

# Working Environments and Health Behaviors of Barbers

## Erkek Kuaförlerin Çalışma Ortamları ve Sağlık Davranışları

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**ABSTRACT Objective:** The study aims to evaluate the working environments and health behaviors of barbers. **Material and Methods:** The study was a cross-sectional study and conducted with 206 barbers. The study was carried out between May and September 2019 in barbershops operating in İzmit, Kartepe, and Başiskele districts of the city of Kocaeli. Survey form was used in the research. The descriptive statistics were presented as distribution of frequencies, and percentages. **Results:** Of the participants 33.5% were in the 31-40 age group, the mean age was 38.3±9.9 years. 77.2% of the participants were married, 45.6% were secondary school graduates. In the study, it was observed that 55.0% of the barbers washed their hands before and after each procedure, 42.9% had hepatitis B vaccination, and 96.6% stopped the bleeding with hematite (bloodstone) when the customer had bleeding. Leg pain was detected in 35.4% and lower back pain was detected in 21.8% of the participants. 55.0% of the barbers stated that they washed their hands before and after each procedure, 42.9% had regular health check-ups, 35.6% had their last check-up in one month. 37.9% of the participants stated that they cleaned their equipment with disinfection machine, 15.0% with disinfectants, 13.6% with alcohol and bleach. **Conclusion:** It was determined in the study that approximately half of the barbers washed their hands before and after each procedure. Barbers are recommended to be trained in hygiene and infectious diseases.

**Keywords:** Hygiene; health behaviour; Hepatitis B; barbering

**ÖZET Amaç:** Araştırmada erkek kuaförlerin çalışma ortamları ve sağlık davranışlarının değerlendirilmesi amaçlanmaktadır. **Gereç ve Yöntemler:** Araştırma kesitsel tipte bir çalışma olup, 206 erkek kuaförle yürütülmüştür. Araştırma Mayıs-Eylül 2019 tarihlerinde Kocaeli ili İzmit, Kartepe ve Başiskele ilçelerinde faaliyet gösteren erkek kuaförlerde gerçekleştirilmiştir. Araştırmada anket formu kullanılmıştır. Tanımlayıcı istatistikler, frekans dağılımı ve yüzde olarak sunulmuştur. **Bulgular:** Araştırmaya katılanların %33,5'i 31-40 yaş grubunda olup; yaşları ortalaması 38,3±9,9'dur. Katılımcıların %77,2'si evli, %45,6'sı ortaokul mezunudur. Çalışmada erkek kuaförlerin %55,0'inin her işlemden önce ve sonra ellerini yıkadığı; %42,9'unun hepatit B aşısı yaptırdığı ve %96,6'sının müşteri kanadığında kan taşı ile durdurduğu saptanmıştır. Araştırmaya katılanların %35,4'ünde bacaklarda ağrı, %21,8'inde bel ağrısı tespit edilmiştir. Çalışmada, berberlerin %55,0'i her işlemden önce ve sonra ellerini yıkadıklarını, %42,9'unun düzenli sağlık kontrolleri, %35,6'sının bir ay içinde son kontrolleri olduğunu belirtti. Araştırmaya katılanların %37,9'u dezenfeksiyon makinesi, %15,0'i dezenfektan madde, %13,6'sı alkol ve çamaşır suyu ile aletleri temizlediğini belirtmiştir. **Sonuç:** Çalışmada erkek kuaförlerin yaklaşık yarısının her işlemden önce ve sonra ellerini yıkadığı saptanmıştır. Erkek kuaförlere hijyen ve bulaşıcı hastalıklar hakkında eğitimler verilmesi önerilmektedir.

**Anahtar Kelimeler:** Hijyen; sağlık davranışı; Hepatit B; berberlik

Hairdressers and barbers have many potential health hazards in their workplaces, including biological, chemical, physical, and ergonomic factors.<sup>1</sup> There are hundreds of chemicals in cosmetic products commonly used by hairdressers and barbers such as shampoos, hair dyes, sprays, and hair conditioners.<sup>2</sup> Hairdressers and barbers may be exposed to a large number of chemicals in their working environments, usually without adequate ventilation or using personal protective equipment.<sup>3</sup>

Hairdressers and barbers are exposed to various occupational health risks such as standing for a long time, low posture and mechanical loading generally in the joints, working for a long time without having a break and thus missed meals.<sup>4</sup> Occupation-related musculoskeletal disorders, including upper extremity disorders, carpal tunnel syndrome, tendonitis and back problems, are common in hairdressers and barbers. These are attributed to the need to maintain strange positions of the upper body

