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THE RELATIONSHIP BETWEEN SAFETY CLIMATE WITH OCCUPATIONAL SAFETY AND HEALTH (OSH) IN EMPLOYEES OF THE MINE DEPARTMENT AND RAW MATERIAL MANAGEMENT OF PT. XYZ

Indah Wahyuni
Department of Psychology, Faculty of Medicine, Universitas Andalas
Email: indahwhyn13@gmail.com

Arni Amir
Department of Physiology, Faculty of Medicine, Universitas Andalas
Email: hamir4967@gmail.com

Tri Rahayuningsih
Department of Psychology, Faculty of Medicine, Universitas Andalas
Email: trirahayuningsih@med.unand.ac.id

Rani Armalita
Department of Psychology, Faculty of Medicine, Universitas Andalas
Email: raniarmalita@med.unand.ac.id

Weno Pratama
Department of Psychology, Faculty of Medicine, Universitas Andalas
Email: wenopratama@yahoo.com

Abstract
This study aims to see the relationship between safety climate and occupational safety and health (OSH) for employees of the Mining and Raw Materials Management Department of PT. XYZ. The research method used in this study is a quantitative method with Spearman's Rho analysis technique. Participants in this study consisted of 100 employees of the Mining and Raw Materials Management Department of PT. XYZ was obtained using the accidental sampling technique. Data collection was carried out using the 24-item Nordic Occupational Safety Climate Questionnaire (NOSACQ-24) and the Workplace Health and Safety Instrument German (WHASI-G). The reliability on the NOSACQ-24 measuring instrument is .905 and on the WHASI-G measuring instrument is .911. The results of this study indicate that there is a significant positive relationship between safety climate and occupational safety and health (OSH). This can be seen from the significance obtained by .000 (p<.05) and the correlation coefficient value of .699.

Keywords: *Safety Climate, Occupational Safety and Health (OSH), Mining Employees*

Abstrak
Penelitian ini bertujuan untuk melihat hubungan safety climate dengan keselamatan dan kesehatan kerja (K3) pada karyawan Departemen Tambang dan Pengelolaan Bahan Baku PT. XYZ. Metode penelitian yang digunakan dalam penelitian ini adalah metode kuantitatif dengan teknik analisis Spearman's Rho. Partisipan dalam penelitian ini terdiri dari 100 karyawan Departemen Tambang dan Pengelolaan Bahan Baku PT. XYZ yang diperoleh menggunakna teknik accidental sampling. Pengumpulan data dilakukan dengan alat ukur 24-item Nordic Occupational Safety Climate Questionnaire (NOSACQ-24) dan Workplace Health and Safety Instrument

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German (WHASI-G). Reliabilitas pada alat ukur NOSACQ-24 adalah sebesar .905 dan pada alat ukur WHASI-G adalah sebesar .911. Hasil peneltian ini menunjukan bahwa terdapat hubungan positif yang signifikan antara safety climate dengan keselamatan dan kesehatan kerja (K3). Hal ini dapat diketahui dari signifikansi yang diperoleh sebesar .000 (p<.05) dan nilai koefisien korelasi sebesar .699.

Kata kunci: *Iklim Keselamatan, Keselamatan dan Kesehatan Kerja (K3), Karyawan Petambangan*

INTRODUCTION

Occupational safety and health (OSH) must continue to grow along with the development of industrialization, globalization, and advances in science and technology (Yuliandi & Ahman, 2019). With this development, companies in Indonesia will also apply the novelty of science and technology that is useful in advancing company productivity. With the progress or increase in company productivity, the risk to the safety and health of workers will also increase. (Buranatrevedh, 2015) states that large companies that have more than 100 employees and are at high risk of occupational disease or injury in Indonesia are required to have an occupational safety and health (OSH) management system.

Occupational Safety and Health (OSH) according to Permenaker Number 5 of 2018 are all activities to ensure and protect the safety and health of the Workforce through efforts to prevent work accidents and work-related diseases. OSH is an effort to protect workers so that they remain safe and healthy in carrying out tasks at work and the production process is used efficiently and safely (Miyanti, 2019). The International Labor Organization (ILO) states that OSH is the promotion and maintenance that elevates the degree of physical, mental and social well-being of workers; prevention of health problems among workers; protection of workers in risky work; placement and maintenance of workers in a work environment suitable to their physiological and psychological equipment. OSH science is an art in which it carries out risk management from a hazard, so that a healthy and safe work environment is created (Susanti & Sugianto, 2019).

