

## Analysis of Work Safety Climate Based on Demographic Characteristics in the Phosphoric Acid Industry Using Radar Plot

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### ABSTRACT

**Introduction:** Phosphoric acid production has not been achieved in the phosphoric acid industry due to unsafe actions and conditions influenced by various factors, including workplace safety. The work safety climate can measure certain perceptions of safety factors in the workplace and has seven dimensions. The demographic characteristics have a relationship with the perceptions of working safety. This study aims to analyze the work safety climate based on demographic characteristics in the phosphoric acid industry using a radar plot. **Methods:** The research design was a descriptive quantitative method with a cross-sectional approach. The population of the study is 44 workers in the phosphoric acid industry, with a total sampling of 44 employees. The dependent variable of the study was the work safety climate, and the independent variable was the demographic characteristics. The instrument employs NOSACQ-50 (50 questions) and analyzes the data with frequency tables and radar plot diagrams. **Results:** Dimensions management safety priority, commitment and competence were classified as good. The work safety climate is good, based on education level and age category. The work safety dimension based on job position is classified as relatively bad. **Conclusion:** The best dimension of work safety climate is in the foreman job position, the dimension of work safety climate is best at the education level after high school graduation, and the dimension of work safety climate is best at all age categories.

**Keywords:** demographic characteristics, phosphoric acid industry, workplace safety climatet

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### INTRODUCTION

Indonesia is recognized as an agrarian country, which can be defined as a country that relies on agriculture as a source of income and as a support for agricultural development (Umasugi, 2019). Several fertilizer industries are required to support the agricultural sector.

Indonesia is listed as one of Southeast Asia's fertilizer producers, and one of the main raw materials for domestic fertilizers, phosphoric acid, is still heavily imported from abroad (Sunaryo and Ratriwardhani, 2018). To prepare for the increase in phosphoric acid, the phosphoric acid industry has begun to emerge in Indonesia.

One of the phosphoric acid industries in Indonesia, which is the research location, has three main commodities: phosphoric acid, sulfuric acid, and gypsum. Every year, the phosphoric acid industry can produce sulfuric acid, phosphoric acid, and gypsum, as measured in MTPY (Metric Tons per Year).

According to Table 1, there is a relatively large gap between production capacity and production

**Table 1.** Production Achievement of Sulfuric Acid, Phosphoric Acid, and Gypsum

| Plant           | Production Capacity (MTPY) | M T P Y 2019 | M T P Y 2020 |
|-----------------|----------------------------|--------------|--------------|
| Sulfuric Acid   | 600,000                    | 545,906      | 591,695      |
| Phosphoric Acid | 200,000                    | 116,111      | 113,798      |
| Purified Gypsum | 500,000                    | 426,361      | 481,811      |

Source: Secondary Data of Phosphoric Acid Industry

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achievements in 2019 and 2020, one of which is the Phosphoric Acid Plant. The failure of the phosphoric acid industry to achieve phosphoric acid production is due to unsafe actions and conditions at the phosphoric acid plant, which are influenced by several factors such as weather and wind direction factors, leadership factors, management, and work safety climate. This impedes workers' ability to do their jobs. The delay in productivity is also due to the high number of work accidents at the phosphoric acid plant compared to other plants in this company. To solve this, a work safety culture must be implemented as part of the organization culture (Dihartawan, 2018). A good organization can identify potential hazards before they become accidents, primarily due to human factors. Accidents in the workplace can be prevented in a variety of ways, one of which is through a work safety approach implemented through an effective safety management system (Silvia, Ihsan and Rizky, 2020).

The work safety climate is the most widely used work safety approach that focuses on human factors (Silvia, Ihsan and Rizky, 2020). The perceptions, policies, procedures, and practices of the organization serve as the standard for the safety climate. The work safety climate reflects employees' perceptions of the true value of safety in an organization and is one of the factors that influence organizational culture (Griffin and Curcuruto, 2016). A safety climate scale can be used to quantitatively assess the work safety climate, and what is measured is the collective perception or opinion of a group of workers of particular dimensions related to work safety factors (Larisca, Widjasena and Kurniawan, 2019).

