

OCCUPATIONAL HEALTH RISKS OF HAIRDRESSERS: KNOWLEDGE, PRACTICE AND SELF-REPORTED SYMPTOMS

By

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Abstract

Introduction: Hairdressing is associated with exposure to various harmful conditions which may be chemical, physical and ergonomic. Proper knowledge of hazardous exposures leads to reduction of adverse health outcomes. Hairdressing has been linked with several self-reported symptoms as respiratory, allergic and musculoskeletal complaints. **Aim of work:** To measure the knowledge of hairdressers regarding hazardous work exposures, safe work practices, in addition to describe the possible work-related symptoms experienced by them. **Materials and methods:** This is a cross sectional study including 200 male hairdressers working in this career for not less than 2 years. A self-administrated questionnaire was used to collect socio-demographic and occupational data, description of the workplace safety measures, their knowledge regarding effects of hazardous work exposures. Complaints of any symptoms were also included related to respiratory, allergic reactions and skin problems. **Results:** Mean knowledge score of the study population was 4.65 ± 1.8 with the highest percentage of them reporting their knowledge of being at risk of musculoskeletal disorders and electrical injuries. Best practice was for wearing personal protective devices, washing hands after handling chemicals and before eating. A significant association was found between mean knowledge score and attending training courses. Moreover, a significant association was found between mean work duration and reporting chest symptoms and between mean working hours per day and skin allergic and musculoskeletal complaints. **Conclusion:** The poor knowledge of the possible health effects due to work exposures and the increased frequency of self-reported symptoms necessitate dissemination of general safety guidelines and offering more training courses to this occupational sector. **Keywords:** Hairdressers, Self-reported symptoms, Knowledge, Safe work practices and Workplace hazards.

Introduction

Hairdressers, barbers and beauticians represent an important occupational group. This group is expected to grow through the coming years, more rapidly than the average of all occupations (Bureau of Labor Statistics, 2009).

Hairdressers are exposed to various occupational health risks such as prolonged standing, usually with poor posture and mechanical load on the joints, and long working hours with no rest breaks and consequently missed meals. Hairdressers are also subjected to physical factors such as noise and high temperature (Mussi and Gouveia, 2008). Hundreds of chemicals are included in cosmetic products frequently used by hairdressers such as shampoos, hair dyes, sprays, and hair conditioners (Mounier–Geysant et al., 2006). All these agents can cause adverse health effects, particularly respiratory and dermatological problems.

Hairdressers have a high incidence of occupational skin diseases. Among the most commonly reported skin disorders are allergic and irritant dermatitis, with incidence rates ranging from 27.3% to 72.7% and 20% to 51.1 % respectively (Lyons et al., 2013). These skin disorders have been associated

with chemical exposures as: detergents, surfactants, colors, fragrances present in shampoos, additives such as preservatives or biocides (formaldehyde), and dyes present in hair product formulations (p-toluene diamine, paraphenylenediamine). In addition, persulphate salts, which are inorganic salts used as oxidizing agents in hair bleaches and hair coloring preparations at concentrations up to 60%, have been reported to cause both delayed type and immediate skin reactions including irritant and allergic dermatitis, urticaria and asthma (Hougaard et al., 2012).

Hairdressers also commonly at risk of musculoskeletal disorders, including work-related upper limb disorders, carpal tunnel syndrome, and tendonitis and back problems. These are attributed to the need for maintaining awkward positions of the upper body and limbs and performing highly repetitive movements (English et al., 1995).

During hair cutting, hairdressers may be exposed to their clients' blood, accidentally or due to unsafe practices, that may lead to acquiring infections by blood-borne route. In addition, they may transmit their own infections to their clients, or transmit the infection from one client to another (Kose et al., 2011).

It has been identified that hairdressers do not pay sufficient attention to the use of protective clothing and gloves, which are highly important for skin and respiratory tract. Some studies found that gloves are often not used during washing customers' hair (Lind et al., 2005).

The interest in developing this study, on workers belonging to hairdressing profession, relates to the fact that among the various professional classes, this stands out as being one of the sectors most affected by various occupational exposures whose adverse health effects can be well prevented with good knowledge of safety measures.

