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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING

Judul karya ilmiah (paper) : Safety Climate Assessment of Furniture Industry: A Case Study
Jumlah Penulis : 3 orang (N Susanto, **H Prastawa,** D D Oktaningrum1)
Status Pengus : Penulis ke-2
Identitas Makalah : a. Judul Prosiding : Annual Conference on Industrial and System Engineering \ (ACISE) 2019
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Surakarta, 26 Oktober 2021
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Prof. Dr. Bambang Suhardi, ST, MT
NIP. 197405202000121001
Unit kerja : Dept. Teknik IndustriUNS

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b. Ruang lingkup dan kedalaman pembahasan (30%)	9		8
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9		8
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	9		8,5
Total = (100%)	30		27
Nilai Pengusul = (40/2%) * 27 = 5,40			

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Reviewer 2

Prof. Dr. Wahyudi Sutopo, ST, MSi.
NIP. 197706252003121001
Unit kerja : Dept. Teknik IndustriUNS

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Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer 1	Reviewer 2	
a. Kelengkapan unsur isi jurnal (10%)	2,2	2,5	2,35
b. Ruang lingkup dan kedalaman pembahasan (30%)	7,8	8	7,90
c. Kecukupan dan kemutahiran data/ informasi dan metodologi (30%)	7,9	8	7,95
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	8,0	8,5	8,25
Total = (100%)	25,9	27	26,45
Nilai Pengusul (Penulis kedua)	5,18	5,40	**5,29**

Reviewer 1

Prof. Dr. Bambang Suhardi, ST, MT
NIP. 197405202000121001
Unit kerja : Dept. Teknik IndustriUNS

Semarang,
Reviewer 2

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Lack of safety awareness has caused many losses including accidents cost, insurance cost as well as
indirect costs. Most of work accidents occurred due low perception of work safety. A measurement of
safety climate for workers and head department should be considered to figure the condition of safety

climate out. The assessment of safety climate is using Nordic Safety Climate Questionnaire (NOSACQ-50). The significance of differences in the safety climate between workers and head department is determined by Mann-Whitney test. The study was conducted on 100 worker samples spread across 10 production departments and 10 head departments in a furniture manufacture. The result shows that the safety climate level is quite low at the management safety justice, workers' safety priority and risk non-acceptance dimensions. The safety climate of head departments shows a good enough result on the 4 dimensions and need an improvement on the 3 other dimensions. There are differences in perceptions between workers and head departments on commitment and competence of management, the management safety justice, workers' safety priority and risk non-acceptance dimensions. © 2019 Institute of Physics Publishing. All rights reserved.

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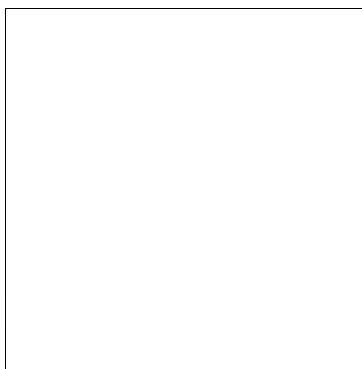
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Safety Climate Assessment of Furniture Industry: A Case Study

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Safety Climate Assessment of Furniture Industry: A Case Study

N Susanto[1], H Prastawa[1], D D Oktaningrum[1]

[1] Industrial Engineering Department, Faculty of Engineering, Diponegoro University

nophie.susanto@gmail.com

Abstract. Lack of safety awareness has caused many losses including accidents cost, insurance cost as well as indirect costs. Most of work accidents occurred due low perception of work safety. A measurement of safety climate for workers and head department should be considered to figure the condition of safety climate out. The assessment of safety climate is using Nordic Safety Climate Questionnaire (NOSACQ-50). The significance of differences in the safety climate between workers and head department is determined by Mann-Whitney test. The study was conducted on 100 worker samples spread across 10 production departments and 10 head departments in a furniture manufacture. The result shows that the safety climate level is quite low at the management safety justice, workers' safety priority and risk non-acceptance dimensions. The safety climate of head departments shows a good enough result on the 4 dimensions and need an improvement on the 3 other dimensions. There are differences in perceptions between workers and head departments on commitment and competence of management, the management safety justice, workers' safety priority and risk non-acceptance dimensions.

1. Introduction

Currently the Indonesian government is giving special attention to the furniture industries. This is realized through the implementation of the *Standar Verifikasi Legalitas Kayu* (SVLK). SVLK is a tracking system that is used to ensure the legality of timber sources that are circulated and traded in Indonesia. Since the SVLK regulated on 1 September 2009, the aspects of Occupational Safety and Health in the wood processing industry are getting noticed. The Occupational Health and Safety Document (OHS) is one of six documents in the SVLK audit implementation. The OHS document contains OHS procedure documents, OHS equipment list documents, and work accident records. PT CJI Furniture is one of the furniture industries that implements SVLK in their companies. The company has been serving overseas purchases to Taiwan, so it is also paying attention to the aspects of occupational safety and health. One of the steps to realize the SVLK in this company are there is OHS experts who have a work accident reporting system. Records of work accidents are carried out to fulfil the aspects of this SVLK document, but in reality, the workers awareness to report on work accidents is still low.

