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NEW APPROACH OF MODELING INFLUENTIAL FACTORS OF SAFETY CLIMATE IN INDUSTRIAL COMPANIES WITH A PREDOMINANTLY FEMALE LABOR FORCE

Violeta Stefanović[a*], Nenad Milijić[b], Snežana Urošević[b], Ivana Mladenović-Ranisavljević[c] and Bruno Završnik[d]

[a]*City Administration of Leskovac, Serbia*
[b]*University of Belgrade, Technical Faculty in Bor, Engineering Management Department, Bor, Serbia*
[c]*University of Niš, Faculty of Technology, Leskovac, Serbia*
[d]*University of Maribor, Faculty of Economics and Business, Maribor, Slovenia*

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Abstract

The research in this paper aims to develop an original model of the influencing factors of the safety climate in industrial processes, as an important element of organizational development. The set of collected data was analyzed by using statistical tool software packages SPSS 21.0 and LISREL 8.80, based on testing a sample of 843 employees of industrial organizations with a predominantly female labore force, in the Republic of Serbia, on the territory of Jablanica District. It was determined that the factors of the working conditions (WC), as well as attitude of employee towards the working conditions (AE), can be indicators of the impact of employee safety. The developed model is a practical, acceptable and applicable solution that can bring positive changes in practice, regarding occupational safety and health (OSH).

Keywords: factors of the working conditions, industrial companies, occupational safety, modeling, attitude of employees

1. INTRODUCTION

Complex technical systems of industrial processes require a special organization of OSH systems, based on a systematic approach, interaction and interconnection of different elements and stakeholders (Federation & ILO, 2019).

Defining the level of safety at work in industrial processes, based on traditional indicators, is a reactive approach for management in this field and measures the

[*] *Corresponding author: violetastefanovic.le@gmail.com*

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events and results which have preceded it, giving significant feedback on the deficiencies in the safety system itself. The contemporary approach to defining OSH emphasizes the proactive evaluation of occupational safety, with appropriate safety factors that enable identification of potential deficiencies in the organization's OSH system, while also emphasizing the importance of developing both OSH and health climate and culture (Grote, 2019).

Analyzing previous research in the field of OSH climate, one can notice the attempts of a large number of researchers to define the most important and all influential factors of OSH. Also, a large number of research points to the importance of modeling OSH factors, in organizations of different areas of business, and the formation of scales for measuring the safety climate at work (Stefanović et al., 2022).

A number of recent researches came to a conclusion that there are certain risk factors at workplace, other than physical factors, known as factors of occupational safety climate that can be influential factors of employee safety (Mladenović-Ranisavljević et al., 2024; Demir et al., 2025). These factors represent a complex set that directly affects employees, as well as organizational processes (Stefanović et al., 2019), employee motivation and commitment to organizational goals. In this regard, employee attitudes about the importance of safety, together with subjective assessment of the work environment in production organizations with predominantly female labor force, could be objective safety measures (Kalteh et al., 2021).

Also, in some literature sources, attempts of modeling occupational safety factors and creating scales for measurement of safety climate in organizations in various fields of business can be found (Igić et al., 2018; Xia et al., 2020; Nurhayati et al., 2022).

Therefore, there is a need for identifying and modeling the influential factors of the OSH in industrial processes and at the same time developing a safety climate at work, in order to ensure that the safety of workers in their workplace is at a satisfactory level.

Based on the data collected through the literature review, the research methodology in this paper was developed. The third part contains the definition of research hypotheses, conceptual model, methodology and research flow, while the fourth and fifth sections include the analysis of research results and concluding observations with implications for future research.

2. METHODOLOGY

2.1. Sampling and data collection

In the research procedure, there are two phases which include three steps each, Figure 1. In the first phase, the necessity for research was stated, then the problems and objectives of the research were defined, and finally the processing of data collection is shown. The second phase of the research includes data processing using the LISREL 8.80, modeling the influential factors of the occupational safety, analysis and final conclusions. LISREL stands for *Linier Structural Relationship* which is a software used for structural modeling or SEM based on covariance and path analysis. It was developed by Karl Joreskorg and Dag Sorbom in the 1970s. LISREL is used for modeling structural regressions. Structural regression models (SEM) are systems of linear equations. The structural model assumes that all variables are measured

