 12. Overall safety climate level in an Army unit – second group

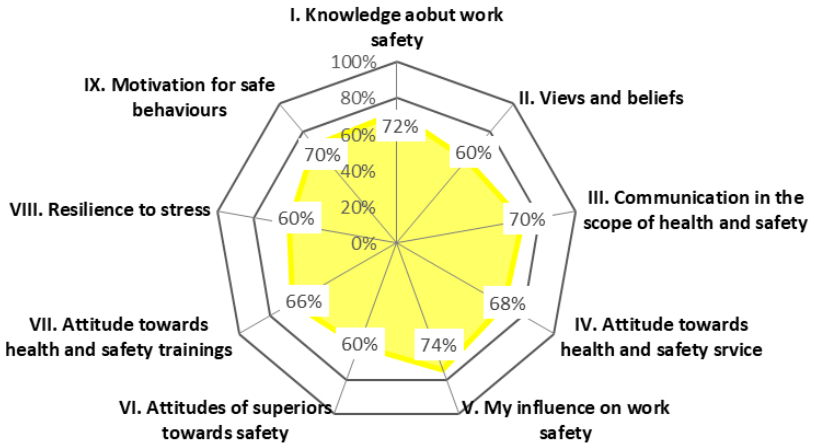

Figure 13. Overall safety climate level in an Army unit – third group

4. CONCLUSION

The main conclusion after the research is the necessity to improve Health and Safety management. Companies on the one hand put a lot of emphasis on implementing mechanisms and schemata for safety, on the other, however, there are deeply rooted areas which influence negatively safety climate.

For smooth functioning of any enterprise, irrespective of industry it operates in, there are many actions to be taken. Apart from operational processes (bringing added value), for correct functioning there are required managing and support processes. Managing Health and Safety surely belongs to actions facilitating operating of a company. Until some time ago, financial resources spent on ensuring safety in a workplace were treated as costs not investments. Only calculations regarding accident costs (damages, production losses, damage to company image) have convinced companies to treat the funds spend on safety as investments.

It is worth noticing that the actions connected with increasing the level of safety culture belong to low cost actions (especially in comparison to expenditures on technical safety measures). Such actions, however, will not bring results immediately, they are spread over a long period of time and they require continuous and constant work.

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Izabela Gabryelewicz
University of Zielona Góra, Zielona Górai Egyetem
E-mail: gabryelewicz@iimb.uz.zgora.pl
ORCID: 0000-0002-0691-4108

Patryk Krupa
University of Zielona Góra, Zielona Górai Egyetem
E-mail: p.krupa@iibnp.uz.zgora.pl
ORCID: 0000-0002-8388-0175

Peter Pantya
University of Public Service, Nemzeti Közszolgálati Egyetem
E-mail: pantya.peter@uni-nke.hu
ORCID: 0000-0003-2732-2766