In individuals, there are many variables that can affect them in responding to work hazards and safety interventions, so that they can influence the individual's behavior (Cornelissen et al., 2013). Aeni and Fermania (2015) stated that human error that occurs in workers is based on the worker's poor OSH behavior. OHS behavior is a response to stimuli outside the organism that depends on the factors of the organism. It is important to highlight individual behavior in understanding psychological processes such as risk cognition or risk perception in terms of workplace safety (Glendon et al., 2006). Susanti and Sugianto (2019) argue that in the world of work, good behavior is behavior that follows issues related to OSH by applying OSH methods, and implementing OSH with commitment and in line with the standards.

Lu and Yang (2010) stated that the OSH (Occupational Health and Safety) management system is useful in protecting employees and creating work safety behavior. Yuliandi and Ahman (2019) revealed that good worker safety and health will maintain absenteeism and morbidity rates and reduce work accidents which will make workers healthy and productive. Companies in Indonesia themselves still have high work accident rates and have not yet reached the zero-accident target (Nai'em et al., 2021). Work

accidents that occur are caused by a lack of OHS behavior in workers, unsafe work assignments, work equipment that does not meet standards, and unsafe work areas (Aeni & Fermania, 2015).

This is supported by data from the International Labor Organization (ILO) which shows that in 15 seconds one worker dies due to a work accident or occupational disease and every 15 seconds there are 153 workers who experience a work accident (Safety Sign Indonesia, 2015). Safety Sign Indonesia (2015) adds that approximately 2.3 million workers die due to accidents and occupational diseases each year. Data on work accidents that occurred in Indonesia according to BPJS Employment (2019) recorded 123,041 work accident cases in 2017 and 173,105 work accident cases in 2018 (Super, 2019). Data from the Ministry of Manpower (Ministry of Manpower) shows an increase in work accidents in 2019 of 114,000 work accidents and in 2020 up to 55.26% there were 177,000 work accidents in Indonesia (Putra et al., 2022).

Qolbi and Muliawan (2020) revealed that one of the many factors that influence worker compliance with the OSH program is the safety climate. According to Hamid et al. (2018), safety climate can be used as a construct to predict the level of OSH performance of an organization based on perceptions of behavioral interactions regarding occupational safety and health between employees and management. Goulart (2013) states that the safety climate is a manifestation of normative beliefs, values, and attitudes regarding the immediate evaluation of OSH practices in organizations. This is also evidenced by the results of research which states that the work safety climate variable has a significant relationship with OSH performance (Kalteh et al., 2021; Liu et al., 2015).

Kines et al. (2011) define safety climate as the perception of work group members about management and policies, procedures, and practices regarding work group safety. Safety climate is an employee's perception of their environment which aims to improve their safety at work, thus employees become prosperous and feel safe in completing work (Oktafanda, 2021). Safety climate is a special form of organizational climate that is based on individual evaluations of their experiences regarding safety in the work environment (Griffin & Curcuruto, 2016). Marin et al. (2017) stated that the safety climate is the employee's perception of the importance of safety in the company and implementing management that adheres to commitments in creating workforce safety and health.

The results of interviews with the mining and reclamation HSE (Health and Safety Environment) head on January 17, 2023, the mine work process starting from land clearing to storage has a high risk and potential for accidents. This is because every mining work process not only requires humans but also large-sized tools. Some of the risks and potential hazards include being hit by rocks, falling from a height, being crushed by heavy equipment, dust, fog, getting dehydrated, being hit by lightning, strong winds, danger from wild animals, and work stress. The risks and dangers of work accidents will have an impact on employees physically and psychologically. Physically, employees experience injuries to certain body parts, while psychologically, employees experience fear of returning to work.

Data obtained from employees of the mining and reclamation HSE (Health and Safety Environment) section on January 17 2023, work accidents that occurred in 2022 were 10 accidents, of which there were eight near misses, one

first aid, and one serious accident that occurred in Mining and Raw Materials Management Department. In 2019 there were 24 work accident incidents in the Mining Department where 17 accidents occurred in the mining operations unit, four accidents occurred in the raw material management unit, and one accident occurred in the utility unit (Suhelmi, 2020). In 2016 there were 10 serious work accidents and one light work accident that occurred in the mining and production department at PT. XYZ (Nisa, 2017).

