

Risk assessment, implementation of occupational health, safety and hygiene in small and medium manufacturing enterprises: A case study in central Vietnam

Gia-Kien Vu^{a,b}, Tuan-Anh Le^{c*}, Toan-Pham Ngoc^d, Tram-Huyen Thi Nguyen^e and Minh-Quan Ha-Nguyen^f

^aPhD student, Law school of Binh Duong University, Vietnam

^bLawyer on Dong Nai Bar Association, Vietnam

^cPhD, Institute of Research and Development, Duy Tan University, Da Nang city 550000, Vietnam

^dPhD, University of Economics Ho Chi Minh City, Ho Chi Minh city, Vietnam

^ePhD, HCMC University of Technology and Education, Ho Chi Minh city, Vietnam

^fMBA, HCMC University of Technology and Education, Ho Chi Minh city, Vietnam

CHRONICLE

Article history:

Received: May 12, 2023

Received in revised format:

June 12, 2023

Accepted: July 7, 2023

Available online:

July 7, 2023

Keywords:

Risk assessment

Occupational health

Safety and hygiene in labor

SMES

Vietnam

ABSTRACT

This study aims to identify and evaluate the influence of the factors affecting the implementation of occupational health and safety of employees and employers and its impact on occupational health and safety and legalize risk assessment in small and medium-sized manufacturing enterprises in central Vietnam through the survey among 246 business representatives and data processing through the software SPSS 20 and AMOS 20. The results show that there are 3 factors affecting the implementation of occupational health, safety and hygiene. In order: (1) Safety regulations and instructions; (2) Occupational health, safety policy and (3) Occupational health and safety training. There is no relationship between the impacts on the implementation of occupational health and safety of the employer. In addition, a very interesting finding about the relationship of factors implementing occupational health and safety of employers was a positive influence on the legalization of risk assessment activities. On the basis of these results, employees, business owners and state management agencies will have grounds to offer useful solutions in risk assessment in order to better perform safety work and occupational health.

© 2023 by the authors; licensee Growing Science, Canada.

1. Introduction

In Vietnam, the studies on occupational health and safety are mainly from the state management agencies in charge of occupational health and safety at the central and local levels, mainly for the purpose of promulgating policies and laws. Legislation on occupational health and safety. In addition, some socio-political organizations or socio-professional organizations also have research in narrow scope such as strengthening information work, propaganda, risk assessment to raise awareness, awareness of occupational health and safety for employees and employers. There are also spontaneous studies on building a safety culture, a culture of preventing occupational accidents and occupational diseases. On March 22, 2022, the Ministry of Labor - Invalids and Social Affairs in Vietnam issued a notice on the situation of occupational accidents in 2021 and some key solutions to proactively prevent occupational incidents and accidents in 2022. Accordingly, in 2021 nationwide, there were 6,504 occupational accidents, (reducing 1,876 cases compared to 2020) causing 6,658 accidents. The situation of occupational accidents in 2021 in the area of industrial relations and the number of employees working without labor contracts both decreased compared to 2020 in both the number of deaths and the number of fatal occupational accidents. The localities with the highest number of work-related deaths in 2021 include both areas such as:

* Corresponding author.

E-mail address: latuan0507@gmail.com (T.A. Lu)

© 2023 by the authors; licensee Growing Science, Canada.

doi: 10.5267/dsl.2023.7.002

Ho Chi Minh City, Ho Chi Minh City, Hanoi, Hai Duong, Thanh Hoa, Binh Duong, Dong Nai, Quang Ninh, Thai Nguyen. Specifically, in the area of labor relations, according to reports from 63 localities, in 2021, there were 5,797 occupational accidents nationwide, causing 5,910 accidents, of which: number of fatal occupational accidents. 574 cases; death toll 602 people; 1,226 people were seriously injured.

A safe working environment is always something that many employees care about when working at enterprises. Therefore, businesses need to put occupational health and safety first, build a safety network for students and improve a safe working environment for workers. Because, employees are the most valuable assets of enterprises, especially in the context of labor shortage today. Every year, the Labor, War Invalids and Social Affairs sector across the country organizes to launch the month of occupational health and safety, and at the same time, conducts intersectoral inspection and examination at enterprises with many risks of occupational accidents and diseases. They also visit victims and families of victims of occupational accidents and diseases in difficult circumstances. The grassroots trade unions base themselves on the plan to direct grassroots trade unions to dialogue with business owners to listen to the thoughts and aspirations of employees on issues related to occupational health and safety at work; organize to commend workers who have overcome difficulties in production with occupational accidents. They organize banners and slogans in response to the month of occupational health and safety at agencies, units and production workshops in enterprises during the launching of the month of occupational health and safety.

