Hairdressers' Knowledge, Perception and Self-Protective Measures towards Harmful Chemical Exposure in Ilishan-Remo, Ogun State

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Abstract: **- Hairdressers like other workers encounter hazards in their workplace that adversely affect their health. Some of these chemicals on contact with skin over a prolonged time can cause severe burns with redness, dermatitis, can damage the respiratory tract and severe pneumonitis. Most of these can be prevented if they use personal protective equipment. Therefore, this study assessed the knowledge, perceptions and self-protective measures towards harmful chemical exposure.**

The study was a cross-sectional design. The total population of hairdressers in the association was used. Data was collected using a validated semi-structured questionnaire that was interviewer administered, with a Cronbach alpha score of 0.722. It was analyzed using Statistical Package for Social Sciences (SPSS) version 21 to generate frequency tables and chi-square tests.

The results showed that almost half 65 (46.4%) of the respondents were between the age range of 25-34 years while 3 (2.1%) of the respondents were between the age range of 55-64 with the mean age of 31.25 S.D ± 8.138. More than half 92 (65.7%) of the respondents had secondary education. Almost half 69 (49.3%) of the respondents had worked for 1-5 years and few 16 (11%) of the respondents had worked for 11-15 years. More than half 83(59.3%) of the respondents are aware that hair products contain chemicals that are harmful to health. Majority 80.7% of the respondents had a negative attitude towards the use of personal protective equipment. A significant relationship was found between awareness of chemical hazards and the use of personal protective equipment (p=0.011).

In conclusion, most of the studied hairdressers had poor education, the most probable reason why some of them lack knowledge on chemicals found in salon/hair products and their effects on health and also ways to protect themselves from these chemicals. Therefore workshops or seminars organized for hairdressers by the local government health management board, educating them on the harmful effects of chemicals they are exposed to in their workplace laying emphasis on the use of personal protective equipment. This may help to increase more positive attitude towards the use of personal protective equipment.

Keywords: **Hairdressers, Knowledge, Perception, Personal Protective Equipment**

I. INTRODUCTION

Work and health have negative as well as positive effects on one another and it is important to minimize or even totally eliminate the mutual negative effects while promoting the positive effects (Asuzu, 1994). Hairdressers like other workers encounter hazards in their workplace that adversely affect their health. The work environment for hairdressers' includes a range of potential hazards, some of which are easily observed, and others that are more insidious (O'Loughlin, 2010). Hairdressing is a common occupation around the world. A hairdresser is a person who specializes in cutting of hair, styling of hair in order to change, enhance or maintain a person's appearance. They achieve this using haircutting or styling techniques, some which involve the use of certain substances, such substances include; hair dyes, shampoos, hairsprays, bleaches and permanent wave solutions.

Many hairdressing establishments are self-employed or engage in small scale salons, where conditions of service are stringent which promote an environment in which there is limited support for them to manage their own health. During a typical work week, a hairdresser can be exposed to hundreds of different chemicals through the skin and via the respiratory system (Leino, 2001). Chemicals such as volatile organic chemicals (e.g. toluene, ethanol, isopropanol, ether, diaminotoluene, paraphenylenediamine) via hairsprays and setting lotions, as well as ammonia, ammonium per sulfates, hydrogen peroxide, sodium hydroxide, 1, 4 dioxane and organic pigments as ingredients of permanent waves, hair dyes and hair bleaching applications (Olsson, 2013). Electrocorp, (2012) explains that the chemicals found in substances that hairdressers use are unregulated, and many release volatile organic compounds and carcinogens; these chemicals are released indoors, and without proper ventilation in most salons or use of personal protective equipment, they are more likely to develop respiratory problems. Health problems can develop in some of the body organs such as the respiratory tract, liver and kidney from repeated exposure to phenylenediamine which is the active chemical in hair dyes. Paraphenylenediamine on its own can cause allergic reactions including redness of skin, rashes, sores, burning sensations, itching and headaches; it can be a possible carcinogen after oxidation, linked to increasing the occurrence of various forms of cancer such as: non-Hodgkin's lymphoma, multiple myeloma, breast cancer, leukemia, bladder cancer (O'Neal, 2013).

