

ORIGINAL CONTRIBUTIONS

The course of acne in healthcare workers during the COVID-19 pandemic and evaluation of possible risk factors

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Abstract

Background: There are a limited number of publications reporting an increase in acne in the COVID-19 outbreak.

Objective: The study aimed to evaluate the course and the clinical features of acne and possible risk factors during the COVID-19 pandemic in healthcare workers.

Method: A total of 172 physicians (female, $n = 159$, male; $n = 13$, mean age = 35.03 ± 5.27 years) who had acne in any period of their life were included in the study. A self-administered online questionnaire was applied.

Results: During the COVID-19 pandemic, 45.35% of the participants reported that their acne complaints increased, 27.33% reported relapses, and 7.56% reported occurrence for the first time. Newly formed acne was reported most frequently on the chin (78.26%). The number of female participants, smoking, increased stress, and the rate of surgical mask use were found to be higher in the group whose acne occurred for the first time, relapsed, or increased than in the group whose acne complaints were unchanged or decreased ($p < 0.05$). In the group whose acne relapsed or increased, adult-onset acne, presence of scar, and use of systemic acne treatment before the COVID-19 pandemic were more common than in the group whose acne complaints were unchanged or decreased ($p < 0.05$).

Conclusion: Almost half of the participants reported an increase in acne. More than a third of the participants reported that their acne relapsed or they had acne for the first time. In addition to the use of surgical masks, factors such as increased stress, smoking, adult-onset acne, presence of scar, and previous systemic acne treatment were found to be responsible for acne development.

KEYWORDS

acne, COVID-19, healthcare worker, mask

1 | INTRODUCTION

The COVID-19 outbreak, which was first reported in December 2019 and declared as a pandemic by the World Health Organization (WHO) on March 11, 2020, significantly affects the field of dermatology. While dermatoses associated with COVID-19 have been described, some dermatoses have been reported to increase with the effect of measures such as hand hygiene and the use of personal

protective equipment (PPE).¹⁻⁶ There are a limited number of publications in the literature reporting an increase in acne frequency in both healthcare workers (HCWs) and the community with the increase in the use of masks during the COVID-19 pandemic.⁶⁻⁸ However, although acne was associated with masks, the details of the use of masks (eg, mask type, duration of use) were not questioned, and other factors that could cause acne to increase were not evaluated.

The main purpose of this study was to evaluate the course and clinical features of acne in HCWs during the COVID-19 pandemic and possible risk factors affecting the development of acne. It was aimed to raise awareness about acne and preventive measures that can be taken against acne formation during the COVID-19 pandemic.

2 | MATERIALS AND METHODS

2.1 | Collection of data

Ethics committee approval was obtained from the local ethics committee (Decision no: 2020/9-5). A self-administered online questionnaire was used in this cross-sectional survey study conducted throughout Turkey between November 1 and December 31, 2020. A total of 172 physicians who worked actively during the COVID-19 pandemic and had acne in any period of their lives were included in this study. They were divided into two groups as one group whose acne complaints were triggered or increased ($n = 138$) and the other group whose acne complaints were unchanged or decreased ($n = 34$). While evaluating personal acne history variables, participants with acne for the first time were excluded from the statistics. The drugs used by the participants were grouped as drugs that increased acne, reduced acne, and did not affect acne.^{9,10} The first COVID-19 case in Turkey was reported on March 11, 2020. In addition, COVID-19 was declared a pandemic by the World Health Organization on March 11, 2020. Prior to this date, it was considered "before the COVID-19 pandemic".

2.2 | Design of questionnaire

Socio-demographic characteristics such as gender and age were questioned. In addition, in the questionnaire, the course of acne during the COVID-19 pandemic, the clinical features of the newly formed acne, and the factors that can be responsible for acne development, such as the clinical history of acne, the type of mask used, the duration of the mask use, the interruption duration of mask use, genetic predisposition to acne, increased stress, face washing habits, the use of additional drugs and changing dietary habits (Appendix 1) were questioned.

