

DESCRIPTION OF PHYSICAL ENVIRONMENTAL FACTORS, CHARACTERISTICS OF INDIVIDUALS, USE OF PPE AND IRRITANT CONTACT DERMATITIS IN BRATANG COMPOST HOUSES

Irfan Hamidi

Department of Environmental Health Faculty of Public Health,
Universitas Airlangga, Surabaya, Indonesia
Correspondence Address: Irfan Hamidi
Email : irfan1szupers@gmail.com

ABSTRACT

Introduction: Compost house is one of the government's efforts to overcome the adverse effects of increasing the volume of waste; one of the large compost houses is the Bratang Compost House. One of the health risks faced by workers is irritant contact dermatitis. The purpose of this study was to individual characteristics and use of PPE with the incidence of irritant contact dermatitis in workers at the Bratang Compost House. **Methods:** The study was descriptive observational with a cross-sectional model. Calculation of RR values was used to see the characteristics of the relationship between the use of PPE and the incidence of irritant contact dermatitis in workers at the Bratang Compost House. **Result:** The results showed that there were 9 workers affected by irritant contact dermatitis and 6 workers who were not affected by irritant contact dermatitis. Most workers affected by irritant contact dermatitis were dominated by workers age less than 30 years old and have a service life of more than 5 years. The results of the calculation of RR values indicated that poor usage of PPE can increase the risk of developing irritant contact dermatitis. **Conclusion:** What needs to be done by workers is to increase awareness of the importance of occupational health and safety especially the usage of PPE. The thing that needs to be done by the manager of the compost house is to fix the physical environmental factors, conduct socialization of health risks in the workplace and provide PPE to improve the safety of workers.

Keywords: Physical Environmental, Characteristics of Individual, Use of PPE, Irritant Contact Dermatitis in Bratang

INTRODUCTION

Every day, humans consume the resources on earth to carry out their activities so as to produce waste. Population increase, industrial development, urban population increase and economic growth can have a maximum impact on the amount of waste generated. Surabaya is a city that has a significant population growth due to industrialization and urbanization because it is the center of the economy in East Java. The increasing volume of waste causes problems for the environment. Therefore, it is necessary to carry out waste management activities in order to reduce the negative impact of waste on the human environment.

Recycling of waste is one solution to reduce the accumulation of waste in the landfill and reduce the unwanted impact of environmental pollution due to waste. Recycling of solid waste is an activity to

manage waste that is considered useless into goods that can be reused. Examples of waste recycling include turning kitchen waste or waste from the market into compost, turning plastic waste into household items by reprinting them. Based on the example of the form of recycling, composting is an alternative solution implemented by the Surabaya City Government to reduce the volume of waste that will go to the landfill through the compost house program. Based on data from the Surabaya City Parks and Hygiene Service, in 2014 there was 68.5% organic waste originating from households, city parks and markets that could be processed into compost (Dhera, 2017). Currently, there are 26 compost houses operating in the city of Surabaya with different capacities and number of workers. The eastern part of Surabaya has seven compost houses with the Bratang Compost House having a large production capacity and a

Cite this as: Hamidi, I. (2022). Description of Physical Environmental Factors, Characteristics of Individuals, use of PPE and Irritant Contact Dermatitis in Bratang Compost Houses. *The Indonesian Journal of Public Health*, 17(3), 418-428. <https://doi.org/10.20473/ijph.v17i3.2022.418-428>

©2022 IJPH. Open access under CC BY NC-SA. License doi: 10.20473/ijph.v17i3.2022.418-428 Received 11 July 2019, received in revised form 5 August 2019, Accepted 7 August 2019, Published online: December 2022. Publisher by Universitas Airlangga

large number of workers, namely 15 people, in contrast to other compost houses in the eastern area of Surabaya, which have a number of workers ranging from two to eight people.

Working in a compost house are not without risk, it is not much different from scavengers because they also have the same activity, namely contact with garbage. Activities in the compost house are sorting and stockpiling waste from households, markets and city parks to collect organic waste that can be produced into compost. Garbage has an influence on the health of the human body. The effects can be from toxic waste, waste containing pathogens, waste containing carcinogens and waste that is corrosive to the body (Slamet, 2014). This can trigger the occurrence of health problems at work.

