

# CHARACTERISTICS OF OCCUPATIONAL CONTACT DERMATITIS AMONG HAIRDRESSERS IN KLANG VALLEY, MALAYSIA

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**Abstract:** The term dermatitis is interchangeable and refer to a particular type of inflammatory reaction of the skin which may be triggered by internal or external factors. Occupational contact dermatitis is an exogenous eczema caused by the interaction of the skin with chemical, biological or physical agents found in the work environment. Contact dermatitis can be classified into allergic contact dermatitis, irritant contact dermatitis and contact urticaria. There are previous researches that showed findings on occupational contact dermatitis among hairdressers. Therefore, to find out if these findings have similar results in Klang Valley, Malaysia, a research was conducted among hairdressers.

This study is a descriptive cross-sectional study. This research was conducted among hairdressers in Klang Valley, Malaysia, Malaysia from the month of October 2020 to November 2020. The data was collected by filling up the data that was given in the questionnaire through a google form. Research was conducted among 76 samples that meets inclusion criteria whereas 3 samples meets exclusion criteria.

It was concluded that, the characteristics of occupational contact dermatitis among hairdressers in Klang Valley, Malaysia are hairdressers who has 6-10 years of working, working hours of 5-6 hours per day, hairdressers who has hair cutting as specified job, who use latex powder free gloves 1-10 hours per day, hairdressers who are not aware of the skin problem they have due to usage of the gloves. Not only that, hairdressers who have frequency of hand wash 10-15 times per day, have complaints on hand wash or liquids used to wash hands, have complaints on certain materials used during work and also hairdressers who have an atopic and allergic history are also the characteristics of occupational contact dermatitis among hairdressers in Klang Valley, Malaysia. Thus, the prevalence of hairdressers who suffer from occupational contact dermatitis 63.2%.

**Keywords:** characteristics, occupational contact dermatitis, hairdressers.

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## 1. INTRODUCTION

Occupational contact dermatitis (OCD) is a skin condition caused by work related exposures. It happens in specialists who are presented to disturbing or allergenic substances or particular physical factors in the work environment. Contact with a few substances can make little territories of the skin thicken, in the long run shaping harsh wart-like developments which may end up destructive. Any piece of the body might be influenced. Dermatitis isn't infectious, yet in the event that untreated it might spread to different parts of the body. Adjust treatment at a beginning period is basic. Taking out or forestalling presentation to these specialists or conditions can to a great extent keep the event, and if effectively present, the seriousness of OCD.<sup>1</sup>

The illness is most common among medical caretakers, hairdressers, beauticians and excellence advisors, engine mechanics, cleaners, development laborers and specific epoxy specialists, printers and those inside the human services and assembling businesses.<sup>2</sup> Occupational contact dermatitis among hairdressers has been recognized as a significant health concern. Hairdressers belong to an occupational group that is commonly affected by occupational skin disease, specifically contact dermatitis, which may be allergic or irritant and, less commonly, contact urticaria. Occupational contact dermatitis predominantly affects apprentices, and atrophy is a recognized risk factor associated with a poor prognosis. Barely any variables adding to occupational contact dermatitis among hairdressers are absence of training among specialists, lacking and unseemly individual defensive gear. Besides presentation towards difficult to-maintain a strategic distance from allergens found in gloves and skin items additionally adds to occupational contact dermatitis among hairdressers.<sup>1</sup>

In most western and Asian industrialized nations, for example, Indonesia, Thailand, Malaysia, OCD is a standout amongst the most generally announced and disparaged work-related contact dermatitis among beauticians with universal assessments of occurrence changing between 50-190 cases for every 100 000 all day specialists for each year.<sup>3</sup> A statistic from an occupational skin surveillance scheme of Great Britain (EPIDERM) showed that prevalence of occupational hand contact dermatitis among staff nurses in that country was 25 cases per 100 000 per year from 2007 to 2016.<sup>4</sup>

