

Original Article

Occupational Health Risks of Female Hairdressers: Knowledge, Practice, and Self-Reported Symptoms

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Abstract

Background & Objective(s): Hairdressers are exposed to various health hazards in their work environment. This study aims to assess the working conditions, knowledge, and practices regarding hazardous work exposure, in addition to identifying potential occupational health problems and their associated variables.

Methods: A cross-sectional study including 151 female hairdressers was conducted in Assiut city, Upper Egypt. An interview questionnaire was used to record personal and job characteristics, descriptions of workplace environments, and knowledge and practices regarding occupational health risks and self-reported health problems. Standard assessment of weight and height was performed, and body mass index was calculated.

Results: Insufficient ventilation of salons was reported by 67.5% of the hairdressers, and first aid measures were available for only 15.2%. Low awareness was found regarding blood-borne diseases transmitted through hair salons. Approximately 70% were disinfecting their equipment, and 12.4% performed this after each customer. The most frequent chronic musculoskeletal complaints were low back (22.5%), shoulder (17.2%), and wrist pain (16.6%). Nearly 24% complained from varicose veins. Varicose veins and knee pain were significantly associated with increases in age and working years. Neck pain was significantly associated with increases in age and being employed or owner of the hairdressing salon.

Conclusion: Proper working conditions and safe practices of the studied hairdressers were insufficient. High awareness was found regarding the possibility of disease transmission through hair salons. However, only a few of them identified these diseases and their transmission modes. Moreover, they complained of musculoskeletal pain, varicose veins, and respiratory symptoms. Recommendations: Pre-employment health education programs should be provided for Egyptian hairdressers, and maintenance of hairdressing salons should be checked regularly.

Keywords: Hairdressers, working conditions, practices, occupational health hazards, Egypt

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INTRODUCTION

Hairdressing is a worldwide occupation that is predominantly a female profession, with over 80% being female workers. The sector is characterized by a young workforce.⁽¹⁾

Hairdressers are exposed to a diversity of harmful agents in the workplace. These comprise chemical agents, such as hair dyes, and physical agents, such as noise and temperature. In addition, ergonomic hazards are an issue due to inappropriate posture during work and long working hours.⁽²⁾ Furthermore, hairdressers implement their duties with the assistance of mechanical tools, i.e., needles and blades. This predisposes both clients and hairdressers to

biological hazards, such as fungi, bacteria, and viruses.⁽³⁾ Exposure to blood-borne diseases, such as hepatitis B (HBV), hepatitis C (HCV), and HIV/AIDS, is more likely through tattooing, manicures, pedicures, and skin care procedures.⁽⁴⁾ The risk of infection increases with lack of awareness, poor instrument handling, and inadequate decontamination of working equipment, cleanliness, and disinfection of the work area.⁽⁵⁾

Recurrent exposures of hairdressers to cosmetic chemical products and indoor air pollution in beauty centers are considered risk factors for numerous health problems, such as respiratory, dermal, ocular, and reproductive concerns. Moreover, various musculoskeletal complaints, such as neck pain, wrist/hand pain, and low

back pain, have been reported among hairdressers, who are subjected to poor ergonomic conditions in their workplaces.⁽⁶⁾ Hairdressers' exposure to serious occupational health risks can cause absenteeism from work, early drop-outs, and social security applications at a relatively young age.⁽⁷⁾

Occupational nursing plays a fundamental role in industrial and community settings. It improves the health and safety of workers⁽⁸⁾ by raising awareness about the prevention and control of health hazards.⁽⁹⁾

Numerous Egyptian hairdressing salons are small roadside establishments. This might provide environments in which there is limited support for workers to promote their own health. Consequently, the increased risk of ill health among hairdressers would induce a public health problem within a growing sector of the community.⁽¹⁰⁾ Moreover, no published studies have explored the working conditions and adverse health effects among hairdressers in Upper Egypt. This study aims to identify working conditions, knowledge, and practices toward occupational health risks among female hairdressers in Assiut, as well as to determine the prevalence of self-reported health problems and their associated variables.

METHODS

Study design, setting and population

A cross-sectional analytical study was conducted in Assiut city, Capital of Assiut Governorate. It is the largest city in Upper Egypt and lies approximately 375 kilometers south of Cairo. The study included female hairdressers who had completed a minimum of 1 year in their job and who agreed to participate in the study. The sample size was calculated using Epi-Info statistical package version 7.2.2.6. The sample size was estimated for a population survey with the following parameters: expected frequency 10% (neck pain led to visiting a doctor)⁽¹⁰⁾, acceptable margin of error 0.05, and confidence level 95%. The minimum required estimated sample size was 138 subjects. After adding a 10% non-response rate, it was raised to 151 subjects.

