

Use of Personal Protective Equipment (Gloves) Can Reduce the Risk of Damage to Skin Integrity in Fish Packaging Workers

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Abstract—One of the health problems for fish packaging workers due to work is damage to the integrity of the skin. Some of the factors that can cause damage to skin integrity are age, years of service, history of skin diseases, personal hygiene, and use of personal protective equipment. Damage to skin integrity is inflammation of the skin caused by a substance in contact with the skin. The purpose of this study was to determine the effect of using personal protective equipment (gloves) on the risk of damage to skin integrity. The method used is quantitative research using a descriptive correlation approach. Cross Sectional. Sampling using total sampling technique, with a total sample of 52 respondents, while the research instruments using a questionnaire and checklist. Bivariate analysis using the Chi Square test. The results obtained from the bivariate test proved that the use of personal protective equipment (gloves) had an effect on the risk of damage to skin integrity. The conclusion is that there is an effect of using personal protective equipment (gloves) on the risk of damage to skin integrity in fish packaging workers.

Keywords—*Personal Protective Equipment (Gloves), Damage to Skin Integrity, Fish Packaging*

I. INTRODUCTION

Occupational skin disease is a skin pathological process that occurs during work and is influenced by the work environment. Damage to the integrity of the skin due to work will reduce the comfort in doing tasks and will ultimately affect the whole production process. The integrity of the occupational skin is one of the main groups of occupational diseases in terms of prevalence. Although the integrity of the skin due to work is not life-threatening, the economic impact is huge [1]. WHO reported that in 2014 the incidence of occupational skin diseases in several countries was the same, namely 50- 70 cases per 100,000 workers per year Health and Safety Executive / HSE (2010) stated that 39,000 people in the UK contracted skin diseases caused by work or around 80 %, in the United States, 90% of occupational health claims due to skin disorders result from contact dermatitis.

One of the efforts that can be made to prevent damage to skin integrals is to use Personal Protective Equipment (PPE). According to the Ministry of Manpower in 2003, the definition of Personal Protective Equipment (PPE) is a device that has the ability to protect a person in work whose

function is to isolate the workforce from hazards in the workplace. Based on the results of a preliminary study conducted in a fish packaging company, 10 workers in the fish packaging department found that all workers used the type of PPE with shoes made of rubber, but only 5 used rubber gloves, and 4 used cloth masks. The results of interviews with 10 workers revealed that 8 workers had experienced itchy skin on the hands and feet, even though they had been treated by health workers, but because the work was the same, then at certain times the hands and feet experienced itching again.

II. METHOD

This type of research is quantitative research. The research method used was descriptive correlation. The research approach was cross-sectional. The population in this study all workers in the fish packaging 52 people. The sample technique used was total sampling. The number of samples was 52 people. The tools used in data collection in this study were a checklist based on the theory of personal protective equipment and skin integrity.

III. RESULT

A. Univariate Analysis

The table 1 shows that male respondents were at most 45 people (86.3%), and female respondents were 7 people (13.7%). Respondents aged 32-39 years were 28 people (52.9%). At least 9 respondents aged 40-47 years (17.6%). Most respondents have high school education as many as 49 people (94.2%), and 3 respondents have a DIII education (5.8%). Most respondents have worked for 6-10 years as many as 24 people (46.2%). Respondents who have worked at least for more than 20 years as many as 1 person (1.9%). Most respondents have used gloves properly while working as many as 33 people (63.5%), while 19 respondents were still bad at wearing gloves when working. (36.5%). The most respondents experienced damage to grade I skin integrity as many as 36 people (69.2%), while 16 respondents had grade II skin integrity damage (30.8%).

Table 1 Distribution of Respondents Frequency

Variabel	Frequency	Persentase (%)
Gender	45	86.3
Man		
Woman	7	13.7
Age		
24-31 years	15	29.4
32-39 years	28	52.9
40-47 years	9	17.6
Level of education		
SMA	49	94.2
DIII	3	5.8
Work experience		
3-5 years	4	7.7
6-10 years	24	46.2
11-15 years	14	26.9
16-20 years	9	17.3
> 20 years	1	1.9
Wearing gloves		
Good	33	63.5
Bad	19	36.5
Damage to skin integrity		
Derajat I	36	69.2
Derajat II	16	30.8

B. Bivariate Analysis

Based on the table 2, it can be seen from the Personal Protective Equipment (gloves) that 33 respondents who wear well are more likely to experience grade I skin integrity damage as many as 27 people (81.2%). A total of 19 respondents who were bad at wearing gloves had more damage to the integrity of the skin with grade II of 47.4%. This data shows that the better the respondents wear gloves, the smaller the degree of damage to skin integrity, the worse the respondents wear personal protective equipment (gloves) the greater the degree of damage to the skin. The results of the Chi Square statistical test obtained $X^2_{count} = 6.718 > 2_{table} = 3.84$ or $p\text{-value} = 0.010$. These results indicate that there is an effect of using personal protective equipment (gloves) on damage to skin integrity among respondents of fish packaging workers.