In Malaysia, occupational skin disease as documented by the Social Security Organisation Malaysia (SOCISO) shows an increasing pattern from 2011 to 2015.<sup>5</sup> However, this pattern is not parallel with the data that has been received by Department of Safety and Health Malaysia in the same time frame whereby it shows a lower and fluctuating pattern.<sup>6</sup>

There are few factors that contribute to the characteristics of occupational contact dermatitis which includes atopic, wet work, chemical used and also gloves. Workers who are atopic are at a higher risk of developing OCD in occupations with frequent exposure to irritants which includes occupation as a hairdresser. Education for people with atopy about avoidance of exposure to skin irritants in high-risk careers is an important preventative measure 'Wet work', according to the German regulation of hazardous substances at the workplace, is defined as occupational duties where "individuals have their skin exposed to liquids for longer than two hours per day, or use occlusive gloves for longer than two hours per day, or clean their hands very often (e.g. 20 times per day), or fewer times if the cleaning procedure is more aggressive. Not only that the usage of different types of chemical directly towards the hand can also worsen the condition and lead to OCD. Gloves are a form of personal protective equipment (PPE), with different types of gloves providing protection for different irritants and allergens. The supply of PPE is distinct from upstream control measures such as substitution of hazardous substances. Whilst the use of gloves may provide a degree of protection against workplace exposures, gloves also present a level of associated risk for workers. To be effective in the control of work-related exposures, appropriate gloves for the specific task must be supplied by the employer. Also, the worker needs to use the gloves, and use them correctly when carrying out the task.<sup>2</sup>

The best way to prevent dermatitis is to totally avoid contact with the substance or chemical as sometimes even casual contact with an irritant or allergic substance may result in symptoms of dermatitis. Good personal hygiene is essential. After contact with the irritant, workers should wash their hands and exposed skin with a mild soap and warm water as soon as possible. Regular use of hypoallergenic moisturizer creams also helps prevent the skin from drying out. If it's not possible to avoid contact, the next best control method includes using another less-reactive product to eliminate the substance. If the condition doesn't get better, can be referred by a physician for further diagnosis.

## 2. MATERIALS AND METHODS

This study is a cross-sectional descriptive study to determine the characteristics occupational contact dermatitis among hairdressers in Klang Valley, Malaysia. The accessible population of this research are the hairdressers from the hair salons located in Klang Valley, Malaysia who are found from the month of October 2020 till November 2020. The sampling technique used in this research is the convenience sampling where a specific type of non-probability sampling method that relies on data collection from population members who are conveniently available to participate in study. Hairdressers in Klang Valley as respondents who agree to follow this research, will fill the questionnaire given by the researcher. The independent variables in this research are age, gender, ethnicity, educational level and marital status. The dependent variable in this research is the characteristics of occupational contact dermatitis among hairdressers.

This study utilizes an instrument from an online research questionnaire entitled Nordic Occupational Skin Questionnaire – NOSQ – 2002 in a modified form and the characteristics of occupational contact dermatitis among hairdressers in Klang

Valley, Malaysia is measured using Mathias Criteria of Occupational Contact Dermatitis. It consists of 48 questions in four divided sections. Section A is on socio-demographic factors. Section B on occupational related factors. Atopy and allergy history were asked in Section C. Section D determined the characteristics of occupational contact dermatitis's status based on Smit 1992's criteria.

The data collected from questionnaire will be interpreted and tabulated with a computer system. Data will be analysed descriptively. Result will be showed as tables and graphics. This research has received ethical eligibility permission from the Research Ethics Commission (KEP) of the Faculty of Medicine, Udayana University with letter number 1547/UN14.2.2.VII.14/LT/2020.

