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Factors related to contact dermatitis in Makassar City salons

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ABSTRACT

Introduction: contact dermatitis is an inflammation of the skin, generally induced by exposure to extrinsic irritants and allergens. Based on direct interviews conducted by researchers, some salon workers experience contact dermatitis. Symptoms are experienced in the form of small bubbles filled with liquid on the palms of the hands, the skin on the palms feels dry and peeling, and the palms are red and sore due to frequent contact with materials found in the salon.

Objective: To determine the factors associated with contact dermatitis in Makassar city salons.

Methods: This study used quantitative research methods with a cross-sectional approach. The population in this study was 60 respondents from 7 salons. The sample in this study was 40 workers. The instrument used was a questionnaire. Data analysis using univariate and bivariate analysis.

Result: showed that there was a relationship between working period and contact dermatitis (p-value = 0.043 < 0.05), there was a relationship between length of contact with contact dermatitis (p-value = 0.022 < 0.05), there was no relationship between personal hygiene with contact dermatitis (p-value = 1.000 > 0.05), there was no relationship between the use of personal protective equipment (PPE) with contact dermatitis (p-value = 0.638 > 0.05).

Conclusion: There is a relationship between the length of work and the length of contact dermatitis in salon workers. It is recommended that salon workers use moisturizer after washing their hands to coat the skin's surface and prevent water loss. Moistors can also be applied to the area affected by dermatitis, which keeps the skin moist so that the recovery process will be faster. Make sure to use a fragrance-free, alcohol-free moisturizer, and hypoallergenic so as not to irritate the skin even more.

Keywords: dermatitis; length of contact; salon; working period.

INTRODUCTION

The skin serves as a link between the inside of the body and its external environment. Physical, chemical, and biologic environmental factors affect the skin. Therefore, disease occurs when the damage exceeds the tolerance capacity of the healing power. Occupational dermatitis is an inflammation of the skin caused by a person's work (Hadi, Pamudji and Rachmadianty, 2021). Contact dermatitis is an inflammation of the skin, generally induced by exposure to extrinsic irritants and allergenic materials. Contact dermatitis is divided into irritant contact dermatitis (DKI), which is a non-immunologic and non-specific skin response caused by irritants. In contrast, allergic contact dermatitis (DKA) is an adaptive immune response to the causative material that penetrates the skin (Houle, Holness and DeKoven, 2021). Occupational skin diseases (OSD) are the second most common after musculoskeletal diseases, accounting for about 22% of all occupational diseases. UK data shows that 1.29 cases per 1000 workers are occupational dermatitis. When viewed from the type of occupational disease, more than 95% is contact dermatitis, while the others are other skin diseases (Park *et al.*, 2020).

While occupational contact dermatitis (OSD) is considered a non-life-threatening condition, some of the symptoms of OSD that have been reported include pain and itching due to illness, as well as psychosocial impacts on workers such as discomfort and lack of confidence in their physical appearance. In addition, the important economic impact on work activities is in the form of decreased productivity at work, frequent sick leave, and eventually having to change their jobs (Kalboussi *et al.*, 2019). Contact dermatitis in salon workers is generally localized on the hands, especially on the fingers or between the fingers, back of the hands and palms. In the salon environment, materials that cause contact dermatitis are shampoos, conditioners, hair masks, body scrubs, bleach hair dye body lotions, hair serums and vitamins, hair dyes, curling irons, hair straighteners and components in gloves (Frosch *et al.*, 2021). Allergic contact dermatitis caused by ophthalmic topical drugs is a common cause of eyelid dermatitis. The introduction of new formulations, including both active ingredients and excipients, along with the lack of availability of some of these drugs, makes patch testing in patients exposed to these drugs particularly challenging. This manuscript compiles most, if not all, of the topical ophthalmic drugs used in our national health system, including information on available allergens, as well as the recommended concentration and vehicle for those allergens that are still unavailable (Pegalajar-García, Coronel-González and Navarro-Triviño, 2024).