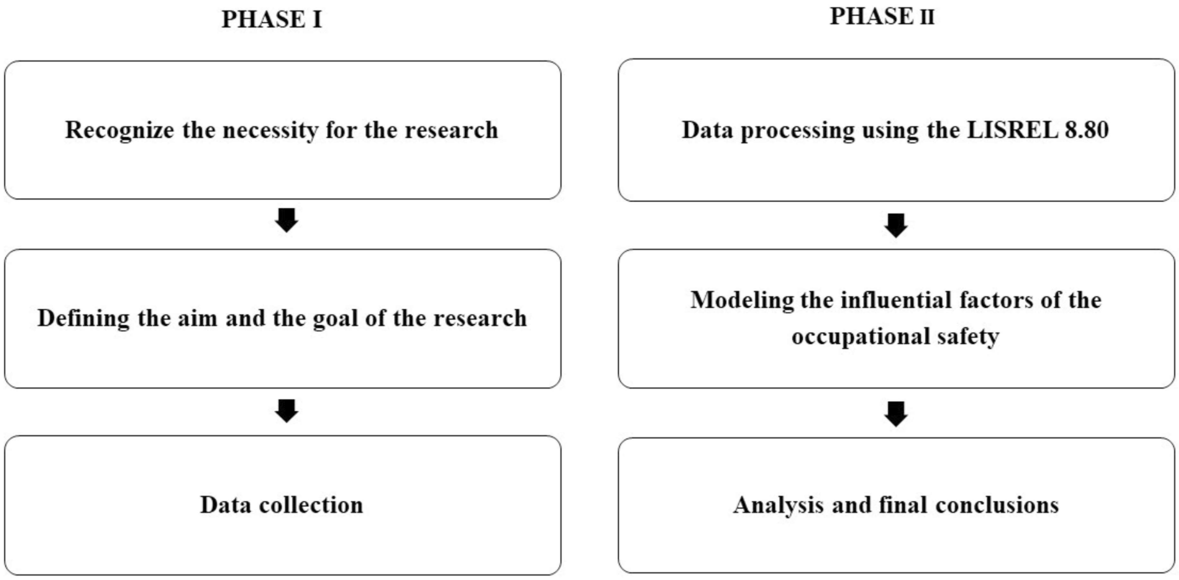


Figure 1. Process of the research

without error. LISREL is precisely the simultaneous estimation of a structural model and a measurement model. It allows combining structural equation and factor analysis. Factor analysis is a technique that deals with the measurement model.

As part of the research, the methodology of the questionnaire was used to collect data. The questionnaire was developed following the previous research on the issues of OSH in industrial companies (Stefanović et al., 2022) based on the available relevant literature and previous researches in the field of OSH (Zohar, 1980; Zohar, 2008; Kines et al., 2011; Milijic et al., 2013; Mohammadfam et al., 2019). The questionnaire consists of two parts. The first part contains 7 questions demographic in character, while the second part consists of 22 questions divided into 5 groups related to the OSH factors. To collect the employees' opinions about the statements listed in the questionnaire a 5-point Likert-type scale (from 1 = s*trongly disagree* to 5 = *strongly agree*) was used.

The research was conducted among employees in industrial organizations with a predominantly female population, in the Republic of Serbia, on the territory of Jablanica District, in which the most difficult WC were determined in previous research (Stefanović et al., 2019). More than 900 questionnaires were sent, 843 of which were validly completed and taken into account; the respondent's participation rate thus was 92.4%. Among 843 respondents 175 were of male gender (20.8%) and 668 of female gender (79.2%). The relationship between sample size and number of questions indicates that it is well above the recommended value (Hair et al., 2006). Demographic characteristics of the survey participants are presented in Table 1.

Based on the demographic characteristics of the sample, it can be concluded that the research included the highest number of respondents in the most productive age, from 30 to 50 years of age, 74.38%. Most of the respondents, 71.41% have a higher education, and 4.03% are with a university

Table 1. Demographic characteristics of the sample

D	C	N	%
Gender	Male	175	20,80
	Female	668	79,20
Age	Less than 20 years	0	0,00
	20 - 30 years	216	25,62
	30 do 50 years	627	74,38
	50 do 65 years	0	0,00
Educational level	Elementary school	0	0.00
	LQW	2	0.24
	QW	205	24,32
	Higher education	602	71.41
	University degree	34	4.03
Appropriate qualifications	Yes	677	80.31
	No	166	19.69
Position in the company	Industrial workers	763	90.51
	Manager in the industrial process	59	7.00
	Manager	0	0.00
	Administrative and technical workers	21	2.49
Work injuries /occupational diseases and / or diseases related to work	Yes	109	12,93
	No	734	87,07
Health monitoring in accordance with regulations	Yes	743	88,14
	No	100	11,86

Note: D = Demographic; C= Respondents; N = Number of the respondents included in survey; % = Percentage of total respondents.

degree. 90.51% of the workers participated in the survey.

Based on the created questionnaire with formed groups of questions, the hypotheses were established related to communication and employee involvement in the safety system, management commitment to the health and safety system, management's activity (MA) to establish OSH systems and safety occupational procedures, and the relationship between employees' attitudes to working conditions and OSH factors were discussed, as influential factors in the development of OSH climate according to the opinions of OSH experts.