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and extremities and to make excessive repetitive movements.<sup>5</sup>

The incidence of occupational skin diseases is high in hairdressers and barbers. The most commonly reported skin diseases include allergic and irritant dermatitis.<sup>6</sup> Hairdressers and barbers are also exposed to physical risk factors such as noise and high temperatures.<sup>4</sup>

During haircutting, hairdressers and barbers may be exposed to blood contact with their customers due to accidental or unsafe practices and may catch blood-borne infections. They can also transmit their infections to their customers or transfer the infection from one customer to another.<sup>7</sup>

Studies on the working environments, applications, health information, and behaviors of barbers are insufficient. The study aims to evaluate the working environments and health behaviors of barbers.

## MATERIAL AND METHODS

This is a cross-sectional study. The study was carried out between May and September 2019 in barbershops operating in İzmit, Kartepe, and Başiskele districts of the city of Kocaeli. Survey form was used in the research. There are 419 barbers in total. The number of barbers to be targeted was calculated as 201 according to the formula of  $n = (N * t(1-\alpha)^2 * p * q) / [S^2 * (N-1) + t(1-\alpha)^2 * p * q]$  used in the calculation of sample size in cases where the number of individuals in the population is known by assuming  $N=419$ ,  $S= 0.05$ ,  $p=0.50$ ,  $q=0.50$ ,  $t(1-\alpha)=1.96$ . The study was conducted with 206 barbers. Ethics committee approval for the study was obtained from the Clinical Research Ethics Committee of the University of Health Sciences Derince Training and Research Hospital (date: 25.04.2019, issue: 2019-20). A questionnaire was used in the study. The study was conducted in accordance with the Declaration of Helsinki Principles. Permission was obtained from the participants.

The study data were evaluated with SPSS 22.0 program. The descriptive statistics were presented as distribution of frequencies and percentages. If the variables are normally distributed, they are presented as mean  $\pm$  standard deviation, if not, by the median (minimum-maximum).

## RESULTS

206 barbers were reached within the scope of the study.

Of the participants 33.5% (n=69) were in the 31-40 age group, the mean age was  $38.3 \pm 9.9$ . 77.2% (n=159) of the participants were married, 45.6% (n=94) were secondary school graduates, 79.6% (n=164) were business owners, 80.5% (n=165) were masters, 79.6% (n=164) worked 6 days a week, and the median duration of occupational work was 22 (1; 50) years (Table 1).

**TABLE 1:** Distribution of socio-demographic characteristics of the participants.

	n (%)*
<b>Age</b>	
30 years and below	51 (24.7)
Between 31-40 years	69 (33.5)
Between 41-50 years	64 (31.1)
51 years and above	22 (10.7)
Total	206 (100)
<b>Marital status</b>	
Married	159 (77.2)
Single	47 (22.8)
Total	206 (100)
<b>Educational status</b>	
Primary school graduate	79 (38.4)
Secondary school graduate	94 (45.6)
High school graduate and higher	33 (16.0)
Total	206 (100)
<b>Position in the workplace</b>	
Business owner	164 (79.6)
Employed	42 (20.4)
Total	206 (100)
<b>Occupational position</b>	
Master	165 (80.5)
Assistant	36 (17.6)
Apprentice	4 (1.9)
Total	205 (100)
<b>Duration of occupational work (years)</b>	
Median (Min; Max)	22 (1; 50)
<b>Number of days worked per week</b>	
5	7 (3.4)
6	164 (79.6)
7	35 (17.0)
Total	206 (100)

\*: Column percentage.

Of the workplaces visited in the study, the size of 23.8% (n=49) was 15 m<sup>2</sup> or below, 28.2% (n=58) was between 16-20 m<sup>2</sup>, 15.5% (n=32) was between 21-25 m<sup>2</sup> and 32.5% (n=67) was 26 m<sup>2</sup> and above. 26.7% (n=55) of the participants stated that they sent towels to wash after each customer, 12.1% (n=25) sent them to wash after two customers, 23.3% (n=48) every evening, and 7.8% (n=16) stated that they used disposable towels. There were medicine cabinets in 23.8% (n=49) and medical waste containers in 12.6% (n=26) of the workplaces.

