HEALTH AND SAFETY CLIMATE PERCEPTIONS AMONG EMPLOYEES IN CONSTRUCTION INDUSTRY IN REPUBLIC OF MACEDONIA*

Prof. Valentina Žileska - Pančovska, Ph.D. M.Sc. B.Sc. Civ.Eng.
University „Ss. Cyril and Methodius", Faculty of Civil Engineering, R. Macedonia
valentinazp@gf.ukim.edu.mk
Assist. Prof. Biljana Blaževska Stoilkovska Ph.D. M.Sc.
University „Ss. Cyril and Methodius", Faculty of Philosophy, Department of Psychology, R.Macedonia
biljanab@fzf.ukim.edu.mk
Assist. Prof. Goran Mijoski, Ph.D. M.Sc. B.Sc. Civ.Eng.
University „Ss. Cyril and Methodius", Faculty of Civil Engineering, R.Macedonia
mijoski@gf.ukim.edu.mk

Abstract

The aim of this paper was to explore health and safety climate perceptions among employees in different work positions in the construction industry in Republic of Macedonia. Three aspects of this construct were in the study focus: perceived management commitment to health and safety in the workplace, perceived health and safety inspections rate and accidents frequency, perceived site workers commitment to work health and safety.
It was hypothesized that skilled workers perceived management staff as less committed to work health and safety, noted health and safety inspection as rare and accidents as frequent and perceived co-workers as more committed to work health and safety compared to civil engineers and clerical employees.
Sample consisted of 156 employees in construction sector. Health and safety climate was measured with 12 items assessed on a 5-point Likert scale. Results showed that perceived priority of work health and safety depends on employees work position.

Key words: Health and safety climate, construction industry, Republic of Macedonia.

* The complete text is available on CD-ROM / Žileska-Pančovska, Blaževska-Stoilkovska, Mijoski

Introduction

Health and safety climate refers to employees' perceptions of the priority of health and safety in the workplace. Precisely, safety climate denotes the degree to which employees believe that true priority is given to safety performance (Cooper and Phillips, 2004). Safety climate is also noted as perceived procedures, polices and practices related to safety in the workplace (Neal and Griffin, 2006).

There is an evidence that positive safety climate is strongly associated to involvement into safety behavior - safety compliance and safety performance (Griffin and Nail, 2000), that is related to higher work satisfaction (Gyekye, 2005), perceived organizational support (Gyekye and Salminen, 2007) and organizational commitment (Tao et al., 1998, as cited in Mearns et al, 2010). It was reported that long tenured workers had more positive safety climate perception than short tenured workers (Gyekye, 2006). Also, there is an evidence that positive safety climate is connected to lower rate of accidents and injures in the workplace (Cooper and Phillips, 2004; Griffin and Neal, 2000; McCaughey et al., 2013, McConagle and Kath, 2010; Neal and Griffin, 2006), as well as to lower risk perception (Rasmussen and Tharaldsen, 2012).

This construct, as stressed by Cooper and Phillips (2004), could be "early warning" of potential failure of safety system.

From a total of 12 deaths at work in 2011 in Macedonia, 11 occurred in the construction sector. They were caused by falls, contusion of construction vehicles and lack of safe work procedures. According to the State labor inspectorate (State labor inspectorate report for year 2011), responsible for this situation are mainly the supervisors and less frequently the workers. The data from the inspectorate indicates that 85 accidents have occurred at the workplace. As the most common cause for them are identified the inconsistent application of regulations, rules and principles of safety at work, unsafe physical working conditions, insufficient training of staff and unfulfilled medical examinations.

Taking into consideration what was mentioned above, it could be concluded that examination of health and safety climate in construction as industry with high rate of injures and fatal accidents will have important scientific and practical implications.

Accordingly, the aim of this paper was to explore health and safety climate perceptions among employees at different work positions in the construction industry in Macedonia.