The questionnaire was designed to be anonymous and based on a voluntary basis so it does not compromise the job or the identity of the respondent in any way. The participants were informed on the scope of the research ensuring that the identity of the respondents remains anonymous. Participants were also assured that the data collected would not be used for commercial purposes, while following strict protocols throughout the data collection process.

2.2. Research hypotheses and the conceptual model

In order to achieve a high level of safety at work, it is necessary to develop good communication, both among employees and at all levels of management (Zhou et al., 2008; Fernández-Muñiz et al., 2017; Grimbuhler & Viel, 2019). Well-developed communication in the organization affects compliance with safety rules and procedures (Mat Zin et al., 2023), increasing knowledge in the field of safety (Griffin & Neal, 2000) as well as positive attitudes and the successful establishment of safety at work (Lay et al., 2017).

In organizations, communication has a significant impact in conveying the vision and goals of the organization to employees, as well as a better understanding of business reality and the achievement of long-term goals of the organization (Obeidat et al., 2023). In this connection, it is extremely important to establish a hierarchical communication and implementation of information related to safety at work, from the organization's management to the workers in the production processes. Also, it is important to establish two-way communication in organizations. Only in this way a satisfactory safety performance can be expected for all workplaces in the enterprise (Lay et al., 2017).

Taking into account the above, the following hypothesis is tested:

H1*: The level of communication (LC) in the OSH system has a positive impact on the employees' attitude towards the working conditions (AE).*

An effective OSH system can only be put in place if all levels of management take full responsibility (Amponsah-Tawiah & Mensah, 2016; Autenrieth et al., 2016; Álvarez-Santos et al., 2018). Therefore, the management of occupational health and safety should be one of the main tasks of management (Urošević et al., 2017) and at the same time an adequate indicator of positive and supportive attitudes of management towards employee integrity and safety (Hsu et al., 2008). Employees' perceptions of management's positive attitudes and actions lead to a reduction of workplace injuries and better safety (Ali et al., 2009; Christian et al., 2009). The success of creating safe working conditions (WC) depends on how much it is received as the responsibility of management and how it is integrated into the existing management system.

Taking into account the above, the following hypothesis is tested:

H2*: Management's commitment (MC) to the OSH system produces a positive impact on AE.*

The management in organization must determine and approve the OSH policy of its organization, as well as ensure that within the scope of application of the OSH management system, the system and procedures of safety are adopted in accordance with positive legal regulations (Stefanović et al., 2019). It is extremely important for organizations that managers at all levels actively participate in the establishment of safety systems and safety procedures (Huang et al., 2006; Robson et al., 2007; Mohammadfam et al., 2019). In this sense, open communication and open relationship between employees and managers is required, while promoting safety behavior through certain procedures and rules (Zohar, 2008).

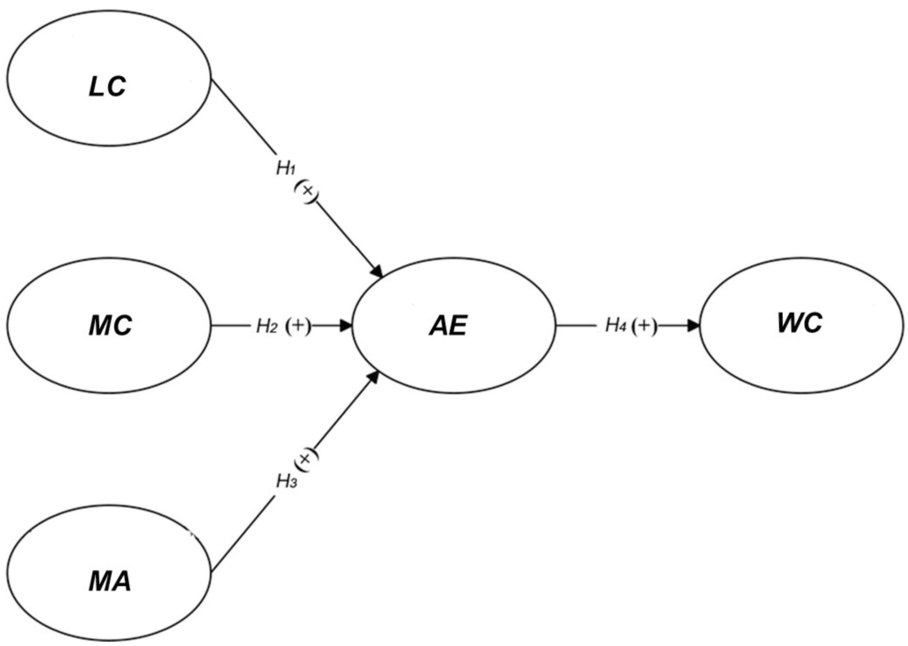
Following through, the next hypothesis is tested:

***H3**: Management's activity (MA) to establish OSH systems and safety occupational procedures produces a positive impact on AE.*

The level of health and safety of employees in organizations directly depends on the conditions and factors under which a person performs his or her tasks at workplace (Naharuddin & Sadegi, 2013; Karvatte et al., 2016; Olufunminiyi, 2019; Benson et al., 2024; Peres & Hendricks, 2024). Therefore, employees' attitudes about working conditions are an important indicator of the development of occupational safety and have a significant impact on the development of a safety climate (Denison, 1996; Glisson & James, 2002). Some authors point out that individual employee attitudes related to perceptions of occupational safety and subjective assessment of the work environment (Čolović & Kondić, 2019) are also significant to employees' behavior in accordance with safety procedures (Fang et al., 2006; Arbaiy et al., 2018).