In the study, 55.0% (n=110) of the barbers stated that they washed their hands before and after each procedure, 43.0% (n=88) had regular health check-ups, 35.6% (n=52) had their last check-up in one month, 12.1% (n=25) had a chronic disease, 13.9% (n=28) were using drugs regularly, 54.9% (n=112) were smoking, and 3.9% (n=8) had been injured in the workplace within the last year (Table 2).

In the study, 44.7% (n=92) of the barbers stated that there was a risk of infectious disease in their works. To protect themselves against infectious diseases, 85.9% (n=177) stated that they washed their hands, 42.9% (n=87) had hepatitis B vaccination, 82.0% (n=168) had tetanus vaccination, 71.1% (n=145) received hygiene education, and 96.6% (n=199) stopped the bleeding with hematite when the customer had bleeding (Table 3).

Of the participants 37.9% (n=78) stated that they cleaned their equipment (scissors, comb, brush, etc.) with disinfection machine, 15.0% (n=31) with disinfectants, 13.6% (n=28) with alcohol and bleach. 77.7% (n=160) of the employees stated that sterilization was carried out in their workplaces, and 47.5% (n=76) of them carried out their sterilization procedures by ultraviolet light, 30.6% (n=49) with alcohol, 28.8% (n=46) by immersing in disinfectants and 20.0% (n=32) by washing with soapy water.

In the study, 77.9% (n=155) of the participants stated that hepatitis B was a disease with serious damages, 69.3% (n=142) stated that hepatitis B was an infectious disease and 49.0% (n=100) stated that hepatitis C was a disease with serious damages, 39.6% (n=80) stated that hepatitis C was an infectious disease, 95.1% (n=195) stated that AIDS was a disease

**TABLE 2:** Distribution of health status and behaviors of the participants.

	n (%)*
<b>Frequency of handwashing during the day</b>	
At odd times	29 (14.5)
Before the procedure	27 (13.5)
After the procedure	34 (17.0)
Before and after the procedure	110 (55.0)
Total	200 (100)
<b>Status of having regular health check-ups</b>	
Yes	88 (43.0)
No	117 (57.0)
Total	205 (100)
<b>Last check-up time</b>	
In one month	52 (35.6)
Three months	23 (15.8)
Six months	32 (21.9)
One year or more	39 (26.7)
Total	146 (100)
<b>Presence of chronic disease</b>	
Yes	25 (12.1)
No	181 (87.9)
Total	206 (100)
<b>Regular drug use</b>	
Yes	28 (13.9)
No	174 (86.1)
Total	202 (100)
<b>Smoking status</b>	
Never smoked	45 (22.1)
Used to smoke, but quit	47 (23.0)
Still smoking	112 (54.9)
Total	204 (100)
<b>Injury at work within the last year</b>	
Yes	8 (3.9)
No	196 (96.1)
Total	204 (100)
<b>Number of injuries</b>	
Median (Min; Max)	2 (1; 5)

\*: Column percentage.

with serious damages, 94.1% (n=190) stated that AIDS was an infectious disease (Table 4).

It was detected that 35.4% (n=73) of the participants had pain in their legs, 21.8% (n=45) had lower back pain, 21.4% (n=44) had neck pain, 19.9% (n=41) had back pain, 16.5% (n=34) had headache, and 10.7% (n=22) had pain in their hands and arms (Table 5).

**TABLE 3:** Distribution of behaviors of the participants related to infectious diseases.

	n (%)*
<b>Presence of infectious disease risk in your work</b>	
Yes	92 (44.7)
No	114 (55.3)
Total	206 (100)
<b>Actions for protection against infectious diseases **</b>	
I don't do anything.	8 (3.9)
I wear a mask	26 (12.6)
I wear gloves	35 (17.0)
I wash my hands	177 (85.9)
Total	206 (100)
<b>Status of having hepatitis B vaccination</b>	
Yes	87 (42.9)
No	116 (57.1)
Total	203 (100)
<b>Status of having a tetanus vaccination</b>	
Yes	168 (82.0)
No	37 (18.0)
Total	205 (100)
<b>Status of receiving hygiene education</b>	
Yes	145 (71.1)
No	59 (28.9)
Total	204 (100)
<b>Method of stopping the bleeding of the customer**</b>	
Dry cotton	12 (5.8)
Cologne	9 (4.4)
Tincture of iodine	5 (2.4)
Hematite (Bloodstone)	199 (96.6)
Alcohol	3 (1.5)
Total	206 (100)

\*: Column percentage \*\*: More than one option is selected, percentages are calculated over the total people.

