

Relationship of PPE Use, Years of Employment, and Personal Hygiene to Contact Dermatitis Symptoms

Almira Aurellia, Dani Nasirul Haqi

¹Department of Occupational Health and Safety, Faculty of Public Health, Airlangga University, Indonesia

Corresponding author: Almira Aurellia, almiraurellia@gmail.com

Co-Author: DNH: dani.nihaq@gmail.com

Submitted: 03/06/2022 **Revised:** 27/08/2022 **Accepted:** 27/09/2022 **Published online:** 27/10/2022

doi: <https://doi.org/10.35308/j-kesmas.v7i2.5567>. **How to cite this article:** Aurellia, A & Haqi, D.N. (2022). Relationship of PPE Use, Years of Employment, and Personal Hygiene to Contact Dermatitis Symptoms. *J-Kesmas: Jurnal Fakultas Kesehatan Masyarakat (The Indonesian Journal of Public Health)*. 9(2): 1-7.

Abstract

The incidence of occupational contact dermatitis in Indonesia is high. PT Semen Indonesia (Persero) Tbk. Gresik Factory is a company which produces various types of cement as a building material. Contact dermatitis is very prone to occur among cement factory workers due to contact of cement dust with the workers' skin. This study is a quantitative study with a cross-sectional approach. The method of data collection was performed by observation and questionnaire completion. The number of respondents in this study is a total population of 30 worker units from the finish mill and packer. This study uses statistical tests with univariate and bivariate tests, namely the chi-square test. The results of this study indicate there are 20% of workers who experience symptoms of contact dermatitis, and there is a correlation between the use of PPE (p-value = 0.003), years of employment (p-value = 0.001), and personal hygiene (p-value = 0.002) with symptoms of contact dermatitis. To be able to reduce the risk of developing contact dermatitis symptoms, it is advised that workers increase awareness in the use of PPE according to standards, such as not rolling up the sleeves and using standard respirators. In addition, the workers with new category of years of employment are advised to recognize the locations of cement dust exposure and know how to prevent cement dust exposure. Workers are also advised to clean themselves directly after being exposed to cement dust after work and change into clean work clothes every day.

Keywords: Use of PPE; Years of Employment; Personal Hygiene; Contact Dermatitis.

Introduction

The workforce is certainly always required to increase productivity at work. To achieve this, optimal health conditions are needed for every worker. Work productivity can transpire optimally if there are efforts to protect workers or the workforce in various aspects to achieve the highest degree of health. One of which is the occupational health of its workers, which aims to create a healthy and productive workforce and prevent occupational diseases (OD) (Aminoto, *et al.*, 2017).

Occupational Diseases (OD) are diseases caused by work and/or work environments including work-related diseases. Work-related diseases are diseases which have several causative agents with work and/or work environment factors playing a role along with other risk factors (Kemenkes RI, 2016). In the Presidential Regulation of the Republic of Indonesia Number 7 of Year 2019 it is stated that Occupational Diseases (OD) are diseases caused by work or work environment. Hence, Occupational Diseases (OD) are diseases that occur as a result of exposure to risk factors in the

workplace and which require serious attention. Occupational diseases can cause a decrease in the productivity and competitiveness of workers, and can cause a large economic burden. According to Anies (2017), occupational skin diseases are the second most common occupational disease after Musculoskeletal Disease (MSDs). According to Witasari (2014), the most common occupational skin disease which occurs among workers is contact dermatitis, where there are 70% – 90% cases of the entirety of work-related skin diseases. Occupational skin diseases are diseases that occur on the skin due to exposure to irritants in the work environment. Based on BPJamsostek data in the first semester of 2020, occupational skin diseases with the incidence of contact dermatitis were found to be around 85 – 98% where this incident is estimated to occur as many as 0.6 – 0.7 cases per 1000 workers every year, thus contact dermatitis is 70 – 90% of all occupational diseases.

Dermatitis is a medical term for a skin disorder in which the skin appears inflamed and irritated and it can

occur anywhere, but the hands and feet are the most affected. Contact dermatitis is the most common type of non-infectious occupational skin disease and in general, contact dermatitis is formed according to allergen/irritant contactants. Dermatitis can occur in workers who meet construction supplies or materials such as cement (Prasetyo, 2014). According to Adhi, et al. (2018), the symptoms of contact dermatitis are red, brownish skin with burning sensation, swelling, and rashes.