In Egypt, hairdressing salons are officially registered as commercial stores. Due to the absence of governmental listing of the numbers or locations of hairdressing salons, the researchers used the non-probability purposive sampling technique for recruitment of the studied subjects. Data were collected from 53 hairdressing salons in Assiut. The criteria for recruiting the hairdressing salons included having a governmental license as a commercial store and putting a women's hairdressing salon sign. Due to difficult sampling of the studied population, the researchers attempted to perform a non-biased recruitment of the salons with different aspects to the greatest extent possible. They included large known salons, and the researchers actively searched the streets for small or unknown salons. The researchers considered the inclusion of all social levels, and the selected salons were distributed all over

Assiut, either in the eastern or western areas. All female hairdressers who had at least 1 year of work experience and agreed to participate in the study were included.

Data Collection

Data were collected by interviewing the studied hairdressers using a semi-structured questionnaire. The questionnaire was designed after reviewing the relevant literature. It comprised five main sections:

- 1) Personal and job characteristics, including age, educational level, residence, marital status, smoking status, work experience in years, working days per week, working hours per day, salon ownership, work nature (full or part time), method of training in this work, whether previously trained on safety and occupational health issues, and whether the job provides enough income.
- 2) Workplace environment in the salon included inquiries with possible answers of "yes" or "no" about these statements, hairdresser seats and washbasins enabling a good posture during work, tasks' variability allowing working in different postures, wearing shoes without heels during work, entering the bathroom when needed during work pressure, taking regular breaks during work of 5 minutes/1 hour or 10 minutes/2 hours, sufficient lighting and ventilation of the salon, being previously informed about safely dealing with dangerous products, usage of cosmetic products that could cause skin problems, even distribution of wet work, protection of electrical devices against splash water, and availability of first aid measures⁷. These questions used for assessment of workplace environment were extracted from the European Agency for Safety and Health at Work tool.⁽¹¹⁾
- 3) Knowledge about diseases that could be transmitted through hair salons and their transmission mode and sources of information about disease transmission were assessed.
- 4) Hairdressers' practices as performed tasks, availability of gloves in the salon and their usage, and methods and frequency of equipment disinfection were assessed.^(4, 12)
- 5) Self-reported health problems were assessed, such as musculoskeletal complaints (pain in wrist, neck, back, elbow, shoulder, and knee), varicose veins, sinusitis, dermatitis, and chest problems. The occurrence of these complaints was investigated for the past 3 months, in addition to queries about whether these complaints led to doctor visits or work absenteeism.^(10, 13)

Pilot testing of the questionnaire was conducted with 10 female hairdressers to assess the clarity of the used questionnaire. No modifications were made to the questionnaire. However, these subjects were not included in the study analysis.

The second tool was a standard assessment of anthropometric measurements, such as weight, height, and waist circumference. Body mass index (BMI) was also calculated. Weight and waist circumference categories

were made according to World Health Organization (WHO) standard cut-off points.^(14,15)

The study was carried out February to October 2018. The questionnaires were filled out by the hairdressers at their worksites. Before leaving the salon, revision of the answers to the filled questionnaires was done to complete any missing data.

Statistical analysis

Data were analyzed using SPSS program, version 21 (SPSS Inc., Chicago, USA). Descriptive statistics were presented as mean and standard deviation for quantitative data, while categorical data were presented as frequencies and percent values. Quantitative data were tested for data normality using the Shapiro test. For the comparison between two independent groups (hairdressers with and without symptoms), the Mann–Whitney U test, Chi-square test, or Fisher's exact test was used. A p-value of less than 0.05 was considered as the cut-off point for statistical significance.

Ethical Considerations

The study was approved by the Nursing Ethical Committee of Assiut University, Egypt (IRB number is 2210035). The researchers ensured the ethical considerations as voluntary participation of the studied hairdressers, obtaining written informed consent before being recruited in the study, and freedom to withdrawal from the study without any negative consequences. In addition, privacy and confidentiality of the collected data were maintained. From an ethical point of view, the researchers performed a process of brief description of the main safety measures after the data collection process. Examples of these items include hand washing after each client, equipment disinfection, not postponing entering bathroom when needed, and wearing gloves when dealing with chemical materials. In addition, the researchers emphasized the value of maintaining good posture during work, task variability, and the availability of first aid measures at the salon.