Small and medium-sized enterprises (SMEs) in Vietnam play a very important role in creating jobs, increasing incomes for workers, and contributing to the state budget. However, the work of ensuring occupational health and safety in this business area has not yet been given due attention. In addition to operating in the fields of business, services and technology, the number of SMEs operating in the fields of construction, transportation and warehousing, exploitation, processing, manufacturing, repair accounts for a relatively high proportion. These are also occupations with a high risk of occupational health and safety insecurity, potentially generating factors that directly cause accidents or affect the health of workers and the social community. According to statistics of the Ministry of Planning and Investment, up to 55% of individual business households still have to use their houses as business locations. Only 2% of individual business households have business locations in commercial centers and supermarkets. For businesses, the rate of using houses as business locations is also up to 33%. Besides, with small and medium-sized production, investment in technology and equipment is more limited and difficult than other types of enterprises, so the investment in labor protection of these enterprises is limited. This unit is also not focused. Even with the habit of many small businesses that only when risks occur, they find ways to handle and solve them without having the habit of proactive prevention in the first place. Along with that, employees working in this area also do not care or lack understanding about occupational health and safety, leading to unpredictability of potential hazards such as occupational accidents and occupational diseases. Environmental pollution can happen at any time, but the consequences are huge, causing damage not only to people, the economy but also to breaking the law.

2. Literature Review And Research Hypotheses

Jilcha and Kitaw (2016) conducted a global review of the literature related to occupation health, health and accident practices from the 1980s to the present. The results show that most of the studies have found that workers lack practical activities on self-protection in the working environment, and are not trained in knowledge related to this activity. Kaaria (2015) commented that the implementation of measures to ensure occupational health for workers working in the commercial center of Kenya is very little. If these workers are more well-trained and receive more attention from competent leaders, the issue of occupational health, hygiene and safety will be significantly improved. Alrawahi et al. (2020) have shown that the awareness of the need to build a system to ensure occupational health, safety and hygiene is having very positive changes globally. The study also shows that in less developed and developing countries, the implementation and construction of systems to ensure occupational health, safety and occupational accidents are very reluctant and there is a lot of skepticism in the developing countries. Propaganda and guidance for employees and employers about the benefits of applying measures to ensure occupational health and safety and occupational health will help to gradually narrow the “gap” with other workers in developed countries. Gallagher et al. (2003) conducted an evaluation of the effectiveness of the occupational health and safety system in Australia. The results show that businesses have set up these systems for their own businesses, but the reliability level is low. Moreover, the management role of senior leaders plays an important role in improving the efficiency of this system in enterprises. Chen et al. (2009) investigated the application of occupational health and safety management systems in 11 companies operating in the field of printed circuit board manufacturing in Taiwan. The results show that the implementation of regulations related to occupational health and safety and occupational health is influenced by the following factors: requirements from customers; corporate image and senior management requirements. The most important factor to decide the success of the occupational health and safety management system is the commitment and support of the company's leadership; while the factor that hinders this system is the weak coordination between departments and individuals in the company. Guerin and Sleet (2021) looked at ensuring the occupational health problems of healthcare workers in the United States. Through the analysis of the theory of behavior change, the issue of occupational health and safety and occupational health will be ensured if health workers are aware of and control their own behavior.