PT Semen Indonesia (Persero) Tbk. is a company which produces cement in the form of sacks or bulk, located in Gresik and Tuban in East Java, Indarung in West Sumatra, Pangkep in South Sulawesi, and Quang Ninh in Vietnam. The main factory was previously located in Gresik Regency, East Java Province before being relocated to Tuban Regency, East Java Province. The Gresik factory is the first factory to produce Semen Gresik where many equipment still utilizes manual systems. The current condition of the Gresik factory is it only operates in the finish mill and packer section if there are special orders from consumers. Workers at the Gresik factory in the finish mill and packer sections certainly come into direct contact with cement dust.

From the results of the preliminary study which was conducted on 3 workers who met cement, through interviews and observations of clinical symptoms which lead to chronic irritant contact dermatitis namely redness on skin and shedding of dead skin layers on the hands and feet. From the results of the interviews, the workers have been exposed to cement while working in the factory for 15 years. During which the workers do not wear gloves, work in high temperature and humidity, and continuously perform work which is in contact with cement.

The finish mill and packer workers in the PT. Semen Indonesia (Persero) Tbk. Gresik area, are at risk of suffering from contact dermatitis. Previously, there has been no research conducted regarding contact dermatitis on workers. Hence, there is no data related to the incidence of contact dermatitis with the use of PPE, period of service, and personal hygiene. Thus, based on the explanation above, the researcher is interested in studying the "The Relationship between Use of PPE, Period of Service, and Personal Hygiene with Symptoms of Contact Dermatitis" among workers at the finish mill and packer units of PT Semen Indonesia (Persero) Tbk. Gresik Factory.

Methods

This study is a quantitative study using a cross-sectional approach. This research was conducted in April 2022. The sample in this study used a total

sample of all workers of the finish mill and packer units of PT Semen Indonesia (Persero) Tbk. Gresik Factory that is as many as 30 workers. Sources of data used in this study is primary data obtained through filling out questionnaires and observation. Data were analyzed using Chi-Square test.

Results

Relationship Between the Use of PPE and Symptoms of Contact Dermatitis

Table 1. Cross-tabulation of the Use of PPE with Symptoms of Contact Dermatitis

Use of PPE	Experience of Dermatitis Contact Symptoms				Total		p-value
	Yes		No		n	%	
	n	%	n	%			
Well used and proper	2	8	23	92	25	100	0,003
Not used and/ not proper	4	80	1	20	5	100	

Source: *Primary Data, 2022*

Based on the table above, the workers of the Finish Mill and Packer units of PT Semen Indonesia (Persero) Tbk. Gresik Factory who used PPE properly and appropriately who experienced symptoms of contact dermatitis were as many as 2 workers (8%), and as many as 23 workers (92%) did not suffer from the symptoms of contact dermatitis. Meanwhile, workers who did not use PPE and/or the PPE used were in inappropriate conditions who experienced symptoms of contact dermatitis were as many as 4 workers (80%), and those who did not experience symptoms of contact dermatitis were 1 worker (20%).

Based on the results of statistical tests using Chi-square, p value = 0.003 was obtained. Whereas the value of $\alpha = 0.05$. Therefore, the value of $p < \alpha$ means H_0 was rejected. Thus, it can be concluded that there is a significant relationship between the use of PPE and symptoms of contact dermatitis among the Finish Mill and Packer unit workers of PT Semen Indonesia (Persero) Tbk. Gresik Factory.

Relationship Between the Years of Employment and Symptoms of Contact Dermatitis

Table 2. Cross-tabulation of the Years of Employment and Symptoms of Contact Dermatitis

Years of Employment	Experience of Dermatitis Contact Symptoms				Total		p-value
	Yes		No		n	%	
	n	%	n	%			
New period	4	100	0	0	4	100	0,001
Long	2	7,7	24	92,3	26	100	



period

Source: *Primary Data, 2022*

Based on the table above, the workers of the Finish Mill and Packer units of PT Semen Indonesia (Persero) Tbk. Gresik Factory who had new period of years of employment who experienced symptoms of contact dermatitis were as many as 4 workers (100%). Meanwhile, the workers with a long period of years of employment who experienced symptoms of contact dermatitis were as many as 2 workers (7.7%) and there were 24 workers (92.3%) who did not experience symptoms of contact dermatitis.