RESULTS

Table 1 displays the personal and job characteristics of the studied female hairdressers, where three quarters (75.5%) of them were aged 20–40 years. Nearly 16% of the studied population had university/post-university education, while 6.6% were illiterate or could read and write. Urban residents represented 78.1% of the total sample, and approximately half of the hairdressers were married. About two-thirds of the studied participants (66.9%) were workers in the salon, while 33% owned/shared ownership of the salon. Those who were trained on this job during work were 83.4%, and the majority were full-time workers. Only 5.3% of the hairdressers received training on safety and occupational health.

Table 2 illustrates the working conditions of the studied population. Approximately 63% of the studied sample mentioned that the seats and washbasin enabled

them to work in a comfortable position. The majority (88.1%) reported wearing flat shoes during work. Most of the studied sample (63.6%) reported that they did not take regular breaks during work. Of the hairdressers, 43% ignored entering the bathroom when needed during work pressure. Most of the studied sample (96.0%) reported sufficient lighting of the salon, while sufficiency of salon ventilation was agreed upon by roughly one-third (32.5%). Those who were previously informed about how to deal with dangerous materials represented 35.1% of the studied sample. Of the sample, 64% were dealing with products that may cause skin problems. Approximately three-quarters of the studied participants reported even distribution of wet work. First aid measures were available for only 15.2% of the studied sample. The majority (86.1%) of the studied population stated that gloves were available in the salon.

Tables 3 and 4 show knowledge and reported practices of the study participants. More than three-quarters of hairdressers were aware of disease transmission through the hair salon. The most commonly reported diseases were hepatitis C (39.1%), respiratory infection (35.7%), fungal infection (20.9%), and scabies (15.7%). However, only 7.7% of them routinely use gloves. Vinyl (66.2%) was the common type of glove used. Dealing with chemical substances was the most frequently mentioned indication for glove usage (92.3%). Among those with disposable gloves in the workplace (n=130), absence of experienced problems with wearing gloves was reported by 50.7% of the studied population, while 49.3% reported facing problems while using gloves. The reported problems with glove use were hand sweating (22.3%), difficulty working (16.9%), gloves too easily damaged (6.2%), incorrect size of gloves (2.3%), taking too long to put on (0.8%), and client complaints (0.8%). Approximately 70% of the hairdressers disinfect their equipment. Forty percent of them immerse the tools in a disinfectant solution, while 20% clean the tools using water and soap. Only 12.4% sterilize the tools after each customer. Only 25.2% perform hand washing after each customer. As illustrated in Figure 1, the most frequent skills performed by the hairdressers were washing hair with shampoo and conditioner (86.8%), coloring hair with dyes (82.1%), pedicures (80.1%), and hair spreading with chemicals (71.5%).

Table 5 shows the health problems reported by the hairdressers. The most frequent chronic musculoskeletal pain was low back pain (22.5%), shoulder pain (17.2%), and wrist pain (16.6%). Similarly, low back pain was most common complaint that necessitated visiting a physician. Neck pain was the main cause of work absenteeism. Approximately one-quarter of the studied hairdressers complained of varicose veins (23.8%), and 11.3% of the studied sample visited a physician because of these varicose veins. Regarding chest problems, dyspnea was reported by 7.3% of the participants, while 6.6% reported they had bronchial asthma. Sinusitis was reported by 10.6% of studied sample and dermatitis by 5.3%.

Table 1: Personal and job characteristics of female hairdressers in Assiut, 2018

Characteristics	Female hairdressers (n= 151)	
	No.	%
Age (years)		
< 20	26	17.2
20–40	114	75.5
> 40	11	7.3
Mean ± SD (Range)	27.42 ±8.196 (14.0–56.0)	
Education		
Illiterate/can read and write	10	6.6
Primary/preparatory	26	17.2
Secondary/upper intermediate	91	60.3
University/post university	24	15.9
Residence		
Urban area	118	78.1
Rural area	33	21.9
Marital status		
Single	74	49.0
Married	75	49.7
Divorced	2	1.3
BMI (Kg/m²)		
Mean ± SD (Range)	27.60±5.428 (17.2–43.5)	
Smoking status		
Current smoker	5	3.3
Non-smoker	146	96.7
Owner of the salon		
Owned	47	31.1
Shared	3	2.0
Working in the salon	101	66.9
Work experience		
1–4 years	61	40.4
5–10 years	64	42.4
More than 10 years	26	17.2
Mean ± SD (Range)	7.354 ± 6.5571(1.0–36.0)	
Daily working hours		
Less or equal to 9 hours	38(25.2)	
More than 9 hours	113(74.8)	
Mean ± SD (Range)	9.52 ± 2.452 (1.0–14.0)	
Working days per week		
1–5 day	9 (6)	
6–7 day	142 (94)	
Mean ± SD (Range)	6.34 ± 0.931 (1–7)	
Training on this job		
In specified beauty training center	14	9.3
During work	126	83.4
Both	11	7.3
Received training on safety and occupational health		
Yes	8	5.3
No	143	94.7
Nature of the work		
Full time	122	80.8
Part time	29	19.2
Job provides enough income		
Yes	84	55.6
No	67	44.4

