Journal of Endocrinology, Tropical Medicine, and Infectious Disease (JETROMI)
Journal homepage: https://talenta.usu.ac.id/jetromi

Relationship between Personal Protective Equipment (PPE) Use Behavior and Working Period with Allergic Contact Dermatitis (ACD) Symptoms in Workers at Mabar Shrimp Factory

Dinda Sani Pratiwi[1*], Rina Amelia[2], Syamsidah Lubis[3], and Bayu Rusfandi Nasution[4]

[1]*Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia*
[2]*Department of Community Medicine, Faculty of Medicine, Universitas Sumatera Utara, Medan,Indonesia*
[3]*Department of Pediatrics, Faculty of Medicine, Universitas Sumatera Utara, Medan,Indonesia*
[4]*Department of Internal Medicine, Faculty of Medicine, Universitas Sumatera Utara, Medan,Indonesia*
[*]Corresponding Author: rina2@usu.ac.id

ARTICLE INFO

Article history:
Received December 20, 2023
Revised January 19, 2024
Accepted April 04, 2024
Available online May 13, 2024

E-ISSN: 2686-0856
P-ISSN: 2686-0872

How to cite:
Pratiwi DS, Amelia R, Lubis S, Nasution BR. Relationship between Personal Protective Equipment (PPE) Use Behavior and Working Period with Allergic Contact Dermatitis (ACD) Symptoms in Workers at Mabar Shrimp Factory . Journal of Endocrinology, Tropical Medicine, and Infectious Disease (JETROMI). 2024 May 13;6(2):69–74. DOI: 10.32734/jetromi.v6i2.14956.

https://doi.org/10.32734/jetromi.v6i2.14956

ABSTRACT

Background. Allergic contact dermatitis (ACD) is one of the most common occupational skin diseases after irritant contact dermatitis (ICD). One of the factors causing ACD is not using personal protective equipment (PPE) and a long working period. This study aimed to analyze the relationship between PPE use behavior and working period with ACD symptoms in workers at the Mabar shrimp factory, Medan.

Method. Cross-sectional research with a consecutive sampling method. Assessment of PPE use behavior and working period used a questionnaire and ACD symptoms by a doctor. The analysis used was univariate and bivariate analysis with chi-square.

Results. The total number of samples that met the inclusion and exclusion criteria of the study was 100 people, 28 people had symptoms of ACD, enough knowledge, good attitudes, and unfavorable actions with a working period of >2 years. Statistical analysis showed a relationship between PPE use behavior and working period with ACD symptoms.

Conclusion. All behavioral factors (knowledge, attitude, and action) and working period have a significant relationship with ACD symptoms

Keywords: PPE, Behavior, Working Period, ACD Symptoms.

ABSTRAK

Latar belakang: Dermatitis kontak alergi (ACD) adalah salah satu penyakit kulit akibat kerja yang paling umum setelah dermatitis kontak iritan (ICD). Salah satu faktor penyebab ACD adalah tidak menggunakan alat pelindung diri (APD) dan masa kerja yang panjang. Penelitian ini bertujuan untuk menganalisis hubungan antara perilaku penggunaan APD dengan gejala ACD pada pekerja di pabrik udang Mabar, Medan.

Metode: Penelitian cross-sectional dengan metode consecutive sampling. Penilaian perilaku penggunaan APD dan masa kerja menggunakan kuesioner dan gejala ACD oleh dokter. Analisis yang digunakan adalah analisis univariat dan bivariat dengan chi-square.

Hasil: Jumlah total sampel yang memenuhi kriteria inklusi dan eksklusi penelitian adalah 100 orang, 28 orang memiliki gejala ACD, pengetahuan yang cukup, sikap yang baik, dan tindakan yang tidak menguntungkan dengan masa kerja >2 tahun. Analisis statistik menunjukkan ada hubungan antara perilaku penggunaan APD dan masa kerja dengan gejala ACD.

