PSYCHOSOCIAL FACTORS THAT PREDICT SAFETY CLIMATE OF ORGANIZATION IN AGRICULTURAL INDUSTRY

Aurelija Stelmokienė[1], Loreta Gustainienė[2], Kristina Kovalčikienė[3]
[1] *Assoc. Prof. Dr Vytautas Magnus University. Jonavos str. 66-331, Kaunas, Lithuania.*
Tel. +370 37 327 824. E-mail aurelija.stelmokiene@vdu.lt
[2] *Assoc. Prof. Dr Vytautas Magnus University. Jonavos str. 66-331, Kaunas, Lithuania.*
Tel. +370 37 327 824. E-mail loreta.gustainiene@vdu.lt
[3] *Dr Vytautas Magnus University. Jonavos str. 66-327, Kaunas, Lithuania.*
Tel. +370 37 327 825. E-mail kristina.kovalcikiene@vdu.lt

Successful functioning of an organization, especially agricultural one, implies the necessity for a properly organized system of employee health and safety. The system will function properly only when employees perceive organizational safety processes and procedures as a part of their behavior at work. The purpose of this study with reference to scientific literature and empirical research to determine the main factors that predict higher safety climate in organization. 961 employees from a large Lithuanian company of agricultural industry participated in the survey. The study was conducted using Sexton's Safety Climate Questionnaire and two scales from Copenhagen Psychosocial Questionnaire. The analysis of data via Structural Equation Modeling confirmed the theoretical model of psychosocial safety climate antecedents. The findings of the study showed that employee trust in management had higher predictive value as compared to workplace commitment, and that the leader's role in promoting safety in an organization is more important than employee attitudes or declared safety-related orders and procedures in the organization.
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JEL Codes: I12, J28, J43.

1. Introduction

Eurostat (2014) declares that during a single year, about 3 percent of the workforce in the EU was absent from work more than three days due to an accident at work, 3691 accidents resulted in death. According to Lithuanian statistics (State Labour Inspectorate, 2017), 44 lethal, 146 serious and 3335 minor accidents at work occurred in 2015. Moreover, the total number of accidents at work was increasing in 2012–2015 (from 2927 to 3525). According to Eurostat (2016) fatal incidence rates for 2013 and 2014 in EU were from less than 1.0 per 100 000 persons employed in Sweden, the United Kingdom, Finland (2013 data), Greece and the Netherlands (as well as Iceland in 2013) to more than 4.0 fatal accidents per 100 000 persons employed in Bulgaria, Latvia, Lithuania and Romania as compared to the EU rate of 1.8.

Thus, Lithuania is above the EU average in fatal accident rate. 14.3 percent of accidents at work took place in manufacturing industry enterprises. Beside other institutions, production organizations that produce nitrogen fertilizers and chemical products for agricultural sector are especially in concern about safety issues because their employees participate in high-risk operations. Besides, 437 occupational diseases were recorded in the Register of Occupational Diseases of Lithuania in 2015. Statistical data about workplace injuries and illnesses confirm economic and social significance of safety issues. However, these issues "have received only cursory attention by management scholars" (Zohar, 2014, p. 317). Research over the past 35 years indicate that safety climate is an important predictor of safety behavior and safety outcomes such as accidents and injuries (Griffin, 2016a). Therefore, additional knowledge about safety climate in organizations is of high importance.

Quite often production organizations declare that taking care of employees' safety at workplace and occupational health is one of their priority objectives. Moreover, safety climate in the organization is understood as an integral part of the organizational culture. Therefore, management system of employee occupational health and employees' safety is necessary for successful functioning of production organization. The National Action Plan on Health and Safety at Work for 2017–2021 (State Labour Inspectorate, 2017) confirms that the health and safety at work are a key factor for increasing production efficiency and competitiveness of organization. The newest scientific approach also confirms the value of preventive role of safety climate and emphasize generative contribution of safety climate to change and growth of organization (Griffin, 2016b). Consequently, practitioners that work in high risk organizations are seeking for particular recommendations what factors could predict higher safety climate in organization and would be valuable to include into management system, because safety climate is related to fewer incidents (Griffin, 2016a).