Aim of work

To measure the knowledge of hairdressers regarding hazardous work exposures, safe work practices, in addition to describe the possible work-related symptoms experienced by them.

Materials and methods

Study design: A cross-sectional study.

Place and duration of the study:

The studied group was hairdressers working in different hairdressing salons during the period from September 2017 to March 2018.

Study sample: Sample size was calculated based on self-reported frequency of asthma as 16% (Bradshaw et al., 2011), with Epi-Info version 6, population survey, worst acceptable frequency as 10%, confidence interval 95%. Accordingly, it was estimated to be 143 subjects. The sample was increased to 200 subjects to include all available individuals in the study.

The study included 200 male hairdressers working in different hairdressing salons for not less than 2 years. Forty-seven hairdressing salons in Cairo, Egypt were visited and all male hairdressers fulfilling the inclusion criteria were included.

Inclusion criteria: working for at least two consecutive years as a hairdresser, had no history of respiratory disease, not taking medications for allergy or respiratory diseases.

The main tasks done by participants were: hair cutting, giving a permanent wave, dyeing/tinting, washing and drying.

Study methods:

- **A self-administered questionnaire** (10 questions) was used to collect data about socio-demographic and occupational characteristics, if they

perceived their work environment as being risky or not, their knowledge of possible work related adverse health effects, and safe work practices.

Knowledge score was calculated by adding all knowledge items included in the questionnaire. Every correct answer was scored “1” and every incorrect answer was scored “0” and the sum of scores was calculated as knowledge score then mean score value was calculated. A total score of less than 60% was considered as poor knowledge score and that of score above 60% was considered as good knowledge score (Munuo et al., 2016).

Safe work practices were assessed by asking participants about wearing personal protective devices, reading the labeling on the used products, washing hands after handling chemicals, washing hands before eating and covering skin wounds while working. Items for ensuring workplace safety were also inquired about. The mean practice score was calculated.

Self-reported symptoms in the last six months; either chest, musculoskeletal or allergic symptoms, were also assessed. Responses were either daily or weekly symptoms, monthly, occasionally, or never. Relief of symptoms if away from work was also inquired about.

Consent

The purpose of the study was explained to all participants; an oral informed consent was obtained and the survey tool was anonymous.

Ethical approval

The study was approved by the ethical committee of the department of Community, Environmental and Occupational Medicine, Faculty of Medicine, Ain Shams University. Also an approval was obtained from the heads of different hairdressing salons from which we took the sample.

Data management

Data was coded, entered on SPSS version 16, analysis was done using frequency distribution and independent samples t test. The statistical significance level was set at ≤ 0.05 .

Results

Table (1): Knowledge of the study participants regarding possible health effects from workplace exposures.

Age / years	Mean ± SD 32.4 ± 5.48
Work duration / years	6.03 ± 2.33
Working hours / day	8.45 ± 1.61
Are you aware that your work may have an adverse effect on your health?	No (%)
NO	83 (41.5)
Yes	63 (31.5)
I do not know	54 (27)
Receiving training courses	
Yes	60 (30)
Marital status	
Married	122 (61)
Single	51 (25.5)
Divorced/widow	27 (13.5)
Education	
Read and write/Primary	22 (11)
Preparatory and secondary	96 (48)
University	82 (41)
Smoking history	
Current smoker	135 (67.5)
Ex-smoker	18 (9)
Non smoker	47 (23.5)
Do you know that some of the exposures you face at work may lead to? (Yes)	No (%)
Musculoskeletal disorders	134 (67)
Electrical injuries	121 (60.5)
Chest problems	115 (57.5)
Skin diseases	91 (45.5)
Risk of allergic diseases	89 (44.5)
Work related accidents	86 (43)
Heat disorders	85 (42.5)
Cancer	75 (37.5)
Noise related exposure disorders	74 (37)
Hepatitis	64 (32)
Knowledge score	
Poor	133 (66.5)
Good	67 (33.5)
Mean ± SD	4.67 ± 1.83

Table (1) showed that nearly 70% of hairdressers either stated there were no occupational exposures that adversely affected their health or that they do not know any information as regard this point. Moreover, 30% only reported receiving training courses (which included topics for skill development and some safety aspects. About 61% of the study participants were married and 48% had preparatory/secondary education, 67.5% are current smokers, having mean work duration of 6 years and working for an average of 9 hours per day. The adverse health effects they knew were at risk due to work exposures were musculoskeletal disorders (67%), electrical injuries (60.5 %), chest (57.5 %) and skin problems (45.5 %). Most of the participants had a poor knowledge score (66.5%).