In Vietnam, there have not been many studies on the factors affecting the implementation of occupational health and safety of workers. The studies are mainly in the direction of statistics describing the current situation and proposing solutions to help the management agency improve the legal basis on this issue. Minh (2019) found that employers have not paid enough attention to occupational health and hygiene for employees. The dissemination of legal documents to the grassroots for enterprises, employers and employees to grasp is still very limited. All levels, branches and localities have not paid attention to allocating funds for law dissemination activities, so the propaganda and training in areas without labor relations has not been much. Through the method of analysis and comparison of laws with statistical methods; interview, the author clarifies the incomplete points of the law on occupational health and safety. The author points out the limitations of state agencies for the work of ensuring occupational health and safety. The study has also mentioned some basic contents of state management on occupation health and safety, proposal ideas and some perfect solutions, mechanism for applying the law on safety and hygiene. Labor productivity is not for the purpose of contributing to preventing and preventing occupational accidents and occupational diseases in the coming time. Pham (2018) conducted in-depth research and systematically presented legal theoretical issues on the inspection of the implementation of the law on occupation health and safety in Lai Chau province and proposed solutions to improve the law and practical solutions to improve the quality and efficiency of the implementation of the law on occupation health and safety in Lai Chau province. Tuy n et al. (2022) conducted a cross-sectional descriptive study at Innov Green Company from September 2019 to December 2019 based on a measurement tool to assess the working environment for the purpose of assessing safety conditions and occupational hygiene in a company. The results show that the company had a labor protection council and a student safety net; 7/7 indicators on microclimate, dust and toxic gases, organic solvents all met the permissible standards and 3/5 noise samples met the permissible standards. Nhi et al. (2019) identified and evaluated aspects of corporate social responsibility (CSR) for employees in Tan Thuan EPZ. The survey scale reached 400 employees in many fields and employment positions, accounting for 0.8% of the total existing employees in the EPZ. The results show 9 most typical factors, constituting CSR in accordance with the context of the export processing zone, including: Working and resting time, Labor contract, Occupation health and hygiene, Policy Salary and bonus, Remuneration and welfare policy, Training and development opportunities, Income guarantee, Collective bargaining - Trade union, Social insurance. With the above research results, a number of solutions and recommendations were suggested to improve CSR for employees. This not only helps businesses develop in a sustainable way, but also protects the interests of workers in the Tan Thuan Export Processing Zone. On the basis of the above research contents, the author proposes a number of research hypotheses affecting the implementation of occupation health and safety of workers as follows:

H_{1a}: *Leadership capacity (LECA) affects (+) the implementation of occupation health and safety of employees (OSHE).*

H_{1b}: *Monitoring the performance of reducing high risks in safe conditions (MSAC) affects (+) the implementation of occupation health and safety of employees (OSHE).*

H_{1c}: *The sense of responsibility and commitment (SRAC) affects (+) the implementation of occupational health and safety of employees (OSHE).*

H_{1d}: *Occupational health training (OSAT) affects (+) the implementation of occupation health and safety of employees (OSHE).*

H_{1e}: *Occupational health policy (OSAP) affects (+) the implementation of occupation health and safety of employees (OSHE).*

H_{1f}: *Safety regulations and guidelines (SRAG) affect (+) the implementation of occupation health and safety of employees (OSHE).*

Marbun (2020) made a comment on occupation health and safety risks and occupational accidents at the company. The level of risk is very unpredictable and often occurs in high-risk areas in ensuring occupational health and safety. To improve this problem requires a lot of efforts by employers and employees to promote the standards of the company's production technology. Su (2003) conducted a review of data on occupational accidents and diseases related to occupation health and safety in China. The results show that, when the law strictly regulates the responsibilities of employers, trade unions and employees as well as the government in this regard, the number of occupational accidents and diseases tends to decrease very fast. Sasaki et al (2020) conducted a cross-sectional study on the relationship between workplace measures implemented in response to the COVID-19 epidemic on psychological health and work performance of employees in Japan. After interviewing 1448 workers, using multiple linear regression techniques, the results show that the use of COVID-19 countermeasures by enterprises had a positive effect on the fear and anxiety of employees. Furthermore, the application of these measures is negatively related to psychological stress and positive to labor productivity. Ak et al. (2022) conducted a step-by-step occupational risk assessment at a textile factory. Based on the analysis of indicators such as frequency; dangerous events; severity; detection ability; costs and use of personal protection, they showed that electrical risks and related risks were rated the highest. These risks arise from the process, employees, employers, working environment as well as production characteristics. From here, solutions to reduce occupational accidents have been proposed for stakeholders such as owners as well as government regulators. Johnson (2020) argued that disclosing establishments that violate regulations on occupational hygiene, safety and safety would cause other businesses to significantly improve compliance on this issue and reduce the occupational accidents. It is the employers who will be more compliant to avoid costs if occupational accidents occur at their businesses. Brown et al. (2020) assessed the occupational hazards and accidents of marijuana workers in Colorado. The results show that, in order to reduce occupational risks and improve the