### 3. RESULTS

#### Research Overview

This research was conducted among hairdressers in Klang Valley, Malaysia, Malaysia from the month of October 2020 to November 2020. The data was collected by filling up the data that was given in the questionnaire through a google form. Research was conducted among 76 samples that meets inclusion criteria whereas 3 samples meets exclusion criteria. Out of the 79 samples, 76 samples were used in data analyzation. 51 samples had complaints such as pain, itching and dryness due to certain chemicals used in work. Mathias proposed 7 criteria for establishing occupational causation and aggravation of contact dermatitis.<sup>7</sup> 4 of the 7 criteria must be positive to conclude occupational dermatitis. Thus, from this research it can be concluded that 48 samples suffer from hand dermatitis.

#### Univariate Analysis

**Table 1. Distribution of socio-demographic respondents (n=76)**

Responden Characteristic	Frequency (n)	Percentage (%)
<b>Age</b>		
20-23 years old	3	3.9
23-29 years old	37	48.7
30-39 years old	30	39.5
More than 40 years old	6	7.9
<b>Gender</b>		
Female	37	48.7
Male	39	51.3
<b>Ethnic</b>		
Chinese	36	47.4
Indian	31	40.8
Malay	9	11.8
<b>Marital Status</b>		
Single	48	63.2
Married	28	36.8
<b>Education Level</b>		
Degree	25	32.9
Diploma	51	67.1

Based on Table 1, can be seen the distribution of socio-demographic respondents (n=76) consists of distribution of age, gender, ethnic, marital status and education level. Based on Table 5.1, it is known that the number and percentage of age most respondents at the age of 23-29 years with a total of 37 respondents (48.7%), followed by the number of respondents at the age of 30-39 years as many as 30 people (39.5), 6 people aged more than 40 years (7.9%). The least number of respondents was found at the age of 20-23 years, namely 3 respondents (3.9%). Of the 76 hairdressers, it was found that the majority of 39 were males (51.3%) and 37 females (48.7%). It is found that the number and percentage of most respondents belong to Chinese ethnic with 36 respondents (47.4%), followed by respondents belong to Indian ethnic with 31 respondents (40.8%) and lastly the respondents belong to Malay ethnic with 9 respondents (11.8%). From the table, it is known that the respondent's marital status single was more with 48 respondents (63.2%) and respondent's marital status married with 28 respondents (36.8%). Among 76 hairdressers, most respondent's education level was diploma with 51 respondents (67.1%) and respondent's education level was degree with 25 respondents (32.9%).

**Table 2. Distribution of Employment Factors (n=48)**

Responden Characteristic	Frequency (n)	Percentage (%)
<b>Years of Working</b>		
1-5 years	23	47.9
6-10 years	21	43.8
11-15 years	4	8.3
<b>Working Hours/Day</b>		
5-6 Hours	4	8.3
6-7 Hours	34	70.8
7-8 Hours	9	18.8
More than 8 Hours	1	2.1
<b>Working Hours/Week</b>		
30-35 Hours	4	8.3
35-40 Hours	2	4.2
40-42 Hours	34	70.8
More than 42 Hours	8	16.7
<b>Specified Hairdresser Job</b>		
Hair Washing	17	35.4
Hair Cutting	11	22.9
Hair Texturing Technique	20	41.7
<b>Perform Paid Work</b>		
Yes (Duration 5-6 hours/Day)	7	14.6
No	41	85.4