Based on the results of statistical tests using Chi-square, p value = 0.001 was obtained. Whereas the value of $\alpha = 0.05$. Therefore, the value of $p < \alpha$ means H_0 was rejected. Thus, it can be concluded that there is a significant relationship between years of employment and symptoms of contact dermatitis among the Finish Mill and Packer unit workers of PT Semen Indonesia (Persero) Tbk. Gresik Factory.

Relationship Between the Personal Hygiene and Symptoms of Contact Dermatitis

Table 3. Cross-tabulation of the Personal Hygiene and Symptoms of Contact Dermatitis

Personal Hygiene	Experience of Dermatitis				Total	p-value
	Contact Symptoms					
	Yes	No				
	n	%	n	%	n	%
Bad	5	62,5	3	37,5	8	100
Good	1	4,5	21	95,5	22	100

Source: *Primary Data, 2022*

Based on the table above, the workers of the Finish Mill and Packer units of PT Semen Indonesia (Persero) Tbk. Gresik Factory who had a poor level of personal hygiene who experienced symptoms of contact dermatitis were as many as 5 workers (62.5%) and those who did not experience symptoms of contact dermatitis were as many as 3 workers (37.5%). Meanwhile, workers who had a good level of personal hygiene who experienced symptoms of contact dermatitis were as many as 1 worker (4.5%) and there were 21 workers (95.5%) who did not experience symptoms of contact dermatitis.

Based on the results of statistical tests using Chi-square, p value = 0.002 was obtained. Whereas the value of $\alpha = 0.05$. Therefore, the value of $p < \alpha$ means H_0 was rejected. Thus, it can be concluded that there is a significant relationship between personal hygiene and symptoms of contact dermatitis among the Finish Mill

and Packer unit workers of PT Semen Indonesia (Persero) Tbk. Gresik Factory.

Discussion

Relationship Between Use of PPE and Symptoms of Contact Dermatitis

Based on the results of the study from the outcomes of the statistical tests, it is found that there is a relationship between the use of PPE with symptoms of contact dermatitis among the Finish Mill and Packer unit workers of PT Semen Indonesia (Persero) Tbk. Gresik Factory. The company requires its workers in the finish mill and packer units to wear PPE in compliance with the applicable regulations. The PPE that must be worn are a long-sleeved shirt and long pants, gloves, safety helmet, safety shoes, respirators, and safety goggles. Workers' PPE is provided by the company where the workers serve and workers can exchange PPE that has been damaged or is inappropriate for use to get new PPE that is appropriate for use to the company every 6 months.

The results of the study on the relationship between the use of PPE with symptoms of contact dermatitis in this study are in line with the research conducted by Hartati in 2018 with the title "The Relationship Between Use of Personal Protective Equipment (PPE), Period of Service, and Personal Hygiene with Symptoms of Dermatitis in Scavengers at the landfill (TPA) of Terjun Sub-District, Marelan District 2018" where the results show that there is a relationship between the use of PPE with symptoms of contact dermatitis. In this study, it is stated that there were 84 scavengers (68.3%) who were not satisfactory in the usage of PPE and experienced symptoms of contact dermatitis. In the study, it is also stated that many of the respondents did not use complete and proper PPE due to the dirty condition of the PPE since they were never replaced, thus causing the respondents to be more at risk of experiencing symptoms of contact dermatitis.

The results of this study are also in line with the research by Wardani, et al. (2018) on airport project workers which states that there is a relationship between the use of PPE and occupational contact dermatitis. The study shows that 74.5% of workers only occasionally used gloves and boots at work because the workers felt sweltered when wearing PPE during the day. This study also mentions that the company had reminded workers to use PPE through tool box meetings and has conducted regular field checks related to the use of PPE.