Contact dermatitis is an inflammation of the skin due to substances or particles that touch the skin; there are two types of contact dermatitis, namely irritant contact dermatitis, which is dermatitis that is not caused by the body's immune system response, while the other is allergic contact dermatitis, caused by a specific immune system response. For example, workers are exposed to certain allergens that cause an inflammatory response in the skin. Based on the period of occurrence of the disease, it is divided into two, namely acute and chronic. Irritant contact dermatitis is caused by substances that are irritating to the skin such as sawdust, household cleaners, engine lubricants, and materials that are too acidic or alkaline. In addition, individual factors can influence such as length of contact, age of the worker, gender and previous history of skin disease (Djuanda et al., 2010). Occupational contact dermatitis is also caused by environmental physical conditions such as environmental temperature and humidity in addition to materials derived from plants such as plant sap, tree branches and leaves (Suma'mur, 1994). So, from the description above, it can be concluded that the composting

process at the Bratang Compost House has a risk of irritant contact dermatitis in its workers.

Data on the incidence of contact dermatitis are indeed rather difficult to obtain, this is probably because not all incidents are reported and recorded by the competent agency and affected workers sometimes do not report it. In a study conducted on garbage collectors in Yogyakarta in 2016, it was stated that 28.9% of 45 respondents admitted that they had complaints of irritant contact dermatitis. In a study conducted at the Jambangan compost house in 2016, data showed that there were 76.2% of 21 composting house workers affected by contact dermatitis (Dhera, 2017). The same results were also shown in a study conducted on waste processing workers at the Cipayung landfill in 2010 where there were more workers affected by irritant contact dermatitis (Annisa, 2010).

Based on the description above, it can be concluded that working in a compost house can cause exposure to risk factors such as air temperature in the compost house, humidity in the compost house environment, gender, age, years of service and knowledge of workers. Factors that do not directly affect the incidence of contact dermatitis in workers include the behavior of using PPE and personal hygiene or personal hygiene (Lestari & Utomo, 2007). The behavior of using PPE can prevent workers from getting contact dermatitis because PPE protects workers from contact with garbage. In addition, personal hygiene is also important in the prevention of contact dermatitis because personal hygiene can eliminate the substance that causes contact dermatitis attached to the body. Personal hygiene activities aim to rid oneself of dirt or chemical substances attached to the skin and maintain physical and psychological health (Wartanah, 2003).

The results of initial observations made by researchers in November 2018 at the Bratang Compost House have obtained

an overview of the activities and skin health complaints experienced by workers. The waste in the Bratang Compost House comes from households, markets and city parks where it contains a lot of organic and inorganic materials that can trigger irritant contact dermatitis in workers. The workers who carry out sampang sorting activities also do not all wear PPE completely and correctly. Symptoms of irritant contact dermatitis are quite varied, this also affects the type of irritant contact dermatitis, namely acute or chronic. Acute irritant contact dermatitis is characterized by peripatched skin, burning heat, erythema and bullae. In patients with chronic irritant contact dermatitis, it is characterized by dry, thickened, and scaly skin (Djuanda et al., 2010). If the disease is not controlled, it can cause pathogenic infection and disability, which can reduce work productivity.

Based on the results of the initial observations above, this study aims to describe the risk factors for the incidence of irritant contact dermatitis among workers at the Bratang Compost House.

METHODS

This study used a cross-sectional research design. The cross-sectional method is a research conducted at one time, both in data collection, observation and studying the relationship between risk factor variables and the effects that will occur (Notoatmodjo, 2005). This research was conducted with a descriptive observational method so that it does not give treatment to the subject under study and the data that have been collected will be processed to obtain a picture that can be presented in the form of a narrative to explain the phenomena that occur.

The research population is 15 people who work at Bratang Compost House. In this study, the sample was taken using a total sampling technique, namely the number of research samples was the same as the total population, this step was

taken because the number of research populations was less than 100 people (Sugiyono, 2007). The research location is in the Bratang Compost House which is located in the Bratang Flora Park complex, Baratajaya Village, Gubeng District, Surabaya City. Data collection was carried out in January 2019.

The independent variables in this study were temperature, humidity, environmental sanitation, years of service, age, gender and use of PPE. The dependent variable in this study was the incidence of irritant contact dermatitis in Bratang Compost House workers. To observe the temperature and humidity of the compost house a thermohygrometer was used and environmental sanitation observed using the assessment sheet. To obtain data on years of service, age, gender, bathing behavior, cleanliness of clothes, knowledge and use of PPE a questionnaire sheet was used. To diagnose workers for contact dermatitis a doctor's examination was used.