C. Discussion

Univariate Analysis

Gender

Based on the research results, it is known that most of the respondents are male, where men are considered to have

more strong energy to pack and sort fish in the fish packaging process. With regard to damage to skin integrity, according to Schnuch and Carlsen [2] women have more sensitive skin than men. However, in this study, it was found that female respondents had more grade I skin integrity damage, this was because the number of female respondents was more than male respondents.

Age

The results showed that most of the respondents were between 32-39 years old. Cohen (2008) states that human skin degenerates with age, so that the skin loses the fat layer above it and becomes drier. This dryness of the skin makes it easier for chemicals to infect the skin, making it more susceptible to damage to skin integrity. Older workers are more susceptible to irritants. Often in the elderly there is failure in the treatment of contact dermatitis, resulting in damage to the integrity of the chronic skin (Utomo, 2012). However, in this study it is known that the increasing age of the respondents is not followed by an increase in the degree of damage to the integrity of the skin. There are respondents who are younger but experience damage to skin integrity with grade II compared to respondents with older age. The results of Alfianti's [3] study explained that there was no effect of age with skin care based on the Braden Q scale score on the incidence of pressure sores in children at Roemani Hospital, Semarang.

Level of education

Based on the results of the study, most of the respondents had high school education. According to Notoadmojo [4], the higher the level of education, the broader the knowledge is expected, including knowing the benefits of wearing Personal Protective Equipment (gloves) while working to reduce the risk of experiencing damage to skin integrity. The results of this study also showed that respondents with high school education used more personal protective equipment (gloves) while working, and respondents with DIII education were all good at wearing personal protective equipment (gloves) and experienced grade I skin integrity damage.

Work experience

Based on the research results, most of the respondents have worked for 6-10 years. Cohen (2008) states that workers with ≤ 2 years of work can be one of the factors indicating that the worker does not have sufficient experience in doing his job. If these workers are often found to have made mistakes in work procedures, not using personal protective equipment such as wearing gloves, then this has the potential to increase the incidence of dermatitis.

Table 2 Effect of Personal Protective Equipment (Gloves) on Damage to Skin Integrity

Wearing gloves	Damage to Skin Integrity				Amount	%	χ^2_{hitung}	χ^2_{tabel}	p-value
	Grade I		Grade II						
	F	%	F	%					
Good	27	81.2	6	18.2	33	100	6,718	3,84	0,010
Bad	9	47.4	10	52.6	19	100			
	36	69.2	16	30.8	52	100			

The results of this study are different from the opinion of Simamora (2009) which states that a person's tenure determines the level of one's experience in mastering their work. It is possible that workers who have worked for more than two years already have resistance to irritants and allergens, so that contact dermatitis sufferers in this group tend to be less likely to be found. The results showed that the respondent's work experience was not followed by the use of personal protective equipment (gloves) properly, and the respondent's work experience was not accompanied by a decrease in the degree of damage to skin integrity. There were respondents with work experience over 15 years but experienced grade II damage to skin integrity.

Wearing personal protective equipment (Gloves)

Based on the research results, it is known that most of the respondents have used personal protective equipment (gloves) properly while working. Suma'mur [5] suggests that the function of gloves is to protect the hands and fingers from sparks or metal, liquids and substances or chemicals, heat, wet and water, cuts or rubs, skin damage, electric shock, and machine explosives.

Based on the results of the study, it is known that respondents wear gloves while working, starting when they are in contact with the fish. The process of selecting and packing fish with a mixture of ice will make the hands feel cooler and make it more difficult for respondents to pack the fish. In contrast to the case of respondents who are bad at wearing gloves. The reason given by respondents was that gloves sometimes made it difficult to select fish in packaging. Respondents stated that it was more comfortable if they did not wear gloves. Another reason that was found was that gloves that were new and used often caused an itchy allergy on the fingers, therefore respondents chose not to wear gloves.