Taking into account all of the above, the following hypothesis is tested:

***H4**: AE have a positive impact on the factors of the WC.*



Note: Main hypothesis of the research are marked with *H1* to *H4*; *H1* = LC in the OSH system has a positive impact on the AE ; *H2* = MC to the OSH system produces a positive impact on AE; *H3* = MA to establish OSH systems and safety occupational procedures produces a positive impact on AE; *H4* = AE have a positive impact on the factors of the WC; AE = Attitude of employee towards the working conditions LC = The level of communication in the OSH system; MA = Management's activity to establish OSH systems and safety occupational procedures; MC = Management's commitment to the OSH system; WC = Working conditions.

Figure 2. Conceptual model

A conceptual model of positive impact, containing three independent latent variables and two dependent latent variables, for the proposed 4 hypotheses is shown in Figure 2.

3. RESULTS

The set of collected data was analyzed by Structural Equation Modeling (SEM) methodology, using the statistical tool software packages SPSS 21.0 and LISREL 8.80.

3.1. Descriptive statistics

Table 2 shows the results of the descriptive statistical analysis and the expressiveness of the research results. According to SPSS 21.0 variable values were calculated as the average values over the entire sample. The obtained results indicate the positive opinions of the respondents that the given parameters can significantly influence the factors of the WC as a measure of the development of the OSH climate, i.e. the obtained values of standard measure of central tendency was used - arithmetic mean (AS) and measure of variability - standard deviation (SD), which are above average considering the theoretical range of the scale (1-5).

3.2. The reliability analysis of the safety indicators

Statistical data processing requires the determination of the validity and reliability of the measuring scale as a starting point, i.e. of the results obtained on the basis of the collected and processed data (Cronbach, 1951; Hair et al., 2006; Ririh et al., 2024). For this purpose, the assessment of internal consistency of the instrument for data collection was carried out using Cronbach alpha test (Allen & Yen, 2002; Kupermintz, 2003). Cronbach's formula is used to calculate the average values of the correlation between items of the measuring instrument when the answers to questions are rated on the basis of the degree of the given threshold (the Likert's five-point scale).

The values obtained based on the reliability test of each subscale, shown in Table 3, indicate an acceptable to high level of reliability, i.e. the obtained value $\alpha=0.857$ indicates a high level of reliability of the used measurement scale, and the statements in the questionnaire show a high level of agreement.

According to this, the values of the coefficient α greater than $\alpha=0.857$ represent a good possibility of modeling results of the questionnaire based on the considered population.

Table 2. Expressiveness of the research results

H	MIN	MAX	AS	SD
LC in the OSH system has a positive impact on the AE	2	5	4.85	0.562
MC to the OSH system produces a positive impact on AE	2	5	4.23	0.705
MA to establish OSH systems and safety occupational procedures produces a positive impact on AE	1	5	4.75	0.455
AE have a positive impact on the factors of the WC	2	5	4.03	0.562

Note: *H* =Main hypothesis of the research; AS = arithmetic mean; SD = standard deviation and measure of variability.

Table 3. Reliability of the entire measurement scale

H	Number of items	Cronbach’s Alpha
LC in the OSH system has a positive impact on the AE	5	0,892
MC to the OSH system produces a positive impact on AE	6	0,822
MA to establish OSH systems and safety occupational procedures produces a positive impact on AE	6	0,804
AE have a positive impact on the factors of the WC	5	0,910
Reliability of the entire measurement scale		α=0.857

Note: $\alpha =$ Cronbach’s Alpha.

3.3. Control model

In order to apply factor analysis, testing the adequacy of the sampling was performed (MSAs - Measures of adequacy sampling) using a KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequace) test and Bartlett test of sphericity (Bartlett’s Test of Sphericity). Based on the literature, the minimum acceptable value for KMO indicator is 0.6, while the level of significance of the Bartlett's test is $p \leq 0.05$ (Cerny & Kaiser, 1977). The obtained result of the KMO coefficient is 0.849, which indicates that the collected data are suitable for the application of the factor analysis. As well, the Bartlett test of sphericity shows significance ($p=0.000$), indicating that there are correlations among the items within the measurement instrument, that is, that the correlation matrix is not an identity (Hair et al., 2006).