Based on Table 2, can be seen the distribution of employment factors respondents (n=48) consists of years of working, working hours per day, working hours per week, specified hairdresser job and perform other paid work. It is known that the years of working of most respondents was 1-5 years with a total of 23 respondents (47.9%), followed by 21 respondents (43.8%) with working years of 6-10 years and 4 respondents (8.3%) with working years of 11-15 years. From the table, it is known that the number of respondents with working hours per day of 6-7 hours is the most with 34 respondents (70.8%), followed by number of respondents with working hours per day of 7-8 hours with 9 respondents (18.8%), 4 respondents (8.3%) with working hours per day of 5-6 hours and lastly the number of respondents with working hours per day of more than 8 hours with 1 respondents (2.1%). The number of respondents with working hours per week of 40-42 hours is the most, with 34 respondents (70.8%), 8 respondents (16.7%) with working hours per week of more than 42 hours, followed by the number of respondents with working hours per week of 30-35 hours with 4 respondents (8.3%) and only 2 respondents (4.2%) with working hours per week of 35-40 hours. Of the 48 hairdressers who are more likely to suffer from dermatitis, it is found that the number of respondents with hair texturing techniques was 20 respondents (41.7%), followed by 17 respondents (35.4%) with hair washing as a specified hairdresser job and the number of respondents with hair cutting as a specified hairdresser job was 11 respondents (22.9%). The number of respondents who do not perform paid work is the most, with 41 respondents (85.4%) and about 7 respondents (14.6%) perform paid work for 5-6 hours per day.

**Table 3. Glove Factors**

Responden Characteristic	Frequency (n)	Percentage (%)
<b>Type of Gloves</b>		
Latex Powder Free	28	58.3
Nitrile Powder	17	35.4
Latex Powdered	2	4.2
don't use gloves	1	2.1
<b>Frequency of Using Gloves/Week</b>		
1-30	3	6.3
More than 30	44	91.7
don't use gloves	1	2.1
<b>Hours of Using Gloves/Week</b>		
1-10 Hours	46	95.8
More than 10 Hours	1	2.1
don't use gloves	1	2.1
<b>Skin Problems Due to Usage of Gloves</b>		
Yes	19	39.6
No	4	8.3
Not Sure	25	52.1

Based on table 3, can be seen respondents (n=48) glove factors that consists of type of gloves, frequency of using gloves per week, hours of using gloves per week and skin problems due to usage of gloves. It is known that the latex powder free type of gloves was used the most with 28 respondents (58.3%), followed by nitrile powdered type of gloves with 17 respondents (35.4%) and only 2 respondents (4.2%) use latex powdered gloves and 1 respondent (2.1%) do not use gloves. From the table, the frequency of using gloves per week of more than 30 times is the most with 44 respondents (91.7%), followed by 3 respondents (6.3%) with frequency of using gloves per week of 1-30 times and the least number of respondents with 1 respondent (2.1%) who do not use gloves. It is shown that, 1-10 hours of using gloves per day is the most among hairdressers, with 46 respondents (95.8%), followed by 1 respondent (2.1%) respectively for hours of using gloves per week more than 10 hours and respondents who do not use gloves. Of the 48 hairdressers who are more likely to suffer from dermatitis, 25 respondents (52.1%) were not sure about having skin problems due to usage of gloves, followed by 19 respondents (39.6%) answered yes to the statement about having skin problems due to usage of gloves and 4 respondents (8.3%) answered no to the statement about having skin problems due to usage of gloves.

**Table 4. Hand Wash Factors**

Responden Characteristic	Frequency (n)	Percentage (%)
<b>Frequency of Hand wash during Work/Times</b>		
10-15	34	70.8
15-20	14	29.2
<b>Having Any Complaints due to Hand Wash Liquid/Soap Used</b>		
No	4	8.3
Not sure	10	20.8
Yes (pain, itching, dryness of the skin, etc)	34	70.8
<b>Type of Soap/Hand Wash Liquid</b>		
Normal	13	27.1
Anti-microbial	35	72.9

Based on Table 4, the distribution of factors of washing hands consists of frequency of hand wash during work, complain due to hand wash liquid or soap used and the type of soap or liquid used. It is known that, the number of respondents with 10-15 times of frequency of washing hands during work is the most, with 34 respondents (70.8%), followed by 14 respondents (29.2%) with 15-20 times of frequency of washing hands during work. 34 respondents (70.8%) were having complains due to hand wash liquid or soap used, followed by 4 respondents (8.3%) answered no to the statement about having complain due to hand wash liquid or soap used and about 10 respondents (20.8%) were not sure about having complain due to hand wash liquid or soap used. In total of 48 respondents, a majority of 35 respondents (72.9%) use antimicrobial hand wash whereas 13 respondents (27.1%) use normal soap.