effectiveness of occupational health implementation at the unit, it is necessary to train safety and supervise the implementation to reduce high risks in working conditions. Ghobadi et al. (2020) argued that there should be a control method and businesses need to comply with risk assessment regulations when applying nanotechnology in production. Lake et al. (2019) also pointed out that it is necessary to develop a legal framework on ensuring safety, as well as measuring risks in the activities of workers at companies. Ahmad (2022) measured the implementation of occupation health and safety affecting labor productivity in oil and gas companies PT. The results show that occupational health and safety has a positive impact on employee productivity as well as the need to improve regulations on risk assessment in the operation of this enterprise. On this basis, the author makes the following hypotheses:

H_{2a}: *Monitoring the performance of reducing high risks in safe conditions (MSAC) affects (+) the implementation of occupational health and safety of the employer (OSHO).*

H_{2b}: *The sense of responsibility and commitment (SRAC) affects (+) the implementation of occupational health and safety of the employer (OSHO).*

H_{2c}: *Safety regulations and guidelines (SRAG) affect (+) the implementation of occupation health and safety of employers (OSHO).*

H_{3a}: *Leadership capacity (LECA) affects (+) the legalization of risk assessment (LERI). H_{3b}: The implementation of occupational health and safety of workers (OSHE) affects (+) the legalization of risk assessment (LERI).*

H_{3c}: *Employers' implementation of occupation health and safety (OSHO) affects (+) the legalization of risk assessment activities (LERI).*

3. Methodology

In order to achieve the stated research objectives, the mixed research method was used by the authors in the study. In the qualitative research method, the authors choose the case method with in-depth expert interview technique as the main method combined with the synthesis of research documents from which to build a theoretical model and also through the use of quantitative methods, in order to confirm the research results within the research scope. This is a mixed study design. This is an inevitable trend that is supported by researchers, since when using a mixed method including qualitative research and quantitative research, it will complement each other because of the limitations associated with each method. Using the mixed method will avoid more limited research results. Qualitative research in the form of document research, reference and selection of relevant typical studies, followed by setting up a research model and finally designing a preliminary survey questionnaire. After determining the research objectives, we determine the factors affecting the implementation of occupation health and safety of workers in small and medium-sized production enterprises. To accomplish this goal, the authors first summarized the previous theories and studies related to the implementation of occupation health and safety. The main data sources for use are scientific articles, research works, theses, master's theses, theses published in prestigious international and Vietnamese scientific journals, sets of indicators and the institutional framework related to the implementation of occupational health and safety in the world and in Vietnam. From the results of this step, the authors identified the factors that affect the implementation of occupation health and safety. These factors may not be suitable for specific characteristics in the research context and the research subjects are small and medium-sized manufacturing enterprises in Vietnam. Therefore, the authors need to take a next step to consider adding or subtracting factors through discussion with experts to ensure that the factors affecting the implementation of safety labor generation are in accordance with the characteristics of small and medium-sized manufacturing enterprises in Vietnam. After the above preliminary survey, the entire scale is adjusted. At this step, the authors can remove some observed variables if they are not suitable, or can also remove the measurement variables for the research concepts, but each research concept will not guarantee the measurement if there are only 2 observed variables. The result of this process will be the final completed survey questionnaire.

The official survey continues to be sent to workers, factory managers, and heads of production departments related to the implementation of occupational health and safety of small and medium-sized manufacturing enterprises in the Central region of Vietnam. The survey period is from October to December 2022. The number of questionnaires sent to the units is 300 votes. After receiving the survey sheets from the surveyed subjects, the data is also cleaned on the Excel spreadsheet (removing faulty and incorrect answer sheets). The cleaned data will be entered into the SPSS 20 software to conduct the official scale assessment. The authors conduct regression testing to evaluate whether the hypotheses in the model are accepted or rejected on the basis of 246 research samples. The obtained results are a model to evaluate the impact of factors affecting the implementation of occupational health and safety of workers in small and medium manufacturing enterprises in Vietnam.

4. Result

Based on the results from data processing on SPSS 20 software, it shows that 188 respondents are male and 58 respondents are female. The number of respondents mainly with college degrees is 145 people, high school graduation is 86 people and university degree is 15 people. Testing the reliability of this factor scale by Cronbach Alpha coefficient, the results are as shown in Table 2.