The next steps of the study examine the correlation between the 22 items of the questionnaire (variables) and safety in production companies. The factor loadings of the variables range from 0.432 to 0.888, which is above the recommended value of 0.4 based on the literary recommendation of Floyd and Widaman (1995). This indicates a significant correlation between the 22 items of the questionnaire and therefore the application of factorial analysis is justified.

Based on the performed CFA analysis, the fit measures of the control model were determined, on the basis of which it is determined whether the control model satisfactorily fits the initial data. The values of individual parameters are shown in Table 4.

From the above, it can be concluded that there is a consistency of data, which further leads to the conclusion that the data are truly representative, and a good consistency of the control model was achieved, which means that all 22 variables (questions) can reliably and validly describe the formed 5 groups of latent variables based on the conceptual model, shown in Figure 2.

The correlation coefficients are positive and above the recommended value of 0.33, which indicates that there is a positive correlation between latent variables which are of practical importance. The level of statistical significance of the correlations is marked and shown in Table 5.

Table 4. Values of fit indicators for control and structural models

Fit indicators	Values for the control (measurement) model	Values for the structural (PATH) model	Recommended values
Relative Chi-Square (χ^2 /d.f.)	2.60	2.60	< 3.0
Root Mean Square Error of Approximation (RMSEA)	0.10	0.10	< 0.08 – 0.10
Goodness-of-Fit Index (GFI)	0.92	0.92	> 0.8
Adjusted Goodness-of-Fit Index (AGFI)	0.85	0.85	> 0.9
Comparative Fit Index (CFI)	0.95	0.95	> 0.9
Incremental Fit Index (IFI)	0.90	0.90	> 0.9
Normed Fit Index (NFI)	0.88	0.88	> 0.9
Non-Normed Fit Index (NNFI)	0.90	0.90	> 0.9
Relative Fit Index (RFI)	0.91	0.91	> 0.9

Note: χ^2 /d.f. = chi-square value; AGFI = adjusted goodness-of-fit index, CFI = comparative fit index, GFI = goodness-of-fit index, IFI = incremental fit index, NFI = normed fit index, NNFI = non-normed fit index, RFI = relative fit index RMSEA = root-mean-square error of approximation.

Table 5. Correlation matrix of latent variables

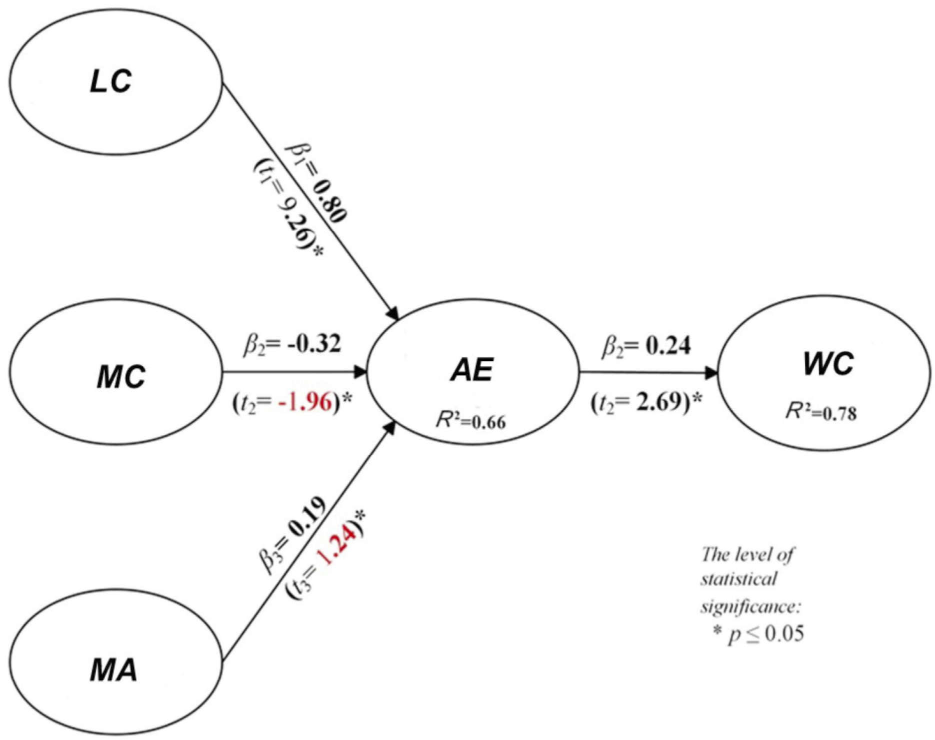
No	LV	1	2	3	4	5
1.	LC and involvement of employees in the OSH system	1				
2.	MC to the OSH system	0.66*	1			
3.	MA to establish OSH systems and OSH procedures	0.60*	0.77*	1		
4.	AE	0,42*	0.49*	0.35*	1	
5.	WC	0,40*	0.56*	0.46*	0.28*	1

Note: Level of statistical significance * p < 0,05; LV = Latent variable.