More precisely, three aspects of health and safety climate were in the study focus:

- perceived management commitment to health and safety in the workplace,
- perceived health and safety inspections rate and accidents frequency and
- perceived site workers commitment to work health and safety.

There are different models with different number of dimensions of safety climate construct (for e.g. Zohar, 1980, as cited in Griffin and Neal, 2000; Dedobbeleer and Beland, 1991; Hayes et al., 1994; Neal and Griffin, 2006). The ones mentioned above are identified in some models, but they are considered to be most usefull for the Macedonian kind of research.

It was expected that employees in construction sector in Macedonia will differ in their perceptions of safety and health at the work site.

Following hypotheses were defined:

- Skilled workers perceived management staff as less committed to work health and safety compared to civil engineers and clerical employees;
- Skilled workers contrary to civil engineers and clerical employees perceived health and safety inspection as rare and accidents as frequent;
- Skilled workers perceived co-workers as more committed to work safety and health compared to civil engineers and clerical employees.

2. Method

2.1. Sample and procedure

The research was performed on a sample of 156 persons, employed in the construction sector in Macedonia, 80.8% were men and 19.2% were women. 91 participants were skilled workers, 34 were civil engineers and 31 were at clerical work position.
The data was collected in December, 2012 during work breaks. It was explained that participation is voluntary, that responses would stay confidential and be only used in research purposes. The questionnaire was filled for 10 to 15 minutes.

2.2. Measure

Twelve items measure developed by the authors of the study was administered to assess health and safety climate dimensions. They were organized into three separate subscales:

- *Management commitment to health and safety subscale* consisted of five items (e.g. *Management provides all necessary safety equipment for employees*). This scale denotes the extent to which management was perceived to be committed to working safely. Cronbach alpha reliability was α=.87.
- *Perceived accident rate and health and safety inspection subscale* has five statements and was used to assess the extent to which employees perceived work conditions in construction sector safety, as well as the perceived level of application of mechanisms by organizations and relevant state institutions (e.g. *Inspections of safety and health conditions in the workplace are conducted frequently*). The reliability coefficient of this subscale was α=.77.
- *Co-workers commitment to safety and health subscale* with two items (e.g. *Some workers do not use safety equipment even if they take risk actions during their work),* measures perception of co-workers' engagement into unsafe behavior during work tasks completion. Its reliability coefficient was α=.78.

Answers were given on a 5-point Likert scale ranging from 1-not at all agrees to 5-completely agree. Higher score on each subscale indicated a more positive perception of safety climate dimensions.

2.3. Statistical analysis

To examine differences in three dimensions of safety climate among participants at distinct work positions Kruskal Wallis test was used. The data was processed with statistical package SPSS v.17.

3. Results

The preliminary analysis showed that the error variance is not equal among the three groups of participants (skilled workers, civil engineers and clerical employees) when it comes to the variable - *perceived management commitment to health and safety in the workplace* ($F(2, 154)=6.82$, $p< .001$) (tab. 1). Shapiro-Wilk test of normality showed that the variable - *perceived management commitment to health and safety in the workplace* is not normally shown in the group skilled workers (stat.= .94, df=91, $p< .001$) and among clerical employees (stat.= .93, df=31, $p< .05$). This test suggest that the distribution of the variable *perceived site workers commitment to work safety* in the category skilled workers is not normal (stat. = .92, df=91, $p< .001$).
Therefore, for data analysis the Kruskal-Wallis test was applied.