Data processing is carried out descriptively, namely by conducting a frequency distribution and then providing a narration that describes the phenomenon. In addition, the researcher also calculated the Relative Risk (RR) value to determine the type of relationship between the independent variable and the dependent variable through the resulting value. This research has also passed the ethical test conducted by the Health Research Ethics Commission, Faculty of Public Health, Airlangga University with certificate number 581/EA/KEPK/2018.

RESULT

Contact dermatitis examination on respondents was carried out by general practitioners. The results of the examination of respondents who are Bratang Compost House workers are nine (60%) workers with contact dermatitis and six (40%) workers without contact dermatitis. In this study, the location of

contact dermatitis included the toes and fingers, soles of the feet and palms, arms, legs, thighs and necks of workers.

The results of the observation of contact dermatitis symptoms in most workers experienced dry and scaly skin as many as five people, then redness of the skin as many as three people, while the rest experienced small bumps filled with fluid and itchy and sore skin. The workers admitted that they often experience itching, redness and soreness after working in the compost house, usually after they sort the garbage or stir the compost pile.

The results of measuring the temperature of the work environment at the Bratang Compost House using a thermohygrometer measuring instrument for five minutes near the point where workers carry out their activities, show a figure of . These results are compared with the standards regulated by the Minister of Public Works Regulation No. 03 of 2033 concerning the Implementation of Waste Infrastructure and Facilities in the Handling of Household Waste and Types of Household Waste which states that the temperature in the waste processing site should be less than 550C (Ministry of Public Works, 2013). So that the temperature in the Bratang Compost House is in accordance with the regulations.

The results of the measurement of air humidity in the Bratang Compost House using a thermohygrometer for five minutes near the point where workers carry out their activities is 61%. The measurement results are then compared with the standards regulated in the Ministry of Health of the Republic of Indonesia No. 48 of 2016 concerning Office Safety and Health Standards where the humidity is between 40% to 60% (Ministry of Health, 2016). So that the air humidity in the Bratang Compost House does not meet the standards. The building design of the compost house may affect the temperature and humidity conditions of the air.

Environmental sanitation in the Bratang Compost House refers to the

standards applied in the Minister of Health Regulation No. 70 of 2016 concerning Industrial Work Environment Health Standards. In this standard, three main aspects are assessed, namely the toilet sink, and the availability of clean water. The toilet aspect criteria are the suitability of the number of toilets with latrines appropriate with the number of workers, available water for toilets, and available soap. The sink aspect has criteria such as there is a hand dryer, there is running water and soap for washing hands. Aspects of the availability of clean water criteria include the availability of sufficient water, which is 20 liters per person, coming from protected sources, odorless water and tasteless water (Ministry of Health, 2016).

The results of the toilet aspect assessment show that there are two criteria which are met, namely the availability of a number of latrines that are in accordance with the number of workers, and the availability of water for toilet facilities. The criteria that have not been met for the toilet aspect is the availability of soap. The number of compost house workers is 15 with the number of toilets already meeting the standards. There is no soap in the toilet because it is possible for workers to bring their own soap from home. The water in the toilet is also always sufficient because it comes from a water source that always drains smoothly.

The results of the assessment of the sink aspect stated that there was only one criterion that met the availability of running water. The sink still does not meet two criteria, namely the presence of a hand dryer and hand soap. Usually workers only wash their hands with running water because it is not a hassle. Only when their hands are really dirty do they use the soap they brought from home. Good and correct hand washing habits can prevent irritant contact dermatitis.

The results of the assessment of the availability of clean water stated that it had met all the criteria. Clean water comes from drilled wells connected to pipes. The

water also looks clear and odorless. For the amount of clean water so far there has never been a shortage because the wells used as water sources have never dried up and, in the event of a blackout from the State Electricity Company (PLN), a generator can be used.

Based on the results of environmental sanitation observations

above not all environmental sanitation facilities are met. Facilities that are not yet available include bath soap in the toilet, hand dryer in the sink and hand soap in the toilet. The lack of sanitation facilities is probably due to the lack of attention from compost house managers and workers who are already satisfied with the existing facilities.