There are seven dimensions of work safety climate, particularly regarding management safety priority is a dimension that aims to capture workers' perceptions of the way management prioritizes safety. Commitment and competence is a dimension to capture perception of workers about how commitment of workers to safety a work is active and cares or otherwise. Management safety empowerment is a dimension relating to all efforts to be done by management to occupational safety. Management safety justice is a dimension to capture perception of workers with the method of management in treating the workers involved in accidents. Workers' safety priority and risk non-acceptance are dimensions capturing perceptions on how to work for the safety of workers. Workers'

trust in the efficacy of safety systems is a dimension to capture perception of workers as to how they see the labor safety audit, planning of the risks and benefits. Safety communication, learning, and trust in co-workers' safety competence is a dimension pertaining to discussion with workers regarding work-related issues (Kines *et al.*, 2011). Work safety climate was analyzed using a radar plot diagram and an instrument developed from the NOSACQ-50 instrument.

The demographic characteristics of workers influence their perception of the safety climate in the workplace (Wisnugroho, Dharmastiti and Hidayat, 2019). Respondent demographic data included age, education level, job position, and gender (Muslima, 2017). This study did not look into gender because all of the workers in the phosphoric acid plant industry are male with a total of 44 workers. This study aims to analyze the description of the work safety climate based on demographic characteristics in the phosphoric acid industry using a radar plot. The author uses radar plot, because it is a graphical method of displaying multivariate data in the form of two dimensional graphs of three or more quantitative variables. So that it can guarantee the highest and lowest levels of the seven dimensions of work safety which are variables in this study.

## METHODS

The research design is a cross-sectional study using quantitative descriptive research methods on 44 workers at a phosphoric acid plant in the phosphoric acid industry. This study was carried out in May 2021 under the research ethics permit number 240/HRECC.FODM/V/2021. The sampling technique used is total sampling, which means that the number of samples is equal to the population size, so the sample size is 44 workers. A phosphoric acid plant in the phosphoric acid industry serves as the research site. In this study, demographic characteristics (job position, education, and age) are the independent variable, while work safety climate is the dependent variable. Primary data were collected through questionnaires distributed offline to all workers in the phosphoric acid plant production unit of the phosphoric acid industry, and secondary data were collected through internal company data and books or articles. The research tool was a work safety climate questionnaire based on the Nordic Safety Climate Questionnaire (NOSACQ-50). There are 50 questions divided into seven work safety climate dimensions with four categories. The radar

plot diagram's interpretation can be described using the safety climate index, which is as follows; A score of more than 3.30 indicates a good level, allowing an organization to be maintained, Scores ranging from 3.00 to 3.30 indicate a relatively good level with a slight improvement, A score of 2.70 indicates a relatively low level with room for improvement, and A score of less than 2.70 indicates a very low level with a significant need for improvement, and massive and immediate improvement is required. Frequency tables and radar plot diagrams are used to analyze data

**RESULT**

**Demographic Characteristics**

***Description of Job Position of Workers in Phosphoric Acid Plant Phosphoric Acid Industry***

Table 2 depicts the frequency distribution of job positions in the phosphoric acid plant in the phosphoric acid industry, with 72.7% of 44 workers employed as operators. A small proportion of employees work as superintendents (9.1%).

***Description of Educational Level of Workers in Phosphoric Acid Plant in Phosphoric Acid Industry***

Table 3 depicts the distribution of education levels among workers in the Phosphoric Acid Industry's phosphoric acid plant. The majority of

**Table 2.** Frequency Distribution of Job position of Workers in Phosphoric Acid Plants, Phosphoric Acid Industry 2021

| Job Position   |           |            |
|----------------|-----------|------------|
| Variable       | Frequency | Percentage |
| Foreman        | 8         | 18.2%      |
| Operator       | 32        | 72.7%      |
| Superintendent | 4         | 9.1%       |

Source: Secondary Data of Phosphoric Acid Industry

**Table 3.** Frequency distribution of Workers' Education Level in the Phosphoric Acid Industrial Phosphoric Acid 2021

| Education Level |           |            |
|-----------------|-----------|------------|
| Variable        | Frequency | Percentage |
| High School     | 33        | 75%        |
| Bachelor        | 11        | 25%        |

respondents have completed senior high school (75%).