The main *scientific problem* of this article – what factors can predict safety climate in a specific organization, manufacturer that produces products for agricultural industry? *Research object*: safety climate. *Research aim*: with reference to scientific literature and empirical research to determine the main factors that predict higher safety climate in organization. *Research objectives*: 1) to conceptualize the importance of safety climate in production organization; 2) with reference to scientific literature to identify the main factors that are related to the improvement of safety climate in organization; 3) with reference to results of empirical research to explore if identified factors are important for the prediction of safety climate in real organization. *Research methods*: analysis and synthesis of scientific literature and quantitative empirical method (survey).

2. Theoretical insights

Zohar (1980, p. 96) defined the concept of safety climate as "shared employee perceptions about the relative importance of safe conduct in their occupational behavior". Safety climate helps to understand employees that during the production process safety is a priority. This understanding is related to more frequent safety behavior

(Zohar, 2014), which in turn is associated with a reduction of injuries and accidents in the workplace (Griffin, 2016a). However, quite often rules and procedures that are associated to safety compete with productivity or efficiency (Zohar, 2010). Therefore, it is important to provide specific arguments for the value of safety climate improvement in organization that deals with high risk procedures in daily performance. First of all, modified version of safety pyramid model suggests the significant effect of safety climate on such injury factors as unsafe acts, unsafe conditions, cumulative exposures (Reason, 1997; Zohar, 2010). Injuries and occupational illnesses mean high direct (e.g. insurance rates) and indirect (e. g. lack of workforce) costs for organization. Investment in safety climate can prevent organization from these costs. Secondly, safety outcomes for organization is not only reduced costs for injuries and occupational illnesses but also additional value of stronger organizational culture (Neal, 2004; Zohar, 2014). Moreover, it may foster both more positive attitudes and behaviors of employees: their extra efforts for organization that cares about them (e.g. higher productivity rates) (Griffin, 2016b; Mearns, 2010). So, investment in safety climate works not only as a preventive tool, but as developmental practice too.

Griffin and Curcuruto (2016) state that motivation to work safely and the safe behavior depends on the organizational context. Perceived management commitment to employee protection is identified as one of the core meanings of safety climate (Zohar, 2014). Actual practices at work are more important for employees than formal espousals of safety (Zohar, 2008). Day-to-day communication about the value of employees' safety and consistent behavior of managers proves the priority of safety among different performance objectives. Moreover, manager's participation in leadership training is related to greater improvement in safety climate expectations by employees and could be presented as an intervention to improve safety (von Thiele Schwarz, 2016). Therefore, employees' trust in management as an organizational factor plays a crucial role for safety climate improvement. Besides, the majority of scientists focused on the general relationship between leadership and safety climate. However, "further research is required for identifying the specific mechanisms with which leaders promote better safety climate in high-risk operations" (Zohar, 2010, p. 1519). With reference to the literature it is hypothesized, that more positive perception of safety climate in organization that participates in agricultural sector as a producer of chemical products is when employees trust in their leaders and this aspect of leadership is a core one.

Individual factors are also included into the analysis of the prediction of safety climate. According to scientific literature (Zohar, 1980; Griffin, 2016a), safety climate is collective property of groups, but single individuals develop this shared perception of the context based on their subjective interpretations. Therefore, employee attitudes toward safety and organization need to be considered. Employees' commitment (as a factor that represent attitudes towards organization) is identified as an individual antecedent of safety (Neal, 2004). It is hypothesized that when employees are committed to the workplace they are interested in safety climate and are motivated to behave safely when performing high-risk jobs. Besides, Barling and Hutchinson