Table 1. Distribution of Contact Dermatitis by Period of Work in Bratang Compost Home Workers in 2019

Working Period	Irritant Contact Dermatitis		No Irritant Contact Dermatitis		Total	
	n	%	n	%	n	%
<5	5	55.6	4	44.4	9	100
≥5	4	66.7	2	33.3	6	100
Total	9	60	6	40	15	100

Table 2. Distribution of Contact Dermatitis by Age in Bratang Compost Home Workers in 2019

Age	Irritant Contact Dermatitis		No Irritant Contact Dermatitis		Total	
	n	%	n	%	n	%
<30	4	66.7	2	33.3	6	100
≥30	5	55.6	4	44.4	9	100
Total	9	60	6	40	15	100

Table 3. Distribution of Contact Dermatitis by Gender in Bratang Compost Home Workers in 2019

Gender	Irritant Contact Dermatitis		No Irritant Contact Dermatitis		Total	
	n	%	n	%	n	%
Male	9	60	6	40	15	100
Female	0	0	0	0	0	100
Total	9	60	6	40	15	100

The variable length of service for the respondents was measured from the time the worker first worked at the Bratang Compost House to the time the worker was examined for his skin by a general practitioner to diagnose box dermatitis. Based on Table 1, workers affected by contact dermatitis are dominated by workers with a working period of five years

(66.7%), while workers without contact dermatitis are dominated by workers with a working period of <5 years (44.4%). In Table 1 it can also be seen that workers with <5 years of service were more likely to have irritant contact dermatitis (55.6%).

The age variable was measured through the worker's date of birth to the time the worker was examined by a doctor to

diagnose contact dermatitis. Based on Table 2, the incidence of irritant contact dermatitis was more experienced by workers who were <30 years old (66.7%), compared to those without irritant contact dermatitis (33.3%). Workers who are 30 years old are also more affected by irritant contact dermatitis (55.6%) than those who do not have irritant contact dermatitis (44.4%).

In Table 3, it can be seen that all workers are male (100%) with 60% of them having irritant contact dermatitis. According to the compost house supervisor, the workers there are dominated by men because the compost processing activity is quite heavy.

Table 4. Distribution of PPE Use for Bratang Compost Home Workers in 2019

PPE Type	Irritant Contact Dermatitis		No Irritant Contact Dermatitis		n	%
	n	%	n	%		
Work uniform						
Use	8	61.5	5	38.5	13	100
Do not use	1	50	1	50	2	100
Gloves						
Use	4	44.4	5	55.6	9	100
Do not use	5	83.3	1	16.7	6	100
Boots						
Use	6	50	6	50	12	100
Do not use	3	100	0	0	3	100

Table 5. Cross-tabulation between the results of the assessment of the use of PPE and the incidence of irritant contact dermatitis in Bratang composting house workers in 2019

Use of PPE	Irritant Contact Dermatitis		No Irritant Contact Dermatitis		Total		RR
	n	%	n	%	n	%	
Buruk	6	75	2	25	8	100	1.75
Baik	3	42.9	4	57.1	7	100	

In Table 4, the use of PPE in the form of work clothes is more widely used by workers affected by irritant contact dermatitis, namely 61.5%, while those without contact dermatitis and wearing work clothes are 38.5%. Workers who do not wear work clothes between workers with irritant contact dermatitis and those who do not have the same number (50%).

In Table 4, the use of PPE in the form of gloves is more widely used in workers who do not have irritant contact dermatitis (55.6%), while those who have

irritant contact dermatitis are 44.4%. Workers who do not wear gloves are more affected by irritant contact dermatitis (83.3%), while workers who do not have irritant contact dermatitis are 16.7%. In addition, Table 4 also shows the possibility that the use of certain PPE also affects the number of sufferers of irritant contact dermatitis. This may be due to their activities, such as sorting waste by hand, but there are still many workers who do not use gloves.

In Table 4, the use of PPE in the form of boots has the same number between workers who have contact dermatitis or not and wear boots, namely 50%. There are still workers who do not wear boots, all of whom are also affected by contact dermatitis.

In Table 5, it can be seen that the poor use of PPE is found in workers with irritant contact dermatitis, which is 75%, while the use of good PPE is mostly found in workers who are not exposed to irritant contact dermatitis, which is 57.1%. The results of the Relative Risk (RR) assessment yield 1.75, which means that poor use of PPE can be a risk factor for the occurrence of irritant contact dermatitis in Bratang Compost House workers.