Occupational immune diseases are some of the most common illnesses that affect workers including inflammation, allergy, respiratory disease, autoimmunity, or other immune modulation resulting in suppression following exposure in the work environment (Anderson, Weatherly and Meade, 2024). Emerging contaminants such as sunscreens, hair dyes and flame retardants have been found at important concentrations in surface water (river, lake, ocean). However, their negative impact on different aquatic species is not fully known (Tapia-Salazar, Diaz-Sosa and Cárdenas-Chávez, 2022). This Clinical Management Review will encompass a review of fragrances, preservatives, rubber, acrylates, metals, and medications, their common sources of exposure, controversies in diagnosis and patch testing, management and how to avoid those allergens (Fonacier, Uter and Johansen, 2024).

Implications This study can provide a solid basis for better prevention and intervention efforts in overcoming contact dermatitis in the working environment of salons in Makassar city, as well as improving the health and safety of salon workers. Based on direct interviews conducted by researchers, some salon workers experienced contact dermatitis. Symptoms experienced are in the form of small bubbles filled with liquid on the palms of the hands, the skin on the palms feels dry and flaky, the palms are red and stinging due to frequent contact with the materials found in the salon. This study aims to find out the factors related to contact dermatitis in Makassar city salons.

METHOD

The type of research used is quantitative research with a cross-sectional study design. The population in this study were 60 respondents from 7 salons. The sample in this study were 40 workers. The instrument used was a questionnaire. Data analysis using univariate and bivariate analysis. The data that has been analyzed is presented in tabular form and then explained in narrative form.

RESULTS

Table 1. Respondent Characteristics

Age Group	N	%
17 - 25	9	22.5
26 - 35	28	70
36 - 45	3	7.5
Education Level		
SMA/SMK	38	95
D3/S1	2	5
Contact Dermatitis		
Dermatitis	36	90
No Dermatitis	4	10
Working Period		
≤5 years	4	10
>5 years	36	90
Length of Contact		
<5 O'clock	3	7.5
≥5 O'clock	37	9.2
Personal Hygiene		
Good	39	97.5
Bad	1	2.5
Use of Personal Protective Equipment		
Using PPE	24	60
Not Using PPE	16	40

Based on table 1.1 characteristics of respondents based on age, that the highest age of respondents was 26-35 years as many as 28 people (70%), while the lowest age was 36-45 years as many as 3 people (7.5%). The characteristics of respondents based on education level, that the respondents who have the highest level of education are SMA / SMK as many as 38 people (95%), while those with D3 / S1 education level are 2 people (5%). Distribution of respondents based on contact dermatitis, that of the 40 respondents, the highest number of respondents was dermatitis as many as 36 people (90%), while the lowest was not dermatitis as many as 4 people (10%). Distribution of respondents based on tenure that of the 40 respondents there were the highest respondents, namely with a tenure of >5 years as many as 36 people (90%), while the lowest was a tenure of ≤5 years as many as 4 people (10%). Distribution of respondents based on length of contact, that of the 40 respondents there were the highest respondents with a length of contact ≥5 hours as many as 37 people (92.5%), while the lowest was a length of contact of 3 people (7.5%). Distribution of personal hygiene respondents, that of the 40 respondents there were the highest respondents, namely respondents with good personal hygiene as many as 39 people (97.5%), while the lowest was respondents with poor personal hygiene as many as 1 person (2.5%). Distribution of PPE use, that of the 40 respondents, the highest was using PPE as many as 24 people (60%), while the lowest was not using PPE as many as 16 people (40%).

Table 2. Relationship between Working Period and Contact Dermatitis in Salon Workers Makassar City.