2.3 | Statistics

Statistical analyses were performed with SPSS software. The compliance of the variables to normal distribution was examined using histogram graphics and the Kolmogorov-Smirnov test. Mean, standard deviation, and median values were used while presenting descriptive analyses. Categorical variables were compared with the Pearson chi-square test. Mann-Whitney U test evaluated variables between the two groups that do not show normal distribution (non-parametric). Factors affecting acne formation were examined with binary logistic

regression analysis. A p -value of <0.05 was considered statistically significant.

3 | RESULTS

3.1 | Demographic data

A total of 172 physicians (female; $n = 159$, male; $n = 13$) were included in the study. The mean age of the participants was 35.03 ± 5.27 years. As the rate of women in the group whose acne was triggered or increased was 94.93%, such a rate was found to be 82.35% in the group whose acne was unchanged or decreased ($p < 0.05$). While the smoking rate was 21.01% in the group whose acne complaints were triggered or increased, it was 2.94% in the group whose acne complaints were unchanged or decreased ($p < 0.05$). There was no significant difference between the group whose acne was triggered or increased and the group whose acne was unchanged or decreased, in terms of mean age (34.75 ± 5.15 and 36.18 ± 5.69 , respectively) and working years in the profession (10.14 ± 4.99 and 11.65 ± 5.92 , respectively) ($p > 0.05$). The mean body mass index was 24.13 ± 4.15 in the group whose acne was triggered or increased, and 26.80 ± 4.64 in the group whose acne was unchanged or decreased ($p < 0.05$). The demographic characteristics of the groups are presented in Table 1.

3.2 | Clinical history of acne

49.42% of the participants had a history of acne in their first-degree relatives. Acne was reported most frequently in siblings (43.02%) in the family history. Adult-onset acne rate was 21.60% in the group whose acne relapsed or increased and 5.88% in the group whose acne was unchanged or decreased ($p < 0.05$). The rate of acne only in adulthood was 19.57% in the group whose acne complaints relapsed or increased, and 5.88% in the group whose acne complaints were unchanged or decreased. Before the COVID-19 pandemic, in the group whose acne relapsed or increased, 62.40% of the participants had acne scars, and 41.60% of the participants used systemic acne treatment. In the group whose acne was unchanged or decreased, these rates were 26.47% and 26.47%, respectively ($p < 0.05$). Before the COVID-19 pandemic, those who did not receive treatment for acne were 55.88% in the group whose acne complaints were unchanged or decreased, and 32.80% in the group whose acne complaints relapsed or increased ($p < 0.05$) (Table 2).

3.3 | Course of acne

45.35% ($n = 78$) of the participants stated that their acne complaints increased, 27.33% ($n = 47$) stated a relapse, and 7.56% ($n = 13$) reported that it occurred for the first time during the COVID-19 pandemic. Those with unchanged acne were 18.02% of the participants, and those with reduced acne were 1.74% of the participants.