**Table 5. Complaints due to certain materials/ chemicals used during work**

Responden Characteristic	Frequency (n)	Percentage (%)
<b>Complaints on certain material/chemical during work</b>		
No	1	2.1
Yes (pain, itching, dryness of the skin, etc)	47	97.9

Based on Table 5, it is known that the 47 respondents (97.9%) answered yes to the statement about having complains on certain materials or chemicals used during work and 1 respondent (2.1%) answered no to the statement about having complains on certain materials or chemicals used during work.

Based on Table 6, the distribution on atopic and allergy history factors consists of eczema history in last 12 months, allergy rhinitis history in last 12 months, asthma history in last 12 months, history on substance allergy in last 12 months, history on family skin problem in last 12 months and lastly family history on other diseases. It is known that 48 respondents (100%) answered yes to the statement about having eczema history in last 12 months. From the table below, it seen shown that 44 respondents (91.7%) answered no, followed by 3 respondents (6.3%) answered not sure and only 1 respondent (2.1%) answered yes to the statement about having allergy rhinitis history in last 12 months. Besides that, 39 respondents (81.3%) answered no and 9 respondents (18.8%) to the statement about having asthma history in last 12 months. Out of the 48 hairdressers, all 48 respondents (100%) answered yes to the statement about having substance allergy history in last 12 months. However, to the statement about having family skin problem history in last 12 months 17 respondents (35.4%) answered no, 12 respondents (25%) answered not sure and 19 respondents (39.5%) answered yes whereas to the statement about having family skin problem history in last 12 months. Out of the total of 48 hairdressers, a majority of 40 respondents (83.3%) answered yes and 8 respondents (16.7%) answered no to the statement about having family history of other diseases.

**Table 6. Atopic & Allergy History Factors (n=48)**

Responden Characteristic	Frequency (n)	Percentage (%)
<b>Eczema history in last 12 months</b>		
Yes	48	100
<b>Allergy Rhinitis in last 12 months</b>		
No	44	91.7
Not Sure	3	6.3
Yes	1	2.1
<b>Asthma last 12 months</b>		
No	39	81.3
Yes	9	18.8
<b>Substance Allergy in last 12 months</b>		
Yes	48	100
<b>Family skin problem in last 12 months</b>		
No	17	35.4
Not Sure	12	25
Yes	19	39.5
<b>Family History of Other Disease</b>		
No	8	16.7
Yes	40	83.3

**Table 7. Hand Dermatitis Data (n=48)**

Responden Characteristic	Frequency (n)	Percentage (%)
<b>Dermatitis Location</b>		
Hands	47	97.9
None	1	2.1
<b>Skin symptoms</b>		
Allergy	23	47.9
Rashes	13	27.1
Irritation	11	22.9
None	1	2.1
<b>Skin Symptoms Worsen</b>		
<b>During Work</b>		
No	1	2.1
Yes	47	97.9
<b>Skin Symptoms Worsen</b>		
<b>Outside Work</b>		
No	25	52.1
Not sure	23	47.9
<b>Skin Symptoms Improve</b>		
<b>away from Work</b>		
No	2	4.2
Not sure	13	27.1
Yes	33	68.8

Based on hand dermatitis data in Table 7, it is shown that having dermatitis in the hands is the most with 47 respondents (97.1%) whereas 1 respondent (2.1%) do not have dermatitis in any part of their body. However, to the statement about skin symptoms 23 respondents (47.9%) experience allergy, 13 respondents (27.1%) experience rashes, 11 respondents (22.9%) experience irritation and lastly 1 respondent (2.1%) do not experience any skin symptoms. 47 respondents (97.1%) answered yes and 1 respondent (2.1%) answered no to having skin symptoms worsen during work. 25 respondents (52.1%) answered yes and 23 respondents (47.9%) answered no to having skin symptoms worsen outside work. However, 33 respondents (68.8%) answered yes, followed by 13 respondents (27.1%) answered not sure and 2 respondents (4.2%) answered no to the statement on skin symptoms improve when away from work. Thus, it can be concluded that out of the 76 hairdressers 48 respondents (63.2%) who are more likely to suffer from hand dermatitis.