Strohl [6] explains that the skin is a place of normal flora, normal skin is usually occupied by bacteria around 102-106 CFU / cm². Normal flora that occupy the skin consists of two types, namely normal flora or transient microorganisms (transient microorganisms) and permanent microorganisms (resident microorganisms). The Association for Professionals in Infection Control (APIC) provides guidelines that transient microorganisms are microorganisms that are isolated from the skin, but are not always present or remain on the skin. Transient microorganisms, which consist of bacteria, fungi, yeast, viruses and parasites, can come from various sources which can eventually come into contact with the skin. Usually these microorganisms can be found on the palms of the hands, fingertips and under the nails. Pathogenic microorganisms that may be found on the skin as transient microorganisms are *Escherichia coli*, *Salmonella* sp, *Shigella* sp, *Clostridium perfringens*, *Giardia lamblia*, Norwalk virus and hepatitis A virus. population density between 102-103 CFU / cm². Flora remains not pathogenic, except for *Staphylococcus aureus*. These bacteria can cause disease when they reach 1,000,000 or 10⁶ per gram, an amount sufficient to produce the toxin. Anaerobic flora such as *Propionibacterium acne*, live in the deeper layers of the skin, in hair follicles, sweat glands and sebaceous glands.

Damage to skin integrity

Based on the results of the study, it was found that most of the respondents had grade I skin integrity damage. Sularsito [7] stated that skin damage can occur due to prolonged contact and contact with certain substances. After some time, the skin will become dry, painful, bleed, and cracked. Damage to the integrity of the skin in these respondents. Based on the results of the study, it is known that the respondents stated that they often experience itching between their hands after working to pack fish, but the frequency of itching is not felt every day.

Bivariate Analysis

Based on the research results, it is known that there is an effect of using personal protective equipment (gloves) on damage to skin integrity with $X^2_{count} = 6.718 > 2_{table} = 3.84$ or $p\text{-value} = 0.010$. Respondents who are good at wearing gloves cause damage to skin integrity at grade I, while respondents who are bad at wearing gloves cause damage to skin integrity at grade II. The results of this study are in line with the research of Nursecha [8] which states that there is a relationship between the frequency of using latex gloves and the incidence of occupational contact dermatitis in health personnel at Sukoharjo Hospital.

According to Power & Polovich [9] personal protective equipment such as gloves are used to protect the skin and mucous membranes of officers from the risk of exposure. Siregar [10] argues that occupational skin disease is a skin pathological process that occurs when doing work and the effects that exist in the work environment. Skin disease may be characterized by a rash that is similar in location to the external area of attack. Scratching the rash due to itching can cause expansion of the exposed area.

Gardiner and Harrington [11] state that wearing gloves can protect against contact with causative media such as sea water, but improper use of gloves can cause a source of damage to skin integrity that can enter between the glove and the skin of the hand. Some people are also allergic to latex and other components in gloves. Smeltzer & Bare [12] also stated that damage to skin integrity is an inflammatory reaction of the skin against physical, chemical, or biological elements. The epidermis is damaged by repeated physical and chemical irritants. Contact dermatitis can be the primary-irritant type in which a non-allergic reaction occurs as a result of exposure to an irritating substance, or an allergic type (allergic contact dermatitis) caused by exposure of a sensitive person to a contact allergen. The first reactions of contact dermatitis include itching, burning, erythema which is immediately followed by symptoms of edema, papules, vesicles and oozing of fluid or secretions.

Based on the results of the study, the itching and rashes on the hands of the respondents were mostly on the back and between the hands, this was due to continuous contact with sea water. Sulistyaningsih, et al (2010) stated that sea water contains high NaCl (sodium chloride) and can interfere with metabolism that occurs in the human body. Sea water when used for bathing, can trigger skin diseases, such as itching.

IV. CONCLUSION

1. Most of the respondents were male (86.3%), aged 32-39 years (52.9%), high school education (94.2%), 6-10 years of work experience (46.2%).
2. Most of the respondents who work in fish packaging are good at wearing personal protective equipment (gloves) (63.5%).
3. Most of the respondents who work in fish packaging experience damage to the integrity of the skin at grade II (69.2%),
4. There is an effect of wearing gloves on damage to skin integrity in fish packaging workers ($p = 0.010$)

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