TABLE 1 Demographical and clinical properties of the participants

	Triggered or increased acne	Unchanged or decreased acne	Total	p-value
	n %	n %	n %	
Gender				
Female	131 (94.93)	28 (82.35)	159 (92.44)	<0.05
Male	7 (5.07)	6 (17.65)	13 (7.56)	
Institution: pandemic hospital				
Yes	75 (54.35)	20 (58.82)	95 (55.23)	>0.05
No	63 (45.65)	14 (41.18)	77 (44.77)	
Direct contact with a diagnosis/suspicious COVID-19 patient				
Available	92 (66.67)	17 (50.00)	109 (63.37)	>0.05
None	46 (33.33)	17 (50.00)	63 (36.63)	
Smoking				
Yes	29 (21.01)	1 (2.94)	30 (17.44)	<0.05
No	109 (78.99)	33 (97.06)	142 (82.56)	
History of acne in first-degree relatives				
Available	72 (52.17)	13 (38.24)	85 (49.42)	>0.05
None	66 (47.83)	21 (61.76)	87 (50.58)	
Menstrual cycle				
Regular before and during the COVID-19 pandemic	107 (81.68)	23 (82.14)	130 (81.76)	>0.05
Irregular before COVID-19 and regular during the COVID-19 pandemic	1 (0.76)	2 (7.14)	3 (1.89)	
Regular before COVID-19 and irregular during the COVID-19 pandemic	11 (8.40)	2 (7.14)	13 (8.18)	
Irregular before and during the COVID-19 pandemic	12 (9.16)	1 (3.57)	13 (8.18)	
Diagnosis of hormonal disorder				
Available	13 (9.92)	2 (7.14)	15 (9.43)	>0.05
None	118 (90.08)	26 (92.86)	144 (90.57)	
Diagnosis of insulin resistance				
Available	16 (11.59)	5 (14.71)	21 (12.21)	>0.05
None	122 (88.41)	29 (85.29)	151 (87.79)	
Working duration during the COVID-19 pandemic (in a week)				
<24 h	3 (2.17)	2 (5.88)	5 (2.91)	>0.05
24–40 h	52 (37.68)	11 (32.35)	63 (36.63)	
>40 h	83 (60.14)	21 (61.76)	104 (60.47)	
Increased food consumption that may increase acne during the COVID-19 pandemic				
Yes	122 (88.41)	33 (97.06)	155 (90.12)	>0.05
No	16 (11.59)	1 (2.94)	17 (9.88)	
Increased milk and dairy products consumption during the COVID-19 pandemic				
Yes	53 (38.41)	14 (41.18)	67 (38.95)	>0.05
No	85 (61.59)	20 (58.82)	105 (61.05)	
Stress during the COVID-19 pandemic				
Decreased	1 (0.72)	3 (8.82)	4 (2.33)	0.009
Not changed	3 (2.17)	2 (5.88)	5 (2.91)	
Increased	134 (97.10)	29 (85.29)	163 (94.77)	

(Continues)

TABLE 1 (Continued)

	Triggered or increased acne	Unchanged or decreased acne	Total	p-value
	n %	n %	n %	
Treatments received during the COVID-19 pandemic				
No treatment	78 (56.52)	31 (91.18)	109 (63.37)	0.001
Topical treatments	51 (36.96)	3 (8.82)	54 (31.40)	
Systemic treatments	9 (6.52)	0 (0.00)	9 (5.23)	
Face washing product				
Non-comedogenic	65 (47.10)	7 (20.59)	72 (41.86)	0.005
Other than non-comedogenic	73 (52.90)	27 (79.41)	100 (58.14)	

Bold values are statistically significant results.

TABLE 2 Personal acne history

	Relapsed or increased acne	Unchanged or decreased acne	Total	p-value
	n %	n %	n %	
The time of acne onset				
Adolescence	98 (78.40)	32 (94.12)	130 (81.76)	<0.05
Over 25 years old	27 (21.60)	2 (5.88)	29 (18.24)	
The periods when acne was experienced				
Only in adolescence	26 (18.84)	7 (20.59)	33 (19.19)	<0.05
In adolescence and adulthood	72 (52.17)	25 (73.53)	97 (56.40)	
Only in adulthood	27 (19.57)	2 (5.88)	29 (16.86)	
Acne scar before the COVID-19 pandemic				
Yes	78 (62.40)	9 (26.47)	87 (54.72)	<0.001
No	47 (37.60)	25 (73.53)	72 (45.28)	
Treatments received before the COVID-19 pandemic				
No treatment	41 (32.80)	19 (55.88)	60 (37.74)	<0.05
Topical treatments	32 (25.60)	6 (17.65)	38 (23.90)	
Systemic treatments	52 (41.60)	9 (26.47)	61 (38.36)	

Bold values are statistically significant results.

One hundred fifty-eight of the participants had active acne. Newly formed acne was reported most frequently on the chin (78.26%). This was followed by cheeks (54.35%), perioral area (37.68%), forehead (16.67%), and nose (15.94%).

3.4 | The use of mask

The surgical mask usage rate was 89.13% while working in the group whose acne was triggered or increased, and it was 75.76% in the group whose acne was unchanged or decreased ($p < 0.05$). No significant difference was found between the group whose acne was triggered or increased and the group whose acne was unchanged or decreased, in terms of taking a break from using masks (60.87% and 50.00%, respectively) and the break duration (18.94 ± 17.81 min in 2.48 ± 1.27 h and 13.85 ± 8.45 min at 2.07 ± 1.33 h, respectively), and the layers of the mask (more than one layer, 61.59%, and 47.06%,

respectively) ($p > 0.05$) (Table 3). Only 3 participants (the group whose acne was triggered or increased; $n = 2$, the group whose acne was unchanged or decreased; $n = 1$, $p > 0.05$) reported that they used a product to prevent moisture formation under the mask.