3.4. Structural model

Structural model testing was performed based on the conceptual model set, using the LISREL 8.80 software package, which tested the relationships between the variables while taking into account all the relationships in the model. This statistical approach has often been used in the analysis of influential OSH factors (Vinodkumar & Bhasi, 2010; Milijic et al., 2013; Martínez-Córcoles & Stephanou, 2017; Zaira & Hadikusumo, 2017), and the same allows authors to test complex models of relationships between variables, while considering all model relationships. In this way, the significance, as well as the strength of certain relationships, can be assessed in the context of the complete model.

Figure 3 shows the results of structural model analysis. Above the arrows are the values of the regression coefficients, which explain the strength of the relationships between the dependent and independent variables. Above the regression coefficients, asterisks indicate the level of statistical significance. The data in brackets represent the values of the t-test. The coefficient of determination (R^2) is shown in the field of the dependent variable, which determines the share of the explained variability in the total, that is, how many variations of the dependent variable are explained by the predictor variable (Milošević et al., 2024; Singh & Chakraborty, 2024).



Note: p = Bartlett's test; β_1 to β_4 = The regression coefficients for *H1* to *H4*; t_1 to t_4 = t-test value; AE = Attitude of employee towards the working conditions LC = The level of communication in the OSH system; MA = Management's activity to establish OSH systems and safety occupational procedures; MC = Management's commitment to the OSH system; WC = Working conditions.

Figure 3. Structural model

After testing the hypotheses, the following results were obtained:

H1 was confirmed and acceptable with statistical significance (β_1=0.80; t_1=9.26; p<0.05).

H2 was not confirmed (β_2=–0.32; t_2=–1.96; p<0.05).

H3 was confirmed, but not acceptable with statistical significance (β_3=0.19; t_3=1.24; p<0.05).

H4 was confirmed and acceptable with statistical significance (β_4=0.24; t_4=2.69; p<0.05).

The regression coefficients for *H1*, *H3* and *H4* have a positive value, which means that these hypotheses are confirmed. However, only two hypotheses, *H1* and *H4*, can be accepted because the t-test coefficients are above the recommended value of 1.96 (Hair et al., 2006). Based on the t-test value (t = 1.24 <1.96) hypothesis *H3* is not acceptable. Therefore, the results of hypothesis testing indicate that the two research hypotheses *H1* and *H4* are confirmed, acceptable and statistically significant, because the obtained results are: *H1* (β_1=0.80; t_1=9.26; p<0.05) and *H4* (β_4=0.24; t_4=2.69; p<0.05). *H3* is confirmed but not accepted. In support of this, one explanation could be found in the fact that time constraints, workloads, pace and pace of work, business pressures, existing risks influence that through its activity's management does not always ensure the implementation of safety rules and procedures in industrial processes. *H2* is not confirmed as shown by β_2=—0.32; t_2=—1.96; p<0.05.

Based on the analysis performed, it can be concluded that the coefficient of determination (R^2) indicates that the influences of the latent predictors are "Level of communication and employee involvement in the OSH system", "MC to the OSH system" and "MA to establish OSH systems and safety occupational procedures" to the latent endogenous variable "Employee attitudes about working conditions" can account for 66% of the variance. Also, the latent endogenous variable "Employee attitudes about working conditions" can be accounted for with 78% of the variance of the "Factors of the working environment" latent predictors.

A study of influential OSH factors as risk factors, indicates that by establishing an interconnection of all the above analyzed factors of the OSH (Zohar, 1980; Kines et al., 2011; Milijic et al., 2013; Mohammadfam et al., 2019) it is possible to create a more positive attitude of employees towards safety and to contribute to the safety performance of the organization. OSH in manufacturing processes with a predominantly female workforce can be reliably and validly described using 22 research questions (variables), divided into 5 groups (latent variables), which represents the proposed conceptual model. LC and involvement of employees in the safety system, as well as the MC to the OSH system, show a positive effect on the employees' attitude on the working occupational conditions, and all together show a positive influence on the factors of the working environment.

Hypothesis *H3* is confirmed but not accepted. In support of this, one explanation could be found in the fact that business pressures, in addition to the existing risks in the workplace, the volume and requirements of the work, the pace of work and time constraints, imply that management does not always ensure the implementation of safety rules and procedures through its activities, in manufacturing processes with a predominantly female workforce. However, numerous studies have established a link between hazard exposure, workplace protection, management practices and safety outcomes (Vredenburgh, 2002; Geldart et al., 2010; Nahrgang et al., 2011; Robson et al., 2012) indirectly point to the importance of the active role of management systems for OSH in implementing and promoting positive approaches to occupational health and safety. A significant impact on injury prevention and other positive safety outcomes according to Yanar et al. (2019), have responsible persons in the health and safety management system.