## DISCUSSION

More than half of the barbers in the study were found to be smokers. Galiotte et al. found that 31.9% of the hairdressers were smoking in a study conducted with hairdressers in Brazil.<sup>8</sup> Mandira-cioglu et al. found that 54.3% of the barbers and hairdressers were smoking in a study conducted with barbers and hairdressers in İzmir.<sup>9</sup> In a study conducted by Hakim and Abdel-Hamid, it was found that 67.5% of the hairdressers were smoking.<sup>10</sup> Studies show that hairdressers smoke too much.

Of the participants 55% stated that they washed their hands before and after each procedure. 75.6% stated that they washed their hands before and after each procedure in a study conducted by Kose et al. in barbers', hairdressers' salons and beauty parlors in İzmir.<sup>7</sup> 52% stated that they washed their hands at odd times and 48% after each procedure in a study conducted by Şahin et al. with hairdressers.<sup>11</sup> Duru-soy et al. found in their study conducted with manicurists and pedicurists that 52.3% washed their hands before and after the procedure.<sup>12</sup> In a study conducted by Demir et al. with barbers and hairdressers in

**TABLE 4:** Information status of the participants related to infectious diseases.

	n (%)*
<b>Is hepatitis B a disease with serious damages?</b>	
Yes	155 (77.9)
No	10 (5.0)
I do not know	34 (17.1)
Total	199 (100)
<b>Is hepatitis B an infectious disease?</b>	
Yes	142 (69.3)
No	21 (10.2)
I do not know	42 (20.5)
Total	205 (100)
<b>Is hepatitis C a disease with serious damages?</b>	
Yes	100 (49.0)
No	12 (5.9)
I do not know	92 (45.1)
Total	204 (100)
<b>Is hepatitis C an infectious disease?</b>	
Yes	80 (39.6)
No	17 (8.4)
I do not know	105 (52.0)
Total	202 (100)
<b>Is AIDS a disease with serious damages?</b>	
Yes	195 (95.1)
No	3 (1.5)
I do not know	7 (3.4)
Total	205 (100)
<b>Is AIDS an infectious disease?</b>	
Yes	190 (94.1)
No	3 (1.5)
I do not know	9 (4.5)
Total	202 (100)

\*: Column percentage.

**TABLE 5:** Distribution of health complaints of the participants.

Complaints	Presence of complaints		Increased complaints while working	
	n (%)*	Total (%)*	n (%)*	Total (%)*
Pain in the legs	73 (35.4)	206 (100)	56 (76.7)	73 (100)
Lower back pain	45 (21.8)	206 (100)	35 (77.8)	45 (100)
Neck pain	44 (21.4)	206 (100)	31 (70.5)	44 (100)
Back pain	41 (19.9)	206 (100)	32 (78.0)	41 (100)
Headache	34 (16.5)	206 (100)	12 (35.3)	34 (100)
Pain in the hands and arms	22 (10.7)	206 (100)	14 (63.6)	22 (100)
Fungal infection	16 (7.8)	206 (100)	8 (50.0)	16 (100)
Watering of eyes	16 (7.8)	206 (100)	7 (43.8)	16 (100)
Skin dryness and rash	13 (6.31)	206 (100)	5 (38.5)	13 (100)
Itching	7 (3.39)	206 (100)	5 (71.4)	7 (100)

\*: Column percentage.

Adıyaman, 56% stated that they washed their hands after each customer, 24% when their hands got dirty and 20% at the end of working hours.<sup>13</sup> Togan et al. determined that 76% of the hairdressers washed their hands after each customer in their study conducted with hairdressers in Aksaray.<sup>14</sup> The frequency of hand washing before and after the procedure is observed to be low in these studies. This may be due to the education levels and lack of training on the hygiene of hairdressers and barbers.

In the study, 26.6% of the participants stated that they sent towels to wash after each customer, 23.3% sent them to wash every evening and 7.7% stated that they used disposable towels. In the study of Togan et al., 47.5% stated that they used separate towels for each customer and 38.9% stated that they used disposable towels.<sup>14</sup> In our study, the frequency of using separate towels was as low as in the other studies.

Of the barbers 42.8% were found to have hepatitis B vaccination in the present study. 39.3% were found to have hepatitis B vaccination in the study conducted by Şahin et al.<sup>11</sup> Durusoy et al. found that 60% had hepatitis B vaccination in their study.<sup>12</sup> Togan et al. determined in their study that 28.8% had hepatitis B vaccination.<sup>14</sup> Although it is important to have hepatitis B vaccination in hairdressers and barbers, vaccination rates are observed to be very insufficient.