Most of the total correlation coefficients of all observed variables are greater than 0.3 and the Cronbach Alpha coefficients of all the observed variables are greater than 0.3. All observed variables are greater than 0.6, thereby ensuring the reliability of the scale.

Table 1
Frequency characteristic statistics of the research sample

Characteristic	Frequency	%
1. Gender	N = 246	100%
Male	188	76,4%
Female	58	23,6%
2. Age	N = 246	100%
Under 25	31	12,6%
From 25 to under 40	116	47,2%
Over 40	99	40,2%
3. Working seniority	N = 246	100%
Under 5 years	20	8,1%
From 5 to under 10 years	87	35,4%
Over 10 years	158	56,5%
4. Level	N = 246	100%
High School Graduation	86	35%
College	145	58,9%
University	15	6,1%

(Source: Processing data from the official survey)

Table 2
Reliability according to Cronbach's Alpha coefficient

Variable	Variable abbreviation	Number of observations	Cronbach's Alpha
Leadership capacity	LECA	4	0.833
Monitoring the performance of reducing high risks in safe conditions	MSAC	3	0.693
The sense of responsibility and commitment	SRAC	3	0.646
Occupation health training	OSAT	3	0.876
Occupation health policy	OSAP	4	0.901
Safety regulations and guidelines	SRAG	3	0.737
The implementation of occupation health and safety of employees	OSHE	5	0.927
The implementation of occupation health and safety of the employer	OSHO	3	0.641
Legalization of risk assessment	LERI	3	0.676

(Resource: The authors collected)

5. Factor exploratory analysis

The scale is measured by 36 observed variables, after checking the reliability by Cronbach's Alpha, the team found that there are 5 variables that do not guarantee reliability, so these variables are excluded from the scale. Through 2 times of processing, the results are obtained as in Table 2. Based on Table 3, the KMO value is $0.792 > 0.5$ and the Sig value of Bartlett's test is $0.000 < 0.05$, showing that the variables are correlated, so the model The figure is suitable for inclusion in exploratory factor analysis.

The extracted factors all have Eigenvalue greater than 1 and the breakpoint when extracting factors at factor 9 has an Eigenvalue of $1,095 > 1$. The sum of extracted variances of 4 factors is $69.253\% > 50\%$ of this. shows the ability to use these 9 components to explain 63.835% of the variation of the observed variables. Based on the factor rotation matrix when running EFA, the remaining 31 variables are extracted into 9 factors.

Table 3
EFA factor exploratory analysis of variables (KMO and Bartlett's Test)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.792
	Approx. Chi-Square	3506.102
Bartlett's Test of Sphericity	df	465
	Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.114	19.724	19.724	6.114	19.724	19.724	4.258	13.736	13.736
2	3.081	9.938	29.662	3.081	9.938	29.662	3.165	10.210	23.946
3	2.454	7.915	37.577	2.454	7.915	37.577	2.757	8.894	32.839
4	2.343	7.559	45.136	2.343	7.559	45.136	2.369	7.642	40.482
5	1.943	6.269	51.406	1.943	6.269	51.406	1.872	6.039	46.521
6	1.799	5.802	57.208	1.799	5.802	57.208	1.862	6.006	52.527
7	1.420	4.582	61.789	1.420	4.582	61.789	1.801	5.809	58.336
8	1.219	3.933	65.722	1.219	3.933	65.722	1.695	5.468	63.804
9	1.095	3.531	69.253	1.095	3.531	69.253	1.689	5.449	69.253
10	.857	2.765	72.018						
11	.833	2.686	74.704						
12	.742	2.395	77.100						
13	.690	2.227	79.327						
14	.640	2.064	81.391						
15	.571	1.843	83.234						
16	.531	1.713	84.946						
17	.493	1.590	86.536						
18	.481	1.552	88.089						
19	.431	1.390	89.479						
20	.419	1.351	90.830						
21	.394	1.271	92.101						
22	.367	1.185	93.286						
23	.354	1.141	94.427						
24	.315	1.017	95.444						
25	.292	.943	96.387						
26	.258	.831	97.218						
27	.227	.731	97.949						
28	.216	.698	98.647						
29	.202	.652	99.299						
30	.119	.383	99.682						
31	.099	.318	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix^a