Hypothesis *H2* is not confirmed as shown by β_2 = –0.32; t_2 = -1.96; p <0.05. In support of this, one explanation could be that employees believe that the function of management of occupational health and safety in the organizations where the research was conducted is not sufficiently developed and that management commitment does not have a positive impact on employees' attitude to working conditions. Some studies show that despite the management's commitment to the occupational health and safety system itself, which is influential for the organization and addressing OSH requirements, the success of OSH activities and programs depends not only on management's commitment, but also on the availability of adequate resources and adequate support (Vinodkumar & Bhasi, 2010; Wachter & Yorio, 2014; Morgado et al., 2019), and hence from its activities. Based on a study conducted by Fernández-Muñiz et al. (2017), they conclude that management commitment does not significantly affect safety or safety involvement, as well as employees' attitudes about safety. However, the health and safety management system have an indirect impact on safety performance through working conditions.

All of the above gives insight into the factors of climate safety that can affect the safety of employees at work. The performed analysis determined the dependence of the factors of the working environment and the attitudes of employees, which are a prerequisite for a development of OSH climate in an organization.

4. DISCUSSION

4.1. Theoretical contributions

Based on the created questionnaire and formed groups of questions, hypotheses related to communication and involvement of employees in the OSH system, management commitment to the health and safety system, MA in establishing OSH system and safety procedures were discussed, as well as the relationship between employees' attitudes about working occupational conditions and themselves, occupational factors as influential factors in the development of OSH climate.

The obtained results show that the level of communication (LC) and involvement of employees in the occupational safety system exert a positive influence on the employees' attitude towards the occupational safety factors, as in the previous researches (Zhou et al., 2008; Lay et al., 2017), and that hypothesis *H1* is confirmed and accepted.

In the study Fernández-Muñiz et al. (2012) concluded that management commitment does not significantly affect safety or safety involvement, as well as employees' attitudes about safety, as we confirm in this research.

But, in a study by Eskandari et al. (2017) stand out that management's commitment to safety is a major occupational factor of safety climate, which implies the extent to which top management shows supportive and positive attitude toward employees' health and safety, through activities to improve organizational factors and reduce occupational accidents.

Hypothesis *H3*, “Management's activity to establish occupational safety systems and safety occupational procedures form a positive impact on employees' attitudes towards the working conditions”, has been confirmed but not accepted, which is conditioned by the status of the previous hypothesis. Based on the research of Naharuddin and Sadegi (2013) and Olufunminiyi (2019), it can be concluded that management's activity to establish OSH system is not the first and basic factor of employee safety, that is, it is much more important to improve the working environment in order to improve work performance and well-being employees.

Hypothesis *H4*, “Employee attitudes about working conditions have a positive impact on the factors of the working environment”, is in accordance with the conducted research (Arezes & Miguel, 2008; Arbaiy et al., 2018).

Considering that environmental factors are the most important elements of employee safety (Stefanović & Urošević, 2019), as determined by the conducted research, we can say that they represent indicators of the impact of employee safety, and a key dimension on the basis of which it is possible to determine the level of development of safety climate in industrial processes (Zohar, 1980; Kines et al., 2011; Nahrgang et al., 2011; Milijic et al., 2013; Fernández-Muñiz et al., 2017; Mohammadfam et al., 2019).

From all of the above, it can be concluded that modeling the risk factors at workplaces in industrial processes with a predominantly female labor force can determine the level of safety development in an organization. Employee attitudes about workplace conditions show a positive impact on OSH in manufacturing companies. Finally, to ensure the safety of high-level employees, it is necessary to continuously analyze and improve the organizational occupational. Considering that occupational factors are influential risk factors in the workplace, the results of this paper are consistent with the results obtained by Nahrgang et al. (2011) and Fernández-Muñiz et al. (2017), as they suggest that reducing risks and hazards and establishing a stable work environment are among the best ways to improve employee safety, and thus indirectly affect the business and business performance of the organization itself.

In line with the aforementioned, the research in this paper can help organizations in linking certain factors of importance for evaluating the safety situation and forming a universal scale for measuring the development of the organizational safety climate.

4.2. Implications for practice

Modeling with the goal of predicting the outcome is the essence of scientific research, as evidenced by the growing trend of research works in this area. Modeling is also becoming an increasingly prevalent method when it comes to approaches to issues of health and safety at the workplace, and especially when researching the development of the safety climate at work in industrial sector organizations (Zohar, 1980; Kines et al., 2011; Milijic et al., 2013; Mohammadfam et al., 2019).