***Description of the Age of Workers in the Phosphoric Acid Plant in the Phosphoric Acid Industry***

Table 4 depicts the age distribution of workers in the phosphoric acid industry's phosphoric acid plant. The majority of workers (56.8%) are in their early adulthood, which is the productive age of workers.

***Analysis of the Work Safety Climate at the Phosphoric Acid Plant in the Phosphoric Acid Industry***

An analysis of the work safety climate in the phosphoric acid plant can be seen through the radar plot diagram as follows. According to the radar plot diagram in Figure 1, all dimensions of the workplace safety climate are in the "relatively good to good" category. Safety management priorities and capabilities are among the dimensions included in the good category. Meanwhile, the dimensions of management safety justice; workers' safety commitment; safety communication, learning, and trust in coworkers' safety competence; management safety justice; workers' safety priority and risk non-acceptance that is not tolerated; belief in the efficacy of the safety system; and empowerment of safety management have the lowest score, but are still in a relatively good category.

***Analysis of Work Safety Climate Based on Demographic Characteristics in Phosphoric Acid Plant Phosphoric Acid Industry***

***Analysis of Work Safety Climate Based on Job Position***

The analysis of the work safety climate based on the job position at the phosphoric acid plant in

**Table 4.** Age Frequency Distribution of Workers in Phosphoric Acid Plants in the Phosphoric Acid Industry 2021

| Age             |           |            |
|-----------------|-----------|------------|
| Variable        | Frequency | Percentage |
| Late teen       | 4         | 9.1%       |
| Early adulthood | 32        | 56.8%      |
| Late adulthood  | 4         | 18.2%      |
| Early elderly   | 25        | 15.9%      |

the phosphoric acid industry can be seen through the following radar plot diagram. According to the radar plot diagram in Figure 2, the job position with the better work safety climate dimension is the foreman position. The dimension of empowerment of safety management has the greatest category of work safety climate in the foreman position, while the priority dimensions of work safety and risk that cannot be tolerated are in the relatively good category.

The dimension of work safety climate in the operator's job position in the best category is the dimension of safety management priorities and capabilities. The lowest score but still in the relatively good category is the dimensions of safety communication, learning, and trust in the safety competence of colleagues and trust in the safety climate of the organization.

The dimension of the work safety climate in the category superintendent position is still lower than in other job positions. The climate dimension of empowerment of safety management and worker safety priorities and risks that cannot be tolerated has the highest score, while the dimension of worker safety trust has the lowest score with a relatively bad category.

**Analysis of Work Safety Climate Based on Education Level**

The analysis of the work safety climate based on the level of education in the phosphoric acid industrial phosphoric acid plant can be seen through the radar plot diagram as follows. Figure 3 shows

that at the educational level, undergraduates (Strata One /S1) have a better work safety climate score than workers with high school graduates. At both levels of education, the highest score for work safety climate is in the good category, namely the dimensions of priority and management safety capabilities, while the lowest score is in the fair category, namely the dimensions of worker management safety justice.