Also, the Canadian Centre for Occupational Health and Safety (2013), explains that sodium hydroxide which is the active chemical in hair relaxers, on contact with skin over a prolonged time can cause severe burns with redness, dermatitis; can damage the respiratory tract and severe pneumonitis. In addition, 1, 4 dioxane, a chemical found in hair extension glue and wig glue causes eye and nose irritation, and potential long term effects include: cancer, liver damage and kidney damage (Scranton, 2014).

Statement of Problem

In a study conducted by Nemer, (2009) on female hairdressers in Hebron City, Palestine; it was concluded that they had scarce knowledge about the chemicals that they used and their potential harmful effects on health. Most of these illnesses are preventable, with improved knowledge of these chemicals by the hairdressers.These health problems can be challenged effectively by introducing measures which usually cost very little. A United Kingdom study has reported that 70% of hairdressers have suffered from work-related skin disorders at some point during their career (English, 2004).

Also, Leino et al., (1998), reported in Finland that during physical examination of hairdressers 109 of 189 that came for medical examination met the criteria for suspected occupational disease. Also, based on the Finnish register data, the annual incidence rate for occupational asthma among female hairdressers was one tenth (37 cases/100,000 employed workers) (Karjalainen et al., 2000). Similarly, in Finland, the one year cumulative incidence of hand dermatitis in two prospective cohort studies of apprentice hairdressers was 27.9% and 28.5%, respectively (Smit et al., 1994 &Uter et al., 1998).

In a similar study conducted in France, it was found that while hairdressers represent about 1% of the entire workforce, 20% of the women affected by work-related asthma are hairdressers (Ameille, 2003). Futhermore, in a study conducted in Nigeria by Okojie&Isah, (2001) showed that 29 (16.7%) of 174 hairdressers had skin problems and that 7 (4%) of the 174 hairdressers had itchy eyes. Also, a study conducted by Omokhodion, Balogun& Ola-Olorun, (2009) reported that hand dermatitis was reported by 5% of hairdressers in Ibadan, Nigeria.

The inconsistent use of personal protective equipment leads to exposure to harmful agents such as hazardous chemicals in the workplace, making hairdressers more susceptible to occupational illness. “According to the National Institute for Occupational Safety and Health (NIOSH) these chemicals are known to cause eye, nose, throat and skin irritations”. The use of personal protective equipments (PPE) has not been totally emphasized in the profession of hairdressing (Jack, 2009). PPEs, such as gloves and nose masks that can serve as adequate protection against physical contact with chemical substances such as phenylenediamine and formaldehyde have been neglected.

Research Questions

- Do hairdressers know of the chemicals with health implications found in salon products?
- What knowledge do hairdressers have on personal protective equipment’s?
- What are the practice of hairdressers that expose them to chemical hazards?
- What do they do to protect themselves from chemical exposure?
- What influences hairdressers use of personal protective equipment?

Hypothesis

HA: There is a relationship between knowledge of chemical exposure and the use of personal protective equipment.

II. METHODOLOGY

The study was a descriptive cross-sectional study. Quantitative method was used for data collection using a self-developed semi-structured questionnaire. The questionnaire was designed to obtain data such as demographic characteristics; knowledge of hairdressers about chemical hazards; perception of hairdressers towards chemical exposure; and self-protective measures of hairdressers towards chemical exposure.

To ensure the validity and reliability of instrument, a draft of self-developed semi-structured questionnaire was reviewed for content validity. It was pretested in one of the communities in Ikenne local government (Iperu-Remo), so that comments, modifications and suggestions were made before finally administering the questionnaire.

Sampling Technique

Purposive sampling technique was used because only the hairdressers’ association members partook in the study.