Based on data in 2015-2017, work accidents are classified as severe in which only 2,3% was recorded by the company. Though based on preliminary studies conducted to 35 workers through a questionnaire, it was found that 72% of workers had experienced work accidents that were not recorded by the company. Work accidents such as hands squeezed by wood, legs struck by wood, fingers pierced by large sewing needles, eyes exposed to glue and nails lost due to doing work [1].

Lack of safety awareness by the workers can be seen when there are no reports of workplace accidents experienced by the workers. The workers consider work accidents they experienced are a

normal thing and does not need to be exaggerated. This makes the company not considering the policies related to occupational health and safety. The company feels that there is nothing about OSH that must be improved or risk control that needs to be done. The workers low awareness about good health and safety perceptions is evident from the number of accidents that still occur.

Research shows that 90% of work accidents often occur in labor caused by unsafe actions of workers, while the remaining 10% is caused by unsafe conditions [1]. Work accidents experienced by workers here are 70% due to unsafe act, low perception of safety and low knowledge and attitudes of workers too. These elements lead to the worker's safety climate that is needed to be studied lies in the level of the worker safety climate so that priority improvements can be made. Unsafe behavior that is often carried out is evident from around 50% of workers not using personal protective equipment provided by the company and perceiving that they are in a safe condition while working without personal protective equipment. Some workers only wear personal protective equipment when department heads or production managers supervise their work. This statement is in accordance with a preliminary study conducted. Some workers still feel uncomfortable when wearing personal protective equipment and some are only used when according to them the work done has a high risk of work accidents. The use of personal protective equipment (PPE) is performed not because of awareness of the importance of occupational health and safety itself. Some work accidents occur due to lack of awareness of workers in using PPE to do their work.

The safety climate of workers needs to be examined because the safety climate can influence the behaviour and involvement of workers in safety practices [2]. Safety climate is the workers' perception of policies, procedures and work practices related to workplace safety [3]. Other than that, the safety climate can also inform the organisation of potential problems and allow preventive actions to be taken before an incident occurs [2].

Measuring the safety climate for department heads also needs to be done because management support for safety and safety interests in the company is the key to the success of climate safety [4]. Organisational support and communication are closely related to each other, where organisational relations or communication are factors that are important enough for the safety climate [4]. According to Ridley, the management plays an important role that can be done by establishing policies that demand high work safety performance [5]. This needs to be done to find out if the unfavourable worker's safety climate is caused by the poor safety of the department head or the safety perception of the workers that still needs to be improved.

The low awareness of workers on occupational health and safety needs to be measured at what level the workers perception of the safety climate is based on the dimensions of the NOSACQ-50. Safety climate is recognized as a measurement and a key indicator of safety to predict safety performance [6]. Some studies related to safety climate has been reported by Eeckelaert et al. [7]. However, NOSACQ-50 has been validated in many countries, and it can be applied in many high-risk sectors. It has been used by some studies [5][8][9][10][11][12][13][14][15][16][17][18][19] for evaluating safety climate in various field. Based on the problem of the low participation of workers in reporting workplace accidents and unsafe behaviour of workers in carrying out their work as evidenced by the lack of awareness of workers in wearing PPE, it proves that the workers lack work safety perception. This study aims at investigating the differences of safety climate between PT CJI Furniture workers and the head of the department using NOSACQ-50.

2. Method of the Research

2.1. NOSACQ-50

The commonly used safety climate measurement is by using a questionnaire through self-reporting with a survey approach. The results of the survey on safety climate produce an individual momentary picture which, if collected up to the level of a group or organisation, tends to be used to measure safety culture [20].

Nordic Occupational Safety climate Questionnaire (NOSACQ-50) Nordic was developed by a team of Nordic work safety researchers based on organisational and safety climate theory, psychological theory, previous empirical research, empirical results obtained through a sustainable development process. Safety climate is defined as members of the working group divided by management perceptions and policies, procedures and practices related to workplace safety. This questionnaire was developed by the Nordic team and is the easiest questionnaire to use among other questionnaires [21].

In the last development written on the official website of NOSACQ, this is then used up to now with 7 dimensions and 50 items of statements with details of dimension 1, that is the work safety management priority has 9 items, dimension 2 is developing work safety from management has 7 items, dimension 3 is fairness of work safety from management has 6 items, dimension 4 of work safety commitment from employees has 6 items, dimension 5 of work safety priorities of employees and attitude of not wanting to take safety risks have 7 items, dimension 6 that is communication and work safety training including believe in the work safety competencies of coworkers has 8 items and 7th dimension that is workers' trust in the work safety system has 7 items [22][23][24].