Kesimpulan: Semua faktor perilaku (pengetahuan, sikap, dan tindakan) dan periode kerja memiliki hubungan yang signifikan dengan gejala ACD

Kata kunci: APD, Perilaku, Masa Kerja, Gejala ACD

1. Introduction

Occupational diseases are defined as diseases that have a specific cause that is related to work activities [1]. Of all cases of occupational skin diseases, 90% of them are occupational contact dermatitis (OCD) divided into allergic contact dermatitis (ACD), which occurs on the skin after exposure to allergens through a sensitization process and there is also irritant contact dermatitis (ICD) [2]. According to the World Health Organization (WHO) in 2013, there were 5.7 million annual visits to doctors for the treatment of dermatitis [3]. Based on data from the National Health Interview Survey OCD is second rank after the first traumatic injuries [4]. According to data taken in the UK and America, workers with patch tests experience more ACD in almost 50% of workers [5]. Data in Indonesia shows that 97% of the total 389 cases are contact dermatitis, 66.3% are ICD and 33.7% are ACD [6]. Previous research showed that there were 50 new patients with OCD and most of them were workers in factories [7]. One of the factors causing contact dermatitis is the use of personal protective equipment (PPE) [8]. According to previous research, the incidence of contact dermatitis due to the use of PPE is 65.5% and there is a significant relationship between the use of PPE and the incidence of contact dermatitis [9]. The working period is the time workers work at a location or workplace. Workers with a long working period, duration of contact, and repeated frequency in the workplace will increase the occurrence of ACD [10].

The type of work that has a high risk of ACD is workers in shrimp factories. Shrimp is one of the fishery products or seafood that is easily damaged. There is cystine, a non-essential amino acid contained in shrimp, which can cause allergy-like symptoms on the skin in the form of redness, itching, blistering, or inflammation when in contact with the skin. Likewise, shrimp contains arsenic, one of the chemicals that can be an irritant [11]. Mabar Shrimp Factory is one of the shrimp exporting factories. The work process is the unloading of shrimp from distributors, washing shrimp, weighing, cutting shrimp heads, and freezing. From the results of mini observations, and short interviews with workers at the Mabar shrimp factory that sometimes there are workers who forget or do not use PPE properly within a working period of more than two years, and it is found that some workers complain as characterized in allergic contact dermatitis (ACD). North Sumatra province still has a high prevalence of contact dermatitis prevalence. In this region, 90% of cases are OCD, with 25% being allergic contact dermatitis [12]. Based on the description above, the purpose of this study was to determine the relationship between the behavior of using personal protective equipment (PPE) and the working period with symptoms of allergic contact dermatitis in workers at the Mabar shrimp factory, Medan Deli District, Medan City.

2. Method

This study used a cross-sectional study design. Research data were obtained from a questionnaire of ACD symptoms by a doctor. This study obtained 100 respondents with the criteria workers at the Mabar Shrimp Factory, who agreed to participate by signing the consent form after explanation (informed consent) and direct exposure to shrimp. This study was approved by the Health Research Ethics Committee Faculty of Medicine USU.

2.1. Statistical Analysis

The data that has been obtained will be processed using the SPSS application. Moreover, to measure the relationship between variables using the chi-square test. The value of $p<0.05$ was considered the hypothesis was accepted.

3. Results

Based on Table 1, the characteristics of respondents based on age are mostly with the age group >25 (25-37 years), namely 78 people (78%). Based on educational characteristics, more respondents with high school education, namely 41 people (41%). Characteristics of respondents based on working time per day of more than 7 hours, namely 76 people (76%). Based on the characteristics of the working period, there were more respondents with a working period of >2 years (2-12 years), namely 60 people (60%), and on the characteristics of ACD symptoms, 28 people (28%) were found to have ACD symptoms and 72 people (72%) were not symptomatic.

Table 1. Characteristics of Research Respondents

Characteristics	Frequency	%
Age (years)		
18-20	2	2
21-25	20	20
>25	78	78
Education		
Primary School	13	13
Junior High School	39	39
Senior High School	41	41
Associate/Bachelor degree	7	7
Working time (hours)		
7	76	76
8	23	23
9	1	1
Working Period (years)		
<2	40	40
>2	60	60
ACD Symptoms		
Yes	28	28
No	72	72
Total	100	100

Based on Table 2 shows the characteristics based on behavior use of personal protective equipment in the form of knowledge, attitudes, and actions. Knowledge characteristics, respondents with enough knowledge are more, namely 46 people (46%). The characteristics of attitude are more with a good attitude, namely 66 people (66%). Based on the characteristics of action, good action is more, namely 54 people (54%).

