



RELATIONSHIP BETWEEN OHS COMPLIANCE AND HOUSEKEEPING IMPLEMENTATION WITH OCCUPATIONAL INJURY RISK IN A CONSTRUCTION COMPANY

HUBUNGAN KEPATUHAN K3 DAN IMPLEMENTASI 5 R DENGAN RISIKO KECELAKAAN KERJA DI PERUSAHAAN BIDANG KONSTRUKSI

Adinda Novia Ardhani¹, Rika Ameiliawati², Noeroel Widajati^{3*}

Department of Occupational Health and Safety, Faculty of Public Health, Universitas Airlangga, Indonesia

ABSTRACT

Background: Construction companies are one of the highest accident-prone fields. One of the efforts to protect the safety and health of construction workers is OHS compliance from the aspect of compliance in using PPE, following work instructions and implementing routine and periodic housekeeping. OHS compliance and housekeeping implementation to prevent the risk of work accidents. However, based on conditions in the field, many workers still do not comply with OHS and have not implemented housekeeping properly. **Purpose:** To determine the relationship between OHS compliance, housekeeping implementation, and occupational injury risk in a construction company. **Method:** This study was an observational study type using a cross-sectional approach. A total of 98 people were used in the sample for this study. Data analysis was performed using the phi test and contingency coefficient test. **Result:** There is a relationship ($p=0,000$) with a strong relation ($\phi=0,959$) between OHS compliance and occupational injury risk, and there is a relationship ($p=0,000$) with a moderate level of relationship ($r=0,583$) between the housekeeping implementation levels and occupational injury risk for the construction company workers. **Conclusion:** There is a strong relation between OHS compliance and occupational injury risk and a relatively strong relation between housekeeping implementation levels and occupational injury risk in construction company workers.

ABSTRAK

Latar belakang: Perusahaan konstruksi merupakan salah satu bidang pekerjaan yang memiliki angka kecelakaan tertinggi. Salah satu upaya untuk melindungi keselamatan dan kesehatannya pekerja konstruksi yaitu kepatuhan K3 dari aspek kepatuhan dalam menggunakan APD dan mengikuti instruksi kerja, serta mengimplementasikan *housekeeping* secara rutin dan berkala. Kepatuhan K3 dan implementasi *housekeeping* guna mencegah risiko kecelakaan kerja. Namun berdasarkan kondisi di lapangan, masih banyak pekerja yang tidak patuh K3 serta belum mengimplementasikan *housekeeping* dengan baik. **Tujuan:** Mengetahui hubungan kepatuhan K3 dan implementasi 5R dengan risiko kecelakaan kerja di perusahaan bidang konstruksi. **Metode:** Penelitian ini merupakan jenis penelitian observasional dengan pendekatan *cross-sectional*. Sampel penelitian ini menggunakan total populasi sebanyak 98 orang. Analisis data menggunakan uji *Phi* dan uji Koefisien kontingensi. **Hasil:** Terdapat hubungan ($p=0,000$) yang kuat ($\phi=0,959$) antara kepatuhan K3 dengan risiko kecelakaan kerja dan terdapat hubungan ($p=0,000$) yang sedang ($r=0,583$) antara tingkat implementasi 5R dengan risiko kecelakaan kerja pada pekerja di perusahaan bidang konstruksi. **Kesimpulan:** Terdapat hubungan kuat antara kepatuhan K3 dengan risiko kecelakaan kerja serta terdapat hubungan cukup kuat antara tingkat implementasi 5R dengan risiko kecelakaan kerja pada pekerja di perusahaan bidang konstruksi.

Research Report
Penelitian

ARTICLE INFO

Received 25 April 2022
Revised 14 May 2022
Accepted 27 July 2022
Online 30 July 2022

Correspondence:
Noeroel Widajati

E-mail :
noeroel.widajati@fkm.unair.ac.id

Keywords:
OHS Compliance, Housekeeping,
Occupational injury

Kata kunci:
Kepatuhan K3, 5R, Kecelakaan
kerja



INTRODUCTION

Every worker has the right to the physical and psychological protection of the employer concerning his welfare, safety and health (UU Republik Indonesia, 2020). If the health and safety of workers are not guaranteed, there is a risk of workplace injury. According to Kementerian Tenaga Kerja Republik Indonesia (1998) a work injury is an adverse event that may result in injury or death. The way to prevent occupational injury is to implement an occupational health and safety program (OHS). Implementation of the OHS program is based on the needs and hazards present in the workplace so that safety measures such as worker compliance in the use of PPE, work instructions and the housekeeping implementation can be developed properly (Astiningsih *et al.*, 2018).