3.5 | Stress, nutrition, and the use of additional medication

In the group whose acne was triggered or increased during the COVID-19 pandemic, 97.10% of the participants reported that their stress increased, while this rate was 85.29% in the group whose acne was unchanged or decreased ($p = 0.009$). During the COVID-19 pandemic, 90.12% of the participants reported an increase in consumption of at least one of the foods that may increase acne, such as foods with a high glycemic index, milk, and dairy products. 75.58% of the participants reported an increase in consumption of

TABLE 3 Mask usage properties of the participants

	Triggered or increased acne	Unchanged or decreased acne	Total	p-value
	n %	n %	n %	
Surgical mask				
Yes	123 (89.13)	25 (75.76)	148 (86.55)	<0.05
No	15 (10.87)	8 (24.24)	23 (13.45)	
FFP1 mask				
Yes	3 (2.17)	0 (0.00)	3 (1.75)	>0.05
No	135 (97.83)	33 (100.00)	168 (98.25)	
FFP2 mask				
Yes	61 (44.20)	19 (57.58)	80 (46.78)	>0.05
No	77 (55.80)	14 (42.42)	91 (53.22)	
N95 mask				
Yes	68 (49.28)	21 (63.64)	89 (52.05)	>0.05
No	70 (50.72)	12 (36.36)	82 (47.95)	
N99 mask				
Yes	11 (7.97)	2 (6.06)	13 (7.60)	>0.05
No	127 (92.03)	31 (93.94)	158 (92.40)	
Layer of mask				
Single-layer	53 (38.41)	18 (52.94)	71 (41.28)	>0.05
More than one layer	85 (61.59)	16 (47.06)	101 (58.72)	
Duration of mask usage (daily)				
Less than 6 h	16 (11.59)	4 (11.76)	20 (11.63)	>0.05
More than 6 h	122 (88.41)	30 (88.24)	152 (88.37)	
Mask changing period				
No change	5 (3.62)	1 (2.94)	6 (3.49)	>0.05
<2 h	2 (1.45)	1 (2.94)	3 (1.74)	
2–4 h	28 (20.29)	5 (14.71)	33 (19.19)	
4–6 h	44 (31.88)	5 (14.71)	49 (28.49)	
6–8 h	25 (18.12)	8 (23.53)	33 (19.19)	
8–10 h	21 (15.22)	7 (20.59)	28 (16.28)	
>10	13 (9.42)	7 (20.59)	20 (11.63)	
Mask changing period				
No change	5 (3.62)	1 (2.94)	6 (3.49)	>0.05
Less than 6 h	74 (53.62)	11 (32.35)	85 (49.42)	
More than 6 h	59 (42.75)	22 (64.71)	81 (47.09)	
Taking a break from using masks				
Yes	84 (60.87)	17 (50.00)	101 (58.72)	>0.05
No	54 (39.13)	17 (50.00)	71 (41.28)	

Bold values are statistically significant results.

at least one food with a high glycemic index during the COVID-19 pandemic, and 38.95% of the participants reported an increase in milk and dairy product consumption during the COVID-19 pandemic (Table 1). 37.21% of the participants had a disease other than acne, and 33.72% reported using regular medication. Drug usage rates that will affect the course of acne were found as follows: 19.64% selective serotonin reuptake inhibitors (SSRI), 10.71% combined

oral contraceptive (COC), 8.93% metformin, 1.79% isotretinoin, and 1.79% spironolactone. There was no significant difference between the group whose acne was triggered or increased and the group whose acne was unchanged or decreased in terms of the rate of drug use that can increase acne (20.83% and 12.50%, respectively) and the rate of drug use that can reduce acne (25.00% and 12.50%, respectively) ($p > 0.05$).