Table 2. Characteristics of Respondents Based on PPE Use Behavior

Characteristics	Frequency	%
Knowledge		
Good	44	44
Enough	46	46
Bad	10	10
Attitude		
Good	66	66
Bad	34	34
Action		
Good	54	54
Unfavorable	46	46
Total	100	100

According to Table 3, all behavioral factors (knowledge, attitude, and action) and working period have a significant relationship with ACD symptoms. Based on the p-value of the knowledge variable is 0.026 (<0.05), the attitude variable is 0.009 (<0.05) and the action variable is 0.022 (<0.05). The working period variable is 0.018 (<0.05).

Table 3. Relationship between PPE Use Behavior, Working Period, and ACD Symptoms

Characteristics	**ACD Symptom, n:44**		
	yes	no	p
Knowledge			**0.026**
Good	8	36	
Enough	14	32	
Bad	6	4	
Attitude			**0.009**
Good	24	42	
Bad	4	30	
Action			**0.022**
Good	10	44	
Unfavorable	18	28	
Working Period			**0.018**
Risk	22	38	
No Risk	6	34	

4. Discussion

This study found that the prevalence of ACD among workers was 28%. One factor that is very influential in increasing work productivity is the education factor [13]. Knowledge is related to ACD symptoms, the higher the level of education and knowledge, the more protective a person is and can know about hazard information, so greater knowledge will result in better protection against allergenic substances [14]. This study is the same as previous research by Putri (2015), as many as 27 people (84.4%) included in the dermatitis group had bad or moderate knowledge [15]. This study contradicts research by Sitti (2017), by her research there is no relationship between knowledge and dermatitis symptoms [16].

Attitude is related to ACD symptoms, attitudes are readiness or willingness to act, not the implementation of certain motives. For attitudes to become actual actions, supporting factors, or enabling conditions. Facilities are one of them. Not only facilities are needed, but also supporters from outside, such as family or closest people who support the use of complete PPE. who support the use of complete PPE [17]. The results of this study are the same as the research of Wahyu et al (2019), 24 people who suffer from dermatitis (26.7%) provide good attitude information, and more than 10 people who suffer from bad attitudes (26.3%) [18]. So, to encourage better attitudes to support the use of PPE, workers must also have good knowledge and attitudes, believing that their work poses a risk of occupational accidents or allergic contact dermatitis.

Action is related to ACD symptoms, a one of the causes of work accidents or occupational diseases is that workers pay less attention to the use of PPE when working [19]. Personal protective equipment (PPE) is a tool or equipment that must be used when working in situations of work-related hazards and risks to maintain the safety of workers and people around them. Thus, the use of PPE has a huge influence on the onset of ACD symptoms. The use of PPE is one way to prevent ACD as it avoids direct exposure and allergens.

The working period is related to ACD symptoms. The working period determines how well they know their work. The longer a worker is on the job, the more exposed a person is to the hazards posed by their workplace. This finding contradicts a study by Alin (2022) who found that there was no correlation between working period and ACD symptoms. This difference may be due to differences in time, place, and sample of the study [20]. Workers with a working period who should not be at risk of ACD or with <2 years of service were found to suffer from ACD. This could be due to other factors that make someone who works < 2 years get ACD.

Longer exposure to the causal substance is frequently the result of delaying diagnosis and seeking treatment. There is evidence that this is associated with a worse prognosis. [21]. Although screening to identify diseases early would be ideal, it is challenging to implement in practice because early identification and care improve results. A self-administered questionnaire has been created as a validated screening tool for hand dermatitis in healthcare professionals. Although screening to identify diseases early would be ideal, it is challenging to implement in practice because early identification and care improve results. A self-administered questionnaire has been created as a validated screening tool for hand dermatitis in healthcare professionals. Although screening to identify diseases early would be ideal, it is challenging to implement in practice because early identification and care improve results. A self-administered questionnaire has been created as a validated screening tool for hand dermatitis in healthcare professionals. A self-administered questionnaire