Infrastructure development by construction companies can accelerate the pace of Indonesia's economy. The construction industry is one of the areas where there is an occupational injury risk (Alfiansah *et al.*, 2020). It is because the work done in construction has a lot of hazard risks and involves a lot of workers as human resources. Also, factors that contribute to the injury-prone factors for workers in the construction industry could be due to the technology involved in the construction industry, methods of completing critical works, and high labor demand with limited time frames for completion (Kementerian Pekerjaan Umum dan Perumahan Rakyat, 2021). According to data released by the Bureau (BPJS), the construction industry is an industry that is prone to occupational injuries, so it is the industry with the most occupational injuries in Indonesia. As of 2019, the number of construction injuries was 114,000. In 2020 the number of occupational injuries in the construction sector increased to 177,000 cases. Data from the Manpower (2014), forms of work accidents that occurred in the construction sector included 26% falling from a height, 12% colliding, and 9% falling (Safitri and Widowati, 2017)

The risk factors for occupational injury in construction are various. According to Aldred *et al.*, (2013) the drivers of occupational injury risk are labor characteristics, work environment factors, and management factors. The characteristics of the workforce are age, gender, years of service, knowledge, attitudes, and compliance with applicable procedures. Work environment factors include noise, air temperature, lighting, and the application of housekeeping. Management factors are supervision, OHS socialization, reward and punishment (Aldred *et al.*, 2013).

OHS compliance is the attitude of workers in carrying out occupational health and safety regulations which include the use of PPE and following work instructions. Work accidents can occur due to workers' negligent behavior such as not complying with the use of PPE and not carrying out work instructions as specified (Batubara *et al.*, 2021). Workers compliance

in implementing OHS such as the use of PPE and carrying out work instructions is very necessary. This is because PPE functions to minimize the occupational injury risk, while work instructions are made so that workers do their work according to these instructions and the actions taken can be accounted for Alfidyani *et al.* (2020). The application of good housekeeping can also minimize the occupational injury risk because the work area can become more conducive so as to encouraging workers to comply more with procedures and behave safely at work (Kurniawan *et al.*, 2017). Housekeeping implementation is an activity to create and maintain a neat, clean, orderly, and safe work environment (Manpower, 2016). A well-organized workplace can increase workers productivity at work and avoid distractions that can lead to lost working hours (Yuliana and Nava, 2022).

Based on literature studies, many work accidents are still caused by workers not complying with OHS compliance (use of PPE and work instructions) and poor housekeeping implementation. Data from Riptifah *et al.* (2021) said that 82,1% of workers who did not comply with using PPE had experienced work accidents in construction companies. Workers compliance in following work instructions or Standard Operating Procedures (SOP) is still relatively low. Research conducted by Putri *et al.* (2017), 65.2% of workers do not apply work instructions due to a lack of awareness of each risk of experiencing work accidents. In addition, the implementation of housekeeping is also often underestimated. Of workers who do not implement it well, 60.9% have work accidents. Poor performance of housekeeping because there is no particular storage area for work equipment (Silalahi, 2019)

The construction company is a company that handles operations and maintenance projects, including industrial plants, cement plants, mining and petrochemicals. The maintenance activities of a construction company are the maintenance and repair activities of the machines used. Based on the results of interviews with a construction company safety officer, maintenance workers already know which work instructions and personal protective equipment to use. However, due to real-world working conditions, there are still many workers who do not follow work instructions and use PPE as recommended. The results of Fairyo and Wahyuningsih (2018) research, in a construction company, it was found that 84% of workers did not use PPE when working. In addition, 81.8% of construction workers do not comply with work instructions (Dyanita, 2017). In addition, the implementation of housekeeping in the workshop area has been carried out, but there are obstacles, namely the lack of interest and cooperation of maintenance workers in the implementation of housekeeping.

As a result of the lack of OHS compliance and poor housekeeping implementation, there are still accidents and near misses that occur among construction workers. Based on this description, researchers are interested in

conducting research related to the relation between the OHS compliance and the housekeeping implementation levels with the occupational injury risk in a construction company.