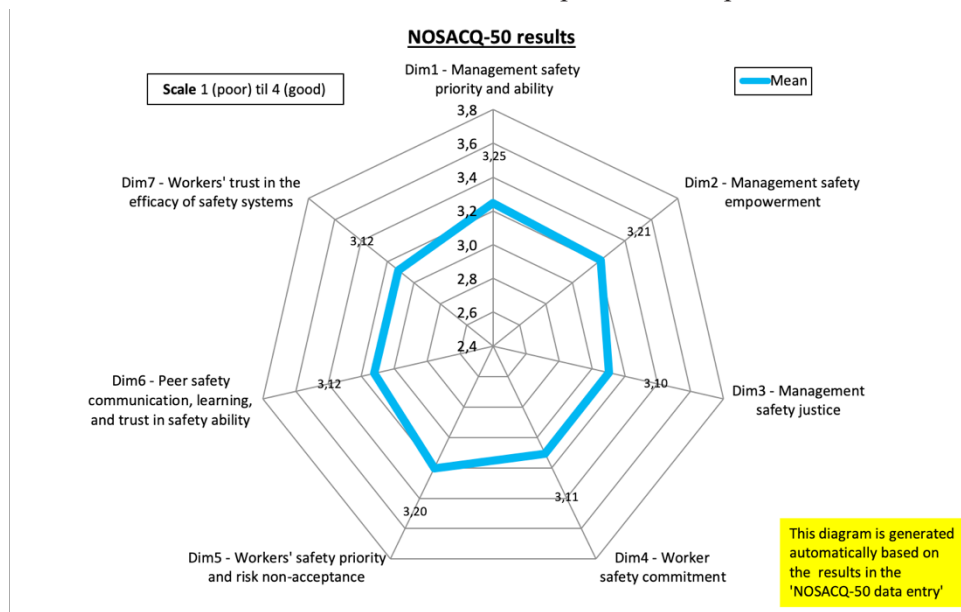
**Analysis of Work Safety Climate Based on Age Category**

The following radar plot diagram depicts an analysis of the work safety climate at the phosphoric acid industrial phosphoric acid plant by age category. Figure 4 shows a radar plot diagram showing that each age group does not have a separate category of work safety climate dimensions. The priority climate dimension and management's safety capability receive the highest score or good category across all age groups. The management safety justice dimension has the highest score in the relatively good category, while the management safety justice dimension has the lowest score in the relatively good category.

**DISCUSSION**

**Demographic Characteristics**

The majority of respondents work as operators, while the smallest number of respondents had a superintendent position. The number of workers



Source: Secondary Data of Phosphoric Acid Industry

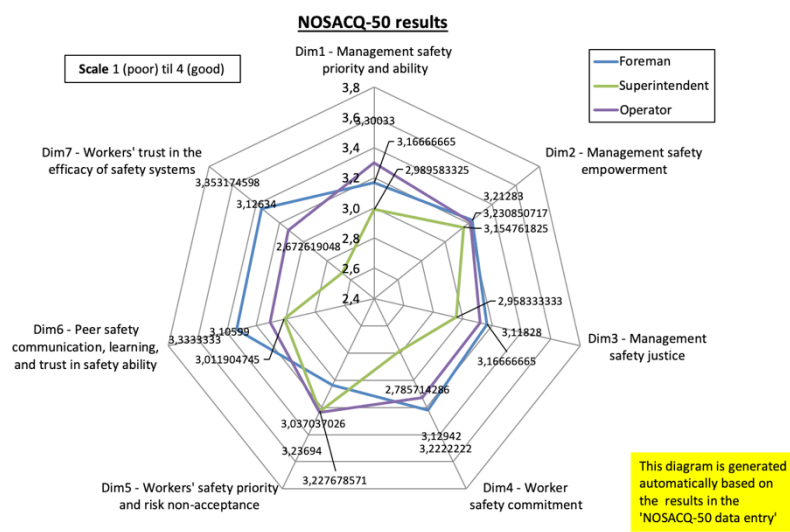
Figure 1. Analysis of the Work Safety Climate



in the phosphoric acid plant must correspond to the primary needs identified in the company's development strategy (Tampubolon, 2016). The majority of employees have graduated from high school. Since the majority of the industrial sector in Indonesia does not require workers who are too smart, high school / vocational high school graduates are absorbed by industry more than undergraduates (Alam, 2017). Early adulthood is the most common age range among workers, which can be said as a good thing. Because younger employees are considered physically stronger than older employees, they are hired more frequently (Zuhroh, Aini and Aini, 2019).