has been created as a validated screening tool for hand dermatitis in healthcare professionals.[22]. Being a complex disorder, OCD frequently arises from the interaction of endogenous, allergic, and irritating causes. When an employee seeks treatment for possible OCD, a rigorous approach is required. Being a complex disorder, OCD frequently arises from the interaction of endogenous, allergic, and irritating causes. When an employee seeks treatment for possible OCD, a rigorous approach is required. Being a complex disorder, OCD frequently arises from the interaction of endogenous, allergic, and irritating causes. When an employee seeks treatment for possible OCD, a rigorous approach is required [23]. It is necessary to perform a thorough occupational history and job exposure assessment. A physical examination may potentially reveal information about the causative agent, but definitive investigations which should include extensive patch testing of compounds suspected to be present in the workplace are crucial to making the right diagnosis. Establishing causation is an important step in the management of OCD since it affects the decision about preventative measures, the likelihood of a successful return to the current or reduced job, and the result of workers' compensation adjudications. This is made easier by the doctors' acquaintance with the businesses that employ the majority of people in their towns and their acquisition of basic knowledge regarding the most prevalent causes of OCD. The weakness of this study is that data collection uses a questionnaire, where the truth of the data and information is highly dependent on the honesty of the respondent, and the diagnosis of ACD is based only on clinical symptoms without further supporting examinations such as patch tests. The advantages of this study can provide knowledge and information about the relationship between PPE use behavior and working period with ACD symptoms.

5. Conclusion

Characteristics of respondents based on working time per day of more than 7 hours, namely 76 people (76%). Based on the characteristics of the working period, there were more respondents with a working period of >2 years (2-12 years), namely 60 people (60%), and on the characteristics of ACD symptoms, 28 people (28%) were found to have ACD symptoms and 72 people (72%) were not symptomatic. All behavioral factors (knowledge, attitude, and action) and working period have a significant relationship with ACD symptoms

References

[1] Kemenkes RI, "Peraturan Menteri Kesehatan Republik Indonesia Nomor 56 Tahun 2016 Tentang Penyelenggaraan Pelayanan Penyakit Akibat Kerja," Menteri Kesehat., 2016;1–35,

[2] Liza Salawati, "Pencegahan Dermatitis Kontak Akibat Kerja Pada Sektor Konstruksi," J. Kedokt. Syiah Kuala, 2022;22(2):122–125, , doi: 10.24815/jks.v22i2.22740.

[3] N. R.Paramata and N. A. Abas, "Pengaruh Kompres Aloe Vera Pada Penderita Dermatitis Di Wilayah Kerja Puskesmas Sumalata Kabupaten Gorontalo Utara," Jambura Nurs. J., 2019;1(1):19–23, doi: 10.37311/jnj.v1i1.2075.

[4] P. Y. Budiarisma and N. Suryawati, "Profil Dermatitis Kontak Akibat Kerja pada Karyawan Pencucian Mobil dan Sepeda Motor di Kota Denpasar Selatan pada Tahun 2016," E-Jurnal Med. Udayana, 2019;9(3):4,

[5] T. Batasina, H. Pandaleke, and P. Suling, "Profil dermatitis kontak alergi di poliklinik rsup prof. Dr. R.D. Kandou Manado periode Januari – Desember 2013," e-CliniC, 2017;5(1), doi: 10.35790/ecl.5.1.2017.14735.

[6] R. Apriliani, Suherman, Ernyasih, N. Rumdhona, and M. Fauziah, "Hubungan Personal Hygiene Dengan Kejadian Dermatitis Kontak Iritan Pada Pemulung Di TPA Bantargebang," Environ. Occup. Heal. Saf., 2020;12(01):10.

[7] D. Witasari and H. Sukanto, "Dermatitis Kontak Akibat Kerja : Penelitian Retrospektif (Occupational Contact Dermatitis: Retrospective Study)," BIKK- Berk. Ilmu Kesehat. Kulit dan Kelamin, 2014;26(3):161–7.