Table 2: Working conditions of female hairdressers in Assiut, 2018

Working conditions	Female hairdressers (n= 151)	
	No.	%
Clients/hairdressers' seats and washbasins enable a good working posture for different tasks		
Yes	95	62.9
No	56	37.1
Wearing shoes without heels during work		
Yes	133	88.1
No	18	11.9
Taking regular breaks (5 minutes/1 hour or 10 minutes/2 hours)		
Yes	55	36.4
No	96	63.6
During work pressure, entering bathroom when needed		
Yes	86	57.0
No	65	43.0
Whether salon ventilation is sufficient		
Yes	49	32.5
No	102	67.5
Whether salon light is sufficient for safe and efficient task performance		
Yes	145	96.0
No	6	4.0
Task variability enables working in different postures		
Yes	127	84.1
No	24	15.9
Previously informed about safely dealing with dangerous materials		
Yes	53	35.1
No	98	64.9
Using cosmetic products that could cause skin problems		
Yes	97	64.2
No	54	35.8
Wet work is distributed evenly among hairdressers		
Yes	114	75.5
No	37	24.5
Whether electrical devices protected against splash water		
Yes	137	90.7
No	14	9.3
Availability of first aid measures in the salon		
Yes	23	15.2
No	128	84.8
Previously instructed to use gloves before work		
Yes	45	29.8
No	106	70.2
Availability of disposable gloves in the workplace		
Yes	130	86.1
No	21	13.9

Tables 6 and 7 display associations of some self-reported symptoms among Egyptian female hairdressers. The mean age was significantly higher among hairdressers who had neck pain, knee pain, and varicose veins when compared to those who did not. The duration of work was significantly associated with only chronic knee pain

($p= 0.038$). The workers in the salon had a significantly higher proportion (47.4%) of neck pain than the owners (42.1%) or those shared salon ownership (10.5%). Meanwhile, the nature of work and BMI were not significantly associated with any of the reported hairdressers' chronic complaints ($p < 0.05$).

Table 3: Knowledge of disease transmission in hair salons among female hairdressers in Assiut, 2018

Items	Female hairdressers (n= 151)	
	No.	%
Knowledge of disease transmission in hair salons		
Yes	115	76.2
No	36	23.8
Reported transmitted diseases (n=115) #		
Fungi	24	20.9
HIV/AIDS	6	5.2
Hepatitis C	45	39.1
Hepatitis B	8	7.0
Scabies	18	15.7
Respiratory infections	41	35.7
Pediculosis (head lice)	14	12.2
Impetigo	15	13.0
Dandruff (false answer) ^a	13	11.3
Reported mode of transmission (n=115) #		
Scissors and used towels, forceps, razors, and hair combs	46	40.0
Blood	25	21.7
Direct contact	48	41.7
Droplet infection	33	28.7
Sources of information (n=115) #		
TV	20	17.4
Doctors	11	9.6
Previous training	11	9.6
Newspaper	1	0.9
Co-workers	79	68.7
Internet	13	19.1

More than one answer was included ^a false answer as it is a type of seborrheic dermatitis and not infectious

Table 4: Practices toward occupational health risks among female hairdressers in Assiut, 2018

Items	Female hairdressers (n= 151)	
	No.	%
Routine use of gloves (n=130)		
Yes	10	7.7
No	120	92.3
Types of gloves worn (n=130) #		
Vinyl (disposable)	86	66.2
Latex (disposable)	54	41.5
Rubber	6	4.6
Indications of glove use (n=130) #		
Washing hair	12	9.2
Dealing with chemical substances	120	92.3
Other (tattooing, pedicure, peeling)	18	13.8
Disinfection of equipment		
Yes	105	69.5
No	46	30.5
Methods of disinfection (n=105) [#]		
Sterilization device (autoclave)	28	26.7
Washing with water and soap	22	21.0
Wiping with alcohol	12	11.4
Immersing in a disinfectant solution	43	41.0
Immersing in boiled water	9	8.6
Frequency of sterilization (n=105)		
Once a day	38	36.2
After every customer	13	12.4
Once weekly	42	40.0
2–3 times per week	9	8.6
On customer need/request	3	2.9
Hand washing after each customer		
Yes	38	25.2
No	113	74.8

