

## CORRELATION BETWEEN OHS KNOWLEDGE, MOTIVATION, WORK STRESS, AND UNSAFE ACTION (STUDY ON PRODUCTION SECTION WORKERS AT PT MANDIRI JAVA FOOD SEMARANG, INDONESIA): A CROSS-SECTIONAL STUDY

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### ABSTRACT

**Background:** As the industrial revolution 4.0 began, technology began to grow, and company owners began to develop their use of technology and human resources. According to the 8<sup>th</sup> Sustainable Development Goal's targets concerning decent work and economic growth, it is necessary to achieve targets related to protecting workers' rights and supporting a safe working environment for all workers, including prevention of work accidents. One of the causes of work accidents is unsafe action in the food industry as PT Mandiri Java Food Semarang that can be caused by personal factors, including knowledge of occupational health and safety (OHS), motivation, and work stress. **Purpose:** This study analyzes the correlation between OHS knowledge, motivation, and work stress with unsafe actions experienced by production workers at PT Mandiri Java Food Semarang. **Method:** This type of research was descriptive observational research with a cross-sectional design using spearman correlation test. The sample of the study was all the total population of the production workers (37 people). **Results:** The results showed a weak correlation between OHS knowledge and unsafe action ( $r = -0.351$ ). Moderate category correlation between motivation ( $r = -0.491$ ) and work stress ( $r = 0.479$ ) with unsafe action. **Conclusion:** This study concludes that OHS knowledge, motivation, and work stress are correlated factors and contribute to the occurrence of unsafe actions carried out by workers in the production sector of PT Mandiri Java Food Semarang.

**Keywords:** OHS knowledge, motivation, work stress, unsafe action, food industry.

## INTRODUCTION

As the industrial revolution 4.0 began, technology grew, and company owners began developing their technology and human resources. According to one of the 8<sup>th</sup> SDG's targets concerning decent work and economic growth, it is necessary to achieve targets related to protecting workers' rights and supporting a safe working environment for all workers, including prevention of work accidents. Without proper occupational safety and health management control work accidents will continue to occur.

In 2018, the International Labor Organization (ILO) recorded more than 2.78 million people die from work accidents and occupational illnesses each year. More than 1.8 million work-related deaths occur each year at the Asia and Pacific region, of which two-thirds happen in Asia. Based on the Indonesian Employment Health Insurance Service Agency, known as BPJSTK (2019) data, in 2017, the number of work accidents reported was 123,041 cases. In contrast, throughout 2018, it reached 173,105 cases. The Indonesian Employment Health Insurance Service Agency annually serves 130,000 cases of accidents from mild to severe levels. Work accidents that occur can cause harm to the nation and the individual.

Two things generally cause work accidents. The first is unsafe actions, and the second is unsafe conditions. Heinrich states that unsafe actions of individuals cause 88% of industrial accidents, unsafe conditions cause 10%, and 2% are unpreventable (Heinrich in Desmayanny *et al.*, 2020). Based on Eka's in Kusumrini, D.A's (2017) food industry research, unsafe actions cause 90.9% of accidents. 80-95% of work accidents occur due to unsafe activities due to workers who feel they have been experts in their field and have never had a work accident. So, there is a lack of concern about working safely and correctly (Cooper in Sirait and Paskarini, 2016).

Kuwana in Putri *et al.* (2019) stated that unsafe actions by 96% cause accidents occurring in various industries. It was the highest percentage due to work positions, work equipment, actions of a person, personal protective equipment, and goods of human origin or self-employment.

Based on some of these statements, it can be known that unsafe actions are the most common cause of workplace accidents. Ramadhanty and Pristya (2019) define unsafe actions as actions that can harm the worker and others that can cause work accidents. In the loss causation model theory presented by Bird and Germain, unsafe action can be caused directly by primary factors related to personal factors, including lack of knowledge about OHS, lack of work motivation, and work stress experienced by workers (Bird and Germain in Ghuzdewan *et al.*, 2019).