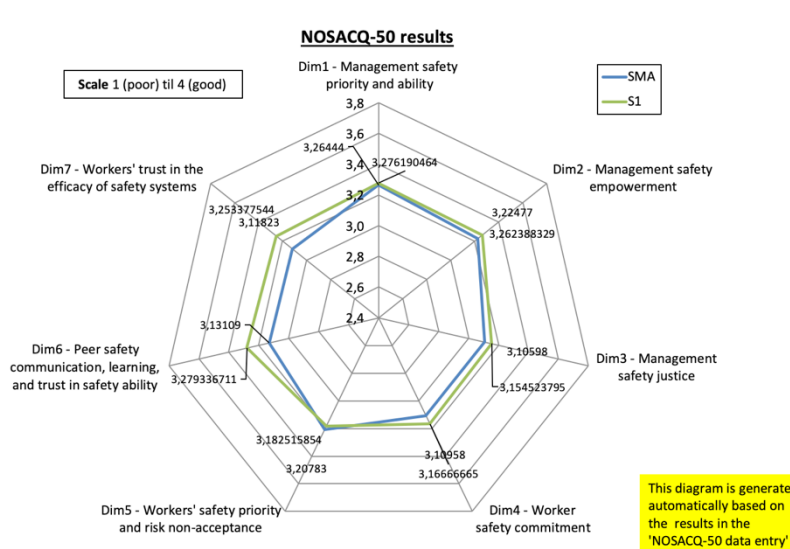
### Analysis of the Work Safety Climate at the Phosphoric Acid Plant in the Phosphoric Acid Industry

Figure 1 shows that each dimension of the work safety climate falls into the "relatively good to good" category. The good category includes the dimensions of the organization's workplace safety priorities and capabilities. These dimensions must be maintained and developed; one intervention that can be made is to redevelop management's role in paying attention to the work safety climate (Sampurna, Sulistyorini and Satoto, 2020). This management is responsible for not only the management of the unit, but also for top management as a whole.



Source: Work Safety Climate (NOSACQ-50)

Figure 2. Radar Plot of Work Safety Climate in Each Job Position



Source: Work Safety Climate (NOSACQ-50)

Figure 3. Radar Plot of Work Safety Climate at Each Education Level

Dimensions that are still in the relatively good category are the dimensions of management safety justice; workers' safety priority and risk non-acceptance that is not tolerated; and workers' safety commitment can be improved by implementing several strategies, such as providing leadership training at the bottom level which is expected to provide a fair work safety climate for each member (David, 2017). Furthermore, safety facilities can be provided in light of the hazard risks in the work unit, for example, such as conducting inspections or audits, training and seminars, reporting of accidents or hazardous conditions, and measuring the work climate (Yuliarti, 2018).

Learning, communication, workplace safety, and innovation are three dimensions with a relatively good category; empowerment of safety management; and trust in work safety capabilities can also be increased by training such as occupational health and safety communication given not only to leaders but also to each member. Workers who have open communication about occupational health and safety tend to discuss safety issues in the workplace (Rosalita, Ratmawati and Agustina, 2016).

### Analysis of Work Safety Climate Based on Demographic Characteristics in Phosphoric Acid Plant Phosphoric Acid Industry