In this regard, the results obtained in this paper have a significant empirical contribution. The importance of the development of the level of safety at work stems from its impact on the operations and business results of companies in the industrial sector. Accordingly, the research in this paper may be of importance in order to link certain factors relevant to the assessment of the safety situation in industrial sector organizations and the formation of a universal scale for measuring the development of the safety climate at work (Amirah et al., 2024; Fernández-Muñiz et al., 2017), thus creating an original and useful tool for managing the entire process of OSH and health management.

Theoretically, the study increases the analysis of the impact of work environment factors on employee safety, especially in industrial enterprises with a predominantly female workforce. The study contributes to the theory by investigating the role of employment assistance on the association of job occupation factors with the EA, which is lacking in the prior knowledge base. The study also provides an opportunity for further research in this area.

4.3. Limitations and future directions

Basically, there are some limitations to this research. First, the sample size was limited which may affect the generalisability of results. Second, the respondents' opinion was sought through closed ended questions which may restrict the respondents to provide more insights into the phenomenon under study. Third, the study did not include only the qualitative opinion of employed women which limited the detailed response from the respondents. These limitations can be overcome in future research in this area.

Also, more respondents, more organizations and more industry sectors can be included in order to increase the sample size and thus the results can be generalized to other industries. Other factors of OSH can also be included in order to obtain a more comprehensive set of factors that affect the safety and health of employees in the workplace, and which can be influential factors of the safety climate at work.

MC to OSH was not confirmed in this research, so future research in this field could be directed towards a more comprehensive analysis of this OSH factor.

5. CONCLUSION

According to conducted analysis, it has been found that the number of influential factors of the OSH climate is extremely high and that modeling of the safety factors at workplaces is extremely important in order to determine the level of risk to employees' safety (Zohar, 1980; Kines et al., 2011; Milijic et al., 2013; Mohammadfam et al., 2019). Starting from the basic hypotheses made in order to model the risk factors at workplaces in industrial processes, oriented towards linking certain factors of importance for the evaluation of the state of safety and formation of a comprehensive model of measuring the level of development of OSH climate (Amirah et al., 2024), based on the obtained research results, it was concluded that LC and involvement of employees in the safety system can be indicators of the impact of employee safety.

From the developed model it can be determined that MA to establish OSH systems and safety occupational procedures has a positive impact on AE, as important factors of OSH climate. Based on the results obtained, it can be said that the AE on the OSH factors have a positive influence on the factors of the working environment, as the most significant risk factors in the workplace, and that these factors can be indicators of the impact of employee safety.

Considering that the analysis of working conditions, risk assessment, identification of the most difficult positions in the workplace and statistical analysis of the employees' opinions confirmed that the factors of the WC are the most important element of employee safety (Fernández-Muñiz et al., 2017; Stefanović et al., 2019), it can be concluded that they represent an indicator of the impact on employee safety and a key dimension based on which it is possible to determine the level of OSH climate development in an organization.

Based on the above, it can be concluded that the modeling of risk factors in workplaces in industrial processes with a predominantly female workforce can determine the level of OSH climate development in an organization. Employee attitudes about workplace conditions show a positive impact on OSH in manufacturing companies. Finally, to ensure the safety of high-level employees, it is necessary to continuously analyze and improve the organizational environment.

The significance of the development of the organizational OSH climate stems from its impact on the business and business results of the organization itself. Accordingly, organizations can use the model presented in this research to link certain factors of significance to the assessment of the state of safety, as well as to establish a universal scale to measure the development of the organizational OSH climate.

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НОВИ ПРИСТУП МОДЕЛОВАЊУ УТИЦАЈНИХ ФАКТОРА КЛИМЕ БЕЗБЕДНОСТИ У ИНДУСТРИЈСКИМ ПРЕДУЗЕЋИМА СА ПРЕТЕЖНО ЖЕНСКОМ РАДНОМ СНАГОМ

Violeta Stefanović, Nenad Milijić, Snežana Urošević, Ivana Mladenović-Ranisavljević, Bruno Završnik

Извод

Истраживање у овом раду има за циљ развој оригиналног модела утицајних фактора климе безбедности у индустријским процесима, као важног елемента организационог развоја. Скуп прикупљених података анализиран је коришћењем алата статистичких софтверских пакета SPSS 21.0 и LISREL 8.80, на основу тестирања узорка од 843 запослена у индустријским организацијама са претежно женском радном снагом, у Републици Србији, на територији Јабланичког округа. Утврђено је да фактори услова рада (енг. working conditions – WC), као и став запослених према условима рада (енг. attitude of employee – AE), могу бити индикатори утицаја на безбедност запослених. Развијени модел је практично, прихватљиво и примењиво решење, које може донети позитивне промене у пракси, у погледу безбедности и здравља на раду (енг. occupational safety and health – OSH).

Кључне речи: фактори услова рада, индустријска предузећа, безбедност на раду, моделовање, став запослених

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