In OHS knowledge, the lack of workers' OHS knowledge is related to the danger and risk of work accidents, which causes indifference in workers. They are encouraged to perform unsafe actions that can harm their safety (Cahyani in Pradanas, 2018). Besides, suppose there is an inequality of knowledge related to OHS owned by workers. In that case, they rely only on experience and skills, which could end in the onset of unsafe action by workers during work. Syamtingrum *et al.* (2017) conducted previous research that correlated OHS knowledge and unsafe action. Another study conducted by Minarti (2016) also showed a correlation between OHS knowledge and unsafe actions

The existence of motivation is a collection of several processes that can generate enthusiasm in a worker for doing an activity. That motivation itself can shape a worker's attitude, including conducting unsafe actions. The less strong motivation of workers to continue to do the optimal work in pursuing the company's targets can end in unsafe action (Suryanto and Widajati, 2017). Wahyudi *et al.* (2020), in their research, proved that there is a significant correlation between workers' motivation and unsafe action ( $p=0.019$ ). Wahyudi *et al.* (2020) also stated that the lower the workers' motivation, the greater the chances of unsafe actions.

In addition to OHS knowledge and motivation, work stress is also the basic cause of unsafe action. Stress arises because the stressors drive from within a person, so it causes dangerous behavior or unsafe actions. The Health and Safety Executive (HSE) (2019) defines stress as a detrimental reaction to people's excessive stress or other types of requests placed on them. Previous research

conducted by Farid *et al.* (2019) proved a correlation between work stress and work accidents in formwork workers. Another study conducted by Putri (2020) showed a significant correlation between work stress levels and unsafe actions

Unsafe action can occur anywhere, including in the food industry. Unsafe action and accidents in food industry, however, not only affects the worker but may also contaminate the products, affecting millions of the consumers. The food industry is one of the manufacturing industries. This management sector industry uses raw materials to produce finished goods, including food and beverages (Priharto, 2020). The ILO (2018) said the manufacturing industry ranks third most occupied by workers, mainly young workers, with 3,110,114 people. It is the most significant contributor, with 50% (2 cases) of total cases of "dangerous occurrences" in 2020 and an increase in cases of fatal injuries in the 12 months since 2019 (Ministry of Manpower, 2020).

PT Mandiri Java Food Semarang is one of the companies engaged in the processing and trading industry, especially in the food sub-sector industry, with the resulting products being crackers. PT Mandiri Java Food Semarang uses the tools needed for production. They are mixers, extruders, steamers, slicers, dryers, cooling, and other equipment that use the average electricity flow.

The process consists of 9 stages in the production section, starting from the weighing stage of raw materials and additional materials, mixing, forming, steaming, cooling, slicing, drying, sorting, and packing. The production section has tremendous potential for work accidents than the other section. In the production section, the type of work performed by workers tends to cause work accidents such as being crushed, run over, cut, and pinched. The potential danger is reinforced by data on work accidents at PT Mandiri Java Food Semarang every year.

As is the case at PT Mandiri Java Food Semarang, there are still reports of accidents caused mainly by employee negligence. In 2018 there were 12 cases of work accidents. In 2019, cases of work accidents decreased to 8 cases. However, even though the rate of work accidents has decreased, it is unavoidable that

work accidents still occur. Most likely caused by unsafe action where it originates from the negligence of the workforce in the company. If the employee's failure renders the accident, then personal factors play a role in the occurrence of the accident.

Based on the identification of problems and description above, it can be seen that unsafe action is one of the causes of most workplace accidents. It can also be seen that basic causes, namely personal factors, influence unsafe action. The researcher is interested in researching the correlation between various factors, namely OHS knowledge, motivation, and work stress related to unsafe action in production workers at PT Mandiri Java Food Semarang.

## METHOD

This is observational descriptive analysis research with a cross-sectional study design. The research was conducted in March 2021. The population of this study was all workers of the production section of PT Mandiri Java Food Semarang, amounting to 37 workers. Data from all of the 37 production workers were collected and analyzed.

The types of data collected were divided into 2, which were secondary and primary data. Primary data taken was the worker's characteristics distribution, type of unsafe action distribution, and unsafe action divided into three categories (low, moderate, and high). Besides that, OHS knowledge was divided into three categories (low, moderate, and high), and motivation was divided into three categories (low, moderate, and high). Moreover, work stress was divided into four categories (low, moderate, high, and very high). Instruments were used were questionnaires and filled out by respondents related to personal data and answered some questions related to variables of OHS knowledge, motivation, and work stress, each of which was up to 10 - 35 points questions.