Table 1.
Ranks of study variables

Safety climate dimensions	Work position	N	Mean Rank
Management commitment to safety in the workplace	Skilled workers	91	70.60
	Civil engineers	34	93.31
	Clerical employees	31	85.45
Safety inspections rate and accidents frequency	Skilled workers	91	70.45
	Civil engineers	34	82.66
	Clerical employees	31	97.58
Site workers commitment to work safety	Skilled workers	91	87.10
	Civil engineers	34	69.29
	Clerical employees	31	63.35

Results showed that participants significantly differ in the perception of health and safety climate.
Skilled workers compared to civil engineers, reported that they perceived management staff as less committed to work health and safety, $H(2)= 7.2$, $p< .05$.
Contrary to clerical employees, skilled workers perceived that there are not enough health and safety inspection and that accidents are relatively frequent, $H(2)= 8.76$, $p< .05$. They, also, perceived their co-workers as highly committed to work health and safety compared to clerical employees, $H(2)= 8.33$, $p< .05$.
Post hoc tests (Mann-Whitney) were performed for further analysis. It was demonstrated that there were not additional differences among pairs of investigated groups of employees in respect to health and safety climate dimensions. Accordingly, hypothesis 1, hypothesis 2 and hypothesis 3 were partially confirmed.

4. Discussion

The aim of this paper was to explore health and safety climate perceptions among employees at different work positions (skilled workers, civil engineers and clerical employees) in the construction industry in Macedonia. Namely, three aspects of safety climate were in the study focus:

- perceived management commitment to health and safety in the workplace,
- perceived health and safety inspections rate and accidents frequency and
- perceived site workers commitment to work safety and health.

According to the report from the State labor inspectorate, it is concluded that safety and health, while working in the construction site, do not reach the satisfactory level. The report states that the management in this sector does not fully obey the procedures for safety at work and in some cases the same is established for the workers.
It often happens for workers to not wear the protective helmets and gloves because they might be less efficient or when in the working environment dominates the opinion that men who wear protective equipment are cowards (Riggio, 2003).
According to the findings, the civil engineers and the clerks judge the workers as less attached to the rules and procedures for safety and health at work. On the other hand, their most direct associates judge them more positively in this dimension of the health and safety

climate, actually their opinion is that they do not take risky actions and that they wear the necessary equipment all the time. But, the Kruskal-Wallis test has shown that statistically there is a big difference in the civil engineers opinion and it has shown that they statistically differ only from the sluzbenicite in the way they perceive the behaviour of their colleagues in the domain of safety at work. Therefore the first hypothesis is partially confirmed.

When it comes to the dimension management commitment to health and safety at work, the results are different – the civil engineers judge the management commitement to the safety rules and procedures positively, while the workers claim that the managers don't make enough efford for the working conditions and that they don't provide training and enough equipment for safety and health. The way the engineers understand this aspect of the health and safety climate does not match the conditions in the State labor inspectorate. But, if taken into consideration that a big part of this group are executives, then it is most likely that they show the situations in the best way possible. It is possible that their grades are based on a minimal level of realized safety standars, which are not enough. But, signal for failure, as it is called Cooper and Phillips (2004) this construct, it is obvious that it shouldn't be neglected.

When it comes to the accidents and the injuries at work sites, clerks state that their number is relatively small and that the controls of the safety are regular. The workers statistics significantly differ from them, about the rate of accidents at the work sites, and the organizational supervision in the implementation of the procedures of safety and health in the workplace. Notably the workers grade this aspect of the health and safety climate more negatively than the clerks.

Generally, the results of the way the employes in the construction sector grade the priority given to the safety and health at work sites, could be due to the different views of the work. Workers at higher job ranks are more satisfied (Furnham, 2011) which maybe further on would lead to more positive perceptions to the health and safety climate. Another explanation could be the degree the employees are familliar with the procedures for safety and health at work sites and the degree of awareness fot the activities the management does in that domain.

Probably, the identification with the group to which the surveyed people consider belonging, the support from the executives and the type of communication that exists in the superior – subordinate relationship should be all considered.

5. Conclusion

The reported findings indicate that employees with different job positions in the construction sector have a different mental model for safety and health at worksites. For more detailed understanding of the given differences it is necessary to examine the role of other factors as well. In that way more secure explanations would be given for the differences in the perception of the health and safety climate.

Furthermore, it would be useful to verify or modify the safety procedures and practices (e.g. Zohar, 2002), all employees should be introduced with them and they should be implemented in the working environment.