Table (2): Description of the work environment and practice of the study participants and the relationship between knowledge and practice scores.

Practice items (yes)	No (%)
Wearing personal protective devices	145 (72.5)
Wash hands after handling chemicals	138 (69)
Wash hands before eating	137 (68.5)
Covering skin wounds	122 (61)
Reading labeling on the products	86 (43)
Poor practice	53 (26.5)
Good practice	147 (73.5)
Mean practice score	3.14 ± 1.10
Describe your work environment as regards availability of:	
Air conditions	140 (70)
Gloves	96 (48)
Washing facilities	93 (46.5)
Persistent odor for 10 minutes	90 (45)
Separate eating place	86 (43)
Persistent morning odors	80 (40)
Good illumination	79 (39.5)
First aid box	73 (36.5)
Fire extinguishers	68 (34)
Aprons	56 (28)
Number of customers dyeing/week	Mean ± SD 4.3 ± 1.5

Relief of symptoms on holidays?				
NO		75 (37.5)		
Yes to some degree		82 (41)		
Yes to a great degree		43 (21.5)		
		Mean± SD	t	p-value
Knowledge score Good practice (No=147)	Poor practice (No=53)	4.64 ± 1.7	0.134	0.893
		4.68 ± 1.86		
		Mean± SD	t	p-value
Knowledge score	Not attending training courses (No=140)	4.47 ± 1.9	2.48	0.014*
	Attending training courses (No=60)	5.13 ± 1.65		

*: Significant

Table (2) showed that 72.5 % of participants reported wearing personal protective devices, 69% washed their hands after handling chemicals and before eating. Most of them (73.5%) had a good practice score, 70% of hairdressers reported availability of air conditions at their workplace. A significant association was found to be present between knowledge score and attending training courses.

Table (3): Work-related symptoms experienced by the study participants

Reported work-related symptoms	Daily/weekly	Monthly	Occasionally	Never
	No (%)	No (%)	No (%)	No (%)
Chest Symptoms				
Chest tightness	37 (18.5)	63 (31.5)	53 (26.5)	47 (23.5)
Cough	44 (22)	83 (41.5)	41 (20.5)	32 (16)
Wheezes	43 (21.5)	67 (33.5)	70 (35)	20 (10)
Allergy symptoms				
Skin inflammation	26 (13)	54 (27)	59 (29.5)	61 (30.5)
Watery eyes	62 (31)	61 (30.5)	32 (16)	45 (22.5)
Blocked runny nose	61 (30.5)	57 (28.5)	48 (24)	34 (17)
Musculoskeletal symptoms				
Low back pain	64 (32)	87 (43.5)	39 (19.5)	10 (5)
Shoulder arm pain	72 (36)	66 (33)	30 (15)	32 (16)
Nail problems or discoloration	53 (26.5)	70 (35)	28 (14)	49 (24.5)

Table (3) showed that watery eyes (31%), blocked runny nose (30.5%) and shoulder arm pain (36%) were commonly reported on daily/weekly basis, while chest tightness (31.5%), cough (41.5%), low back pain (43.5%) and nail problems (35%) were commonly reported on monthly basis.

Table (4): Relation between self-reported symptoms experienced by the study participants and work-related factors:

	Duration of work/years		Working hours / day	
	Mean \pm SD	p-value	Mean \pm SD	p-value
Chest Symptoms Yes (No=188) NO (No =12)	6.15 \pm 2.34 4.08 \pm 1.17	0.003*	8.39 \pm 1.63 7.92 \pm 2.11	0.457
Skin Allergic symptoms Yes (No = 80) NO (No = 120)	6.08 \pm 1.91 6.00 \pm 2.59	0.825	8.80 \pm 1.42 8.08 \pm 1.76	0.002*
Musculoskeletal symptoms Yes (No = 178) NO (No = 22)	6.17 \pm 2.26 4.86 \pm 2.70	0.013*	8.56 \pm 1.619 6.82 \pm 1.22	0.0001**