Other instruments used were observation sheets filled directly by researchers and interviews with related people of the company. The instrument was tested for validity and reliability ( $\alpha = 0.942$ ,  $\alpha = 0.906$ , and  $\alpha = 0.928$ ). Secondary data was obtained through company profile data and PT Mandiri Java Food Semarang reports. The research has been ethically approved by the Health Research

Ethical Clearance Commission of Universitas Airlangga by ethical approval number 034/HRECC.FODM/I/202. Informed consent for this research was obtained in writing from each respondent.

## RESULTS

**Table 1.** Frequency Distribution of Participant's Characteristics in Production Section at PT Mandiri Java Food Semarang

Variable	Frequency (f)	Percentage (%)
<b>Age</b>		
21 – 30	16	43,2
31 – 40	12	32,4
41 – 50	9	24,3
Total	37	100
<b>Sex</b>		
Male	28	75,7
Female	9	24,3
Total	37	100
<b>Work Period</b>		
< 3 years	21	56,8
4 – 6 years	24	64,9
> 7 years	3	8,1
Total	37	100

Table 1 shows the characteristics of participants, which are the workers in the production division at PT Mandiri Java Food, related to age, sex, and work period. Most of the workers were 21 – 30 years, with sex dominated by male workers. In addition, most workers have less than 3 years of work.

**Table 2.** Frequency Distribution of Variables in Production Section Workers at PT Mandiri Java Food Semarang

Variable	Frequency (f)	Percentage (%)
<b>Unsafe Action</b>		
Low	23	62,2
Moderate	11	29,7
High	3	8,1
Total	37	100
<b>OHS Knowledge</b>		
Low	7	18,9
Moderate	10	27
High	20	54,1
Total	37	100
<b>Motivation</b>		
Low	7	18,9
Moderate	18	48,6
High	12	32,4
Total	37	100
<b>Work Stress</b>		
Low	8	21,6
Moderate	24	64,9
High	4	10,8
Very High	1	2,7
Total	37	100

Table 2 shows that most of the workers in the production section at PT Mandiri Java Food Semarang performed unsafe actions in the

three categories of unsafe action. The low category was 23 people with a percentage of 62.2% and in the high category of 3 people with 8.1%.

In the knowledge variable, most of the workers in the production section at PT Mandiri Java Food Semarang have OHS knowledge with a good category of 37 people with 54.1%. It means the workers already have and understand OHS knowledge and a low category of 7 people with a percentage of 18.9% means that workers still have less knowledge and lack of understanding related to OHS. Then in the motivation variable, most of the workers in the production section at PT Mandiri Java Food Semarang have motivation with a moderate category for as many as 18 people with a percentage of 48.6%. It means they were in the middle position of motivation to work (not too high and not too low).

A low category for 7 people with a percentage of 18.9% means the workers have low work motivation. On the variable work stress, as many as 24 people with a percentage of 64.9% in the moderate category of work stress levels, which means they have enough work stress during work, and one person with a percentage of 2.7% in the very high category means the worker has very high work stress during work.

**Table 3.** Frequency Distribution of Unsafe Action Types in Production Section Workers at PT Mandiri Java Food Semarang

No.	Type of Unsafe Action	Frequency (f)	Percentage (%)
1.	Operate a tool or machine without permission or authority	1	0,5
2.	Repair equipment while in operation or turn on	2	1,1
3.	Not using Personal Protective Equipment	25	14
4.	Operate equipment at an inappropriate speed	6	3,3
5.	Make machine safety or safety equipment out of operation	5	2,7
6.	Eliminate or move safety equipment	13	7,2
7.	Incorrect loading	25	14
8.	Using a broken work tool	1	0,5
9.	Wrong body position at work	27	15
10.	Working under the influence of alcohol or drugs	1	0,5
11.	Joking around at work	12	6,6
12.	Do not give warnings (such as: showing signs, stop symbols, and labels	15	8,2

Continuation of Table 3.