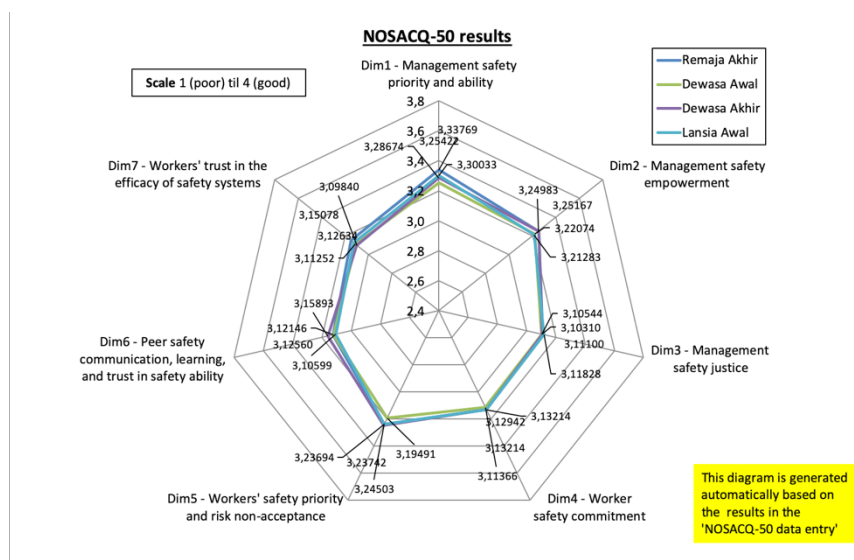
#### Analysis of Work Safety Climate Based on Job position

Figure 2 shows that the foreman's position has a better work safety climate dimension than other

jobs. This is because the foreman's job description includes checking for abnormal items, maintaining field stability, analyzing and solving problems, all of which contribute to a higher work safety climate perception. The climate dimension of work empowerment, which has a high score in the good category, needs to be maintained or even developed again by providing regular and continuous training to each worker. This work empowerment can be achieved, by involving employees in decision-making and problem-solving. The dimension of workers' safety priority and risk non-acceptance that is not tolerated still needs to be improved, which can be done by providing interventions such as before carrying out production instructions regarding safety priorities (Tutiany, Lindawati and Krisanti, 2017).

The dimensions of workers' safety priority and risk non-acceptance that is not tolerated, which require efforts to maintain or develop, are the dimensions of the work safety climate in the operator's position with the highest score in the good category. Meanwhile, to achieve a good category, the dimensions of work safety climate with a low score in the relatively good category, namely safety communication, learning, and trust in coworkers' safety competence and trust in the work safety climate in the organization, need to be improved. Training, discussing safety issues, learning from knowledge, assisting each other in working safely, treating safety advice from each other, and mutual trust in the abilities of workers are all steps that can be taken (Lestari *et al.*, 2016).

Since this position is not directly exposed to the production process, the dimensions of the work



Source: Work Safety Climate (NOSACQ-50)

Figure 4. Radar Plot of Work Safety Climate in Each Age Category

safety climate in the superintendent position are still in the worst category when compared to other job positions. The dimensions of the management climate of safety empowerment and the priority of worker safety and risks that cannot be tolerated are the dimensions of the work safety climate that have a high score in the good category. Because the gap with other positions is quite far, these two dimensions still need to be improved. While the dimensions of work safety climate with the lowest score in the category of bad enough, namely the dimensions of work safety trust in the system or organization and the dimensions of worker safety trust, both require significant improvement. Improvements that can be made include including all positions in every work safety intervention in the company, as well as cultivating a sense of work safety ownership in each position (David, 2017).

#### ***Analysis of Work Safety Climate Based on Education Level***

Figure 3 shows that the dimension of work safety climate with the highest score is at the high school graduate education level. Which has the highest score is the dimension of safety management priorities and capabilities at both levels of education. It is necessary to consider and develop dimensions with good categories. The dimension of management safety justice has the lowest score in the relatively good category of work safety climate dimensions. Improving work safety culture, one of which is reporting irregularities or reporting culture, is one way to improve management safety justice (Purwaningsih, Handayani and Miranda, 2019). A good reporting culture is one in which employees of all levels are willing to report errors and near-miss incidents (Casey *et al.*, 2017). Efforts can be made to treat workers who have been involved in accidents fairly (Listyaningsih and Harianto, 2021).

#### ***Analysis of Work Safety Climate Based on Age Category***

Based on Figure 4, it can be seen that the dimension of safety management priorities and capabilities has the highest score or is in the good category in all age categories of work safety climate. The management safety justice dimension has the lowest score across all age categories, indicating

that intervention is required. In the research by Nopiyanti and Muttaqin (2020), the low dimension of management safety justice is something that needs to be improved because this dimension is very important in the life of the organization in the workers environment, because if there is no justice, it causes a decrease in the commitment of the workers, the occurrence of crime in the workplace, and the desire of workers to protest.