	Component								
	1	2	3	4	5	6	7	8	9
OSHE4	.890								
OSHE5	.846								
OSHE1	.837								
OSHE3	.812								
OSHE2	.807								
OSAP4		.885							
OSAP3		.869							
OSAP2		.843							
OSAP1		.811							
LECA4			.843						
LECA1			.830						
LECA3			.807						
LECA2			.753						
OSAT1				.897					
OSAT4				.856					
OSAT3				.824					
SRAC4					.865				
SRAC1					.845				
SRAC2					.506				
MSAC4						.777			
MSAC2						.763			
MSAC3						.730			
OSHO1							.796		
OSHO3							.779		
OSHO2							.675		
SRAG2								.672	
SRAG3								.648	
SRAG1								.582	
LER11									.751
LER13									.731
LER12									.598

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 6 iterations.

(Resource: The authors collected)

Chi-square=593.582;df=422;CMIN/df=1.407;p=.000;
TLI=.941;CFI=.947;RMSEA=.041

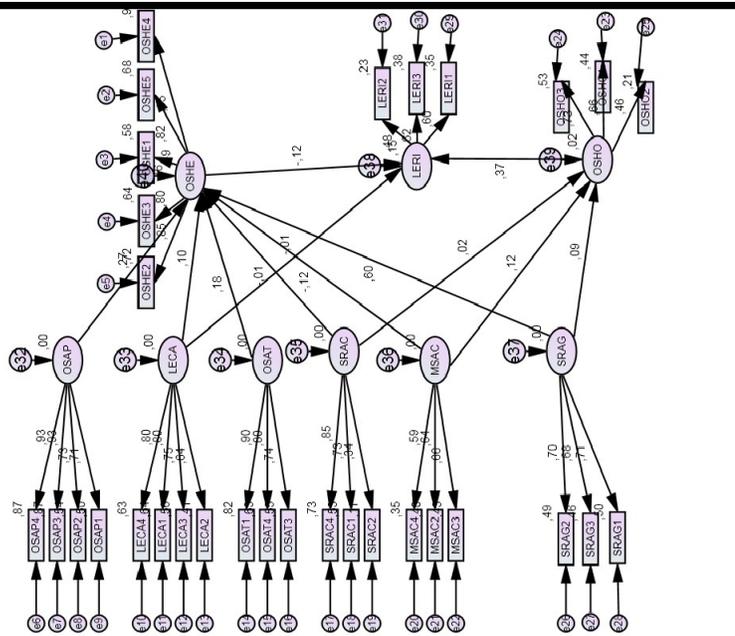


Fig. 1. Linear structural model results

(Resource: The authors collected)

Table 4
Results of testing the research hypotheses

			Estimate	S.E.	C.R.	P	Label
OSHE	←	LECA	0.112	0.062	1.812	0.07	Reject H1a
OSHE	←	MSAC	-0.197	0.113	-1.748	0.08	Reject H1b
OSHE	←	SRAC	-0.006	0.049	-0.13	0.896	Reject H1c
OSHE	←	OSAP	0.222	0.045	4.913	***	Accept H1e
OSHE	←	SRAG	0.915	0.119	7.692	***	Accept H1f
OSHO	←	MSAC	0.136	0.109	1.242	0.214	Reject H2a
OSHO	←	SRAG	0.096	0.09	1.072	0.284	Reject H2c
OSHE	←	OSAT	0.159	0.05	3.179	0.001	Accept H1d
OSHO	←	SRAC	0.014	0.048	0.284	0.776	Reject H2b
LERI	←	LECA	-0.004	0.057	-0.068	0.946	Reject H3a
LERI	←	OSHE	-0.074	0.051	-1.441	0.15	Reject H3b
LERI	←	OSHO	0.337	0.103	3.267	0.001	Accept H3c

Table 5
Impact of variables on the implementation of occupation health, health and safety of employees (OSHE)

	Relationship		Beta	%	Order of influence
OSHE	←	OSAP	0.222	17.13	2
OSHE	←	SRAG	0.915	70.6	1
OSHE	←	OSAT	0.159	12.27	3
	Sum		1.296	100	

(Resource: The authors collected)