MATERIAL AND METHOD

This study is a quantitative study using the analytical observation method. The study is also descriptive and will describe the OHS compliance and housekeeping implementation levels and the risk of occupational injury for workers in a construction company. This study was conducted using a cross-sectional approach to understand the relationship between variables. The population in this study was all construction company workers, up to a maximum of 98. The sampling technique was the total population, so the study sample was 98 people. The variables used are independent and dependent variables. The independent variables identified for the study were OHS compliance and the housekeeping implementation levels, while the dependent variable was occupational injury risk. Techniques for data collection use questionnaires and checklists. The OHS compliance questionnaire consists of 5 questions which will then be scored, while the occupational injury questionnaire instrument it will be categorized workers who have experienced work injury and have never had the occupational injury. The housekeeping implementation levels variables will be categorized as very good, good, fair, poor, and very poor. The instrument in this study has passed ethical test No. 366/HRECC.FODM/VII/2021. After collecting the data, it was analyzed using univariate analysis to determine the frequency distribution of each variable, while bivariate analysis was to determine the strong correlation between variables. Bivariate analysis with Phi test to see the strong correlation of the 2x2 table cross-tabulation and contingency coefficient test to see the strong relationship of the table > 2x2.

RESULT

Company overview

The studied company is among the well-known construction companies in Indonesia. This construction company has been operating in the manufacture of power plants, fertilizer plants, cement, mining, paper, steel, gas and oil, and petrochemicals for more than 40 years. The maintenance services offered by the construction company cater to all types of construction. It also includes construction planning and scheduling, erection, supervision, site administration and quality control, construction tool and equipment control and supervision, site procurement, safety and security control, warehouse and material control, site facilities, pre-commission services, and mechanical acceptance. The company also provides fabrication services for workshops, open field areas, and locations where buildings are erected. In order to maintain

the environment as well as the safety and health of its workers, it has a commitment to implement the OHS program. The purpose of implementing this OHS program is also to maintain compliance of all workers with all OHS regulations and requirements as well as implement healthy and safe behavior while in the work area. Workers are also expected to comply with OHS as a preventive measure to avoid incidents or injury at work, Occupational Diseases (PAK), and property damage. The OHS programs that have been carried out by a construction company include Safety Induction, Tool Box Meeting, Permit to Work, JSA (Job Safety Analysis), Safety Morning Talk, Daily Safety Inspection, PPE inspection, CEVTM Inspection & Colour Code, Daily Inspection Equipment, HSE Sign Board & Poster, General Cleaning, Accident – Incident Report, Weekly Safety Report, Monthly Safety Report.

OHS compliance and housekeeping implementation levels

The results of this OHS compliance distribution (Table 1) are obtained from filling questionnaire regarding the use of Personal Protective Equipment (PPE), work instructions, hazard analysis, application of work permits or work permits, and application of housekeeping while doing work. On the implementation of housekeeping is assessed by filling out a form that includes the driving factors for management commitment, the established housekeeping organization, training and promotion of housekeeping programs, as well as the implementation of housekeeping implementation, namely concise, neat, clean, caring, and diligent. The assessment of the implementation of housekeeping is carried out in 3 areas, namely the warehouse area and workshop. The distribution results are obtained regarding the application of housekeeping (clean, concise, neat, caring, and diligent) when doing work.

Table 1. Distribution of ohs compliance and housekeeping implementation levels in a construction company workers

Research variables	Category	Freq	%
OHS compliance	Obedience	51	52,0
	Disobedience	47	48,0
Total		98	100,0
Housekeeping implementation levels	Poor	39	39,8
	Fair	37	47,8
	Good	22	22,4
Total		98	100,0

The distribution of OSH compliance of workers in a construction company was obtained from a questionnaire about the use of Personal Protective Equipment (PPE) and work instructions while workers in a construction company were doing their jobs. The results of the distribution of OHS compliance, found that the majority of OHS compliance is in the obedience category with 51 workers and a percentage 52,0%.

In addition to OHS compliance, there is a variable level of housekeeping implementation. The housekeeping implementation levels are obtained from filling out the form, which includes the driving factors of management commitment, housekeeping organization, training and promotion of housekeeping programs, and the housekeeping implementation (Concise, Neat, Clean, Treat, Diligent). This assessment is carried out in the warehouse, workshop, and work areas. Based on filling out the form, it was found the majority of the housekeeping implementation levels are in the poor category of 39 workers with a percentage of 39.8%.