Result

Data derived from the coded questionnaire was analyzed using the Statistical Package for Social Sciences (SPSS) version 21, to provide descriptive of percentages, tables, chart, and inferential statistics of chi-square.

III. RESULTS

As shown in table 1 below, more than half 83 (59.3%) of the respondents know that hair relaxers, hair dyes contain chemicals that are harmful to health. About 55 (39.3%) of the respondents mentioned that hydrogen peroxide is found in hair products while few 21 (15%) reported that chloroform can be found in hair products (Fig 4.1). Most 122 (87.1%) of the respondents know of measures to protect themselves from exposure to chemicals. Majority 113 (80.7%) of the respondents listed that gloves can be used to as protection against exposure to chemicals while few 21 (15%) listed that goggle can be used to protect against chemical exposure.

More than half 79 (56.4%) of the respondents read hair product labels before applying them. Few respondents 39 (27.9%) of those that read hair product labels stated that the reason they read hair product labels is to know how to apply the product (Fig 4.2). Almost half 67 (47.9%) of the respondents reported that hand eczema is an effect from repeated exposure to chemicals found in hair products, while 31 (22.1%) reported ringworm as an effect from exposure to chemicals in hair products.

Table 1: Knowledge of the Respondents on Chemicals

Variable	Yes	No
	Frequency (N) Percentage (%)	Frequency (N) Percentage (%
Respondents Knowledge on Chemical Exposure		
Do you know that hair relaxers, hair dyes contain chemicals that are harmful to health?	83 (59.3)	57 (40.7)
Respondents knowledge on Self-Protection		
Are there ways to protect yourself from these chemicals?	122 (87.1)	18 (12.9)
Respondents reported that self-protective equipment can be used		
Gloves	113 (80.7)	27 (19.3)
Hair net	34 (24.3)	106 (75.7)
Nose cover	68 (48.6)	72 (51.4)
Goggles	21 (15)	119 (85
Respondents Who Read Hair Product Labels		
Do you read hair product labels before applying them?	79 (56.4)	61 (43.6)
Respondents reported effects of chemical exposure in hair products		
Back pain	37 (26.4)	103 (73.6)
Ring worm	31 (22.1)	109 (77.9)
Hand eczema	67 (47.9)	73 (52.1)
Eye irritation	66 (47.1)	74 (52.9)