Based on the work accident data, it can be concluded that the implementation of occupational safety and health (OSH) rules for employees of the Department of Mining and Raw Material Management has not been implemented optimally. The causal factors for work accidents come from the employees themselves and company management according to the Mine and Reclamation HSE (Health and Safety Environment) Staff. Employees do not understand OHS SOPs at work, this is because these employees have not received special OHS training in mining because they have just been transferred from another department and the attitude of employees is careless at work so they do not apply OHS. Company management also lacks understanding of OSH SOPs such as not conducting safety talks before starting work and only giving work orders to employees.

The results of interviews with mining and reclamation HSE (Health and Safety Environment) staff on January 17th, 2023, the safety climate in the Department of Mining and Raw Material Management has not been fulfilled optimally. There are a number of things that are still lacking, such as lighting and air circulation in several rooms/work areas that are lacking, coordination for obtaining drinking water for workers is not optimal, and signs, slogans, and OSH banners that have not been updated.

METHOD

The research method used in this study is a quantitative approach and a correlational research design. Quantitative research is research that explores the analysis of data or numbers put together using measurement methods and statistical analysis processing (Azwar, 2017). Correlational research design to examine the extent to which variations in a variable relate to variations in other variables (Azwar, 2017).

The sample was determined by accidental sampling technique with a total of 100 employees. The safety climate variable is measured using 24 items of the Nordic Occupational Safety Climate Questionnaire (NOSACQ-24), which consists of 4 Likert scale options. Occupational safety and health (OSH) variables are measured by the German Workplace Health and Safety Instrument (WHASI-G), which consists of 5 Likert scale options. Data analysis techniques in this study used the Spearman's Rho Test.

RESULT AND DISCUSSION

Description of Research Subjects

The collection was carried out in June 2023 by taking a sample of 100 employees in the mining and raw material management department of PT. XYZ. The following is the complete data of 100 employees who participated:

Table 1. *Characteristic of participants*

Characteristic	Freq.	Percentage
Gender		
Men	100	100
Woman	0	0
Age		
Early adulthood	26	26
Late adulthood	39	39
Early elderly	35	35
Education		

High School	49	49
Diploma III	22	22
Bachelor	26	26
Magister	3	3

Research Result

The following descriptive data and hypothetical data for each variable can be seen below:

Table 2: *Description of descriptive data and hypothetical data*

Variable	**Descriptive**			
	Min	**Max**	**Mean**	**SD**
Safety Climate	69	96	79.99	8.268
OSH	80	58	69.50	6.537
Variable	**Hypothetical**			
	Min	**Max**	**Mean**	**SD**
Safety Climate	24	96	60	12
OSH	16	80	48	10.67

According to Table 2 above, it is evident that for the safety climate variable, the mean value is 79.99, the standard deviation is 8.268, the maximum value is 96, and the minimum value is 69. In the occupational safety and health variable (OSH) the mean value is 69.50, the standard deviation is 6,537, the maximum value is 80, and the minimum value is 58.

Based on Table 2 it can also be seen that the safety climate variable has a hypothetical mean of 60, a standard deviation of 12, a maximum value of 96, and a minimum value of 24. The occupational safety and health variable (OSH) has a hypothetical mean of 48, a standard deviation of 10.67, a maximum value of 80, and a minimum value is 16.

The following table categorizes occupational safety and health (OSH) based on the hypothetical score:

Table 3*: Categorization of occupational safety and health (OSH)*

Categorization Norm	**Category**	**Score Level**	**Total**	**%**
X<(μ-1σ)	Low	X<37.33	0	0
(μ-1σ) ≤X<(μ+1σ)	Medium	37.33≤X <58.67	1	1
X≥(μ+1σ)	High	X≥58.67	99	99
	Total		**100**	**100**

According to table 3 above, it is evident that the occupational safety and health (OSH) of employees is included in the high category of 99% and the medium category of 1%.

The following table categorizes safety climates according to the official NOSACQ interpretation guide:

Table 4: *Categorization of safety climate*

Category	**Categorization Norm**	**Total**	**%**
Low	X <2.70	0	0
Fairly Low	2.70 ≤ X ≤ 2.99	16	16
Fairly Good	3.00 ≤ X ≤ 3.30	41	41
Good	X > 3.30	43	43
	Total	**100**	**100**

According to Table 4 above, it is evident that employee safety climate is included in the good category by 43%, the category is fairly good by 41%, and the category is fairly low by 16%.

The Spearman's Rho correlation test analysis showed that sig = 0.000 (p <0.05). This demonstrates a connection between the safety climate and occupational safety and health for staff members of the mining department and PT. XYZ.