3.6 | Effect of acne

Participants were asked the question, "Do conditions such as itching and pain caused by acne affect you while doing your profession?". 29.75% of the participants with active acne answered occasionally/sometimes, 18.35% frequently/mostly, and 1.9% all the time/always.

3.7 | Preventive behaviors and treatment

No significant difference was found between the group whose acne was triggered or increased and the group whose acne complaints were unchanged or decreased, in terms of the mean value of face washing (2.27 ± 1.29 and 2.41 ± 1.28 , respectively) and the rate of using a moisturizer (69.57% and 55.88%, respectively) ($p > 0.05$). While the rate of using non-comedogenic face-washing products at least once a day was 47.10% in the group whose acne was triggered or increased, this rate was found to be 20.59% in the group whose acne was unchanged or decreased ($p = 0.005$) (Table 1). The participants most frequently used non-comedogenic face-washing gel (36.63%). 13.37% of the participants reported that they washed their faces only with water. During the COVID-19 pandemic, 60.13% of the participants with active acne reported that they did not receive acne treatment, 34.18% used topical treatments, and 5.70% used systemic treatment. The rate of not using treatment in the group whose acne was triggered or increased during the COVID-19 pandemic was 56.52% (Table 1).

3.8 | Regression analysis

Parameters associated with the newly formed acne, such as gender, smoking, the time of acne onset (adolescence/over 25 years old), the periods when acne was experienced, presence of scar and the treatments used for acne before the COVID-19 pandemic, stress status during the COVID-19 pandemic, and the usage of surgical masks were analyzed with regression analysis. It was found that smoking increased acne formation by 13.923 times ($p < 0.05$, 95% CI: 1.494–129.770), the presence of scar increased acne formation by 3.149 times ($p < 0.05$, 95% CI: 1.135–8.739), and the use of surgical mask increases acne formation by 3.789 times. ($p < 0.05$, 95% CI: 1.114–12.883).

4 | DISCUSSION

This study revealed a significant increase in both existing acne and new acne formation during the COVID-19 pandemic. About half of the physicians reported that their acne had increased, and more than a third reported that their acne had relapsed or had first time occurred. The reason for the determination of the sample group as physicians is that this group has the competence to distinguish acne from other dermatoses such as contact dermatitis, contact urticaria,

folliculitis that may occur due to mask use, or rosacea that may be exacerbated by mask use. There are limited numbers of publications in the literature reporting an increase in acne with increased use of a mask during the COVID-19 outbreak.^{6–8} Singh et al. evaluated facial dermatoses induced by PPE use in HCWs and reported 11.63% acne.⁶ On the contrary, Han et al. stated that many patients experienced recurrent acne or apparent exacerbation of acne due to masks during the COVID-19 pandemic. In addition, they also drew attention to the initial attack of acne.⁷ In the study of Zou et al., in which the skin reactions caused by N95 masks and medical masks were evaluated by a self-reported questionnaire in HCWs, 43.6% of acne patients reported an increase in acne.⁸ Similarly, in the presented study, 45.35% of the participants reported an increase in acne. In fact, acne has already been noted in the severe acute respiratory syndrome (SARS) epidemic.^{11,12} Foo et al. evaluated adverse skin reactions caused by PPE use in HCWs during the SARS outbreak in 2003. In the study, 109 (35.5%) of 307 HCWs, who regularly used masks, reported adverse skin reactions on the face. Moreover, acne (59.6%) was the most common adverse skin reaction due to the use of the N95 mask.¹¹ However, in all these studies, although acne was associated with the use of masks, the details of the use of masks (eg, mask type, duration of use) were not questioned, and other factors that could cause acne were not evaluated. Many of the changes in the living conditions of HCWs in the COVID-19 pandemic are among the factors that can contribute to the development of acne. With this study, possible risk factors were evaluated in detail for the first time. In addition, which factor was more critical in the development of acne in the COVID-19 pandemic was evaluated by considering many factors simultaneously that may play a role in acne etiology.