Of the participants 96.6% stated that they stopped the bleeding with hematite. Kose et al. found in their study that 35.9% used hematite, 44.4% used dry cotton and 19.7% used cotton with cologne for clotting.<sup>7</sup> In the study conducted by Togan et al., 25% stated that they stopped the bleeding with dry cotton, 18.6% with tincture of iodine, 15% with alcohol, 10% with cologne and 3.4% with hematite.<sup>14</sup>

Of the participants 37.8% stated that they cleaned their equipment (scissors, comb, brush, etc.) with disinfection machine, 15.0% with disinfectants, and 13.5% with alcohol and bleach in the study. 77.6% of the employees stated that sterilization was carried out in their workplaces, and 47.5% of them carried out their sterilization procedures by ultraviolet light, 30.6% with alcohol, 28.7% by immersing in disinfectants and 20.0% by washing with soapy water. Mandiracioglu et al. determined that 80.9% used ultraviolet sterilization devices, 9.2% preferred to wash their equipment with soapy water, 41.7% wiped it with alcohol and 12.7% immersed it in disinfectant chemicals in their study.<sup>9</sup> In the study of Şahin et al., 39.5% stated that they cleaned their equipment with sterilization device, 16.9% with bleach, 32.3% with zephiran/disinfectant, and 9.7% with clear water.<sup>11</sup> In the study conducted by Durusoy et al., 90.5% stated that they disinfected their equipment with dry-heat sterilizer, 29.4% stated that they



wiped it with cologne/alcohol, 19.8% stated that they kept it in bleach.<sup>12</sup> In the study of Demir et al., 48.9% stated that they used ultraviolet light, 25% boiling method, 13.8% dry-heat sterilizer, 11.5% autoclave.<sup>13</sup> It was found in the study of Togan et al. that 45.8% used ultraviolet sterilization device, and 27.1% used alcohol.<sup>14</sup>

It was found that 35.4% of the participants had pain in their legs, 21.8% had lower back pain, 21.3% had neck pain, and 19.9% had back pain. Mandiracioglu et al. found that 32% had musculoskeletal disorders and the most common ones were lower back pain in 27.4% and lumbago in 25.5% in their study.<sup>9</sup> In the study conducted by Hassan and Bayomy, it was found that 13.8% had pain in their elbow, 12.5% in their lower back and shoulder, 11.3% in their hand/wrist, and 10% in their leg and foot within the last 12 months.<sup>15</sup> Lower back pain was found in 32% and shoulder/arm pain was found in 36% in the study conducted by Hakim and Abdel-Hamid.<sup>10</sup> Mermer et al. found that 59.1% had neck pain, 57.7% shoulder pain, 51.2% leg pain, 46.1% lower back pain and 42.6% wrist pain in their study.<sup>16</sup> Studies show that musculoskeletal problems are at a significant degree.

It was determined that 16.5% of the barbers in the study had a headache, 7.7% eye-watering and fungal infection, and 6.3% skin dryness and rash. Mandiracioglu et al. found in their study that 35% had at least one allergic complaint, 5.8% had a headache, and 15.5% had varicose veins.<sup>9</sup> It was found in the study conducted by Hakim and Abdel-Hamid that 31% had watery eyes and 22% had coughs.<sup>10</sup> Conjunctivitis was observed in 38.7% and fatigue was observed in 62.1% in the study conducted by Mermer et al.<sup>16</sup>

## CONCLUSION

It was determined in the study that approximately half of the barbers washed their hands before and after each procedure and approximately one-quarter of them changed towels after each customer. 42% of the participants were found to have hepatitis B vaccination. It was found that approximately one-third of the participants had leg pain, and approximately one-fifth of them had lower back, neck and back pain. Barbers are recommended to be provided with training on hygiene, infectious diseases, and exercise and have hepatitis B vaccination.

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### Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

### Authorship Contributions

**Idea/Concept:** Mustafa Çakır, Cankut Gönenç, Ahmet Akalan, Nuray Yılmaz; **Design:** Mustafa Çakır, Cankut Gönenç, Ahmet Akalan, Nuray Yılmaz; **Control/Supervision:** Mustafa Çakır, Cankut Gönenç, Ahmet Akalan, Nuray Yılmaz; **Data Collection and/or Processing:** Mustafa Çakır, Cankut Gönenç, Ahmet Akalan, Nuray Yılmaz; **Analysis and/or Interpretation:** Mustafa Çakır; **Literature Review:** Mustafa Çakır, Cankut Gönenç, Ahmet Akalan, Nuray Yılmaz; **Writing the Article:** Mustafa Çakır, Cankut Gönenç, Ahmet Akalan, Nuray Yılmaz; **Critical Review:** Mustafa Çakır, Cankut Gönenç, Ahmet Akalan, Nuray Yılmaz; **References and Findings:** Mustafa Çakır, Cankut Gönenç, Ahmet Akalan, Nuray Yılmaz.