6. Discussion

Through the results in Table 4 and Table 5, we can see that OSHE is affected in the following order: (1) Safety regulations and guidelines (SRAG); Occupation health Policy (OSAP) and Occupation health Training (OSAT). Compared with the results of previous studies, the authors have found that occupational health regulations and guidelines are very necessary to help workers understand and perform better occupational health and safety and the results are consistent with Jilcha and Kitaw (2016) and Alrawahi et al. (2020). The introduction of occupational health policies such as fully equipping workers with protective equipment, regularly checking and reminding workers to practice help lower unnecessary risks. Currently, there are strict penalties for workers who violate regulations on occupational health (Guerin & Sleet, 2021; Pham, 2018). Regulations and guidelines for the implementation of occupational health: regulations are established and specific instructions on occupation health, periodically monitoring and evaluating the usefulness of the occupation health system at the construction site, and setting up warning signs on occupation health will help workers be more conscious in ensuring the safety of their employees (Kaaria, 2015); Gallagher et al., 2003; Chen et al., 2009). Although there is no hypothesis

affecting the implementation of occupational health and safety of workers, employers are accepted, but we can see that the main reason is that most of the respondents are workers or representatives of the business owner to answer the questionnaire, so they have not really met the group's expectations. The results have shown that there is a relationship between the implementation of occupational health and safety of the employer, which affects the legalization of risk assessment activities (Ghobadi et al., 2020; Lake et al., 2019). Employers themselves need to be more honest when taking measures to limit risks in the implementation of occupational health and safety of employees. Workers, especially in small and medium-sized enterprises, do not have the ability and understanding to protect their legitimate interests, but it is essential that the voice of business managers, owners, businesses and unions to protect them.

7. Conclusion

Through the research topic, the authors have found the problem of risk assessment and implementation of occupational health and safety, occupational accidents in small and medium enterprises in the manufacturing sector in the central region, Vietnam. Many respondents, when asked, had not shown that they took steps as well as methods of assessing occupational health and safety risks and occupational accidents at their units. Therefore, it is very urgent to legislate this activity more thoroughly, build training courses and issue certificates for this activity. Regulations must be directed to each specific group of business lines.

Regarding new research directions, future studies should mention more about the relationship of business characteristics affecting the assessment of current risks of occupational health and safety and occupational accidents. In fact, when businesses can build this process themselves, they are very knowledgeable about their production and business activities and thereby reduce the risk of occupational health and safety problems and occupational accidents at the company. Furthermore, further research should approach with a larger sample size as well as focus on each specific business line to have a better view of this activity at the enterprise.