More than one answer was included

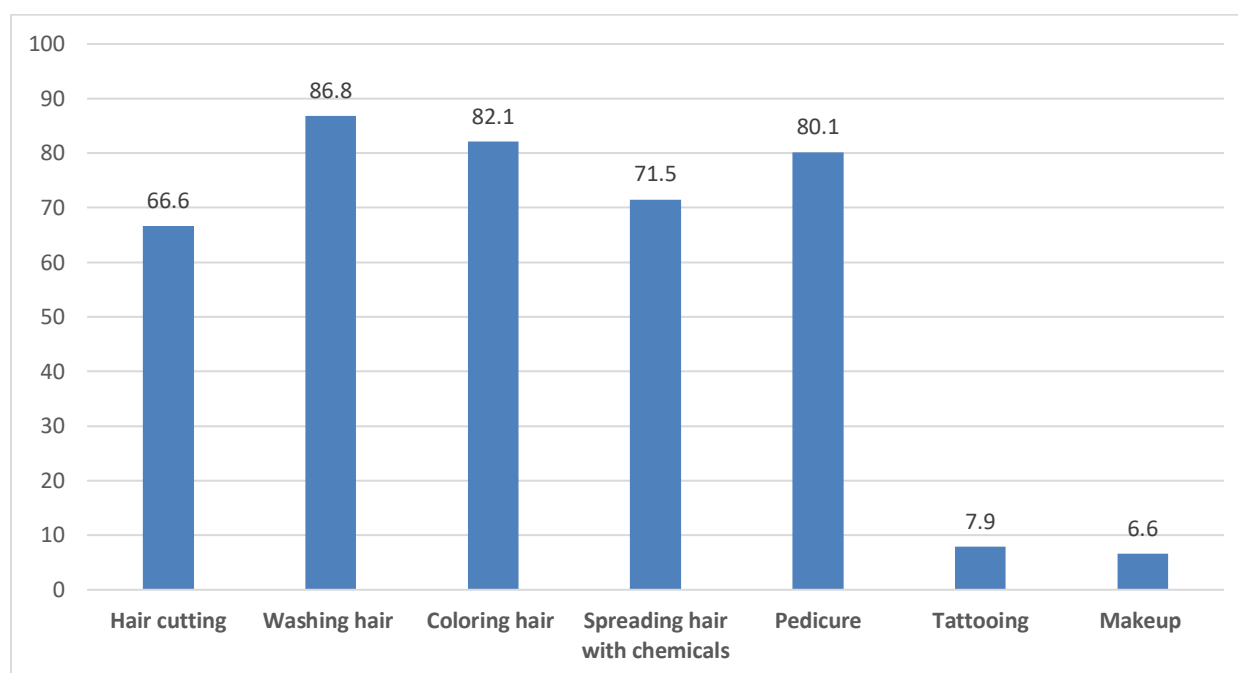


Figure 1: Performed job tasks among female hairdressers in Assiut, 2018

Table 5: Self-reported health problems among female hairdressers in Assiut, 2018

Variables	In the last 3 months	Visited physician	Lead to absenteeism
	(n= 151) No. (%)	(n= 151) No. (%)	(n= 151) No. (%)
Musculoskeletal problem			
Neck pain	19 (12.6%)	10 (6.6%)	6 (4.0%)
Wrist pain	25 (16.6%)	7 (4.6%)	5 (3.3%)
Elbow pain	11 (7.3%)	4 (2.6%)	1 (0.7%)
Shoulder pain	26 (17.2%)	6 (4.0%)	4 (2.6%)
Low back pain	34 (22.5%)	11 (7.3%)	5 (3.3%)
Knee pain	19 (12.6%)	5 (3.3%)	2 (1.3%)
Varicose veins	36 (23.8%)	17 (11.3%)	8 (5.3%)
Chest problems			
Shortness of breath	11 (7.3%)	0 (0%)	0 (0%)
Bronchial asthma	10 (6.6%)	8 (5.3%)	1 (0.7%)
Sinusitis	16 (10.6%)	13 (8.6%)	7 (4.6%)
Dermatitis	8 (5.3%)	3 (6.6%)	2 (1.3%)

Proportions of those who answered yes

Table 6: Associates of self-reported musculoskeletal symptoms among female hairdressers in Assiut, 2018