#### 4. DISCUSSION

Dermatitis among hairdressers has been recognized as a significant occupational health problem. To explore the characteristics of occupational contact dermatitis among hairdressers the present cross-sectional study was conducted in Klang Valley. From the results of this study, it can be seen that based on age, the majority of aged between 23-29 (48.7%) are hairdressers. This is in line with the results of research by Islam et al where 55 (47.7%) hairdressers were aged between 21-30 years.<sup>8</sup> According to a study conducted by Kose S among hairdressers was found that 59.9 % hairdressers were male which similar to the present study where 39 (51.3%) hairdressers were male.<sup>9</sup> The present study shows that the number of Chinese hairdressers were more with majority of 36 (47.4%) which differs with a research conducted by Hufaizah H et al on occupational contact dermatitis among nurses in Selangor, Malaysia that resulted 188 (91.2%) nurses were Malay.<sup>10</sup> This because in Malaysia most of the Chinese ethnic take the job as a hairdresser. 48 (63.2%) hairdressers were found unmarried from this present study which is in line with the results of research by Kim et al where 591 (59%) hairdressers were unmarried. From the results of a study conducted by Islam et al 76 (65.5%) hairdressers had primary level education which is similar to the present research that shows 51 (67.1%) hairdressers had primary level education which is diploma. This is because they are not aware of many chemicals due to lower education level, they are not exposed to knowledge about many chemicals and its hazardous.<sup>8,11</sup>

From the present study, out of the 76 hairdressers 48 hairdressers meets the Mathia's criteria of causation. In the Mathia's criteria it is stated that 4 out the 7 criteria have to be positive, to conclude the possibilities of having occupational contact dermatitis. Therefore, from this current study hairdressers who meets the Mathia's criteria are hairdressers who are exposed to chemicals during working hours, have complaints due to chemicals used, have skin problems and also have a history of skin disease. Thus, these 48 hairdressers were analyzed to find out about the characteristics of occupational contact dermatitis among hairdressers in Klang Valley, Malaysia. The present study shows that the years of working 1-5 years is the most, this is because an increasing number of years in hairdressing, indicating perhaps that highly susceptible individuals leave their jobs due to skin problems because a minimum of two years working, using water and hazardous chemicals daily leads to dermatitis. According to a study conducted by Kim et al it was found that the main tasks performed in hair salons in Korea can be grouped into 4 categories: cutting, giving a permanent wave, dyeing/tinting, and washing/drying where permanent waves or dyeing/tinting involve the use of various kinds of chemicals.<sup>11</sup> Exposure to hairdressing chemicals such as dyeing or tinting agents is likely to induce an acute form of dermatologic symptoms. On the other hand, relatively weak chemicals, such as detergents used in washing work, are more likely to act as a chronic form of irritant and induce a chronic form of dermatologic symptoms. Additionally, wet work acts as a weak but chronic irritant which can perturb the skin barrier, and it plays a prominent role in inducing dermatologic symptoms. In detail, the results of the present study showed that hairdressers reported texturing hair to be their main task are 20 (41.7 %) hairdressers. Sensitization from allergens can developed through wet skin during the work process and impaired skin barrier function. Awareness of the need for hand protection increases the use of natural latex rubber gloves. Van der Walle & Brunsveld suggested the use of vinyl gloves for protection, as delayed reaction to latex mostly occur in combination with type I allergies where in the present study 28 (58.3%) hairdressers uses latex powder free gloves. Some workers may have a type I latex allergy, which is caused by allergenic proteins that are added to the latex by the rubber trees that make natural rubber latex. Type I allergies can have systemic effects such as coughing, sneezing and rashes on the face, as well as local effects on the skin under the gloves. These proteins are important in stabilizing the latex as a free-flowing liquid, but they have no further purpose after that liquid has been mixed with other ingredients, applied to hand forms and converted into gloves. Newly made gloves are leached, which removes much of the leftover protein. Manufacturers have been successful in improving the leaching procedure to reduce the residual amounts of allergenic proteins in gloves. Newer gloves are, therefore, much less likely to cause workers to develop allergies. But it is impossible to remove the proteins entirely. They still may trigger reactions in workers who already have become allergic. Workers who know or suspect they have a latex allergy should consider switching to a synthetic alternative such as nitrile, neoprene or vinyl gloves. Wearing protective watertight gloves often leads to a blockade of moisture and heat. To reduce this, gloves can be changed frequently, cotton under gloves can be worn that are changed after becoming moist or a sweat-reducing skin protection cream can be applied.<sup>12</sup>