Occupational injury risk

The following Table 2 contains work accidents that occur to construction company workers while doing their work.

Table 2. Distribution of occupational injury risk in a construction company workers

Research variables	Category	Freq.	%
Occupational injury risk	Never	48	49,0
	Ever	50	51,0
Total		98	100,0

Data on the distribution of occupational injury risk variables were obtained through filling out

questionnaires by workers which included exposure to heat, being pinched, stabbed or cut by sharp objects, tripping, and slipping. Those occurrences are categorized as an incident because it does not cause a major loss or loss of working days or even death. Based on the research, it was found that the majority 51 workers with a percentage of 51% were at risk of having an occupational injury incident.

Relation between OHS compliance with occupational injury risk for construction company workers

The following of Table 3 is the result of a cross tabulation between the OHS Compliance variable with occupational injury risk. Based on the Table 3, it is known that workers who have been at risk of having an occupational injury and have lower OHS compliance are 49 workers with a percentage of 96%. Based on the results of the Phi test (Table 3), a p-value of 0.000 and a phi value of 0.959 means there is relation with a strong relation between OHS compliance with the risk of injury for workers in a construction company.

Relation between the housekeeping implementation levels with occupational injury risk for construction company workers

The following of Table 4 is the result of a cross tabulation between housekeeping implementation variable with occupational injury risk.

Table 3. Relation between OHS compliance with occupational injury risk for a construction company workers

OHS compliance	Occupational injury risk				p-value	Phi
	Never		Ever			
	n	%	n	%		
Obedience	47	97,9	1	2,0	0,000	0,959
Disobedience	1	2,1	49	96,0		
Total	48	100,0	50	100,0		

Table 4. Relation between the housekeeping implementation levels with occupational injury risk for construction company workers

Housekeeping implementation levels	Occupational injury risk				p-value	Contingency coefficient
	Never		Ever			
	n	%	n	%		
Poor	4	8,3	35	70,0	0,000	0,584
Fair	34	78,8	3	6,0		
Good	10	20,8	12	24,0		
Total	48	100,0	50	100,0		

Based on the Table 4, it can be seen that in workers who have poor housekeeping implementation, as many as 4 workers (8.3%) have never been at risk of having a work accident, and 35 (70.0%) workers have been at risk of having a work accident. Workers with adequate housekeeping implementation, as many as 34 workers (78.8%) were never at risk of having a work accident, and

3 workers (6.0%) were at risk of having a work accident. Workers with adequate housekeeping implementation, as many as 10 workers (20.8%) were never at risk of having a work accident, and 12 workers (24.0%) were at risk of having a work accident. The results of the cross-tabulation between the housekeeping implementation levels with an occupational injury

risk, it can be seen that most workers have been at risk of experiencing occupational injury with a poor level of housekeeping implementation has as many as 35 workers with a percentage of 70%. Based on the contingency coefficient test results, a p-value of 0.000 and a contingency coefficient of 0.584, it means there is relation with a moderate level relation between the housekeeping implementation levels with the occupational risk for workers in a construction company.

DISCUSSION

Relation between OHS compliance with occupational injury risk for construction company workers

Based on the data analysis process using the Phi test (Tabel 3), it can be concluded that there is a strong correlation between occupational health and safety compliance and occupational injury risk for workers in a construction company, with a p-value of 0.000 and a phi of 0.959. This is because as many as 50 workers failed to follow work instructions and adhered to the use of PPE and were at risk of injury on the job. The use of PPE is the most important aspect that must be obeyed by all workers when doing work because by using PPE, workers' body parts can be protected from potential hazards in the work environment that are at risk of causing accidents or occupational diseases (Tarwaka, 2014). The results of the regression test from Kale (2020) state that workers who experience work accidents in construction workers in Turkey are workers who do not comply with occupational health and safety. In line with the research made by Runtuwarow *et al.* (2020) which states that compliance with the use of PPE is related to the incidence of work accidents at PT. Tropica Cocoprime Lelema, South Minahasa Regency due to lack of knowledge of workers regarding the importance of using PPE. Based on the research conducted by Amelita (2019) workers who do not comply with the use of PPE are at a risk as high as 26,000 of having work accidents.