(2000) confirmed that commitment-based safety practices had both direct and indirect (by enhancing trust in management and affective commitment) effect on perceived safety climate. The newest research (Tsao, 2017) also supported the hypothesis that management commitment and employee involvement significantly influence the safety awareness and behavior. Therefore, future research should focus on complex relationship of organizational and individual factors (e.g. leadership and employees' commitment) with safety climate in organizations (Hofmann, 2004; Neal, 2004). Results of this research could propose comprehensive evidence-based recommendations for human resource managers how to create and maintain a safe working climate.
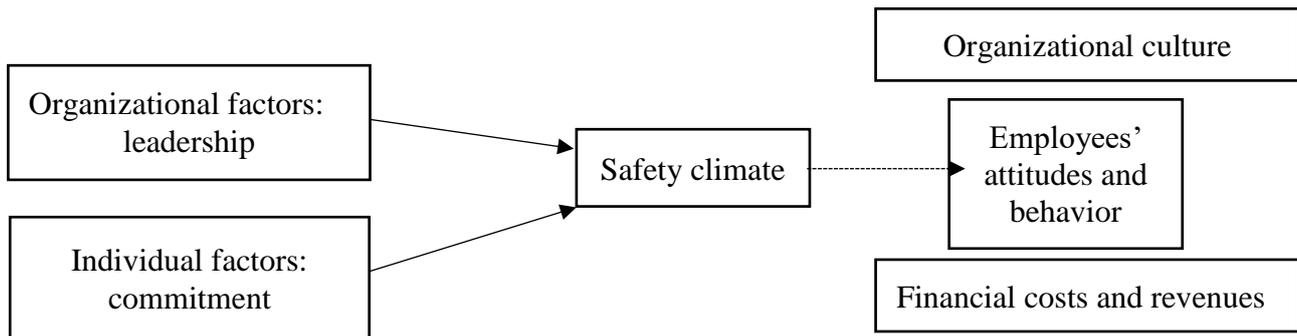

Fig. 1. The theoretical model of safety climate (designed by the authors of the article)

Figure 1 presents theoretical model of safety climate. It includes two groups of antecedents of safety climate (organizational and individual factors) and employees' attitudes and behaviour together with organizational culture and financial costs and revenues as outcomes. Based on the research aim, empirical research will focus only on antecedents of safety climate. Outcomes of safety climate are analyzed from the theoretical perspective in more detail in the beginning of this section as the realization of the first objective.

3. Research methods

Methodology of the research is focused on the analysis and synthesis of scientific literature (presented above) and quantitative empirical method (survey).

Cross sectional quantitative empirical research (survey), ordered by the institution studied, involved 961 employees (25 percent females, 71 percent males and 4 percent didn't respond to the question about their gender). Respondents were from a Lithuanian company that is a producer of different products for agriculture and industry. Employees from 18 different subdivisions of this company participated in the survey. Their work experience ranged from 1 until more than 20 years (the majority of them (68 percent) had more than 11 years of work experience). 20 percent of respondents were leaders and 76 percent – subordinates (5 percent didn't respond to the question about their position).

Participants filled up a self-administered questionnaire. It consisted of a Safety Climate Questionnaire (Sexton, 2003) and two scales (Commitment to the workplace

and Trust regarding management) from Copenhagen Psychosocial Questionnaire, version II (COPSOQ II; Pejtersen, 2010). Voluntary participation in the research and confidentiality were guaranteed (questionnaires were returned to researchers in closed envelopes).

A Safety Climate Questionnaire (Sexton, 2003) was used to evaluate employees' attitude towards safety. All 16 items in the questionnaire were measured on a six-point Likert scale (from 1 – totally disagree, till 6 – totally agree). Higher score means more positive evaluation of safety climate in organization. A Safety Climate Questionnaire consists of three components: (1) Leaders' attitude and responsibilities regarding safety (in the organization); (2) Employees' attitude towards safety (in the organization); (3) Organization-related safety factors: complying to safety requirements and employee training (Gruodyte, 2009). Cronbach alpha 0.834 confirmed reliability of the questionnaire.

One question about the commitment to the workplace and Trust regarding management scale from Copenhagen Psychosocial Questionnaire, version II (COPSOQ II; Pejtersen, 2010) helped to assess employees' commitment to the workplace and their trust in managers. All 5 items were measured on a five-point Likert scale (from 1 – rarely or never, till 5 – very frequently, if not always). Higher score means stronger commitment and bigger trust in managers. Cronbach alpha 0.670 confirmed reliability of the Trust regarding management scale.

Additional questions about employees' gender, work experience and position were included in the questionnaire.