## REFERENCES

- Hollund BE, Moen BE. Chemical exposure in hairdresser salons: effect of local exhaust ventilation. *Ann Occup Hyg.* 1998;42(4):277-82. [[Crossref](#)] [[PubMed](#)]
- Mounier-Geyssant E, Oury V, Mouchot L, Paris C, Zmirou-Navier D. Exposure to hairdressing apprentices to airborne hazardous substances. *Environ Health.* 2006;5:23. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Wenzel SM, Welzel J, Hafner C, Landthaler M, Bäuml W. Permanent make-up colorants may cause severe skin reactions. *Contact Dermatitis.* 2010;63(4):223-7. [[Crossref](#)] [[PubMed](#)]
- Mussi G, Gouveia N. Prevalence of work-related musculoskeletal disorders in Brazilian hairdressers. *Occup Med (Lond).* 2008;58(5):367-9. [[Crossref](#)] [[PubMed](#)]
- English CJ, Maclaren WM, Court-Brown C, Hughes SP, Porter RW, Wallace WA, et al. Relations between upper limb soft tissue disorders and repetitive movements at work. *Am J Ind Med.* 1995;27(1):75-90. [[Crossref](#)] [[PubMed](#)]
- Lyons G, Roberts H, Palmer A, Matheson M, Nixon R. Hairdressers presenting to an occupational dermatology clinic in Melbourne, Australia. *Contact Dermatitis.* 2013;68(5):300-6. [[Crossref](#)] [[PubMed](#)]
- Kose S, Mandiracioglu A, Oral AM, Emek M, Gozaydin A, Kuzucu L, et al. Seroprevalence of hepatitis B and C viruses: awareness and safe practices of hairdressers in Izmir: a survey. *Int J Occup Med Environ Health.* 2011;24(3):275-82. [[Crossref](#)] [[PubMed](#)]
- Galiotte MP, Kohler P, Mussi G, Gattas GJF. Assessment of occupational genotoxic risk among Brazilian hairdressers. *Ann Occup Hyg.* 2008;52(7):645-51. [[PubMed](#)]
- Mandiracioglu A, Kose S, Gozaydin A, Turken M, Kuzucu L. Occupational health risks of barbers and coiffeurs in Izmir. *Indian J Occup Environ Med.* 2009;13(2):92-6. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Hakim SA, Abdel-Hamid MA. Occupational health risks of hairdressers: knowledge, practice and self-reported symptoms. *Egyptian J Occup Med.* 2019;43(1):161-74. [[Crossref](#)]
- Şahin NH, Bilgiç D, Esen Ü, Çetinkaya R, Tozoğlu Z. [Determining knowledge and practices of hairdressers and manicurist-pedicurists about hepatitis B]. *TAF Prev Med Bull.* 2009;8(2):147-54.
- Durusoy R, Mermer G, Türk Soyer M. [Knowledge on infection control and practices of manicurists and pedicurists in establishments registered to the chamber of professionals in Bornova]. *Ege Journal of Medicine.* 2012;51(2):83-91.
- Aktuğ Demir N, Kögelier S, Demir LS, Özçimen S, Inkaya AC. The knowledge and behavior of hairdressers and barbers on blood-borne diseases. *Viral Hepatitis Journal.* 2014;20(2):67-71. [[Crossref](#)]
- Togan T, Tosun S, Turan H, Arslan H. Knowledge and behavior of coiffeur employees about hepatitis in Aksaray city center. *Ege Journal of Medicine.* 2014;53(4):189-94.
- Hassan OM, Bayomy H. Occupational respiratory and musculoskeletal symptoms among Egyptian female hairdressers. *J Community Health.* 2015;40(4):670-9. [[Crossref](#)] [[PubMed](#)]
- Mermer G, Türk M, Durusoy R. [Hairdressers' working conditions and occupational health problems]. *Türk Tabipleri Birliği Mesleki Sağlık ve Güvenlik Dergisi.* 2014:70-6.