NOSACQ-50 is found to be a reliable instrument for measuring safety climate, and is valid for predicting safety motivation, perceived level of security, and security behaviour assessed on its own. The validity of the NOSACQ-50 is further confirmed by its ability to distinguish between organizational units and detect significant differences in the security climate. The first three dimensions are related to perceptions of safety management within the organisation and four other dimensions related to perceptions of the workgroup [21].

2.2. Sample

The sample was a part of the subject that was examined which was taken from the population or part of the population which is also called an example that can represent the object to be investigated [23]. The formula used to calculate the number of samples is Slovin formula. The number of population is limited as many as 340 workers and 10 department head. Based on the formula, the number of respondents was determined 100 workers and 10 department head. The respondent characteristic can be found in Table 1.

2.3. Data Collection

In this study, 7 dimensions were used which consisted of 50 questions in which each part represented elements of the workplace climate that was developed by Kines, with a questionnaire called The Nordic Safety climate Questionnaire or NOSACQ-50 [21]. There were 26 positive statements on NOSACQ-50 and 24 negative statements. The scale used in this questionnaire was a 4-point scale starting from strongly disagree to strongly agree where questionnaire items formulated in two groups (positive and vice versa).

The next stage was the distribution of the questionnaire distributed to the number of worker samples that had been previously calculated that is to PT CJI Furniture production workers after the data was obtained and then processed using SPSS software. The following is a representation of the measurement results of each dimension (NORDIC Official Web) as seen in Table 2.

The analysis was divided for two situations. First analysis was conducted for each dimension, the second was performed for each department. There are 10 departments in this case, they were a sawmill, material processing, cabinet set, BS, chair, table, finishing, packing, seat and sandpaper departments

3. Result and Discussion

3.1.Interpretation of Mean Value and Statistical Test

Based on statistic science, the ordinal scale uses the median to calculate the middle value of the respondent's answer. The median can be determined for all scales except the nominal scale. However, refers to the NOSACQ-50 method on the official web, the calculation of the respondent's answer data is calculated using the mean. Based on the data processing of the mean calculation in Table 3, an analysis of the seven dimensions of work safety climate is considered. These seven dimensions are identified as dimensions of the safety climate based on research conducted by the NORDIC research team [21]. The picture can be depicted in Figure 1, as well.

Table 1. Characteristics of the Respondents

	Characteristics	Total	Percentage (%)
Gender	a. Male	89	81
	b. Female	21	19
Age (Years old)	a. 20-30	33	30
	b. 31-40	54	49
	c. 41-50	13	12
Work experiences	a. < 1 year	14	13
	b. 1 - 3 year	9	8
	c. 3 - 5 year	9	8
	d. > 5 Tyear	78	71
Education Level	a. Elementary school	3	3
	b. Junior high school	13	12
	c. High school	85	77
	d. D3	4	4
	e. Undergraduate	3	3

Table 2. Interpretation of NOSACQ-50

Value	Interpretation
≤ 2.70	Low level, lowest and requires revision
2.70 – 2.99	The level is quite low, requires improvement
3.00 – 3.30	Good enough, requires slight improvement
≤ 3.30	Good level, which must be maintained and improved continuously

Table 3. Mean Value of Data

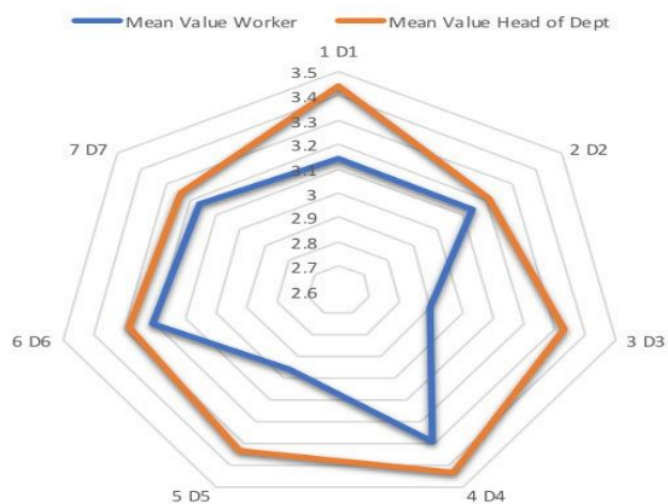| No.	Dimension	Mean Value	
		Worker	Head of Dept
1	D1	3.14	3.44
2	D2	3.14	3.21
3	D3	2,.90	3.33
4	D4	3.29	3.43
5	D5	2.96	3.33
6	D6	3.21	3.28
7	D7	3.17	3.24

Figure 1. Mapping of Mean Value for worker and head department

The results of the research are used as material to improve the existing conditions and achieve better performance in Health and Safety. The results of the interpretation of the Safety Climate level based on table 2 shows that the worker's safety climate at a quite low level is found in the dimensions of management safety justice and the dimensions of workers' safety priorities and risk non-acceptance, while in other dimensions it shows at a good enough level and requires a slight improvement.