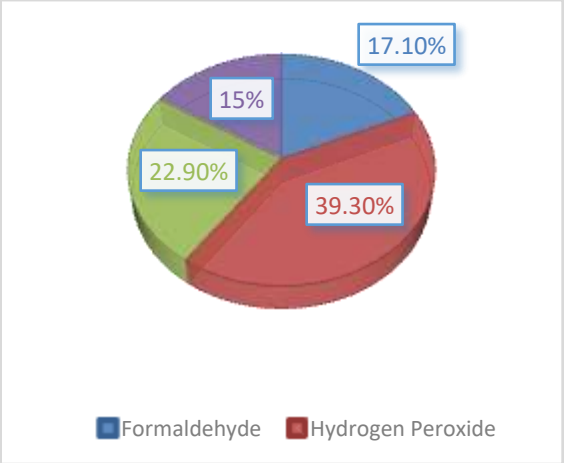

FIG 1: Respondents List of Chemicals Found in Hair Products

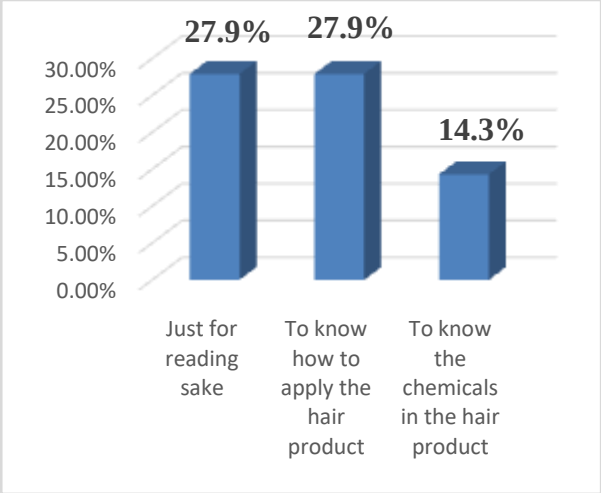

FIG 2: Respondents Reason for Reading Hair Product Labels

Table 2 below shows that majority 125 (89.3%) agreed that not reading hair product labels before application would expose them to health problems. The proportion of those that agreed that there is a risk of developing health problem from continuous exposure to chemicals were 91 (65%). One hundred and ten (78.6%) agreed that not protecting themselves when handling hair products expose them to chemicals that are harmful to health.

On perceived severity of chemicals found in the hair products, a quarter 35 (25%) of the respondents agreed that exposure to chemicals found in hair products would lead to permanent changes in their health, also more than half of the respondents 93 (66.4%) agreed that once there are no symptoms from chemical exposure health problems would not exist, and 68 (48.5%) agreed that diseases such as cancer and dermatitis that result from prolonged exposure to chemicals in hair products would last a long time (Table 3).

Furthermore, Table 4 shows that majority 126 (90%) agreed that wearing of glove, apron and nose cover during work will protect the, from harmful chemicals. Also majority 114 (81.4%) agreed that wearing of glove, apron and nose cover would prevent future health problems for them. Thirty three (23.6%) of the respondents agreed that reading label before using any hair product would prevent them from exposure to harmful chemicals. The proportion of those that agreed that wearing of glove, apron, and nose cover during work is uncomfortable were 47 (33.6%). Most of the respondents 114 (81.4%) disagreed that glove, apron and nose cover are not available for them while 26 (18.6%) agreed. 101 (72.1%) of respondents report that reading labels before applying hair products takes their time while 39 (27.9%) agreed.

As shown in Table 5, half 70 (50%) of the respondents agrees that regular education on the use of glove, apron and nose cover would make them wear it always. A little below the average respondents 60 (42.9%) agreed that if they see other hairdressers wearing glove, apron and nose cover it would remind them to use it.

On perceived self-efficacy as shown in Table 6, few 11 (7.8%) of the respondents agreed that they would remember to use glove, apron and nose cover before applying any hair product, also 25 (17.8%) of the respondents agreed that they will remember to read hair product labels before they use them and 45 (32.1%) of the respondents agreed that wearing glove, apron and nose cover would not slow them down during work.

Table 2: Respondents Perceived Susceptibility to chemical exposure

Variables	Agree		Disagree	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
If I do not read hair product labels before application I can be at risk of health problems	125	89.3	15	10.7
I think I can be at risk of developing a health problem due to continuous exposure to chemicals	91	65	49	45
I believe not protecting myself when handling hair products expose me to chemicals that are harmful to health	110	78.6	30	21.4

Table 3: Respondents Perceived Severity to Chemical Exposure

Variables	Agree		Disagree	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
Exposure to chemicals found in hair products would lead to permanent changes in my health	35	25	105	75
I believe that once there are no symptoms from chemical exposure health problems would not exist	93	66.4	47	33.6
Diseases such as cancer and dermatitis that result from prolonged exposure to harmful chemicals in hair products would last a long time	68	48.5	72	51.5

Table 4: Respondents Perceived Benefits and Barrier of Proper Health Behavior

Variable	Agree		Disagree	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
Wearing of gloves, aprons and nose cover while working will protect me from harmful chemicals	126	90	14	10
Wearing of gloves, aprons and nose cover will prevent future health problems for m	114	81.4	26	18.6
Reading labels before using any hair product would prevent me from exposure to harmful chemicals	33	23.6	107	76.4
Wearing of gloves, apron and nose cover while working is uncomfortable	47	33.6	93	66.4
Gloves, aprons and nose cover are not available for me	26	18.6	114	81.4
Reading labels before applying hair products takes my time	39	27.9	101	72.1