No.	Type of Unsafe Action	Frequency (f)	Percentage (%)
13.	on hazardous chemicals or other hazards) Using work tools that do not fit the job	15	8,2
14.	Improper placement such as placing work equipment, both at work and after work	21	11,6
15.	Not doing security (such as: turning off unused equipment or work machines)	12	6,6
<b>Total</b>		181	100

Based on Table 3, there were 15 types of unsafe actions, with 181 unsafe actions performed by production workers at PT Mandiri Java Food Semarang. The most common type of unsafe action performed by workers was unsafe action in the form of wrong body position in work which was as many as 27 people. They did not use Personal Protective Equipment (PPE) for as many as 25 people with a percentage of 14% and incorrect loading of 25 people with a percentage of 14%.

Table 4. Correlation of Variables to Unsafe Action in Production Section Workers at PT Mandiri Java Food Semarang

Variable	Unsafe Action						Total		Significant (p-value)	Correlation Coefficient (r)
	Low		Moderate		High					
	f	%	f	%	f	%	f	%		
<b>OHS Knowledge</b>										
Low	2	5.4	3	8.1	2	5.4	7	18.9	0.033	-0.351
Moderate	6	16.2	4	10.8	0	0	10	27		
Good	15	40.5	4	10.8	1	2.7	20	54.1		
Total	23	62.2	11	29.7	3	8.1	37	100		
<b>Motivation</b>										
Low	2	5.4	3	8.1	2	5.4	7	18.9	0.002	-0.491
Moderate	10	27	7	18.9	1	2.7	18	48.6		
Good	11	29.7	1	2.7	0	0	12	32.4		
Total	23	62.2	11	29.7	3	8.1	37	100		
<b>Work Stress</b>										
Low	7	18.9	1	2.7	0	0	8	21.6	0.003	0.479
Moderate	16	43.2	6	16.2	2	5.4	24	64.9		
High	0	0	4	10.8	0	0	4	10.8		
Very High	0	0	0	0	1	2.7	1	2.7		
Total	23	62.2	11	29.7	3	8.1	37	100		

Table 4 shows the results that there is a correlation between OHS knowledge and unsafe action in the production workers of PT Mandiri Java Food Semarang with a value of  $p\text{-value} = 0.033$  where the value is less than the alpha value ( $<0.05$ ). There is a significant correlation with a value of  $r = -0.351$  which means a strong-weak correlation between the OHS knowledge and unsafe action. Moreover, there is a negative correlation value (-) which means the correlation is in the opposite direction: the better the worker's knowledge, the lower the unsafe action category performed. The motivation variable also shows the r correlation with unsafe action with a  $p\text{-value} = 0.002$  and a  $r = -0.491$ , which means there is a strong correlation between the motivation variable with unsafe action and the negative correlation value (-). The work stress variable shows that there is a correlation between work stress and unsafe actions with a  $p\text{-value} = 0.003$  and  $r = 0.479$ , which means there is a strong

correlation between the motivation and unsafe actions. The value of positive correlation (+) indicates a direct correlation where the higher the work stress that the worker has, the higher the category of unsafe actions performed.

## DISCUSSION

Table 2 shows that most workers perform unsafe actions in the low category while working—23 workers with low unsafe action, with a percentage of 62.2%. Workers did unsafe acts in the low category because workers' knowledge and skills were quite good considering they have participated in occupational safety and health training. Workers were equipped with information related to unsafe actions and unsafe conditions at work.

Based on the distribution of unsafe action types in Table 3, researchers found that among the 15 types of unsafe actions studied, the wrong body position at work is the most



common type of unsafe action performed by workers, with a total of 27 people. Many workers did the wrong position of the body in work at the mixing stage. The position that workers often did was too bent when stirring cracker dough, the wrong foot placement when distributing raw materials to raise the danger of the risk of spraining the legs and falling to the floor. In addition to the mixing stage, the packing stage also found workers who performed in the wrong position. Most workers had outreach hands that were too far when doing flapping. Furthermore, during the observation process, the workers did not get warnings or reprimands from co-workers because many justified it and did the same.