In this present study six factors were discovered to be measurably critical related with occupational contact dermatitis which are hours wear glove every week, having skin issue due to glove, recurrence of hand washing per week, having skin problems due to handwashing, eczema history and allergy history. Wet work comprises of two component which are wearing occlusive glove more than two hours and frequency of hand washing more than twenty time per shift. In this study majority of hairdressers wore gloves 1-10 hours per week. This finding could be explained by the nature of occlusive glove that

trapped heat and sweat of the wearer which are causing an impairment on the skin's barrier function. The longer duration of wearing glove will further worsen the skin's condition.<sup>13</sup> In the present study, the frequency of washing hands 10 to 15 times a day is the most with 34 hairdressers. In a study conducted by Douglas K.E shows that although 100% of respondents agreed that they washed their hands after every use of chemicals, their method of hand washing was inappropriate as 9.3% used water alone, 27.7% used water and hand wash liquid based, while 2.0% used other materials like soap and salt. The standard is water and soap. However, improper hand washing after hair dressing may predispose persons to hand dermatitis. A report by Health and Safety Executive, United Kingdom, states that hand dermatitis can develop gradually even with frequent work with milder chemicals like shampoo. In this current study, skin symptoms that occurred due to hand washing liquid or soap was found to be significantly associated with characteristics occupational contact dermatitis. It was similar with a finding by Smith.<sup>14</sup> In their study they found significant skin symptoms following hand washing among healthcare worker which is similar in current study where even hairdressers more frequently use soap and many other types of chemicals. Moreover, in a study among Nigerians hairdressers are often unaware of the risks associated with the chemicals contained in lotions, creams and relaxers they use daily at work. As a result, many may come down with the problem of hand dermatitis and its resultant complications such as blisters, scarring, deformed nails, pustular lesions when infected it can even lead too having depression from the resulting stigma.<sup>13,14</sup>