Working Period	Contact Dermatitis				Total		p-value
	Dermatitis		No Dermatitis				
	N	%	N	%	N	%	
New	2	50	2	50	4	100	0,043
Long	34	94,4	2	5,6	36	100	
Length of Contact							
Vulnerable	35	94,6	2	5,4	37	100	0,022
Not Vulnerable	1	33,3	2	66,7	3	100	
Personal Hygiene							
Good	35	89,7	4	10,3	39	100	1,00
Bad	1	100	0	0	1	100	
Use of PPE							
Using PPE	21	87,5	3	12,5	24	100	0,638
Not Using PPE	15	93,8	1	6,3	16	100	

Based on table 1. shows that the new working period with contact dermatitis in the dermatitis category is 2 respondents with a percentage of (50.0%) and no dermatitis is 2 respondents with a percentage of (50.0%). Meanwhile, the length of service with contact dermatitis in the dermatitis category was 34 respondents with a percentage of (94.4%) and no dermatitis was 2 respondents with a percentage of (5.6%). The results of statistical tests using chi-square obtained $PValue$= 0.043<0.05 which means there is a relationship between working period and contact dermatitis in salon workers in in Makassar City. Shows that the length of contact that is susceptible to contact dermatitis in the dermatitis category is 35 respondents with a percentage of (94.6%) and not dermatitis as many as 2 respondents with a percentage of (5.4%). Meanwhile, the length of contact that is not susceptible to contact dermatitis in the dermatitis category is 1 respondent with a percentage of (33.3%) and not dermatitis as many as 2 respondents with a percentage of (66.7%). The results of statistical tests using chi-square obtained a value of $PValue$= 0.022 which means there is a relationship between length of contact and contact dermatitis in salon workers in in Makassar City.

Shows that good personal hygiene with contact dermatitis in the dermatitis category is 35 respondents with a percentage of (89.7%) and not dermatitis as many as 4 respondents with a percentage of (10.3%). Meanwhile, poor personal hygiene with contact dermatitis in the dermatitis category was 1 respondent with a percentage of (100%) and no dermatitis was 0 respondents with a percentage of (0.0%). The results of statistical tests using chi-square obtained a value of $PValue$ =1.000> 0.05 which means there is no relationship between personal hygiene and contact dermatitis in salon workers in Makassar City. Shows that the use of PPE with contact dermatitis in the dermatitis category was 21 respondents with a percentage of (87.5%) and not dermatitis as many as 3 respondents with a percentage of (12.5%). Meanwhile, the use of PPE that does not use PPE with contact dermatitis in the dermatitis category is 15 respondents with a percentage of (93.8%) and not dermatitis is 1 respondent with a percentage of (6.3%). The results of statistical tests using chi-square obtained a value of $PValue$ = 0.638> 0.05 which means that there is no relationship between the use of PPE and contact dermatitis in salon workers in Makassar City.

DISCUSSION

The researcher's findings are that there is a relationship between the length of work, the length of contact and dermatitis in salon workers in Makassar City. Tenure can have both positive and negative impacts on a person's performance. A positive effect on a person's performance is increased experience because with an increase in working period, experience will improve. Meanwhile, the negative impact of the working period if the working period is longer can cause

the risk of disease. The working life and cumulative risk of salon workers who have a longer working period tend to have a higher cumulative exposure to chemicals used in beauty care products. This long-term exposure increases the risk of developing contact dermatitis as they are exposed to potential allergens and irritants more often and for longer (Garg, Brod and Gaspari, 2021). Duration of contact with chemicals Long direct contact with chemicals such as hair dyes, straightening agents, and skincare products contributes to the risk of dermatitis. Workers who frequently use these products without adequate protection are more susceptible to irritation and allergic reactions (Silvia *et al.*, 2020). Working conditions in salons Many salons in Makassar may not have adequate preventive measures, such as good ventilation, the use of personal protective equipment, and training on safe work practices (Suprapto, 2020). These limitations can exacerbate the risk of contact dermatitis because workers may not be fully aware of the dangers and how to prevent them. Direct contact with chemicals is the biggest cause of occupational dermatitis. Salon workers always have direct contact with chemicals. These chemicals are found in shampoos, conditioners, rebonding agents, hair dyes and others. These chemicals have the potential to cause dermatitis (Kam *et al.*, 2023).