Table 4 shows a correlation between OHS knowledge and unsafe actions in the production workers at PT Mandiri Java Food Semarang with a  $p$ -value = 0.033 and  $r = -0.351$ , which means a weak correlation and a negative correlation value (-) indicates the correlation is opposite. It follows the theory put forward by Bird and Germain in the Loss Causation Model theory that OHS knowledge is part of personal factors that are considered the root of the problem and the real cause behind unsafe action. The result is also in line with previous research conducted by Syamtingrum *et al.* (2017), which stated a correlation between OHS knowledge and unsafe action. Research conducted by Minarti (2016) and Kristianti and Tualeka (2018) also prove the correlation between knowledge and unsafe action. The results of this research also followed Rogers' statement quoted by Syamtingrum (2017) that if the behavior is carried out based on knowledge, it will be more lasting than if it is not based on knowledge.

Most of the 20 workers (54.1%) have OHS knowledge in the good category. The results prove that most workers, 15 people (40.5%), unsafe actions in the low category. It demonstrates that the workers in the production section at PT Mandiri Java Food Semarang have done their job safely. It is also supported by results, showing that only 1 person (2.7%) performs unsafe actions in the high category. The company has made several efforts to improve the knowledge of its workers by conducting human resources development programs thus workers can be equipped with knowledge and information related to work and safety in the workplace. However, the impact of

the results of job training by each individual was different, making workers still have low OHS knowledge of as many as 7 people (18.9%) and a moderate category of 10 people (27%).

The level of knowledge determines how workers decide to take action at work. As for the workers who had good knowledge, they belonged to the group that was able to receive good information obtained from training held by the company but was not implemented in work, so some of them were still doing unsafe actions. This is also in line with the theory of Green who stated that increased knowledge does not always lead to behavior change. However, knowledge is highly important given before an individual performs an action. The action obtained will be in accordance with the knowledge when the individual is able to receive a signal strong enough to motivate him to act in accordance with his knowledge.

Based on the results of statistical tests in Table 4, there is a correlation between motivation and unsafe action in the production workers at PT Mandiri Java Food Semarang with a value of  $p = 0.002$  and a value of  $r = -0.491$ . It means there is a strong correlation between the motivation variable and unsafe action and the negative correlation value (-) indicates the correlation is opposite. It is in line with research conducted by Wahyudi *et al.* (2020), which states the correlation between motivation and unsafe actions ( $p$ -value = 0.019) in workers. The results of the study are also in line with previous research conducted by Minarti (2016) that found a correlation between delivered both variables ( $p$ -value = 0.015) and a medium correlation ( $r = -0.523$ ). However, the results of this study are not in line with research conducted by Pradanas (2018), which states that there is no correlation between motivation and unsafe actions by workers.

Most workers have moderate motivation for a moderate category of 18 people (48.6%). The results also showed that most workers, 10 people (27%) performed unsafe actions in the low category. That proves that the workers in the production section at PT Mandiri Java Food Semarang did their job safely. It is also supported by results, showing only 1 person (2.7%) took unsafe action in the high category. The workers felt that they had moderate motivation because of the efforts made by the company to fulfill the satisfaction of the

workers, such as providing a sense of health insurance and old age life and providing a sense of security and comfort to the work environment. However, if a company has tried to eliminate dissatisfaction among its workers, it may be successfully realized, but not necessarily the efforts made were motivational for workers.

Therefore, some workers had low motivation, 7 people (18.9%), and most of those in the category were moderate. This is since the motivation they received from the company was considered inappropriate. The lack of conformity felt by these workers was more likely to be the absence of rewards received, such as getting praise and appreciation for the work done during work. On the other hand, there was a motivation that was not appropriate, a worker could increase the potential for unsafe action being carried out and caused a decrease in the enthusiasm of workers at work. This kind of imprecision of motivation belongs to the poor performance feedback felt by employees of the company as stated by Bird and Germain in the theory of the Lost Causation Model. The lack of appropriate motivation can also cause a decrease in the enthusiasm of workers at work. When a company has made efforts to eliminate dissatisfaction of its employees, it may be successful, but it is not necessarily that the efforts made are motivational for workers.