Open communication and support among management, supervisors and workers is needed, too. It is expected that, that is the way of overcoming the wrong perceptions/misperceptions connected to the roles of each of these sides in the safety and health at worksites.

Finally, that will contribute to health and safety behavior and physical and mental health among employees. Working in safe and health environment in turn, will lead to higher work performance and lower financial costs from accidents, injures, medical treatments and absenteeism.

Further investigations of safety climate from broader perspective (eg. Kines et. al., 2011) together with other psychological aspect of work environment in construction industry (eg. Boschman et al. in press) is needed.

References

Cooper, M. D. and Phillips, R. A. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research 35,* 497-512.

Neal, A., and Griffin, M. A. (2006). A study og the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology, 91* (4), 946-953.

Griffin, M. A. and Neal, A. (2000). Perceptions of safety climate at work: a framework for linking safety climate to safety performance, knowledge, and motivation. Journal of Occupational Health Psychology, 5 (3), 347-358.

Gyekye, S. A. (2005). Workers' perceptions of work safety and job satisfaction. International Journal of Occupational Safety and Ergonomics, 11 (3), 291-302.

Gyekye, S. A. & Salminen, S. (2007). Workplace safety perceptions and perceived organizational support: Do supportive perceprions influence safety perceptions? International Journal of Occupational Safety and Ergonomics, 13, (2), 189-200.

Mearns, K., Hope L., Ford. M. T. amd Tetrick, L. E. (2010). Investment in workforce health: exploring the implications for workforce safety climate and commitment. Accident Analysis and Prevention, 42, 1445-1454.

Gyekye, S. A. (2006).Organizational tenure and safety perceptions: coparative analysis. Journal of Occupational Health and Safety, 22 (4), 359-371.

Deirdre McCaughey, D., Jami L. DelliFraine, J. L., Gwen McGhan, G., & Bruning, N. S. (2013). The negative effects of workplace injury and illness on workplace safety climate perceptions and health care worker outcomes. *Safety Science, 51,* 138-147. http://dx.doi.org/10.1016/j.ssci.2012.06.004

McConagle, A. K. & Kath, L. M. (2010). Work-safety tension, received risk, and work injures: a mesomediational model. *Journal of Safety Research, 41,* 475-479.

Rasmussen, H. B. & Tharaldsen, J. E. (2012). The impact of safety climate on risk perception on Norwegian and Danish production platforms. Advances in Safety, Reliability and Risk Management, 1833-1839.

State labor inspectorate report for year 2011. Retrived from http://dit.gov.mk/godisniIzvestai_full.php?id=2011, 15.04.2011

Dedobbeleer, N & Beland, F. (1991). A safety climate measure for construction sites. Journal of Safety Research, 22, 97-103.

Hayes, B. E., Perander, J., Smecko, T. & Trask, J. (1994). Measuring perceptions of workplace safety: development and validation of the work safety scale. Journal of Safety Research, 29, 145-161.

Riggio, R. E. (2003). Introduction to Industrial/Organizational Psychology. New Jersey: Pearson Education, Inc.

Furnham, A. (2011). The psychology of behaviour at work. Hove: Psychology Press, Taylor and Francis Group.

Zohar, D. (2002). Modifying supervisory practices to improve subunit safety: a leadership-based intervention model. Journal of Applied Psychology, 87, 156-163.

Kines, P., Lappalainen, J., Lyngby Mikelsen, K., Olsen, E., Pousette, A., Tharaldsen, J., Tómasson, K. & Törner, M. (2011). Nordic Safety Climate Questionnaire (NOSACQ-50): A new tool for diagnosing occupational safety climate. International Journal of Industrial Ergonomics, 41, 634-646.

Boschman, J. S., van der Molen, H. F., Sluiter, J. K. & Frings-Dresen, M. H. W. Psychosocial work environment and mental health among construction workers. Applied Ergonomics, in press, retrieved from: Sciencedirect.com, 19.04.2013