[8] D. L. Janah and R. Windraswara, "Kejadian Dermatitis Kontak pada Pemulung," Higeia J. Public Heal. Res. Dev., 2020;4(2):404–14.

[9] H. Mei and T. N. Utami, "Prosiding Nasional Forikes 2022 : Pembangunan Kesehatan Multidisiplin Hubungan Penggunaan Alat Pelindung Diri dengan Keluhan Dermatitis pada Nelayan Ikan di Desa Mela II Kabupaten Tapanuli Tengah Sumatera Utara Prosiding Nasional FORIKES 2022 : Pembangunan," 2022:74–7.

[10] H. Mutiara et al., "Faktor-Faktor yang Mempengaruhi Kejadian Dermatitis Kontak Akibat Kerja pada Karyawan Salon di Kelurahan Pahoman," J Agromedicine, 2019;6(2):307–11.

[11] A. D. P. Arum, "Faktor yang Berhubungan dengan Dermatitis Kontak pada Pekerja Udang di PT. Sultratuna Samudra Kendari," Kesmas Uwigama J. Kesehat. Masy, 2020;6(1):30–9, doi: 10.24903/kujkm.v6i1.898.

[12] Dita Maulida Anggraini, Endang Sutedja, Achadiyani Achadiyani "Etiology of Allergic Contact Dermatitis based on Patch Test," 2017;4(4):541–5. DOI: 10.15850/amj.v4n4.1265

[13] A. Soraya, "Analisis Faktor-Faktor Yang Mempengaruhi Produktivitas Kerja Karyawan Bagian Pabrikasi Pada Pabrik Gula Kebon Agung Di Kota Malang," 2018.

[14] Kajal Patel, Rosemary Nixon. Irritant Contact Dermatitis - A Review. Current Dermatology Reports 2022;11:41–51. DOI. 10.1007/s13671-021-00351-4

[15] R. Wiratama et al., "Analisis Hubungan-Hubungan Dermatitis Kontak Alergi," vol. 1, no., pp. 1–6. November 2020

[16] R. R. Dewi, L. Tina, and W. O. S. Nurzalmariah, "Hubungan Personal Hygiene, Pengetahuan dan Pemakaian Sarung Tangan Dengan Kejadian Penyakit Dermatitis Kontak Pada Pemulung Sampah di TPA Puuwatu Kota Kendari Tahun 2016," J. Ilm. Kesehat. Masy., 2017;2(6):1–9

[17] Howard Bauchner, Phil B. Fontanarosa, Edward H. Livingston. Conserving Supply of Personal Protective Equipment. A Call for Ideas. JAMA. 2020;323(19):1911. DOI:10.1001/jama.2020.4770

[18] A. Wahyu, A. U. Salamah, A. R. Fauziah, M. A. Angaradipta, and S. S. Russeng, "Faktor Dominan Yang Mempengaruhi Kejadian Dermatitis Kontak Dan Dampaknya Terhadap Kualitas Hidup Pada Petani Rumput Laut Di Dusun Puntondo Takalar," J. Kesehat. Masy. Marit., 2019;1(1), doi: 10.30597/jkmm.v1i1.8703.

[19] Cici Aprilliani, Keselamatan Dan Kesehatan Kerja (Hiperkes). 2016.

[20] A. Yulia, M. Z. Adha, and L. Komariah, "Hubungan Personal Hygiene, Lama Kontak Dan Masa Kerja Dengan Gejala Dermatitis Kontak Iritan Pada Manusia Silver Di Kota Tanggerang Selatan," Fram. Heal., 2022;1(2):1–11

[21] Holness DL. Occupational dermatosis. Curr Allergy Asthma Rep. 2019 19(9):42

[22] Nichol K, Copes R, Kersey K, Eriksson J, Holness DL. Screening for hand dermatitis in healthcare workers: comparing workplace screening with dermatologists' photo screen. Contact Dermatitis. 2019;80:374–81

[23] Nicholson PJ, Llewellyn D, English JS; Guidelines Development Group. Evidence-based guidelines for the prevention, identification, and management of occupational contact dermatitis and urticaria. Contact Dermatitis. Oct 2010;63(4):177–86.