The variable work stress shows a correlation between work stress and unsafe actions in the production section workers in PT Mandiri Java Food Semarang with  $p\text{-value} = 0.003$  and  $r = 0.479$ . It means there is a strong correlation between the motivation variable with unsafe actions and the value of positive correlation (+). It is in line with previous research conducted by Putri, NH (2020), which also showed a significant correlation between work stress levels and unsafe actions ( $p\text{-value} = 0.00$ ,  $r = 0.528$ ). Also, in line with previous research conducted by Farid *et al.* (2019), there is a correlation between work stress and work accidents in formwork workers.

Most of the workers were 24 people (64.9%) with work stress levels in the moderate category. It can also be seen in the direction of correlation that shows that unsafe action would be done in a high category when workers had high work stress. The study results prove that as many as 16 workers (43.2%) have unsafe actions in the low category. It demonstrates that the

workers in the production section at PT Mandiri Java Food Semarang have done their job safely. That is also supported by results that show that only 2 people (5.4%) performed unsafe actions in the high category.

The company has made several efforts to reduce conditions that could make stressors generate stress in the workplace by providing a sense of security and strong protection while working. Workers also felt that the orders given by the company were apparent and understood the job description, goals, and result of the type of work done so that they were able to complete their tasks. These things can make workers not feel strongly moderate because of the favorable environmental conditions. That also proves that unsafe actions undertaken by workers are in a low category. There was still a high-stress rate of 4 people (10.8%) and very high work stress of 1 person (2.75%) due to the demands of the work that required them to work intensively and quickly, considering that the production part has become the most critical part of the company's operations. The workgroup in this section was quite stressful, following the concept of work stress that is constantly increasing, where the more demand, the more potential for work stress, and the opportunity to face tension will also come together. Each type of job has its skills and competencies, adding to how workers should work more and rely on themselves, knowing it is not that easy to find a replacement as their backup. The existence of unsafe action can be caused by the urge of stressors from within a person and insecurity about doing work.

## CONCLUSION

Based on the results of the study, it can be concluded that the production workers at PT Mandiri Java Food Semarang perform the majority of unsafe actions in the low category of 23 workers with the distribution of unsafe actions that are often performed being the wrong body position when working as many as 27 people. All those three variables, OHS knowledge, motivation, and work stress correlate with unsafe action variable. There is a weak correlation and negative correlation value (-) with OHS Knowledge. The moderate correlation between motivation variable with unsafe action as well as a negative correlation value (-). The work stress variable has a moderate correlation with unsafe action and a positive correlation value (+).

## SUGGESTION

It is advised that PT Mandiri Java Food Semarang continue to improve Human Resources (HR), such as regular training with increasing frequency of implementation and paying greater attention to the degree of training received by each worker. The company also needs to strengthen routine and expert monitoring, particularly in manufacturing, to discourage dangerous activities and prevent workplace accidents. Workers are required to be more closely connected to company regulations and undertake activities arranged by the company in earnest and correctly implement them.

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## CONFLICT OF INTEREST

Author has no conflict of interest.

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## AUTHOR CONTRIBUTION

Author Ayu Sekar Pawening Assigned to determine the title, framework, data analysis, discussion, and references. Author Tri Martiana tasked with reviewing articles and conducting discussions on the results of data analysis.

## REFERENCES

- Askharya, R. A 2017. Faktor Unsafe Action (Perilaku Tidak Aman) Pada Pekerja Kontruksi Proyek Pembangunan Rumah Bertingkat oleh PT Jader Cipta Cemerlang Semarang Tahun 2017 *Thesis, Universitas Islam Negeri Alauddin Makassar, Makassar.*
- Banjarnahor, M. J. 2019. Gambaran Tingkat Pengetahuan Mahasiswa Tentang Penetralisirasi Alat Kesehatan Gigi dan Mulut Terhadap Penularan Penyakit Di Tingkat II-B Jurusan Keperawatan Gigi Poltekkes Kemenkes RI Medan, *Thesis, Politeknik Kesehatan RI, Medan.*