4. Results and discussion

Results of the research are presented in a couple of steps: first of all, descriptive statistics are introduced and after that the test of theoretical model is explained. Table 1 presents the correlation matrix, mean scores and standard deviations for all the main variables (trust regarding management, commitment to the workplace and safety climate).

Table 1. Descriptive statistics and correlation matrix for the main variables in the research (N=961)

Variable	Mean	SD	1	2
Trust regarding management	3.52	0.74		
Commitment to the workplace	3.42	1.11	0.391**	
Safety climate	4.33	0.57	0.588**	0.447**

Notes: **correlation is significant at the 0.01 level

Table 1 shows that safety climate is positively related with trust regarding management as well as commitment to the workplace. The commitment to the workplace is more strongly related to the safety climate than trust regarding management. In order to test the theoretical model Structural Equation Modeling (SEM) was employed using AMOS 16. Results of the analysis are presented in Fig. 2 and Table 2.

Table 2. Model fit measures (N=961)

Model	GFI	RMSEA	CFI	χ^2 (p)
Default	0.976	0.119	0.962	58.663
Saturated	1.000	–	1.000	(<0.01)
Independence	0.562	0.385	0.000	

Notes: the method of maximum likelihood

The fit indices obtained indicated that hypothesized theoretical model fit the data well, $\chi^2 = 58.663$, p < 0.01, RMSEA = 0.119, CFI = 0.962, GFI = 0.976 (Table 2). The results indicated that leaders' attitude and responsibilities regarding safety ($\beta = 0.878$, p < 0.01), employees' attitude towards safety ($\beta = 0.662$, p < 0.01) as well as organization-related safety requirements and training ($\beta = 0.483$, p < 0.01) significantly predicted safety climate in the organization. Also, employees' commitment to the workplace ($\beta = 0.382$, p < 0.01) and trust regarding management ($\beta = 0.582$, p < 0.01) has significant predictive value as safety climate antecedents in the organization (Fig. 2).
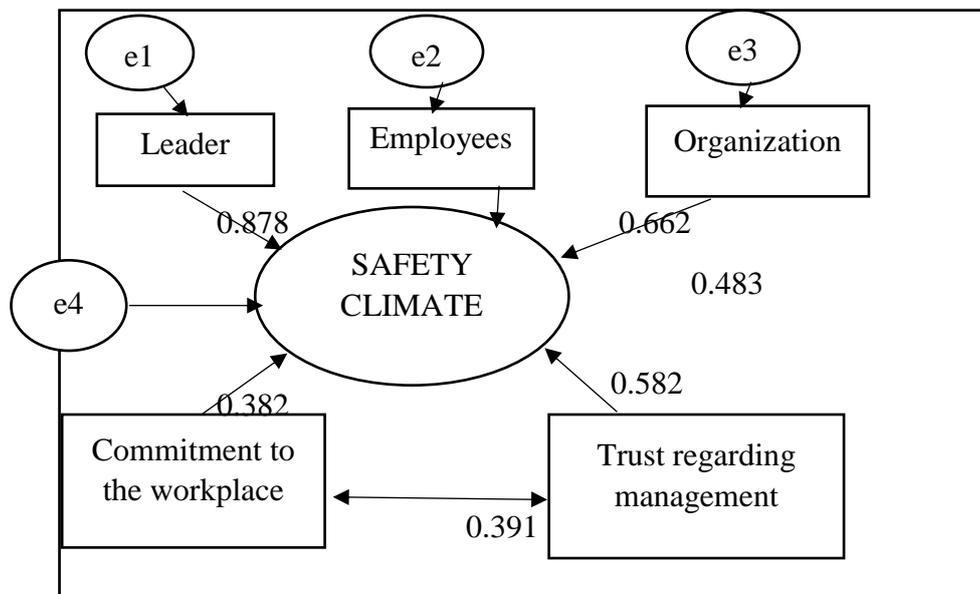
Notes: Leader: leaders' attitude and responsibilities regarding safety; Employees: employees' attitude towards safety; Organization: organization-related safety factors (complying to safety requirements and employee training).