There is significant association found between history of eczema and characteristics of occupational contact dermatitis in this study where 42 hairdressers had history of eczema. Many researchers found that a history of eczema was strongly associated with occupational hand contact dermatitis. In a study conducted in Japan, eczema history was found to increase 2.7 times risk of occupational hand contact dermatitis (OR 2.7, 95% CI 1.8-4.0).<sup>15</sup> If you have an history of eczema, the immune system overreacts to even small irritants or allergens. This overreaction can inflame your skin and more easily causes dermatitis. A similar finding was found in Northern China whereby the risk of occupational hand contact dermatitis is 5-fold higher with the presence of eczema history.<sup>16</sup> This was because skin with eczema/ atopy more prone to be irritated and the healing process or repair of the skin take longer time.<sup>15</sup> It is also contributed due to disruption of the skin physiological protection and impairment of immune system of the respondent with eczema or atopic dermatitis. This predisposed a person with atopy skin/ eczema with occupational hand contact dermatitis. In this study 48 of the respondents was reported to have an allergy reaction to substances such as animal fur, medicine, food and beverages and metal. This is supported by previous studies which showed a significant association between history of allergy and occupational hand contact dermatitis. Research in Japan found a respondent with allergy history had 3.7 times risk to get occupational hand contact dermatitis (OR 3.7, 95% CI 2.1-6.6). This was because, the skin became more prone to irritation by lowering the irritation threshold in a person with allergy history. It is T-cell mediated inflammation of the skin caused by repeated skin exposure to happens in a sensitized individual. Allergic contact dermatitis has two phases. The sensitization phase in which antigen-specific effector T cells are induced in the draining lymph nodes by antigen captured cutaneous dendritic cells that migrate from the skin. The elicitation phase includes effector T cells that are activated in the skin by antigen captured cutaneous dendritic cells and produce various chemical mediators, which create antigen-specific inflammation.<sup>17</sup>

In this study 48 respondents (100%) experience dermatitis in hands which is similar to a study conducted by Cheng Y in Beijing where it was found that the hands were the main affected location for OCD. A possible interpretation is that epoxy resin, p-tert-butylphenol formaldehyde resin, and colophony, regarded as volatile organic compounds, may cause airborne contact allergies at exposed sites of the body. An occupational dermatology research stated that allergic skin symptoms can occur at any time in a hairdresser often happens after irritation that has already damaged the skin. Allergy will cause the skin to be very itchy, flake, split, crack and blister. The skin will flare-up some hours after the particular chemical has been contacted, because this type of allergy is delayed up to 4-24 hours after contact. In this study 23 respondents (47.9%) experience allergy skin symptoms. This is because allergies occur when your immune system reacts to a foreign substance such as p-phenylenediamine, toluene-2,5-diamine, persulphates and glyceryl monothioglycolate. In this current study 48 respondents (63.2%) are more likely to suffer from hand dermatitis which is similar in a research conducted by Islam MD concludes that three fourth of respondents had dermatitis lesions in their hands. This happens because disruption of the lipid bilayer in hand dermatitis occurs when it is exposed to detergents, soaps, and other chemicals or irritants. Inflammation results from an irritant that is either strong enough or in contact with the skin for a long enough time to erode the barrier. Repeated or severe exposures spread to deeper layers of skin and endothelium. This, in turn, can cascade into a vicious cycle of chronic and/or severe disease.

## 5. CONCLUSION

Based on the findings in this study, factors that contribute to the characteristics of occupational contact dermatitis among hairdressers in Klang Valley, Malaysia: Years of working, Working hours, Hairdresser's specified job, Type of glove, Hours of gloves used per day, Frequency of hand wash, Type of liquid used in washing hands, Materials/Chemicals that causes skin problems, Atopic or allergy history among hairdressers and hairdresser's family.

Characteristics of occupational contact dermatitis among 48 hairdressers in Klang Valley, Malaysia: 6-10 years of working, Working hours of 5-6 hours per day, Texturing techniques as specified job, Usage of latex powder free gloves 1-10 hours per day, Unaware of skin problem, Frequency of hand wash 10-15 times per day, Complaints on hand wash or liquids used to wash hands, Complaints on certain materials used during work, Hairdressers who have an atopic and allergic history. Finally, the prevalence of hairdressers who suffer from occupational contact dermatitis is 63.2%.

## 6. RECOMENDATION

For hairdresser are suggested to use proper protective equipment during work and also learn more about ways to prevent themselves from being exposed to chemicals which can result in having contact dermatitis. Hairdressers are also advised to consult a doctor if come across any mild symptoms of contact dermatitis.

For future research, it is suggested that future researchers should explore deeper about this issue and conduct a research on some other matter related to occupational contact dermatitis that could be beneficial and informative.

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