References

- Ahmad, F. (2022). Implementation of Occupational Safety and Health (K3) for Increasing Employee Productivity. *Jurnal Economic Resources*, 5(2). <http://repository.nobel.ac.id/id/eprint/114/>
- Alrawahi, S., Sellgren, S. F., Altouby, S., Alwahaibi, N., & Brommels, M. (2020). The application of Herzberg's two-factor theory of motivation to job satisfaction in clinical laboratories in Omani hospitals. *Heliyon*, 6(9), e04829. <https://doi.org/10.1016/j.heliyon.2020.e04829>
- Ak, M. F., Yucesan, M., & Gul, M. (2022). Occupational health, safety and environmental risk assessment in textile production industry through a Bayesian BWM-VIKOR approach. *Stochastic Environmental Research and Risk Assessment*, 1-14. <https://doi.org/10.1007/s00477-021-02069-y>
- Brown, C. E., Shore, E., Van Dyke, M. V., Scott, J., & Smith, R. (2020). Evaluation of an occupation health and safety training for cannabis cultivation workers. *Annals of work exposures and safety*, 64(7), 765-769. <https://doi.org/10.1093/annweh/wxaa026>
- Chen, C. Y., Wu, G. S., Chuang, K. J., & Ma, C. M. (2009). A comparative analysis of the factors affecting the implementation of occupational health and safety management systems in the printed circuit board industry in Taiwan. *Journal of Loss Prevention in the Process Industries*, 22(2), 210-215. <https://doi.org/10.1016/j.jlp.2009.01.004>
- Gallagher, C., Underhill, E., & Rimmer, M. (2003). Occupation health and safety management systems in Australia: barriers to success. *Policy and practice in health and safety*, 1(2), 67-81. <https://doi.org/10.1080/14774003.2003.11667637>
- Ghobadi, M. Z., Afsaneh, E., & Ghourchian, H. (2020). Nanotechnology: occupational health hazards of nanoparticles and legalization challenges. *The ELSI handbook of nanotechnology: risk, safety, ELSI and commercialization*, 113-134. <https://doi.org/10.1002/9781119592990.ch7>
- Guerin, R. J., & Sleet, D. A. (2021). Using behavioral theory to enhance occupation health and safety: Applications to health care workers. *American journal of lifestyle medicine*, 15(3), 269-278. <https://doi.org/10.1177/1559827619896979>
- Jilcha, K., & Kitaw, D. (2016). A literature review on global occupation health and safety practice & accidents severity. *International Journal for Quality Research*, 10(2), 279.
- Johnson, M. S. (2020). Regulation by shaming: Deterrence effects of publicizing violations of workplace safety and safety laws. *American economic review*, 110(6), 1866-1904. DOI: 10.1257/aer.20180501
- Kaaria, A. G. (2015). Factors affecting the implementation of health and safety in supermarkets in Kenya. <http://librarycatalog.kwust.ac.ke:2051/xmlui/handle/123456789/267>
- Lake, S., Kerr, T., Werb, D., Haines-Saah, R., Fischer, B., Thomas, G., ... & Milloy, M. J. (2019). Guidelines for public health and safety metrics to evaluate the potential harms and benefits of cannabis regulation in Canada. *Drug and alcohol review*, 38(6), 606-621. <https://doi.org/10.1111/dar.12971>
- Marbun, J. (2020). Juridical analysis of the occupation health and safety management system in the company. *Budapest International Research and Critics Institute-Journal (BIRCJJournal)*, 3(2), 895-901.
- Minh, T. T. (2019). *Pháp luật về an toàn, vệ sinh lao động qua thực tiễn áp dụng tại tỉnh Ninh Thuận (Law on occupation health and safety through practice in Ninh Thuan province)*. Thesis, University of Economics Ho Chi Minh city, Ho Chi Minh city, Vietnam. <https://digital.lib.uhh.edu.vn/handle/UEH/60007>

- Nhi, N. T., Tuyết, B. T. N., Nhi, Q. Y., Vân Hà, T. T., & Xuân, P. T. T. (2020). Trách nhiệm xã hội của doanh nghiệp đối với người lao động: Nghiên cứu tình huống tại khu chế xuất Tân Thuận (Corporate social responsibility towards employees: A case study in Tan Thuan export processing zone). *Tạp chí Nghiên cứu Tài chính-Marketing*. <https://jfm.ufm.edu.vn/index.php/jfm/article/view/126>
- Phạm, Đ. K. (2018). Hoạt động thanh tra việc thực hiện pháp luật an toàn, vệ sinh lao động trên địa bàn tỉnh Lai Châu (Inspection activities on the implementation of the law on occupation health and safety in Lai Chau province). Thesis, Vietnam National University, Ha Noi, Viet Nam https://repository.vnu.edu.vn/handle/VNU_123/66267
- Sasaki, N., Kuroda, R., Tsuno, K., & Kawakami, N. (2020). Workplace responses to COVID-19 associated with mental health and work performance of employees in Japan. *Journal of occupational health*, 62(1), e12134. <https://doi.org/10.1002/1348-9585.12134>
- Su, Z. (2003). Occupational health and safety legislation and implementation in China. *International Journal of occupational and environmental health*, 9(4), 302-308. DOI: [10.1179/oeh.2003.9.4.302](https://doi.org/10.1179/oeh.2003.9.4.302)
- Tuyên, P. V., Nhu, N. T., & Sinh, Đ. M. (2022). THỰC TRẠNG AN TOÀN VỆ SINH LAO ĐỘNG CỦA CÔNG NHÂN CÔNG TY INNOV GREEN KHU KINH TẾ NGHỈ SƠN HUYỆN TỈNH GIA TỈNH THANH HÓA NĂM 2019 (SITUATION OF OCCUPATIONAL SAFETY AND HYGIENE OF INNOV GREEN WORKERS OF INNOV GREEN ECONOMIC AREA, GIA TINH DISTRICT, THANH HOA PROVINCE IN 2019). *Tạp chí Y học Cộng đồng*, 63(1). <http://tapchihcd.vn/index.php/yhcd/article/view/280>



© 2023 by the authors; licensee Growing Science, Canada. This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).