The intervention that can be made is to treat all workers fairly, without discriminating against accident investigations in each workgroup (Sutrisno *et al.*, 2017). Efforts can also be made by instituting a reporting culture for irregularities, errors, or near-miss events (Casey *et al.*, 2017). When an accident occurs, company management should stop turning on workers of all ages, as this can hinder the reporting culture (Siregar and Azrina, 2019).

## **CONCLUSION**

The seven dimensions of the work safety climate in the phosphoric acid industrial phosphoric acid plant are classified as relatively good to good. According to the occupation, the one who demonstrates a better dimension of work safety climate is the foreman. Furthermore, based on the level of education that shows the dimensions of a better work safety climate are undergraduates (S1). There is no age category with a better work safety climate dimension, but there is one with the highest score across all age categories, namely safety management priorities and capabilities. Suggestions to improve the perception of the work safety climate in all dimensions are to conduct safety representative training activities for each work group and the company to periodically conduct an assessment of the work safety climate for workers at each plant in the company, so that the development of the perception of the work safety climate can be seen.

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## REFERENCES

- Alam, S. (2017) 'Tingkat Pendidikan dan Pengangguran di Indonesia (Telaah Serapan Tenaga Kerja SMA/SMK dan Sarjana)', *Jurnal Imiah BONGAYA (Manajemen & Akuntansi)*, (XIX), pp. 250–257.
- Casey, T. *et al.* (2017) 'Safety Climate and Culture: Integrating Psychological and Systems Perspectives', *Journal of Occupational Health Psychology*, 22(3), pp. 341–353.
- David, C. (2017) *Safety Climate and the Influence of Leadership : A Study of Safety Climate and the Influence Leadership Training has on Employee Perceptions of Health and Safety*. Thesis. New Zealand: Masters of Business, Massey University.
- Dihartawan, D. (2018) 'Budaya Keselamatan (Kajian Kepustakaan)', *Jurnal Kedokteran dan Kesehatan*, 14(1), pp. 98–108.
- Griffin, M. A. and Curcuruto, M. (2016) 'Safety Climate in Organizations', *Annual Review of Organizational Psychology and Organizational Behavior*, 3(July), pp. 191–212.
- Kines, P. *et al.* (2011) 'Nordic Safety Climate Questionnaire (NOSACQ-50): A new Tool for Diagnosing Occupational Safety Climate', *International Journal of Industrial Ergonomics*, 41(6), pp. 634–646.
- Larisca, N., Widjasena, B. and Kurniawan, B. (2019) 'Hubungan Iklim Keselamatan Kerja dengan Tindakan Tidak Aman pada Proyek Pembangunan Gedung X Semarang', *Jurnal Kesehatan Masyarakat (e-Journal)*, 7(4), pp. 122–128.
- Lestari, M. D. *et al.* (2016) *Psikologi Industri dan Organisasi*. Denpasar: Universitas Udayana.
- Listyaningsih, D. and Harianto, F. (2021) 'Iklim Keselamatan Kerja Pada Proyek Konstruksi Di Surabaya', *PADURAKSA: Jurnal Teknik Sipil Universitas Warmadewa*, 10(1), pp. 70–83.