	Neck pain (n =151)		Wrist pain (n =151)		Shoulder pain (n =151)		Lower back pain (n =151)		Knee joint pain (n =151)	
	Yes (n= 19)	No (n=132)	Yes (n= 25)	No (n=126)	Yes (n= 26)	No (n=125)	Yes (n= 34)	No (n=117)	Yes (n=19)	No (n=132)
Age (years) (Mean ± SD)	31.21 ±8.96	26.88±7.97	28.92±8.39	27.13±8.16	29.08±7.85	27.08±8.26	28.12±7.46	27.22±8.42	31.47±8.15	26.84± 8.07
<i>p</i> value	0.044* α		0.319 α		0.210 α		0.421 α		0.016* α	
Work experience (years)	10.37±7.96	6.92±6.25	8.30±7.08	7.17±6.46	7.85±6.32	7.25±6.63	8.441±6.67	7.04±6.52	10.05±7.14	6.966± 6.41
<i>p</i> value	0.059 α		0.364 α		0.466 α		0.149 α		0.038* α	
Salon owner										
Owner	8 (42.1%)	39 (29.5%)	8 (32.0%)	39 (31.0%)	7 (26.9%)	40 (32.0%)	10 (29.4%)	37 (31.6%)	9 (47.4%)	38 (28.8%)
Sharing	2 (10.5%)	1 (0.8%)	2 (8.0%)	1 (0.8%)	2 (7.7%)	1 (0.8%)	2 (5.9%)	1 (0.9%)	0 (0. .0%)	3 (2.3%)
Working in Salon	9 (47.4%)	92 (69.7%)	15 (60.0%)	86 (68.3%)	17 (65.4%)	84 (67.2%)	22 (64.7%)	79 (67.5%)	10 (52.6%)	91 (68.9%)
<i>p</i> value	0.007*©		0.059 ©		0.69 ©		0.180 ©		0.231 ©	
Nature of work										
Full time	14 (73.7%)	108 (81.8%)	19 (76.0%)	103 (81.7%)	22 (84.6%)	100 (80.0%)	28 (82.4%)	94 (80.3%)	16 (84.2%)	106 (80.3%)
Part time	5 (26.3%)	24 (18.2%)	6 (24.0%)	23 (18.3%)	4 (15.4%)	25 (20.0%)	6 (17.6%)	23 (19.7%)	3 (15.8%)	26 (19.7%)
<i>p</i> value	0.368 #		0.578 #		0.786 #		0.793 ©		0.100 #	
BMI \bar{x} (Mean ± SD)	26.93±5.164	27.69±5.47	25.83±5.38	27.95±5.38	27.49±6.46	27.62±5.226	26.46±4.82	27.92±5.56	29.59±5.81	27.33±5.34
<i>p</i> value	0.703 α		0.087 α		0.749 α		0.213 α		0.103 α	

© Chi-square test

Fisher's exact test

α Mann–Whitney U Test

‡ one case was excluded due to pregnancy status (n=150) * *p* <0.05

Table 7: Associates of self-reported varicose veins among female hairdressers in Assiut, 2018

Variables	Varicose veins	
	Yes (n= 36)	No (n=115)
Age (years) (Mean ± SD)	30.86±7.21	26.35±8.22
<i>p</i> value		0.001* ^α
Work experience (years) ^α Mean ± SD	8.89±6.53	6.874±6.52
<i>p</i> value		0.046*
Salon owner		
Owner	14 (38.9%)	33 (28.7%)
Sharing	1 (2.8%)	2 (1.7%)
Working in Salon	21 (58.3%)	80 (69.6%)
<i>p</i> value		0.454 [©]
Nature of work		
Full time	33 (27.0%)	89 (77.4%)
Part time	3 (10.3%)	26 (22.6%)
<i>p</i> value		0.087 [©]
BMI ^β Mean ± SD	28.39±5.35	27.35±5.44

[©] Chi-square test, ^α Mann–Whitney U Test, ^β one case was excluded due to pregnancy status (n=150), * *p* < 0.05

DISCUSSION

Hairdressers are exposed to several health hazards in their workplace. The present study is one of the earliest studies to assess working conditions in hair salons and knowledge and practices of female hairdressers toward occupational health risks. In addition, this study explored the occupational health problems and their associations within the target population. Regarding the personal characteristics of the participating hairdressers, the largest proportion of the studied hairdressers were aged ≤ 40 years. Contributions of young workers in the main workforce were similarly found among Spanish, Brazilian, and Turkish studies.^(1, 12, 16)

Regarding the level of education, a high education level in the current study constituted nearly 16% of the studied sample, and middle education formed roughly 60%. This agreed with educational status observed among other Egyptian hairdressers in Benha, Kalyobiya governorate⁽¹⁰⁾, as well as the overall Egyptian women described by the Egyptian Demographic Health Survey, 2015.⁽¹⁷⁾

Regarding ownership of the salon, two-thirds of the studied sample were workers in the salons, and this is congruent with the results of Abia et al. (2016), who reported that 75% of Cameroonian female hairdressers were employed.⁽⁶⁾

According to work nature, the majority of hairdressers were full-time workers. This agreed with results reported by Loughlin and Oosthuizen (2012) in Western Australia⁽¹⁸⁾, Ferreira (2013) in Brazil⁽¹⁾, and Bradshaw et al. (2011) in the United Kingdom⁽¹³⁾. This might be explained by the fact that hairdressing job is considered the main source of earning for hairdressers, and most of them do not work at another job.