In addition, according to Putri *et al.* (2017) a relation was found between the implementation of SOPs and the occupational injury risk at PT XTangerang. The factor that causes workers not to implement SOPs properly is because there are still some workers who do not have awareness in applying SOPs when doing work, then there is no punishment if workers do not implement SOPs, and there are workers who are burdened with SOPs because SOPs do not save time in carrying out their duty profession. Lack of worker compliance in carrying out work instructions so that misunderstandings arise between workers is also a factor that causes accidents to construction workers in Malaysia (Ayob *et al.*, 2018). The contingency coefficient test conducted by Akmalia and Nawawinetu (2018) also found that the more workers who did not follow the work instructions, the higher the number of work accidents at PT Waskita Karya (Persero). Workers' non-compliance with work instructions is

because they have to pursue targets. However, the results of Nindriyawan and Darnoto (2017) do not show a correlation between work instructions and the incidence of occupational injury.

Relation between housekeeping implementation levels with occupational injury risk for construction company workers

The results of the contingency coefficient test of this study (Table 4) prove that there is a moderate level relation between the housekeeping implementation levels with the occupational injury risk for workers in a construction company with p-values of 0.000 and r 0.584. A good housekeeping implementation is useful for creating a safe, healthy, and productive work environment so as to prevent the risk of injury at work Rachmawati *et al.* (2018). In line with the study conducted by Silalahi (2019) namely in construction workers there is a correlation between the housekeeping implementation and occupational injury because there is no storage area. In addition, according to Khaqiqudin *et al.* (2019) there is a relation between housekeeping and minor injuries to project workers. conducted by Singarimbun and Gultom (2019) states that the housekeeping factor and the incidence of occupational injury are related to each other due to the lack of routine housekeeping inspections by the management.

The implementation of housekeeping is essential for a company in carrying out easier production activities, avoid work accidents, and if work tools are neatly arranged, it can speed up the production process Manabung *et al.* (2018). In addition, housekeeping can also increase work efficiency and worker comfort while on duty Hafidz and Soediantono (2022). Poor housekeeping implementation is a causative factor that can exacerbate accidents in construction. Housekeeping accounts for about 50% of the total construction accidents in 13 large companies in Iran (Soltanzadeh *et al.*, 2017). According to Barlas and Izci (2018), increasing the implementation of housekeeping at shipyards in Turkey can reduce work accidents. The conclusions of several researchers above do not align with the results of the research of Trismayanti *et al.* (2021) which states that housekeeping and work accidents have no relation.

CONCLUSION

Based on the study results of the relation between OHS compliance and the housekeeping of implementation levels and occupational injury risk of construction workers, it can be concluded that there is a strong relation between OHS compliance with occupational injury risk of workers in the construction company. Furthermore, there is a moderate level correlation between the housekeeping of implementation levels with the occupational injury risk among workers in a construction company.

ACKNOWLEDGMENTS

The author would like to thank the respondents, a construction company and all parties who could contribute to this study. The author declared no competing interests with respect to the research, authorship, and/or publication of this article.