Plausible mechanisms of mask in acne pathogenesis include rupture of comedones induced by pressure and friction, occlusion of pilosebaceous duct, microcirculation dysfunction due to long-term pressure, and humid environment, which is conducive to bacteria proliferation.¹³ In this study, the use of masks was questioned in detail, and it was found that only the use of surgical masks caused an increase in acne. In the regression analysis, it was found that the use of surgical masks increased acne formation by approximately four times. On the contrary, Zou et al. associated N95 masks with more skin reactions than medical masks.⁸ However, many skin reactions were evaluated in this study, and the effect of the N95 mask on acne was not specifically reported. In contrast to the presented study, Foo et al. reported no skin reactions in staff using only surgical masks or paper masks.¹¹ In addition to other studies, taking a break from using masks and the break duration, layers of the mask, and the use of a product to prevent moisture formation under the mask were evaluated in the current study, and no statistically significant effect on acne was found. According to the institution where the physician was working and the contact with the COVID-positive patient, the course of acne did not differ.

In this study involving 172 physicians, it was observed that newly formed acne lesions were most frequently located on the chin and then on the cheeks. Han et al. reported that the lesions were most frequently located on the cheeks in five patients presented with the

first acne attack.⁷ However, the number of patients is the most critical limitation of this study. The notification of the newly formed acne on the forehead in our study indicates that off-mask factors are also effective in the formation of acne.

The effect of smoking on acne is controversial. In questionnaire-based studies, in addition to studies reporting that smoking increases or decreases acne severity, there are also studies reporting that it does not cause any change.¹⁴⁻¹⁷ Recent epidemiological data suggest a strong relationship between acne and smoking, especially after adolescence.¹⁸ Similarly, in this study, it was found that smoking was high in the group whose acne was triggered or increased. In the regression analysis, it was found that smoking was the variable that increased acne formation the most.

This study revealed that acne relapsed more or aggravated more in patients with acne scars, and the presence of scar increased threefold acne formation. In addition, the rate of not receiving treatment before the COVID-19 pandemic was higher in the group whose acne was unchanged or decreased, while the rate of receiving systemic treatment was higher in the group whose acne relapsed or increased. In the light of these findings, the severity of acne experienced before the COVID-19 pandemic may be considered to contribute to the development of acne during the COVID-19 pandemic. In addition, in this study, adult-onset acne and the presence of acne only in adulthood were found to be effective in terms of acne development during the COVID-19 pandemic. This study demonstrated the effect of previous personal acne history on newly formed acne in the COVID-19 pandemic.

Stress is another factor that is considered to affect acne. Many studies have reported an increase in acne severity with increasing stress.¹⁸⁻²¹ In this study, 97% of the participants reported that their stress increased during the COVID-19 pandemic in the group whose acne was triggered or increased, and this rate was statistically significantly higher than the group whose acne was unchanged or decreased.

Advances in twin studies have contributed to determining the relationship between environmental and genetic factors in acne pathogenesis.²² A twin study revealed that 81% of the variance of the disease was attributable to additive genetic effects.²³ A family history of acne has been reported in 70% of the patients.²⁴ In this study, 52% of the participants with triggered or increased acne had a history of acne in first-degree relatives, and it was less than the literature. This finding suggests that environmental factors are highly effective in the formation of acne for the HCWs during the COVID-19 pandemic.

In this study, no difference was found between the age groups whose acne was triggered or increased and the group whose acne was unchanged or decreased. However, the staff that developed acne during the SARS outbreak was younger than those who did not develop acne.¹¹

Another factor contributing to acne development is body mass index.²⁵⁻²⁷ Contrary to expectations, body mass index was lower in the group whose acne was triggered or increased in the presented study.

In this study, the effect of hormonal factors on acne was evaluated. However, menstrual irregularity, polycystic ovary syndrome, combined oral contraceptive use, and insulin resistance were not effective in developing acne in physicians during the COVID-19 pandemic. Similarly, Di Landro et al. reported that menstrual patterns and the use of oral contraceptives are not associated with acne risk.²⁵

There are studies suggesting that foods with a high glycemic index and milk and dairy products may be responsible for the pathogenesis of acne.²⁸⁻³² In the present study, changing dietary habits during the COVID-19 pandemic were questioned. However, even in face-to-face studies, it is difficult to evaluate the effect of diet on acne. Questioning the foods whose consumption has increased or decreased significantly during the COVID-19 pandemic does not fully show the effect of diet on acne. It just gives a general idea on this issue. In this study, the effect of diet on the development of acne could not be demonstrated during the COVID-19 pandemic in physicians.