Regarding training in hairdressing job, 83.4% of the studied sample trained in this job during their work. This

might be attributed to the absence of beauty schools or colleges in the Egyptian formal or informal educational system. This is in contrast with the results of Bradshaw et al. (2011), where 72% of English hairdressers reported receiving previous training in this job in college or beauty schools.⁽¹³⁾

The current study assessed working conditions for the studied hairdressers using the European Agency for Safety and Health at Work, 2008.⁽¹¹⁾ The majority of the studied hairdressers reported good working conditions in the hair salons, including good posture, adequate lighting, wearing flat shoes during work, fair distribution of wet work, and electrical devices' protection against water splash.

Forty-three percent of the participants ignored entering the bathroom when needed during work pressure. The current study was not in the same line with Ferreira (2013), who observed a much lower percentage (8.5%) of the Brazilian studied sample reporting never or rarely having time for a toilet break while at work.⁽¹⁾

More than two-thirds of studied sample mentioned having insufficient ventilation in the salons. This result disagreed with the instructions of the European Agency for Safety and Health at Work, 2014. This agency ensures the existence of proper ventilation of hairdressing salons to minimize exposure to fumes during work.⁽¹⁹⁾

Approximately 65% of the participants reported dealing with hazardous products causing skin problems; however, only one-third of the hairdressers were previously informed about safely dealing with dangerous supplies. Moreover, a negligible percent had been trained in occupational safety. This highlight the value of educational training among these populations.

The results of current study showed that more than three-quarters of the hairdressers were knowledgeable about the probability of disease transmission through hair salons, although HCV, HBV, and HIV could be transmitted through unsafe beauty treatments (tattooing,

piercing, manicure, and pedicure) with improperly sterilized equipment. Blood-borne diseases were reported by a small number of the hairdressers. In contrast, a high level of awareness about blood-borne diseases was reported by Italian hairdressers. This attributed to national media HIV campaigns and HBV vaccinations of beauty center workers before employment.⁽⁴⁾ In Egypt, hairdressing is an ignored occupation, with an absence of a governmental policy that controls the practices of the hairdresser occupation or provides supportive services, such as training, essential vaccination, and health education. The majority of the studied population stated that gloves were available in the salon. However, a minority of them (7.7%) routinely used gloves. In the same line, a low percentage of Turkish hairdressers and barbers (19.4%) and Italian hairdressers (14.3%) used gloves during every procedure, as reported by Demir *et al.* (2014)⁽²⁰⁾ and Amodio *et al.* (2009).⁽²¹⁾

Glove material is one factor that affects the gloves' effectiveness as a barrier against biological agents. Latex gloves have less biological leakage than vinyl gloves.⁽²²⁾ In the current study, vinyl gloves were the most commonly used type. This finding disagreed with the results of Nixon *et al.* (2006), who showed that disposable latex gloves were the most popular gloves used in up to 70% of Australian participants.⁽²³⁾

Although the European Agency for Safety and Health at Work, 2014, recommends the use of gloves to protect from both chemical and biological hazards⁽¹⁹⁾, only 13.8% of hairdressers in the present study used gloves with dermatological invasive procedures such as tattooing and pedicures. This might be attributed to their low awareness about biological hazards resulting in non-usage of gloves during work. In the current study, nearly half of the participants reported facing problems while using gloves. The most frequently reported problems were hand sweating and difficulty working. Similar findings were reported by Nixon *et al.* (2006) among Australian hairdressers.⁽²³⁾

Regarding disinfection procedures, roughly 70% of the studied hairdressers disinfected their instruments. The frequently applied methods were immersing the tools in disinfectant solution (41%), using autoclave devices (26.7%), and cleaning the tools with water and soap (21%). This disagreed with the results of Kose *et al.* (2011), where the use of ultraviolet cleaner was the commonest disinfection method (80.9%) among Turkish hairdressers, followed by wiping with alcohol (41.7%), boiling (13.9%), and washing with an antiseptic solution (12.7%).⁽⁵⁾ Additionally, this finding disagreed with the results of Alemairy *et al.* (2016), who observed that autoclave, sanitizers, and flame were sterilization/disinfection methods used in Sudanese hairdressing salons.⁽²⁴⁾