DISCUSSION

Incidence of Contact Dermatitis in Workers at Bratang Compost House

Irritant contact dermatitis or commonly abbreviated as DKI is an inflammation of the skin due to direct exposure of cells to toxic chemicals, it can also be due to physical, biological agents on the epidermis of cells without the production of certain antibodies (Kezic et al., 2009).). Irritant contact dermatitis can occur due to factors from outside the body (exogenous) or factors from inside the body (endogenous). Factors originating from within the body itself or commonly referred to as endogenous can be in the form of gender, heredity, ethnicity or race, the location of the disease, and a history of atopy. While factors originating from outside the human body or commonly referred to as exogenous include chemicals that have irritant properties, exposure characteristics, environmental factors, mechanical factors and UV radiation. Chemical properties of irritants can be in the form of pH level, concentration of chemical exposed, carrier material and solubility level of the substance. Exposure characteristic factors are usually in the form of amount, concentration, length of time, type of exposure, exposure that triggers other irritants and the time span after

previous exposure. Environmental factors usually consist of temperature and humidity (Sularsito & Djuanda, 2009).

The results of the research on irritant contact dermatitis among workers at Bratang Compost House were 60% of workers with irritant contact dermatitis and 40% of workers without irritant contact dermatitis. Most workers experience symptoms such as burning skin, reddened skin, dry and scaly skin, and small fluid-filled bumps known as vesicles. Common symptoms in patients with irritant contact dermatitis are usually the appearance of a shiny epidermal layer, the presence of fissures, well-defined erythematous macules and dry or blistered skin (Sularsito & Djuanda, 2009).

Based on the description above, it can be concluded that the incidence of irritant contact dermatitis in workers is the result of exposure to irritant chemicals and biological agents, where many chemicals and biological agents are found in the waste to be sorted and stacked to become compost. Garbage which is the main raw material for composting comes from households, markets, offices and city parks. The waste consists of several elements such as tree branches, dry leaves, vegetable scraps, meat scraps, plastic bags, household cleaners and so on. The workers choose the waste to be separated between organic and inorganic waste and pile the organic waste into compost. It is very possible for contact with disease agents on the skin of workers. If workers do not use adequate PPE, poor personal hygiene and unfavorable physical environmental factors can trigger irritant contact dermatitis in Bratang Compost House workers.

Temperature, Humidity and Environmental Sanitation

The results of temperature and humidity measurements in the Bratang Compost House are the environmental temperature which is 35.50C and the humidity 61%. The environmental temperature of the Bratang Compost House

has complied with the regulations stipulated by the Minister of Public Works No. 03 of 2033 concerning the Implementation of Waste Infrastructure and Facilities in the Handling of Household Waste and Waste Similar to Household Waste, which is not more than 550C. Meanwhile, the humidity in the Bratang Compost House is 61% so it does not meet the standards set by the Minister of Health Regulation No. 48 of 2016 concerning Office Occupational Safety and Health Standards, which is 40%-60%.

The temperature and humidity of the air in the compost house must be in accordance with regulations. If the low temperature and humidity result in a decrease in the level of wetting or hydration of the stratum corneum, it makes the skin dry easily; under these conditions irritant chemicals will easily enter the skin tissue (Cohen, 1999). Damage to the skin's defense function can also occur if the temperature and humidity are too high, causing excessive hydration of the stratum corneum and also at too low a temperature and humidity (Safeguards, 2010). In addition, other opinions also state that when humidity drops and air temperature increases, it will cause severe contact between strong acids and strong bases besides making the skin condition more dry, making it easier for chemicals to irritate the skin, making it easier to get irritant contact dermatitis (1981).

The results of environmental sanitation research at the Bratang Compost House show that there are still sanitation criteria that are not available including the absence of soap in the toilet, the absence of hand dryer media in the sink and the unavailability of hand soap in the sink. Lack of environmental sanitation facilities can affect the healthy behavior of workers. One of the most prominent is the inhibition of workers to carry out personal hygiene behavior to the fullest. One of the personal hygiene factors is hand washing. Washing hands properly can remove dirt that sticks to the skin; it is very beneficial for skin

health because it can reduce the duration of exposure, reduce the concentration of substances and prevent disease agents from entering through the skin. Another example is the availability of hand dryers, which can be a preventive measure to maintain a stable level of skin hydration through reducing moisture in wet skin after washing hands (WHO, 2009). Based on the description, it can be concluded that environmental sanitation is not directly related to the incidence of contact dermatitis, but poor personal hygiene factors due to poor environmental sanitation facilities can trigger the incidence of contact dermatitis in workers.

The Relationship of Working Period with the Incidence of Contact Dermatitis

Most of the workers at Bratang Compost House who suffer from contact dermatitis have a working period of less than five years, but the workers who have a working period of more than five years are also dominated by contact dermatitis sufferers. If workers have a long working period, it will result in a longer period of exposure to contact dermatitis triggers (Suma'mur, 1996). In addition, continuous skin contact with irritant chemicals will increase the severity of irritant box dermatitis, which can be acute or chronic.