REFERENCE

- Akmalia, R.R., Nawawinetu, E.D., 2018. Hubungan Karakteristik Pekerja dan Lingkungan Kerja dengan Kejadian Kecelakaan Kerja di PT Waskita Karya (Persero). *J. Ind. Hyg. Occup. Heal.* Vol.3(1), Pp. 1-12.
- Aldred, M.L., Allen, F., Allen, M.M.C., Arslan, A., Barnes, B.R., Beech, N., Clampit, J.A., Collings, D.G., K.M. Conroy, R.C., Cuervo-Cazurra, A., M. Demirbag, D.D., Filippaios, F., Fovargue-Davies, M., Gaffney, N.T., Genc, M.E., Giroud, A., Godard, J., Greig, G., Haworth, N., Hotho, J.J., Hughes, S., Karademir, B., Kedia, B.L., G. Klerck, S.K., Larimo, J., McGuinness, M., B. McSweeney, H.M., Morgan, G., Morrison, C., Patrick, H., Pedersen, T., Stepanov, R., Stoian, C., Stone, Z., Upchurch, M., Wee, K.H., Wood, G., Yaprak, A., Yen, D.A., Yukhanaev, A., 2013. The International Labour Organization, Handbook of Institutional Approaches to International Business. In: Wood, Geoffrey (Ed.), *Research Handbooks in Business and Management Series*. Edward Elgar Publishing, Canada and Mehmet Demirbag, p. Pp. 640.
- Alfiansah, Y., Kurniawan, B., Ekawati, E., 2020. Analisis Upaya Manajemen K3 Dalam Pencegahan dan Pengendalian Kecelakaan Kerja pada Proyek Konstruksi PT. X Semarang. *J. Kesehat. Masy.* Vol. 8(5), Pp. 595-600.
- Alfidyani, K.S., Lestantyo, D., Wahyuni, I., 2020. Hubungan Pelatihan K3, Penggunaan APD, Pemasangan Safety Sign, dan Penerapan SOP dengan Terjadinya Risiko Kecelakaan Kerja (Studi pada Industri Garmen Kota Semarang). *J. Kesehat. Masy.* Vol. 8(4), Pp. 478-483.
- Amelita, R.A., 2019. Faktor-Faktor yang Menyebabkan Kecelakaan Kerja pada Pekerja Bagian Pengelasan di PT Johan Santosa. *J. Kesehat. Masy.* Vol. 3(1), Pp. 35-49.
- Astiningsih, H., Kurniawan, B., Suroto, S., 2018. Hubungan Penerapan Program K3 terhadap Kepatuhan Penggunaan APD pada Pekerja Konstruksi di Pembangunan Gedung Parkir Bandara Ahmad Yani Semarang. *J. Kesehat. Masy.* Vol.6(4), Pp. 300-308.
- Ayob, A., Shaari, A.A., Zaki, M.F.M., Munaaim, M.A.C., 2018. Fatal Occupational Injuries in The Malaysian Construction Sector-Causes and Accidental Agents. *IOP Conf. Ser. Earth Environ. Sci.* Vol. 140, Pp. 1-10.
- Barlas, B., Izci, F.B., 2018. Individual and Workplace Factors Related to Fatal Occupational Accidents among Shipyard Workers in Turkey. *Saf. Sci.* Vol. 101, Pp. 173-179.
- Batubara, C.M., Wahyuni, I., Kurniawan, B., 2021. Hubungan antara Pengetahuan, Sikap, dan Persepsi Ketersediaan APD dengan Risiko Kecelakaan Kerja pada Pekerja Pemadam Kebakaran di Dinas Pemadam Kebakaran Kota X. *J. Kesehat. Masy.* Vol. 9(1), Pp. 27-31.
- Dyanita, F., 2017. Kepatuhan terhadap SOP Ketinggian Pada Pekerja Konstruksi. *Indones. J. Occup. Saf. Heal.* Vol. 6(2), Pp. 225-234.
- Fairyo, L.S., Wahyuningsih, A.S., 2018. Kepatuhan Pemakaian Alat Pelindung Diri pada Pekerja Proyek. *HIGEIA (Journal Public Heal. Res. Dev.* Vol. 2(1), Pp. 80-90.
- Hafidz, A., Soediantono, D., 2022. Benefits of 5S Implementation and recommendation in the Defense Industry: A Literature Review. *Int. J. Soc. Manag. Stud.* Vol. 3(3), Pp. 13-26.
- Kale, O.A., 2020. Determination of Poor Compliance with OSH Rules of Construction Workers using Ordinal Regression Model. *Mugla J. Sci. Technol.* Vol. 6(1), Pp. 78-88.
- Kementerian Pekerjaan Umum dan Perumahan Rakyat, 2021. *Era Baru Konstruksi Berkarya Menuju Indonesia Maju*, 2nd ed. Kementerian Pekerjaan Umum dan Perumahan Rakyat.
- Kementerian Tenaga Kerja Republik Indonesia, 1998. *Peraturan Menteri Tenaga Kerja Republik Indonesia Nomor 3 Tahun 1998 tentang Tata Cara Pelaporan dan Pemeriksaan Kecelakaan*.
- Khaqiqudin, M.G., Wahyuni, I., Kurniawan, B., 2019. Hubungan Karakteristik Pekerja, Housekeeping, Ketersediaan dan Pemakaian Alat Pelindung Diri Terhadap Kejadian Minor Injuri (Studi di Proyek Pembangunan Apartemen X, Kota Semarang). *J. Kesehat. Masy.* Vol.7(4), Pp. 239-245.
- Kurniawan, W., Setyaningsih, Y., Wahyuni, I., 2017. Hubungan Faktor Karakteristik Pekerja, Safety Morning Talk (SMT), dan Housekeeping dengan Kejadian Minor Injury pada Pekerja di Proyek Pembangunan Gedung Kantor PT X Jakarta. *J. Kesehat. Masy.* Vol. 5(3), Pp. 323-331.
- Manabung, A.R., Suoth, L.F., Warouw, F., 2018. Hubungan antara Masa Kerja dan Beban Kerja dengan Stres Kerja pada Tenaga Kerja di PT. Pertamina TBBM Bitung. *J. KESMAS* 7, Pp.1-10.
- Manpower, M., 2016. *Workplace Safety and Health Guidelines Workplace Housekeeping*.
- Nindriyawan, N.M., Darnoto, S., 2017. Hubungan Kepatuhan Instruksi Kerja dengan Kejadian Kecelakaan Kerja Pada Bagian Produksi di PT. Aneka Adhilogam Karya Ceper Klaten. Universitas Muhammadiyah Surakarta.