The result of the normality test using Kolmogorov-Smirnov pointed all dimension has a sig. value >0.05. Therefore, a non-parametric statistical test (Mann-Whitney Test) will be used to analyse the perception differences between the worker and the head of the department. The results show that dimension 1, 3 and 5 have a sig. value<0.05. The calculation result for the mean value of the safety climate for each department can be seen in Table 4.

Based on the normality test using *Kolmogorov-Smirnov*, the data of all dimensions produces sig <0.05. It means that the data is not normally distributed and parametric statistics cannot be used as data testing to the next stage. The non-parametric test is chosen to test differences for workers and department heads.

Table 4. Mean Value of Data for each Department

No.	Department	Dimension						
		1	2	3	4	5	6	7
1	Cabinet set	3.03	3.27	2.67	3.35	2.93	3.21	3.26
2	BS	2.91	3.06	2.77	3.27	2.95	3.25	3.03
3	Table	3.02	3.14	2.85	3.33	3.01	3.35	3.2
4	KS	3.17	3.14	2.82	3.29	3.19	3.39	3.17
5	Seat	3.11	3	3.13	3.4	2.8	3.1	3.09
6	Sandpaper	3.27	3.29	2.93	3.37	3.14	3.08	3.2
7	Sawmil	3.14	3.13	2.94	2.94	2.64	3.17	3.13
8	Finishing	3.13	3.12	2.89	3.33	2.87	3.23	3.26
9	Packing	3.29	3.1	3.02	3.29	3.08	3.04	3.06
10	Material processing	3.28	3.13	3.01	3.3	2.97	3.17	3.24

The Mann Whitney test is a non-parametric statistic that does not require normal data. Based on the Mann Whitney test data processing with SPSS software it is known that in dimensions 1 (p=0.011), 3 (p=0.004) and 5 (p=0.002) there are significant differences between perceptions of the safety climate between the workers and the department heads. If the *asymp value* of sig> 0.05 then H_o is accepted so that there is no significant difference between the perception of the worker and the department head on the dimensions of management safety priority.

3.2. Safety Climate for Each Department
Based on the mean value in each department, it is found that the average has a low yield on 2 dimensions, namely on the dimensions of management safety justice and the dimensions of workers' safety priority and risk non-acceptance. The packing department is the only department that has an average climate safety value at a good level because the packing department is not directly related to the machine and has a small risk of falling goods, pinched or other work accidents that occur in other departments. Departments that have a low level of climate safety are the BS and Sawmill departments. The Department of BS has a low level of climate safety value on the dimensions of management safety priorities with a value of 2.91, the dimension of management justice with a value of 2.77 and the dimensions of worker's safety priority and risk non-acceptance with value 2.95. The sawmill department also has a low value of climate level safety in the dimensions of management safety justice with a value of 2.94, dimensions of workers' safety commitment with a value of 2.94 and dimensions of worker's safety priority and risk non-acceptance with a value of 2.64.

The results of the value of climate safety need to be considered by the company especially in the BS department and sawmill. These 2 departments have greater job risk than other departments and deal directly with the machine. So that the safety climate of workers in both departments must be improved. By doing so, the safety perception can be increased, and work accidents can be reduced. In addition, occupational health and safety training in this departments need to be redesigned such as by providing longer training time for the machine operator and identifying the potential risks of the machine so that workers can be more vigilant and increase safety awareness.

4. Conclusion
Based on the results, it can be concluded that the depiction of workers' climate with regard the interpretation of the safety climate level is quite low especially in the dimension of management safety justice and the dimension of workers' safety priority and risk non-acceptance. The other dimensions show a good level of the safety climate and require mild improvement. The depiction of the safety climate for the department heads result in a good level for 4 dimensions and needs some improvement in the other 3 dimensions. Some significant differences in perceptions between the workers and the department heads have been found including the dimension of management safety priority, commitment and competence, the dimension of management safety justice, and dimension of workers' safety priority and risk non-acceptance. This is caused by the lack of communication systems such as reporting and supervision by management.

The recommendation for the industry are improving effective communication, innovate and develop a procedure of hazard and incident report, analyze hazard potency in the industry and prioritise health and safety management program for the department with a low level value of safety climate. Further studies will apply NOSACQ-50 for measuring the safety climate for each organisation level. Besides, it can evaluate the result of recommendation implementation as well.

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