In the present study, only 12.4% sterilized tools after each customer. This observation is in agreement a study

conducted in Sudan, which showed that only 10.2% of the Sudanese barber and female hairdresser participants disinfected instruments between customers.⁽²⁴⁾ However, a high proportion (66%) of Italian hairdressers reported disinfection of instruments between customers.⁽⁴⁾ likewise, only one-quarter of the studied hairdressers washed their hands between customers. In contrast, other studies showed that the majority of Turkish and Italian hairdressers wash their hands before each customer.^(4, 9)

In the current study, back pain was the predominantly reported chronic musculoskeletal pain (22.5%), followed by shoulder pain (17.2%), wrist pain (16.6%), and knee pain (12.6%). Similarly, back pain was the most reported complaint among other Egyptian and Greek studies. The most commonly reported chronic musculoskeletal pain sites among hairdressers in Benha, Kalyobiya governorate, were back pain (7.5%) and knee pain (7.5%), followed by shoulder pain (6.3%) and hand/wrist pain (6.3%).⁽¹⁰⁾ Cosmetologists in Greece reported low back and hand/wrist complaints as the most frequent musculoskeletal disorders.⁽²⁵⁾ In contrast, the shoulder was the most frequently affected body site among Brazilian hairdressers, followed by the neck and back.⁽²⁾

There is growing evidence of associating prolonged standing at work with the development of varicose veins. Nearly one-fifth of varicose vein cases in Denmark are attributed to prolonged standing or walking while at work.⁽²⁶⁾ The results of the present study showed that 23.8% of the studied hairdressers complained of varicose veins. A similar proportion of Taiwanese hairdressers (24.2%) had lower limb varicose veins.⁽²⁷⁾

In this data, approximately 6.6% of the hairdressers complained of bronchial asthma, and 10.3% had sinusitis. A Palestinian study linked the hairdressing occupation with respiratory symptoms and asthma, where higher prevalence was detected among female hairdressers when compared to controls.⁽²⁸⁾ Moreover, a follow up of the Palestinian hairdressers revealed that current workers developed more respiratory symptoms and declining lung functions than hairdressers who stopped working.⁽²⁹⁾

In this study, the prevalence of self-reported dermatitis was 5.3%. Hairdressers are frequently affected by occupational skin disorders, especially contact dermatitis.⁽³⁰⁾ This is attributed to the nature of their work and their exposure to irritant substances, such as bleaches, dyes, and permanent wave solutions. Studies conducted in Egypt, England, and Turkey reported skin affection among hairdressers.^(10, 13, 31)

Regarding risk factors associated with musculoskeletal complaints, no significant association was detected between age and musculoskeletal complaints, except for neck pain and knee pain. Only those who reported knee complaints had significantly higher mean durations of work when compared to those who did not. In contrast, all musculoskeletal symptoms were significantly associated with age and work experience among Egyptian female

hairdressers in Lower Egypt⁽¹⁰⁾ and with increasing experience among Brazilian hairdressing professionals.⁽²⁾

In the present study, BMI was not significantly associated with any of reported musculoskeletal complaints. However, an observed higher risk of musculoskeletal symptoms was detected among obese workers when compared to workers with normal weight in Netherland and Egyptian female hairdressers.^(10,32)

In the current study, complaints of varicose veins were significantly associated with increasing age and work experience. However, no significant association was detected with BMI. Similarly, Taiwanese hairdressers with varicose veins had significantly higher ages and longer work histories than those without varicose, and BMI had no significant association with varicose veins.⁽²⁷⁾

In the current study, there was no relationship between being a full- or part-time worker with reported musculoskeletal complaints or varicose veins. Similarly, being an owner, shared owner, or worker in the salon was not significantly associated with any of reported hairdressers' complaints, except for neck pain, which means that part- or full-time hairdressers are exposed to the same occupational hazards. In addition, most of hairdressing salons in Egypt are small stores, so the owners of salons practice this occupation with their co-workers to preserve the work quality and save on the cost of employing other workers.

CONCLUSION AND RECOMMENDATIONS

Proper working conditions and safe practices of the studied hairdressers were insufficient. They had deficient knowledge of blood-borne diseases transmitted during their occupation. Moreover, they complained of musculoskeletal pain, varicose veins, and respiratory manifestations.

Pre-employment health education programs should be provided to the hairdressers to raise their awareness about the measures to mitigate health hazards and value disinfecting their equipment. Construction and regular checks of maintenance of the hairdressing salons should be initiated and supervised by governmental authorities.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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