Table 5: *Correlation Spearman's Rho Test*

Variable	Sig	r
Safety Climate OSH	0.000	0.699

The following is an illustration of the mean occupational safety and health based on its dimensions:

Table 6: *Description of the Mean Dimensions of Occupational Safety and Health (OSH)*

Variable	Dimensi	***Mean***
Keselamatan dan Kesehatan Kerja (OSH)	*Safety knowledge*	4.31
	Safety motivation	4.46
	Safety compliance	4.35
	Safety participation	4.24

According to Table 6 above, it is evident that in the occupational safety and health variable (OSH) the dimension of safety knowledge has a mean value of 4.31, safety motivation has a mean value of 4.46, safety compliance has a mean value of 4.35, and safety participation has a mean value of 4.24. From the mean value, it can be concluded that the safety motivation dimension has a higher mean value compared to the other seven dimensions.

Discussion

The discussion on the relationship between safety climate and occupational safety and health for mining department employees and PT. XYZ raw material management is interesting to know because based on initial interviews, the mine work process has high risks and hazards (based on interviews with Head of HSE and Reclamation, 17 January 2023).

Based on the results of data processing obtained using Spearman's Rho correlation test, it results that there is a significant relationship between safety climate and occupational safety and health (OSH) for employees of the Department of Mining and Raw Material Management of PT. XYZ. The correlation test produces a value of 0.699 with the correlation categorization being at a strong level of relationship strength. The correlation between safety climate and occupational safety and health (OSH) is positive.

The findings of this study are consistent with those of numerous investigations carried out by numerous earlier researchers. The research of Ishanuddin et al. (2019) showed that there was a positive relationship between safety climate and KAP (knowledge, attitude, and practice) of occupational safety and health (OSH) for workers from two manufacturing factories. Research conducted by Lyu et al. (2018) produced a significant positive relationship between safety climate and safety behavior in construction workers. Research conducted by Hon et al. (2014) also produced a significant positive relationship between safety climate and safety participation and safety compliance among RMAA workers.

The outcome of the categorization of occupational safety and health (OSH) variables were obtained that there were 99 (99%) out of 100 employees having occupational safety and health (OSH) at a high level, 1 (1%) employee having occupational safety and health (OSH) at medium level, and no employees who have occupational safety and health (OSH) at a low level. Yuliandi and Ahmad (2019) revealed that high worker safety and health will maintain absenteeism, illness, and reduce work accidents which will make workers healthy and productive.

Of the four dimensions in the occupational safety and health variable (OSH), the safety motivation dimension produces the highest mean value, which is 4.46. So, it can be concluded that the

average employee of the Department of Mining and Raw Material Management PT. XYZ has a will to seek behavior and values related to safety. Neal and Griffin (2006) stated that safety motivation is the willingness of workers to seek behavior related to safety and values related to this behavior. Conchie et al. (2013) stated that leaders with high levels of safety motivation can influence safety behavior in work members. Safety motivation plays an important role in good safety behavior so as to achieve better safety results (Panuwatwanich et al., 2017).

The dimension of occupational safety and health (OSH) which has a low mean value is the dimension of safety participation with a mean value of 4.24. So, it can be concluded that the average employee of the Department of Mining and Raw Material Management PT. XYZ does not support safety in the work environment. Griffin and Neal (2000) stated that safety participation is a worker behavior that helps in developing an environment that supports safety in the workplace. Employees show less participation in reporting suggestions that can improve safety performance. According to Masso (2015), employees who frequently demonstrate a participation to safety will always submit grievances and recommendations that can help improve safety performance.

High occupational safety and health for employees of the Department of Mining and Raw Material Management PT. XYZ is influenced by personality factors. Kotze and Steyn (2013) stated that personality is one of the psychological factors that affect work safety. Personality is a characteristic or individual traits in thinking, feeling, behaving, and reacting (Reber & Reber, 2001). Negative personality has a significant negative relationship with safe work behavior (Paul & Maiti, 2008). Personality of the Department of Mining and Raw Material Management PT. XYZ can be seen from its attitude in working whether it has used the correct PPE (Personal Protective Equipment) and safety equipment before going into a dangerous and risky work area.