- BPJS Ketenagakerjaan. 2019. *Angka Kecelakaan Kerja Cenderung Meningkat, BPJS Ketenagakerjaan Bayar Santunan Rp 1,2 Triliun.*
- Desmayanny, D., Wahyuni, I., & Ekawati. 2020. Literatur Review : Faktor Terjadinya Unsafe Action Pada Pekerja Sektor Manufaktur. *Jurnal Kesehatan Masyarakat (e-journal)*, 8(6), 832-839, <https://doi.org/10.14710/jkm.v8i6.28372>
- Farid, M. M., Jayanti, S., & Ekawati. 2019. Hubungan Antara Stres Kerja dengan Kecelakaan Kerja Pada Pekerja Bagian Bekisting PT Kongsruksi X di Kota Semarang. *Jurnal Kesehatan Masyarakat (e-Journal)*, 7(4), 331–335. <https://doi.org/10.14710/jkm.v7i4.24289>
- Ghuzdewan, T. & Damanik, P. 2019. Analysis of Accident in Indonesia Construction Projects. *MATEC Web of Conferences* 258(02021). <https://doi.org/10.1051/matecconf/201925802021>
- Health and Safety Executive. 2019. *Tracking Work-Related Stress Using the Management Standards Approach: A step-by-step workbook.*
- Hendriyaldi, H. 2019. Revolusi Industri 4.0: Tantangan dan Peluang Manajemen Sumber Daya Manusia Untuk Meningkatkan Produktivitas Grand Hotel Jambi. *Jurnal Manajemen dan Sains*, 4(2), 240. <http://dx.doi.org/10.33087/jmas.v4i2.104>
- Kemenaker RI. 2018. *Profil K3 Nasional Indonesia 2018.* International Labour Organization. [https://www.ilo.org/jakarta/whatwedo/publications/WCMS\\_711986/lang--en/index.htm](https://www.ilo.org/jakarta/whatwedo/publications/WCMS_711986/lang--en/index.htm)
- International Labour Organization. 2018. *Menuju Budaya Pencegahan Keselamatan dan Kesehatan Kerja yang Lebih Kuat di Indonesia.* Indonesia : Press Release. [https://www.ilo.org/jakarta/info/public/pr/WCMS\\_616368/lang--en/index.htm](https://www.ilo.org/jakarta/info/public/pr/WCMS_616368/lang--en/index.htm)
- Javaid, M. U., Isha, A, N, S., Ghazali, Z., & Langove, N. 2016. Psychosocial Stressors in Relation to Unsafe Acts. *International Review of Management and Marketing*, 6(4), 108–113. <https://www.econjournals.com/index.php/irmm/article/view/2473/0>