* Statistically significant

**: Highly statistically significant

Table (4) showed a significant association between chest and musculoskeletal symptoms with job duration (those with chest and musculoskeletal symptoms had longer mean job duration than their counterparts). Moreover, a significant association exists between skin allergic symptoms and musculoskeletal complaints with working hours per day (those with positive symptoms spent significantly longer mean working hours per day than their counterparts)

Discussion

Hairdressers are exposed daily to a variety of chemical, physical and mechanical conditions, which are issues of concern in this field. Insufficient protection against such hazardous exposures increases the possibility of adverse health outcomes.

Knowledge of hairdressers was an important factor to be evaluated in this study since accurate knowledge leads to positive attitude and practice and hence better protection from many serious health hazards.

The study included (200) participants with Mean \pm SD of age: 32.4 \pm 5.48, mean work duration 6 years and mean working hours per day was 8 hours. Most of the study participants were educated (48% preparatory/secondary and 41% with university certificates) (Table 1). Educational level is very important for hairdressers to understand their workplace exposures and how to protect themselves.

Although the current work had a high percentage of well-educated (41% were with university education); but their knowledge was poor (Table 1) yet their practice was good (Table 2). Nazlim et al; 2014 in their study on the

knowledge and behavior of barbers on blood borne diseases found that 19% of participants were elementary school graduates, 39% were with secondary school certificates and 3.4% graduated from high school (so most of participants were moderately educated) but both their knowledge and their practice were insufficient.

The current study showed that about 68% of participants (41.5% reported that their work exposures have no effect on their health and 27% do not know any relation between exposure and health outcome) moreover a poor knowledge score of possible adverse health effects was found in more than half of the participants (66.5%) as shown in Table (1). These findings agreed with the results of the study done by Munuo et al., 2016, who reported that the majority (69%) of the studied group of hairdressers were not aware that their occupation had any adverse health effects.

The present study detected that the best knowledge was for musculoskeletal disorders (67%), electrical injuries (60.5 %), chest (57.5 %) and skin problems (45.5 %) (Table 1). These findings agreed with the results of Bradshaw et al., 2011 ; Hassan and Bayomy, 2015 who reported that most of hairdressers

were complaining of work related low back pain in comparison to controls (42% of them reported low back pain in the previous 3 months compared to 20% of the controls ($p < 0.01$)). In another study, most hairdressers complained of long working and standing hours and consequently low back pain (Omokhodion et al., 2009). Neck, wrist/hand pain together with low back pain was commonly reported by the Greek hairdressers. These complaints were related to lack of ergonomics in the form of prolonged standing, use of vibrating tools, and uncomfortable body postures (Tsigonia et al., 2009).

The risk for cancer was known by 37.5% of participants (Table 1). The International Agency for Research on Cancer, in one of its monographs (2010), stated that its overall evaluations for occupational exposures to chemicals as a hairdresser or barber are probably carcinogenic to humans (group 2A) (World Health Organization and International Agency for Research on Cancer, 2010).

The hairdressing trade may potentially expose its practitioners and their customers to blood borne infections. In the current work, only 32% declared their knowledge about the risk of getting infection with hepatitis (Table 1).

This disagree with the results of the study done by Amodio et al., 2009 who detected that 93% of the hairdressers knew they were at risk of being infected with hepatitis through parenteral route and by razors.

Most of hairdressers reported they wore personal protective devices (72.5%) while 69% and 68.5% respectively washed their hands after handling chemicals and before eating. Good overall practice was found in 73% of the participants (Table 2). This is partly similar to the results obtained by Nazlim et al., 2014, who found that 38.7% of the participants used protective gloves, 59.5% reported using protective masks and 65.3% washed their hands after handling chemicals.

Our work revealed that 30% of the participants attended training courses which were both professional and safety directed (Table 1). This is lower than the results reported by Gopal and Rajendra, 2012, who found that 82% of the studied hairdressers received professional training. Moreover, the knowledge score was significantly higher among those who attended such courses (Table 2).

The present study revealed that 48% of the participants stated that

gloves were available (Table 2) ; which is lower than the findings detected by Gopal and Rajendra, 2012 where 83% of participants reported that they were provided with gloves during their work . Okojie and Isah, 2001, in their work in Benin city in Nigeria declared that the availability and usage of personal protective clothing and devices were good.