Workers who have worked in salons for longer periods of time tend to be exposed to harmful chemicals and irritants over a longer period, which can increase their risk of developing contact dermatitis (Olusegun and Martincigh, 2021). Repeated and prolonged exposure to allergens and irritants can cause skin sensitivity to increase over time, making workers with longer working periods more susceptible to dermatitis. Prolonged exposure to chemicals during the workday also contributes significantly to the risk of dermatitis (Fourie and Singh, 2022). Workers who frequently handle chemical products without using adequate personal protective equipment are more at risk of developing contact dermatitis. Salon procedures such as hair coloring, bleaching, manicures, and pedicures involve strong chemicals, which can cause irritation and allergic reactions with repeated exposure (Jacobsen *et al.*, 2022). There is a need for better education and training for salon workers on the dangers of chemicals and the importance of using personal protective equipment, such as gloves and eye protection. Workers need to be provided with clear information on how to identify the early signs of dermatitis and the preventive measures that can be taken to reduce the risk (Pastor-Nieto and Gatica-Ortega, 2023).

Farm work entails a heterogeneous mixture of exposures that vary considerably across farms and farmers. Farm work is associated with various health outcomes, both adverse and beneficial (Dalton *et al.*, 2024). The education and awareness of salon workers may have limited knowledge about the chemicals they use and their potential impact on skin health. Inadequate education regarding protection and prevention measures can result in higher exposure and a lack of precautions (Li and Li, 2021). Protection and prevention using gloves, personal protective equipment, and safe work techniques can reduce the risk of dermatitis. However, the implementation of these measures may still be less than optimal in many salons. Irritant contact dermatitis is the most frequent cause for occupational contact dermatitis (Uter *et al.*, 2023). Increase education and training for salon workers on the dangers of chemicals and preventive measures that can be taken to protect their skin. This training program should include information on the use of personal protective equipment and safe work practices. Implement stricter regulations regarding the use of chemicals in salons and ensure that all products used are secure and compliant. Regulations should include the obligation to provide personal protective equipment and ensure safe working conditions in salons (I. L and J. E. F, 2023).

Facility upgrades improve salon facilities, such as good ventilation and adequate workspaces, to reduce the risk of exposure to chemicals (Galvañ-Pérez del Pulgar and Martin-Gorgojo, 2024). Immigrant nail salon owners and employees face multiple barriers to accessing occupational health training and services. We formed an academic-community-based organization–business owner partnership—unique in that all partners were culturally congruent—to develop a pilot intervention program for the nail salon community (Huỳnh *et al.*, 2024). Provide sufficient personal protective equipment and encourage its use by all workers (Huynh *et al.*,

2021). Monitoring and evaluation conduct routine monitoring of working conditions in salons and workers' health to identify and address health problems that arise. Periodic evaluations to ensure that preventive and protective measures are properly implemented (Zhang *et al.*, 2021). Nail salon workers are an underserved population exposed to various occupational hazards. Comprised primarily of women and immigrants, these workers face challenges that further increase their workplace exposures and adverse health outcomes (Dang, Rosemberg and Le, 2021). By understanding the relationship between working life, length of contact, and the risk of dermatitis in salon workers, more effective prevention efforts can be developed to protect workers' skin health and improve working conditions in salons.

CONCLUSION

It can be concluded that there is a relationship between the length of work and the length of contact with contact dermatitis in salon workers. It is recommended that salon workers should use moisturizer after washing their hands to coat the surface of the skin and prevent water loss. The use of moisturizer can also be applied to the area affected by dermatitis, this keeps the skin moist so that the recovery process will be faster. Be sure to use a moisturizer that is fragrance-free, alcohol-free, and hypoallergenic so as not to irritate the skin even more. It is recommended that salon workers: Use moisturizer regularly after washing your hands to coat the surface of the skin and prevent water loss. Apply moisturizer to the area affected by dermatitis to keep the skin moisturized and speed up the recovery process. These measures are important to protect the skin health of salon workers and ensure they can work comfortably and effectively.

Conflicts of Interest:

The authors declare no conflict of interest.

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