It is known that acne negatively affects the quality of life.³³⁻³⁵ Approximately one-fifth of the participants with active acne in this study reported that they were adversely affected by acne while doing their jobs. The point to note is that patients with acne may feel itching and discomfort and tend to touch their face by removing the mask, which can increase the risk of COVID-19 contagion.³⁶

Considering the preventive measures and treatment, it has been observed that even by physicians with high disease awareness, preventive measures and treatment are inadequate. Approximately two-fifths of the participants washed their faces with the appropriate product, and even in the group whose acne was triggered or increased, more than half of the participants did not wash their faces with the appropriate product. In addition, two-fifths of the participants reported that they never stopped using masks as long as they worked. Approximately two-thirds of participants with active acne during the COVID-19 pandemic reported that they did not use any treatment for acne. Only 3 participants reported using a product to prevent moisture formation under the mask. HCWs should be informed regarding the proper use of masks and skincare. The surgical mask should be changed every 4 h and the N95 mask should be replaced every 3 days. The patients should put two layers of gauze inside the mask. In addition, the application of non-comedogenic cleaning products and emollients containing oil control components is recommended.^{7,37,38} The skin should be cleaned and moisturized routinely at least 1 h before using the facial PPE, and day and night. The use of the mask should be paused for 15 min every 2 h.³⁷ In cases that general measures are not sufficient, topical retinoids, benzoyl peroxide, salicylic acid, and antibiotics can be recommended for patients with mild acne. Patients with moderate-to-severe acne should be referred to a dermatologist.^{13,39}

The most critical limitation of this study is that it included a limited number of participants and the participants' self-reported acne. The use of goggles, another factor that can cause acne formation, was not evaluated. Another limitation may be response bias, as physicians with acne will be more likely to answer the

questionnaire. The strength of this study is that the participants were physicians, who have the competence to distinguish acne from other dermatoses.

5 | CONCLUSION

During the COVID-19 pandemic, almost half of the participants reported an increase in their acne, while more than one-third of the participants reported that it occurred for the first time or had a relapse. In addition to the increased use of surgical masks due to the COVID-19 outbreak, factors such as increased stress, smoking, adult-onset acne, presence of acne scar, and previous systemic treatment use for acne were found to be responsible for the increase in acne. Approximately one-fifth of the participants with active acne reported that they were negatively affected by acne while doing their profession. This may affect the work motivation of physicians during the pandemic that will last for months, maybe years. HCWs should be informed about the proper use of masks and skincare.

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CONFLICT OF INTEREST

No conflict of interest.

PRESENTATION AT A MEETING

This has been presented at the Türk Dermatoloji Derneği Sanal Dermatoloji Buluşması, İSTANBUL (e-kongre)/TÜRKİYE, 12-14 February, 2021.

ETHICAL APPROVAL

Ethics committee approval was obtained from the local ethics committee (Decision no: 2020/9-5).

DATA AVAILABILITY STATEMENT

Data were available on request from the authors. The data that support the findings of this study are available from the corresponding author upon reasonable request.

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APPENDIX 1

1. The foods of which consumption has increased significantly during the COVID-19 pandemic

Milk and dairy products: skimmed milk, whole milk, yogurt, white cheese, kasseri cheese, ice-cream, cream of milk, cream, Nescafé with coffee-mate

Egg

*Sugar

*Foods for breakfast: Cereals, Porridge

*Bakery products: White wheat bread, whole wheat bread, bran bread, cookery made of white flour, desserts

*Vegetables: Potato, corn, pumpkin, carrot

*Fruits: Watermelon

*Cereals: Rice

*Fast foods

*Prepared foodstuffs: Chocolate, biscuits, cracker, waffle, potato chips

*Beverages: Coke, kola, prepared fruit juice, energy drinks, beer

Oilseeds: Sunflower seed, pumpkin seed

*Other: fried potatoes

*High glycemic index foods.