Our study showed that, 34% and 36.5% of the studied group stated that fire extinguishers and first aid boxes were available respectively. Although air conditions were reported to be present at workplaces by 50% of participants, 45% reported persistent morning odors and persistent odors for at least 10 minutes (Table 2). Mandiracioglu et al., 2009 detected that 70% of hairdressers had air conditioned workplaces. Studies have shown that concomitant exposure to multiple chemicals in the workplace is a problem and that the inner atmosphere is not only chemically unsafe but also environmentally as regards temperature, humidity, illumination and ventilation (Leino et al., 1999, Evci et al., 2007 and Ronda et al., 2008).

Mean knowledge score was significantly higher among those who attended training courses on skill development and some occupational safety

aspects (Table 2). A similar study was done by Wong et al., 2005; pointed to the importance of providing appropriate education and training regarding safety measures necessary for the safe handling of relevant chemicals. In another study done by Mohammad et al., 2015, they found that intervention by a health education program was successful in improving most aspects of hairdressing as environment of salons, use of personal equipments, waste disposal, safety and healthy behaviors of hairdressers. So they suggested that health educational programs for hairdressers should be integrated into their training courses.

In the current study, chest, musculoskeletal and allergic symptoms were reported among the participating hairdressers (Table 3), which is consistent with Bradshaw and his coworkers (2011) who found that hairdressers reported significantly higher levels of musculoskeletal system problems including work related shoulder pain, work related wrist and hand pain, upper and lower back pain, and leg/foot pain. They also reported that work related cough was significantly more frequently reported in hairdressers than among controls.

In a French study, it was found that 20% of the women affected by work related asthma were hairdressers (Ameille et al., 2003). This could be related to the products used by hairdressers that may contain irritants, allergens or sensitizers.

Various chemicals used in hairdressing salons can produce respiratory symptoms. Some of these chemicals are considered as allergens, other are irritants and both may cause acute non-specific respiratory tract reactions shortly after exposure. The exposure to these chemicals was almost daily where the mean number of customers using dyes was on an average of 4 per week as revealed in our work (Table 2). The results of our study are lesser than what was detected by Hollund et al., 2001, who found that the number of customers using dyes ranged from 13 to 15 per week.

The examined hairdressers complained of work related symptoms exacerbating during the working week, as they became more sensitive to several stimuli indicating an increased reactivity in the nasal mucosa (Table 2). Moreover, they were feeling that the reactivity decreased considerably when they were away from work as was the

condition in the study done by Diab et al., 2009.

Musculoskeletal symptoms and watery eyes were commonly reported on daily basis, low back pain, cough and nail problems were reported by hairdressers on monthly basis (Table 3). This agrees with a study done by Hollund et al., 2001, that hairdressers reported significantly more wheezes, breathlessness, runny eyes and blocked or runny nose due to exposure to hair dyes, permanent oils, bleaching powder and other chemicals used in hairdressing salons, compared to office workers.

Skin inflammatory disorders related to allergic problems were reported in about 40% as revealed in Table 3. These results were similar to the work done by Majken GH et al., 2015 where 34.5% of hairdressers reported hand eczema and contact urticaria. They also reported that both diseases increased with increasing the duration of work; which is against the results of the current study as was shown in table 4.

Our study showed a significant association between chest and musculoskeletal symptoms with working years and also between skin allergic symptoms and musculoskeletal complaints with working hours per day (Table 4). This

is in contrast to the findings of another study where shorter work experience (less than 10 years) was significantly associated with reporting hand eczema (Mohammad et al., 2018) but similar to Ahmad et al., 2015 where longer work duration as a hairdresser is a risk factor to develop hand dermatitis or eczema during their work period.

Recommendations: Education, training and prevention are the best methods for the managing the adverse health effects that are common among hairdressers. Training should be given in areas such as hazards and risks in the salon, control measures to minimize risks, maintenance of equipments, use of personal protections and emergency procedures. Moreover, there is a need for better control of air quality by increasing the availability of air conditions and suction systems.

Conflict of interest

Authors have declared that no conflict of interest exists.

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