Relationship of Worker Age with the Incidence of Contact Dermatitis

Based on the results of interviews with workers' age, it shows that workers who are affected by irritant contact dermatitis are mostly over 30 years old, but workers who are under 30 years old are also dominated by workers who are affected by irritant contact dermatitis. The increasing age of workers causes a decrease in the lipid layer on the skin which manifests in the drying of the skin and making the skin more permeable to irritating chemicals (Cohen, 1999).

On the other hand, many workers who are under 30 years old or who are still

young are also affected by irritant contact dermatitis. This phenomenon is also explained by Cohen (1999), according to whom the experience of young workers is still less when compared to older workers so that contact with cilia is more common. Because older workers know more about how to avoid boxes and older workers value their safety more, so they are more disciplined in using PPE.

Relationship between Worker Sex and the Incidence of Contact Dermatitis

The results of the research on the sex of workers at Bratang Compost House showed that all workers were male. Contact dermatitis is actually not gender-based, it affects men and women the same. However, there is a lot of literature which states that more female workers are affected by irritant contact dermatitis than male workers. This is because women's skin is thinner and they rarely have fine hair, making it easy for irritating chemicals to enter the skin. The skin layer in women secretes fewer lipids so the skin becomes drier. The high rate of contact dermatitis in women may also be possible due to more frequent use of jewelry, use of cosmetics, and interactions with the surrounding environment. However, although it is more dominated by women, men are also susceptible to contact dermatitis if they are not disciplined in using PPE, are not diligent in maintaining personal hygiene, and individual characteristics are susceptible to irritant contact dermatitis. In addition, the level of awareness and knowledge of workers which are still low may be a risk factor for the occurrence of irritant contact dermatitis.

The Relationship between the use of PPE with the Incidence of Contact Dermatitis

In this study, there were three types of PPE that must be worn by compost house workers, including work clothes, gloves and boots. The use of work clothes for Bratang Compost House workers shows that there

are many workers who use work clothes and there are only two workers who do not wear work clothes where one of them has contact dermatitis. Workers who do not wear gloves are more affected by contact dermatitis, as well as boots where there are three workers who do not wear them and are exposed to irritant contact dermatitis. The results of the calculation of the RR value also show that poor use of PPE is a risk factor for the incidence of irritant contact dermatitis in workers at the Bratang Compost House.

The use of work clothes aims to protect the body from dirt or chemical irritants present in the waste for contact with the worker's body. Although many workers have worn work clothes, many still have contact dermatitis. This is possible, because workers do not pay attention to the cleanliness of the work clothes used and there are still workers who change clothes with other people. This behavior is very likely to transmit skin diseases on the skin of someone who wore the clothes before. Lack of cleanliness of clothes can also cause irritating chemicals and biological agents to accumulate in the clothes, making workers who wear them more often exposed.

The lack of workers wearing PPE in the form of gloves is also a contributing factor to the occurrence of irritant contact dermatitis. Activities in the compost house that allow workers to touch the waste with their hands need to be protected by gloves so that the skin of their hands does not touch the waste directly. This is because in the waste there are many chemicals that are irritants and biological agents that can cause workers to get contact dermatitis. The same thing happens with the use of PPE boots, which are also to protect the skin of the feet from contact with garbage and protect the skin from friction against sharp objects in the garbage.

In a study conducted on workers making paving block by Erliana (2008), it was found that the use of PPE has a strong relationship with the incidence of contact dermatitis through the chi-square test. The use of PPE is actually not to eliminate or

minimize existing hazards, but to reduce contact with workers by providing a place that prevents workers' contact with hazards (Suma'mur, 1992).

CONCLUSION

The incidence of contact dermatitis in workers at Bratang Compost House occurs due to physical environmental factors, individual characteristics, and waste as the main agent of the disease. The incidence of contact dermatitis can reduce worker productivity and increase the budget burden for workers or managers.

The temperature of the compost house has met the standard but the humidity is still below the standard. This needs to be controlled so that the temperature and humidity of the air can be optimal to support the health of the workers' skin.

To prevent the incidence of contact dermatitis effort needs to be carried out by all parties and requires high awareness. Workers must have high motivation to maintain work safety by using PPE properly and correctly. Managers must also provide PPE, socialize the correct use of PPE and provide sanctions if workers do not use PPE properly and correctly. Managers must also pay attention to a good environmental sanitation system so that workers are able to carry out personal hygiene optimally. There should also be socialization to workers about contact dermatitis.

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