Table 5: Respondents perceived Cues to Actions

Perception Items	Agree		Disagree	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
Regular education on the use of glove, apron and nose cover would make me wear them always	70	50	70	50
If I see other hairdressers wearing glove, apron and nose cover it would remind me to use it	60	42.9	80	57.1

Table 6: Respondents Perceived Self-Efficacy

Perception Items	Agree		Disagree	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
I believe that I will remember to use gloves, aprons and nose cover before applying any hair product	11	7.8	129	92.2
I believe that I will remember to read hair product labels before I use them	25	17.8	115	82.2
I believe that wearing gloves, aprons and nose cover would not slow me down while working	45	32.1	95	67.9

As shown in table 7 below, more than half of the respondents 76 (54.3%) reported that they used glove during work while a few 9 (6.4%) reported that they used goggles.

Table 7: Self-Protective Measure of Respondents

Variable	Yes	No
	Frequency (N) Percentage (%)	Frequency (N) Percentage (%)
Gloves	76 (54.3)	64 (45.7)
Nose cover	69 (49.3)	71 (50.7)
Aprons	63 (45)	77 (55)
Goggles	9 (6.4)	131 (93.6)

**multiple response

From Table 8, from the chi-square test between knowledge of chemical exposure and the use of apron, it is shown that it has a significance of 0.011, $p < 0.05$. Therefore knowledge of chemical exposure has a relationship with the use of apron.

Table 8: Relationship between Respondents' Knowledge of Chemical Exposure and the Use of Apron

Chi-square Test

	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	6.459	1	0.011

IV. DISCUSSION

Research Question 1: Do hairdressers know of the chemicals with health implications found in salon products?

The result showed that the hairdressers know that harmful chemicals are found in salon products and but did not know the health implications of these chemicals. This is at variance with the study of Hammam et al., 2014. In this study it reported that studied hairdressers in Egypt, had a high decrease in knowing chemicals used at work. This may be because they read hair product label, thereby knowing labels and the chemicals before applying them.

Furthermore, this is in line withBradshaw et al., (2011). In their study they expressed that hairdressers in Palestine and United Kingdom respectively lacked knowledge that certain chemicals have the potential to cause health problems. This may be because the information contained in the hair product label, does not contain the harmful effects of these chemicals.

Research Question 2: What knowledge do hairdressers have on personal protective equipments?

The hairdressers had high knowledge on measures to protect themselves from exposure to chemicals while working. This finding is in line with the findings of Garbaccio, (2015) of studied beauticians in Brazil which found out that 83.4% of the beauticians had knowledge on the use of personal protective equipment. This may be as a result of the knowledge that chemicals found in salon products are harmful to health which would prompt the hairdressers to know measures to protect themselves.

Research Question 3: What are the practice of hairdressers that expose them to chemical hazards?

The hairdressers had a poor knowledge in identifying which of the chemicals found in hair products that pose a health risk. The findings from this study is in line with Nemer, (2009) and Hammam et al., 2014, which reported that studied hairdressers in Palestine and Egypt, had a significant decrease in knowing chemicals used at work and their potential health risks. This may be due to some of the hairdressers having low educational level, making them not able to read hair product label.

Research Question 4: What do they do to protect themselves from chemical exposure?

Gloves was used more frequently than other personal protective equipment by the hairdressers (54.3%). The finding from this study is in line with Mendes et al., 2011, on studied Portuguese hairdressers, where most of the hairdressers (71%) reported that they used gloves as personal protective equipment when dyes and other products were handled. The reason for gloves is that some hair products usually come with gloves, providing the hairdressers means to protect themselves.

Research Question 5:What influences hairdressers use of personal protective equipment? From the hypothesis accepted, it shows that the hairdressers' knowledge on chemical exposure influences some of them to use of apron while working. This may be to protect their clothing from damage.

In conclusion, Most of the studied hairdressers had poor education, the most probable reason why some of them lack knowledge on chemicals found in salon/hair products and their effects on health and also ways to protect themselves from these chemicals.

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