Fig. 2. Empirical model of safety climate antecedents (designed by the authors of the article)

The findings of the present study highlight the role of leader in analyzing the climate safety factors in the organization. Leaders' attitude and responsibilities regarding safety has a greater prognostic value for safety climate than employees' attitude or organizational factors towards safety. These findings allow the leader or manager consider as an important contributor for improvement of safety climate in organization (Hofmann, 2004; Zohar, 2008; 2014; von Thiele Schwarz, 2016). Leader's or manag-

er's communication and consistent behavior, their ability to make satisfying decisions proves the priority of safety and plays a crucial role for safety climate improvement.

Besides, when employees are committed to the workplace they are interested in safety climate and are motivated to behave safely. Moreover, the employees' trust regarding management influence the safety awareness and behavior more compared with individual commitment. These findings supported the works of other scholars in the field of safety climate in organizations (e. g., Barling, 2000; Neal, 2004; Tsao, 2017). One more significant finding is that the present study confirmed safety climate criteria identified in literature analysis, i.e. both individual (commitment to the workplace) and organizational (trust regarding management) are important to safety climate.

5. Conclusions

1. The value of safety climate improvement in practice is based on three main arguments: reduced direct and indirect costs for employees' injuries and occupational illnesses, stronger organizational culture and more positive employees' attitudes and extra efforts for organization. Additional value of this safety climate research for science is twofold: possibility to identify the specific mechanisms with which leaders promote better safety climate in high-risk operations and to analyze complex relationship of organizational and individual factors (leadership and employees' commitment) with safety climate in organizations that work in agricultural sector. Thus, factors that predict safety climate could be integrated into two groups: organizational and individual antecedents. Leadership represents organizational factors and employees' commitment – individual factors.

2. The analysis of Structural Equation Modeling (SEM) confirmed the theoretical model of psychosocial safety climate antecedents. With reference to results of empirical research, employees' trust regarding management has higher predictive value for safety climate in comparison with employees' commitment to the workplace. However, prediction of safety climate needs integration of individual and organizational factors (employees' commitment to the workplace and trust regarding management are significantly inter-correlated in the empirical model of safety climate antecedents).

3. Drawing from the findings of this study, human resource managers or organizational psychologists might serve for organizations by considering and providing interventions designed to increase safety climate in organizations. The interventions could be direct by conducting interviews or training for leaders, or indirect, with interventions designed to decrease barriers to or increase motivation determining safety climate creation and maintenance.

Thus, the added value of the study is twofold - both for science and for practice: the confirmed model of safety climate predictors can be useful for and practiced in other organizations as well.

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PSICHOSOCIALINIAI VEIKSNIAI, PROGNOZUOJANTYS SAUGOS KLIMATĄ ŽEMĖS ŪKIO PRAMONĖS ORGANIZACIJOJE

Aurelija Stelmokienė, Loreta Gustainienė, Kristina Kovalčikienė
Vytauto Didžiojo universitetas

Santrauka

Profesinės sveikatos ir darbuotojų saugos valdymo sistema yra būtina sėkmingam gamybos organizacijų funkcionavimui. Straipsnyje pristatomas tyrimas, kurio tikslas – nustatyti pagrindinius saugos klimato veiksnius. Tyrime dalyvavo 961 didelės Lietuvos žemės ūkio pramonės įmonės darbuotojas. Tyrimas atliktas naudojant Sexton Saugos klimato klausimyną ir dvi skales iš Kopenhagos psichosocialinio klausimyno. Struktūrinių lygčių modeliavimo analizė patvirtino teorinį psichosocialinių saugos klimato veiksnių modelį. Nustatyta, kad darbuotojų pasitikėjimas valdymu turi didesnę prognostinę vertę, palyginti su darbuotojų įsipareigojimu darbui, o vadovo vaidmuo skatinant saugumą organizacijoje yra reikšmingesnis nei pačių darbuotojų požiūris ar organizacijoje deklaruojamos tvarkos ir procedūros.

Reikšminiai žodžiai: įsipareigojimas darbui, pasitikėjimas valdymu, saugos klimatas, vadovas, žemės ūkio pramonės organizacija.

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