- Muslima, A. (2017) *Gambaran Iklim Keselamatan (Safety Climate)*. Undergraduate Thesis, Jakarta: Faculty of Medicine and Health Sciences, Universitas Islam Negeri Syarif Hidayatullah.
- Nopiyanti, E. and Muttaqin, A. (2020) 'Hubungan Iklim Keselamatan Dengan Budaya K3 Di Proyek Citra Tower Kemayoran Evi', *Jurnal Bidang Ilmu Kesehatan*, 10(1), pp. 1–22.
- Purwaningsih, R., Handayani, N. U. and Miranda, N. (2019) 'Penilaian Budaya Keselamatan Dengan Metode Scart (Safety Culture Assessment Review Team) Pada Badan Pengelola Instalasi Nuklir', *J@ti Undip : Jurnal Teknik Industri*, 14(1), pp. 27–32.
- Rosalita, N. A., Ratmawati, D. and Agustina, T. S. (2016) 'Mediasi Safety Knowledge Dan Safety Motivation Pada Pengaruh Safety Management Practices Terhadap Safety Performance Karyawan Bagian Produksi PT.Petrokimia Gresik', *Jurnal Manajemen Teori dan Terapan| Journal of Theory and Applied Management*, 8(3), pp. 201–215.
- Sampurna, E. R., Sulistyorini, E. and Satoto, H. F. (2020) 'Analisis Pada Pengaruh Keselamatan dan Kesehatan Kerja Di Dalam Perusahaan Kontruksi Surabaya', *KAIZEN : Management Systems & Industrial Engineering Journal*, 3(1), pp. 8-15.
- Silvia, S., Ihsan, T. and Rizky, I. A. (2020) 'Analisis Iklim Keselamatan Kerja dan Pengaruh Karakteristik Responden pada Bagian Produksi di PT. X', *Jurnal Serambi Engineering*, 5(3), pp. 1155–1164.
- Siregar, N. and Azrina, A. (2019) 'Evaluasi Iklim Keselamatan Kerja Dengan Menggunakan Metode NOSACQ-50 di PT. XYZ', *Talenta Conference Series: Energy and Engineering (EE)*, 2(3), pp. 486-491.
- Sunaryo, M. and Ratriwardhani, R. A. (2018) 'Gambaran Faktor Internal Dan Eksternal Pekerja Terhadap Penerapan Sistem Safety Permit Di PT. Z', *Proceeding 2nd Conference on Safety Engineering and Its Application*, (2581), pp. 425–430.
- Sutrisno *et al.* (2017) 'Pengaruh Iklim Keselamatan terhadap Perilaku Keselamatan pada Proyek Tol Surabaya-Mojokerto Seksi 1B', *Proceeding 1st Conference on Safety Engineering and its Application*, (2581), pp. 19–23.
- Tampubolon, H. (2016) *Strategi Manajemen Sumber Daya Manusia dan Perannya dalam Pengembangan Keunggulan Bersaing*. Jakarta: Papas Sinar Sinanti. pp. 8-13.
- Tutiany, Lindawati and Krisanti, P. (2017) 'Bahan Ajar Keperawatan: Manajemen Keselamatan Pasien', Pusat Pendidikan Sumber Daya Manusia Kesehatan Kementerian Kesehatan RI, pp. 2–14.



- Umasugi, L. (2019) 'Peranan Sektor Pertanian terhadap Perekonomian di Kabupaten Kepulauan Sula Provinsi Maluku Utara', *Jurnal Biosainstek*, 1(01), pp. 10–15.
- Wisnugroho, A. D. H., Dharmastiti, R. and Hidayat, M. (2019) 'Pengaruh Usia, Jenis Kelamin, Status Pendidikan, dan Masa Kerja terhadap Persepsi Iklim Keselamatan dari Pengemudi PT XYZ Yogyakarta', *Prosiding Seminar Nasional Geotik*, pp. 374–383.
- Yuliarti, L. (2018) *Gambaran Iklim Keselamatan Kerja (Safety Climate) Pada Perawat Dan Tenaga Penunjang Medis Di RSUD Kota Depok Tahun 2017*. Undergraduate Thesis. Jakarta: Faculty of Medicine and Health Sciences, Universitas Islam Negeri Syarif Hidayatullah.
- Zuhroh, F., Aini, K. and Aini, D. N. (2019) 'Hubungan Stres Kerja Dengan Produktivitas Pegawai Pabrik', *Jurnal Keperawatan Jiwa*, 5(1), pp. 19-24.