- Kusumarini, D.A. 2017. Perbedaan Unsafe Action dan Unsafe Condition Antara Sebelum dan Sesudah Safety Patrol. *Skripsi, Universitas Muhammadiyah, Semarang*.
- Kristianti, I., & Tualeka, A. R. 2019. Hubungan Safety Inspection dan Pengetahuan dengan Unsafe Action di Departemen Rolling Mill. *The Indonesian Journal of Occupational Safety and Health*, 7(3), 300. <https://doi.org/10.20473/ijosh.v7i3.2018.300-309>
- Minarti, A. 2016. Hubungan Faktor Personal Pekerja Terhadap Unsafe Actions di Bagian Maintenance Mekanik, PT Smart Tbk, Surabaya. *Thesis, Universitas Airlangga, Surabaya*.
- Ministry of Manpower. 2020. *Workplace Safety and Health Report January - June 2020*, 54.
- Kementerian KetenagaKerjaan. 1998. Peraturan Menteri Tenaga Kerja (Permenaker) Nomor 03 / Men / 1998. Jakarta, Kementerian KetenagaKerjaan.
- Pradanas, L. R. D. 2018. Faktor yang Berhubungan dengan Unsafe Action Pada Pekerja Bagian Mid Proyek Gedung Apartement 88 Avenue PT Pulau Intan Baja Perkasa Surabaya. *Thesis, Universitas Airlangga, Surabaya*.
- Pratama, H. A. & Iryanti, H. D. 2020. Transformasi SDM Dalam Menghadapi Tantangan Revolusi 4.0 di Sektor Kepelabuhan. *Majalah Ilmiah Bahari Jogja*, 18(1), 71–80. <http://dx.doi.org/10.33489/mibj.v18i1.229>
- Priharto, S. 2020. Perusahaan Manufaktur : Pengertian, Jenis, dan Contohnya.
- Putri, D. L., Sumihardi., Irfan, A., & Djaja, I, M. 2019. *Relationship Between Unsafe Action and Condition with Work Accident Among Production Unit Workers at The Jaya Sentrikon Indonesia Company, Padang, West Sumatra*. The 6th International Conference on Public Health. 49–49. <https://doi.org/10.26911/the6thicph.01.26>
- Putri, N. H. 2020. Hubungan Tingkat Stres Kerja dengan Perilaku Tidak Aman Pada Pekerja di PT Kusuma Putra Santosa Karanganyar. *Skripsi, Universitas Sebelas Maret, Surakarta*.
- Rahman, A. F. 2019. Faktor-Faktor yang Mempengaruhi Perilaku Tidak Aman (Unsafe Behavior) Pada Karyawan Produksi di PT Mekar Armada Jaya Bekasi. *Skripsi, Universitas Negeri Semarang, Semarang*.
- Ramadhany, A, F. & Pristya, T. Y. 2019. Faktor-Faktor yang Berhubungan dengan Tindakan Tidak Selamat (Unsafe Act) pada Pekerja di Bagian Produksi PT Lestari Banten Energi. *Jurnal Ilmiah Kesehatan Masyarakat*, 11(2), 199–205. <https://doi.org/10.52022/jikm.v11i2.32>
- Safety Institute of Australia Ltd. 2012. *Models of Causation : Safety*. Tullamarine, Victoria, Australia.
- Sibaja, R. C. 2002. *Salud Y Seguridad en El Trabajo*. UNED.
- Sirait, F. & Paskarini, I. 2016. Analisis Perilaku Aman Pada Pekerja Konstruksi Dengan Pendekatan Behavior-Based Safety (Studi di Workshop PT X Jawa Barat). *The Indonesian Journal of Occupational Safety and Health*, 5, 91–100. <https://doi.org/10.20473/ijosh.v5i1.2016.91-100>
- Sugiyomo. 2017. *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.
- Suryanto, D. I. D. & Widajati, N. 2017. Hubungan Karakteristik Individu dan Pengawasan K3 dengan Unsafe Action Tenaga Kerja Bongkar Muat. *The Indonesian Journal of Public Health*, 12(1), 51. <https://doi.org/10.20473/ijph.v12i1.2017.51-63>.
- Suyanto., Amal, A, I., Noor, A., & Astutik, I, T. 2018. *Analisis Data Penelitian Petunjuk Praktis Bagi Mahasiswa Kesehatan Menggunakan SPSS*. Semarang: Unissula Press.
- Syantinningrum, M. D. P. 2017. Pengembangan Model Hubungan Faktor Personal Dan Manajemen K3 Terhadap Tindakan Tidak Aman (Unsafe Action) Pada Pekerja PT. *Yogya Indo Global. Thesis, Institut Teknologi Sepuluh Nopember, Surabaya*.
- Pemerintah Indonesia. 2003. Undang-Undang Republik Indonesia Nomor 13 Tahun 2003 Ketenagakerjaan. 23 Maret 2003. Lembaran Negara Republik Indonesia Tahun 2003 Nomor 39. Jakarta.
- United Nations. Department of Economic and Social Affairs : *Sustainable*

*Development.*

<https://sdgs.un.org/goals/goal8>.

Wahyudi J., Silaban, G., & Aulia, D. 2020. The Relationship between Motivation and Unsafe Action on Passenger Ship Crews in Tanjung Pinang. *Britain International of Exact Sciences Journal*, 2(1), 390 - 404.

<https://doi.org/10.33258/bioex.v2i1.174>

Wang, J., & Yan, M. 2019. Application of an Improved Model for Accident Analysis: A Case Study. *Internation Journal of Environmental Research and Public Health*, 16(2756),

<https://doi.org/10.3390/ijerph16152756>

Zevanya, A.S.T. 2019. Determinan Perilaku 5S Pada Pekerja di Unit Line Maintenance PT Garuda Maintenance Facility (GMF) Aero Asia. *Skripsi, Universitas Airlangga, Surabaya*.