Based on the results of researchers' observations regarding the use of PPE for respondents for three consecutive days, overall, the workers in the Finish Mill and Packer units wore long sleeves and trousers which



were the work uniforms of the original company. There were some workers who tended to roll up their sleeves to their elbows. This causes the skin on the lower hands of workers to be exposed to cement dust so that it might cause symptoms of contact dermatitis. However, all workers wore proper and fitting trousers.

The use of PPE in the form of gloves was also rarely performed by workers. Based on the observations, it is found that 90% of the workers did not wear gloves. This can cause the skin on the back of the hands and fingers to be susceptible to exposure to cement dust which can cause symptoms of contact dermatitis among workers. Based on the results of interviews, workers with the type of work of operators who were in direct contact with cement dust and did not wear gloves because the operators were in charge of packing the finished cement into the sack manually so it was difficult to take the cement sack when wearing gloves. Based on the results of the study, the use of proper and fitting gloves was only carried out by 3 workers (10%) who were workers in the loader section. Based on the results of interviews with workers, the loader is assigned to take up cement sacks from the conveyor and arrange them on a truck that will pick up the cement. Therefore, the workers stated that the gloves used by the loader were not only used to protect the hands from the dangers of cement dust, they were also used so that the hands were not easily injured when lifting heavy loads from hundreds of cement sacks.

Regarding the use of PPE in the form of safety helmets and safety shoes, based on the results of the observation which was carried out for three consecutive days, it is found that all workers used safety helmets and safety shoes. There was only 1 worker who used a safety helmet carelessly and invertedly so that it did not meet the standards. However, all workers wore proper and standard safety shoes.

Hence, based on the results of research through questionnaires, observations, and interviews, it is found that there is a relationship between the level of use of PPE with the incidence of contact dermatitis symptoms where workers who do not use PPE can increase the possibility for experiencing contact dermatitis symptoms. Meanwhile, workers who have used PPE but incorrectly and/or do not meet the standards such as rolling up the sleeves of the work clothes to the elbows and using an inverted safety helmet. The use of PPE that is not in accordance with the standards can cause the body's skin to not be properly protected so that it is more easily exposed to chemicals in the form of cement dust. Moreover, maintaining the cleanliness of PPE also needs to be considered because the cleanliness of PPE can also play a role in preventing exposure to cement dust on the skin of workers.

Relationship Between Years of Experience and Symptoms of Contact Dermatitis

Based on the results of the study, it is found that there is a relationship between years of experience and symptoms of contact dermatitis in workers. This study shows that of all workers who experienced symptoms of contact dermatitis, 66.7% were experienced by workers with a new category period of years of employment or less than 5 years. The results of this study are not in accordance with the theory of Suma'mur (1996) which states that the longer a person is at work, the more a person will be exposed to the dangers posed by the work environment.

The results of this study are also not in line with the research conducted by Hartati (2018) which states that there is no relationship between working period and symptoms of contact dermatitis in scavengers at the landfill (*TPA*), Terjun Sub-District, Medan District, Marelan. According to Hartati (2018), it is stated that period of service has no relationship with symptoms of dermatitis since everyone has different characteristics, one of which is the immune status where the skin of the scavengers will be increasingly immune to chemicals in the work environment which can cause contact dermatitis along with the period of service.

However, the results of this study are in line with the research which was conducted by Pradananingrum, et al. (2018) which states that there is a relationship between period of service and symptoms of irritant contact dermatitis among the Mrican tofu craftsmen in Semarang. In the study, it is stated that a long period of service would be more likely to affect contact dermatitis due to the frequency of contact with chemicals that is getting more frequent and prolonged. Researchers also stated that workers have different resistances to chemical exposure in the workplace.

This study is also not in line with research conducted by Damayanti, et al. (2020) which states that there is no relationship between period of service and complaints of contact dermatitis among the premix workers at PT. X Cirebon. The study states that many workers have long working periods yet still have the risk of experiencing contact dermatitis conditions due to other factors such as the type of work and the period of contact.

This research is in line with the theory expressed by Cohen which states that workers with a period of service of less than 2 years can be one of the factors that indicate workers with new category of period of service do not have enough experience in doing their work so that they are often found making mistakes in their performance on chemical exposure prevention procedures. This can increase the potential for contact dermatitis symptoms

in workers who have a new category of period of service.