- Putri, F.A., Suroto, S., Wahyuni, I., 2017. Hubungan Antara Pengetahuan, Praktik Penerapan SOP, Praktik Penggunaan APD dan Komitmen Pekerja dengan Risiko Kecelakaan Kerja di PT X Tangerang. *J. Kesehat. Masy.* Vol. 5(3), Pp. 269-277.
- Rachmawati, S., Rinawati, S., Suryadi, I., W, M.P., 2018. Penerapan Budaya 5R (Ringkas, Rapi, Resik, Rajin dan Rawat) dengan Pendekatan SNI ISO 22000:2009 dan Penilaiannya di PT Y Surakarta. *J. Ind. Hyg. Occup. Heal.* Vol. 2(2), Pp. 132-140.
- Riptifah, S., Handari, T., Qolbi, M.S., 2021. Faktor-Faktor Kejadian Kecelakaan Kerja pada Pekerja Ketinggian di PT. X Tahun 2019. *J. Kedokt. dan Kesehat.* Vol. 17(1), Pp. 90-98.
- Runtuwarow, N.Y., Kawatu, P.A.T., Maddusa, S.S., 2020. Hubungan Kepatuhan Penggunaan Alat Pelindung Diri dengan Kejadian Kecelakaan Kerja. *J. Public Heal. Community Med.* Vol. 1(2), Pp. 21-26.
- Safitri, N., Widowati, E., 2017. Penerapan Risk Management pada Pekerjaan di Ketinggian Berdasar SNI ISO 31000:2011. *HIGEIA (Journal Public Heal. Res. Dev.* Vol. 1(2), Pp. 77-88.
- Silalahi, M., 2019. Hubungan Penerangan dan Housekeeping Terhadap Kecelakaan Kerja pada Pekerja Konstruksi Bangunan PT DAP di Perumahan Citra Land Bagya City Medan Tahun 2019. *J. Mutiara Kesehat. Masy.* Vol. 4(1), Pp. 45-53.
- Singarimbun, A.N., Gultom, D., 2019. Faktor-Faktor yang Berhubungan dengan Kejadian Kecelakaan Kerja pada Pekerja Bagian Produksi PT Hilon Sumatera. *J. Kesmas dan Gizi* Vol. 2(1), Pp. 9-16.
- Soltanzadeh, A., Mohammadfam, I., Moghimbeygi, A., Ghiasvand, R., 2017. Exploring Causal Factors on the Severity Rate of Occupational Accidents in Construction Worksites. *Int. J. Civ. Eng.* Vol. 15(7), Pp. 959-965.
- Tarwaka, T., 2014. Keselamatan dan Kesehatan Kerja; Manajemen dan Implementasi K3 di Tempat Kerja, Edisi 2, C. ed. Harapan Press Surakarta, Surakarta.
- Trismayanti, D., Ikhtiar, M., Nurlinda, A., 2021. Hubungan Kemampuan Penanganan P3K oleh Karyawan Bagian Produksi dengan Kecelakaan Kerja di PT Sermani Steel. *Wind. Public Heal. J.* Vol. 2(2), Pp. 961-969.
- UU Republik Indonesia, 2020. Undang-Undang (UU) Ketenagakerjaan. 11.
- Yuliana, L., Nava, S., 2022. Implementasi Housekeeping sebagai Upaya Preventif Kecelakaan Kerja PT XYZ di Kota Balikpapan. *JUMANTIK (Jurnal Ilm. Penelit. Kesehatan)* Vol. 7(1), Pp. 68-78.