Other factors that affect occupational safety and health (OSH) for employees of the Department of Mining and Raw Material Management PT. XYZ is an OSH program formed by the company. The purpose of the OSH program is so that the implementation of occupational safety and health in the company can run effectively so that safe working conditions will arise and workers who comply with the rules (Edigan et al., 2019). Caroline et al. (2021) stated that having OSH programs and training at companies can increase employee knowledge of the importance of using PPE. Department of Mining and Raw Materials Management PT. XYZ has its own field of HSE (Health and Safety Environment) and reclamation at its location. The HSE (Health and Safety Environment) and mine reclamation fields have OSH program regulations both from the aspects of occupational safety, occupational health, and work environment. The OSH program is always disseminated during safety talks or safety meetings, not only to employees but also to contractors and visiting guests. The OSH program is socialized when workers start their work both on daily and shift schedules. Each unit under the Department of Mining and Raw Material Management also has its own OHS team which is responsible for carrying out inspections. Each unit head is also responsible for making an IBPR (Hazard Identification and Risk Control) every year.

The role of the leader or supervisor also affects occupational safety and health (OSH) for employees of the Mining and Raw Materials Management Department of PT XYZ. Zohar (2002) states that effective supervisors will observe whether

the work they are doing is correct, including using PPE. Supervisors play a role in communicating occupational safety and health (OSH) with their workers such as giving warnings to workers who do not apply OSH behavior and praising workers who implement OSH behavior properly (Aeni & Fermina, 2015). Before starting work, the supervisor always conducts a safety talk with workers to ascertain whether PPE and other safety equipment have been used properly. Workers' knowledge can be increased by safety talk to understand the importance of occupational safety and health (OSH) at work to prevent work accidents (Muslim & Harianto, 2021). The supervisor will also be responsible if a member has a work accident, becomes sick, and violates the OSH SOP. Employees who violate the OSH SOP will be given a sanction in the form of a warning from the HSE (Health and Safety Environment) section and are required to write a warning report together with the supervisor.

From the outcome of the categorization of the safety climate variable, it was found that 43 (43%) employees had a good level of safety climate, 41 (41%) employees had a fairly good level of safety climate, 16 (16%) employees had a level of safety climate at a fairly low level, and there are no employees who have a low level of safety climate. Thus, it can be said that the level of safety climate for the employees of the Department of Mining and Raw Material Management PT. XYZ on average, is in the good category and the Occupational Safety and Health (OSH) employees of the Department of Mining and Raw Material Management PT. XYZ is in the high category. Summer et al. (2022) stated that it is possible to maintain a good level of safety climate and continue its development. There are several interventions that can improve safety climate, namely executive training, leadership development, identification of safety behavior (safety communication, teamwork, and management credibility), development of an action plan for gaps in current and desired safety critical behavior, observation of safety behavior, and feedback (Zohar, 2014).

Among the seven safety climate dimensions, the first dimension, namely workers' safety commitment, produces the highest mean value with a value of 3.48. So it can be concluded that the average employee of the Department of Mining and Raw Material Management PT. XYZ has a high perception of commitment to safety, promotes safety, and cares about the safety of co-workers. Kines et al. (2011) stated that workers' safety commitment is the perception of workers regarding how they relate to safety in the workplace such as showing safety commitment promoting safety and caring for each other's safety. Based on the results of an interview with one of the employees of the Department of Mining and Raw Material Management, PT. XYZ has a high commitment to safety because some employees always remind colleagues to complete PPE before going to the field, if they are not equipped, work cannot be done. Most of the employees are also married so they are more concerned with work safety and must go home healthy and safe.

The dimensions that have the lowest mean value with a value of 2.06 are the dimensions of management safety priority, commitment, and competence. So it can be concluded that the average employee of the Department of Mining and Raw Material Management PT. XYZ has a low perception of management in prioritizing safety. Kines et al. (2011) explained that management safety priority, commitment, and competence are workers' perceptions of management that prioritizes safety, actively promotes safety, and reacts to unsafe behavior,

demonstrates competency in handling safety, and communicates safety issues.

CONCLUSION

Following analysis of the research's findings, it can be said that there is a positive relationship with the strength of a strong relationship between safety climate and occupational safety and health (OSH) for employees of the Mining and Raw Materials Management Department of PT. XYZ. The correlation between safety climate and occupational safety and health (OSH) is positive. So that the higher the employee safety climate, the higher the occupational safety and health (OSH), conversely the lower the employee safety climate, the lower the occupational safety and health (OSH). The alternative hypothesis (Ha) is accepted while the null hypothesis (H0) is rejected, according to the findings of this study.

For further researchers who also wish to conduct research using the WHASI-G (Workplace Health and Safety Instrument German) measuring instrument, it is hoped that they can use a different analysis from this study such as multidimensional analysis and consider using other variables related to occupational safety and health (OSH) such as personality and leadership.

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