Based on the results of interviews with workers, it is known that the symptoms of contact dermatitis were experienced by most of the workers in the first 5 years of working at the Finish Mill and Packer units of PT Semen Indonesia (Persero) Tbk. Gresik Factory. According to workers, this can happen because new workers have yet to have skin immunity to cement dust. In addition, new workers are not familiar with exposure to cement dust so they do not know how to prevent exposure to cement dust. According to Chandra (2007), it states that the factors which can cause humans to experience disease depend on the characteristics found within each individual, one of which is immune status. Immune status is defined as the body's reaction to certain disease exposures.

Hence, based on the results of the study, it can be concluded that there is a relationship between years of employment and symptoms of contact dermatitis among Finish Mill and Packer unit workers at PT Semen Indonesia (Persero) Tbk. Gresik Factory, but the relationship is inversely proportional. This means that the lower the working period of the worker, the higher the risk of the occurrence of contact dermatitis symptoms. Workers who suffered symptoms of contact dermatitis as many as 63.7% were experienced by workers with a new category of period of service. Workers with a new category of years of employment are considered to have no skin immunity to chemical exposure.

Relationship Between Personal Hygiene and Symptoms of Contact Dermatitis

Based on the results of the study, it is found that there is a relationship between personal hygiene and symptoms of contact dermatitis among the workers at the Finish Mill and Packer units of PT Semen Indonesia (Persero) Tbk. Gresik Factory. It can be seen that as many as 83.3% of workers who experienced symptoms of contact dermatitis had a poor level of personal hygiene. Poor personal hygiene, such as occasionally or never keeping hair clean, using his own hair care tools, using soap when washing hands, washing hands with soap before and after eating, keeping nails clean, washing hands and feet after work, taking a shower after work, using his own towel or not sharing with others, changing clean work clothes every day, and drying clothes that have been washed under the hot sun, can cause accumulation of cement dust which can cause inflammation of the skin which is a symptom of dermatitis contact.

This study is in line with the research conducted by

Hartati (2018), which states that there is a relationship between personal hygiene and symptoms of contact dermatitis among the scavengers at the landfill (TPA) of Terjun Sub-District, Medan District, Marelau. According to the researcher, respondents will be susceptible to occupational diseases such as contact dermatitis if their personal hygiene is not good, such as not washing their hands immediately after contact with garbage, not changing work clothes, and poor nail conditions.

This study is also in line with the research conducted by Wardani, et al. (2018) with the title "Factors Associated with Occupational Contact Dermatitis in Airport Project Workers" which states that there is a relationship between personal hygiene and occupational contact dermatitis. The study also reveals that workers with poor personal hygiene had 9 times greater risk of experiencing occupational contact dermatitis than workers with good personal hygiene.

The results of this study are also in line with research conducted by Damayanti, et al. (2020) which states that there is a relationship between personal hygiene and conditions of contact dermatitis among PPSU officers at Gunung Sub-District Jakarta Selatan. In this study, the personnel of PPSU officers were not good at cleaning their hands and feet using soap and did not wash clothes after work, so it could cause the skin to be easily exposed to germs so it can cause skin inflammation on PPSU officers.

Research conducted by Apriliani, et al. (2022) stated that there is a relationship between skin hygiene and the incidence of irritant contact dermatitis among scavengers at the Bantargebang landfill (TPA). In this study, it was stated that poor personal hygiene can increase the risk of irritant contact dermatitis. According to the researchers, the poor personal hygiene carried out by respondents was caused by the lack of clean water facilities, the respondent's lack of concern for skin hygiene such as bathing twice a day, the use of bath soap by turns with others, and poor bathing practices.

Based on the results of the researcher's interview with one of the workers, it is known that there were still many workers who did not give attention to good personal hygiene such as not immediately cleaning the body by washing hands and feet and bathing after exposure to cement dust during working hours. Furthermore, workers also did not know that the use of soap and personal hygiene tools such as hair combs that alternate with others can also increase the occurrence of contact dermatitis symptoms. Whereas based on observations, it can be seen that the working conditions were filled with cement dust, heat, and humidity so it could make sweat appear more so that chemicals such

as cement dust would easily stick. The Canadian Center for Occupational Health (CCOHS) (2016) states that the purpose of improving personal hygiene is as an effort to reduce or eliminate chemicals that can expose workers' skin. Since chemicals in the form of cement dust that are not cleaned regularly will cause a buildup on the skin so the cement dust will penetrate and react, hence, it can cause symptoms of contact dermatitis in workers.

Therefore, it can be concluded that there is a relationship between personal hygiene and symptoms of contact dermatitis among the Finish Mill and Packer unit workers of PT Semen Indonesia (Persero) Tbk. Gresik Factory. This can be interpreted that the worse personal hygiene carried out by workers, the more it will increase symptoms of contact dermatitis. Fundamentally, maintaining good personal hygiene such as habitualizing washing hands and feet, keeping hair clean, keeping nails clean, using one's own cleaning equipment, bathing, and changing clothes right away after work can prevent the occurrence of symptoms of contact dermatitis. The company can give counseling, training, and supervision related to personal hygiene in hopes that workers are able to acknowledge ways to maintain personal hygiene properly and correctly, and to recognize symptoms of contact dermatitis which arise because of poor personal hygiene.

Conclusion

The results of this study indicate that there is a relationship between the use of PPE, years of employment, and personal hygiene with symptoms of contact dermatitis in workers at the finish mill and packer units of PT Semen Indonesia (Persero) Tbk. Gresik Factory. Suggestions that can be given to workers are increasing awareness in the use of PPE, especially not wrapping the sleeves so can protect the skin of the hands and the operator should use anti-slip gloves when taking cement bags so still protected from exposure cement dust. For workers with a new period of years of employment, it is recommended to know locations that have a lot of dust exposure so they can increase knowledge about the ways to prevent cement dust. Workers are also advised to improve personal hygiene including changing work clothes every day and using personal hygiene equipment that is not shared with others.

Acknowledgment

This research can be carried out well and smoothly because of the support of various related parties. Thankyou to the respondents, PT Semen Indonesia (Persero) Tbk. Gresik Factory, and the Public Health

Faculy Airlangga University.

Author Contribution and Competing Interest

Contributing authors for this research are interested in collecting and analyzing data and compiling the manuscript.

References

- Aisyah, S., 2020. Hubungan Penggunaan Alat Pelindung Diri (APD) dengan Keluhan Penyakit Kulit Pada Nelayan di Kelurahan Bagan Deli, Medan: UIN Sumatera Utara Medan.
- Alvira, Y. & Budi, D. S., 2020. The Relationship between Endogenous Factors and Contact Dermatitis on Electroplating Workers in Durungbanjar. *IJOSH (The Indonesian Journal of Occupational Safety and Health)*, IX(3), pp. 258-268.
- Aminoto, T. & Berbudi, A., 2017. Pengaruh Faktor Risiko Ergonomi Terhadap Keluhan Nyeri Punggung Bawah (Low Back Pain) Pada Karyawan Bushindo Training Center Jakarta Timur. *Jurnal Ilmu dan Teknologi Kesehatan*, 4(II), pp. 189 - 194.
- Audina, D. V., Budiastuti, A. & Widodo, A., 2017. Faktor Penyebab Terjadinya Dematitis Kontak Akibat Kerja Pada Pekerja Salon. *Diponegoro Medical Journal (Jurnal Kedokteran Diponegoro)*, Volume VI, pp. 1-11.
- Damayanti, A., Buntara, A., Karima, U. Q. & Pulungan, R. M., 2020. Hubungan Higiene Personal, Masa Kerja, dan Karakteristik Individu dengan Keluhan Dermatitis Kontak pada Petugas PPSU Kelurahan Gunung Jakarta Selatan Tahun 2020. pp. 1-12.
- Fitri, H., 2019. Garuda QHSE Institution. [Online] Available at: <https://www.garudasystain.co.id/safety-helmet/> [Accessed 29 January 2022].
- Ginting, E., D., Fetarayani, D. & Hidayati, A. N., 2021. Contact Dermatitis in Tertiary Hospital: A 2-year Retrospective Study. *Periodical of Dermatology and Venereology*, 33(2), pp. 88-92.
- Hartati, R., 2018. Hubungan antara Pemakaian Alat Pelindung Diri (APD), Masa Kerja, dan Personal Hygiene dengan Gejala Dermatitis Kontak pada Pemulung di TPA Kelurahan Terjun Kecamatan Marelan Tahun 2018, Medan: Institut Kesehatan Helvetia.
- Hasanah, M. & Rifai, M., 2021. Hubungan Personal Hygiene dan Penggunaan APD dengan Keluhan Dermatitis Kontak pada Pembatik Warna Sintetis di Giriloyo Kabupaten Bantul. *Jurnal Kesehatan Masyarakat*, IX(1), pp. 9-20.



- Hasibuan, A. et al., 2020. Teknik Keselamatan dan Kesehatan Kerja. s.l.:Yayasan Kita Menulis.
- Hidayah, N., 2017. Perbedaan Sanitasi Lingkungan, Perilaku Hidup Bersih dan Sehat dan Kejadian Dermatitis Kontak pada Masyarakat di Desa Terkena dan Tidak Terkena Air Rob (Studi di Desa Morodemak dan Desa Gebang Arum Kecamatan Bonang Kabupaten Demak), Semarang: Universitas Muhammadiyah Semarang.
- HMKM FK Unud, 2018. FK Unud. [Online] Available at: <https://hmkm.fkunud.com/warna-warni-helmet-safety-di-rumah-sakit-beda-arti-beda-fungsi/#:~:text=Helm%20keselamatan%20atau%20safety%20helmet,kimia%20ataupun%20suhu%20yang%20ekstrim> [Accessed January 2022].
- Jones, R., n.d. ISO 45001 and the evolution of occupational health and safety management systems. [Online] Available at: https://iosh.com/media/4413/iso_45001_and_the_evolution_of_ohsms.pdf [Accessed November 5 2021].
- Kandenapa, 2019. Hubungan Kebersihan Diri (Personal Hygiene) dengan Kejadian Penyakit Kulit Scabies di Asrama Serui Klampis Aji II No 26 Kota Surabaya, Surabaya: Unmerbaya.
- Maris, I. K., 2021. Fator-Faktor yang Berhubungan dengan Dermatitis Kontak Akibat Kerja pada Pekerja Salon Kecamatan Ujung Pandang Kota Makassar Tahun 2020, Makassar: Universitas Hasanuddin.
- Ogestin, I. E., 2018. Hubungan Karakteristik dan Personal Hygiene dengan Kejadian Dermatitis Kontak di Mess Taruna B Stimart Amini Semarang, Semarang: Universitas Muhammadiyah Semarang.
- Pradaningrum, S., Lestanty, D. & Jayanti, S., 2018. Hubungan Personal Hygiene, Lama Kontak, dan Masa Kerja dengan Gejala Dermatitis Kontak Iritan pada Pengrajin Tahu Mrican Semarang. *Jurnal Kesehatan Masyarakat*, VI(4), pp. 378-386.
- Prasetyo, D. A., 2014. Faktor-Faktor yang Berhubungan Dengan Dermatitis Kontak Iritan Pada Tangan Pekerja Konstruksi yang Terpapar Semen di PT. Wijaya Kusuma Contractors Tahun 2014, Jakarta: Universitas Islam Negeri Syarif Hidayatullah.
- Retnoningsih, A., 2017. Analisis Faktor-Faktor Kejadian Dermatitis Kontak Pada Nelayan (Studi Kasus di Kawasan Tambak Lorok Kelurahan Tanjung Mas Kecamatan Semarang Utara Kota Semarang Tahun 2017), Semarang: Universitas Muhammadiyah Semarang.
- Siregar, A. D. S., 2021. Hubungan Antara Personal Hygiene dengan Gejala Penyakit Kulit pada Pemulung di Tempat Pembuangan Akhir (TPA) Terjun Kecamatan Medan Marelan, Kabanjahe: Politeknik Kesehatan Kemenkes Medan.
- Wardani, H. K., M. & Bustaman, N., 2018. Faktor yang Berhubungan dengan Dermatitis Kontak Akibat Kerja pada Pekerja Proyek Bandara. *The Indonesian Journal of Occupational Safety and Health*, VII(2), pp. 249-259.
