

ORIGINAL ARTICLE

Dermatological findings in patients admitting to dermatology clinic after using face masks during Covid-19 pandemic: A new health problem

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Abstract

In the present study, the purpose was to evaluate the presence of dermatological symptoms and the effects of mask use on existing dermatological diseases associated with face in patients admitting with any dermatological disease. The present study consisted of 150 patients, including 91 volunteering women and 59 men, admitting to our dermatology clinic with any dermatological symptoms. The presence of symptoms, such as itching, rash, drying and peeling, discomfort, redness, burning, pain, swelling, acne, oily skin symptoms because of mask use, and previous history of facial dermatological disease, whether this disease increased with the use of mask, were questioned. The diagnosis made after dermatological examination and the dermatological examination findings were evaluated with the results of the survey. The most common finding in all patients after mask use was itching with a rate of 64.7%. Similar rates were detected for other symptoms. A significant increase was detected in the severity of acneiform and inflammatory dermatosis after the use of masks ($P < .05$). Our study showed that long-term mask use caused primary skin symptoms, such as itching, redness, rash, dryness and peeling, burning, oily skin, and acne formation in individuals who have dermatological diseases, and also increased the existing dermatological facial diseases. Therefore, it should be recommended to use water-based moisturizers as it may have a barrier effect on the faces of individuals who use a face mask and have any facial dermatosis, and patients should be closely monitored for skin diseases on the face.

KEYWORDS

Covid-19, dermatological findings, face mask, inflammatory dermatose

1 | INTRODUCTION

Coronavirus disease 2019 (Covid-19) is a respiratory disease caused by Corona Virus 2 (SARS-COV-2) as a severe acute respiratory syndrome that emerged in China and that has spread to many countries around the world since December 2019.¹⁻³ The virus spreads first among people when an infected person coughs or sneezes and when the individual touches the contaminated surface and objects, and then

through respiratory droplets when they touch their nose or possibly eyes, or take their hands to their mouths.⁴

In addition to hand hygiene, one of the infection control measures is routine face mask use to minimize infection risk. In many countries, including Turkey, the use of face masks during pandemic, has been made compulsory. The use of face masks during Covid-19 pandemic can cause the appearance of various dermatological findings in the facial area.⁵⁻⁹

The use of face masks increases itching symptoms in the facial area in individuals with facial dermatosis, such as sensitive skin, acne, seborrheic dermatitis, atopic predisposition, allergic contact dermatitis, and atopic dermatitis.⁹ Wearing face masks can cause dermatological lesions, such as itching, redness and associated excoriation and abrasion.⁹ Itching, which mostly causes excoriations that are dermatological lesions can occur in systemic and dermatological diseases.¹⁰ Also, the use of masks can cause various dermatological findings, such as dryness, redness, burning, acne, and swelling in the face due to irritant and allergic substances used in mask production.^{7,11} It was documented that N95 and surgical masks contain formaldehyde and other preservatives.¹² It was also reported that there were cases of allergic contact dermatitis due to formaldehyde in surgical masks.⁸

Especially long-term mask use can cause dermatosis, such as allergic contact dermatitis, irritant contact dermatitis, frictional dermatitis, abrasions, acne, seborrhea, and/or the increase of existing dermatosis that previously exist in the face.¹¹

Friction, moisture and mechanical pressure play roles in the pathogenesis of the formation of dermatological lesions associated with mask use.⁵ It was shown that mechanical damage to the skin, maceration, abrasion, erythema, desquamation, itching, and acne were seen due to the long time use of the masks, especially in health care employees.^{6,12}

There are a limited number of studies in the literature conducted on the effects of mask use on dermatoses and its effects on the facial area in individuals with existing dermatological diseases.^{4,6} In our study, the presence of dermatological symptoms (ie, itching, redness, rash, burning, pain and tingling, swelling and numbness, oily skin formation, and acne) after use face mask and the effect of mask use on existing dermatological diseases that are associated with face were examined in patients admitting to our clinic due to any dermatological disease. Since all previous studies in the literature were in the form of survey studies conducted in health care employees and healthy individuals. We believe that our study will contribute to the literature as it included the dermatological examination findings and severity of face dermatose admitting to dermatology clinics after use face mask.

2 | MATERIAL AND METHOD

Ethical approval was obtained for the study (Decision number: 2020/7-38). This study was a cross-sectional survey study. The study was conducted at a third-line health care institution serving as a pandemic hospital.

The patients in this manuscript have given written informed consent to the publication of their case details.

Our study consisted of 150 patients, including 91 volunteering women and 59 men admitting to our dermatology clinic with any dermatological symptoms. After detailed dermatological examinations of the patients were carried out, a survey consisting of 27 questions were applied face to face. The inclusion criteria of the study were having any dermatological disease, being over 18 years of age, having the level of education to understand and answer the survey questions. All

patients had been wearing face masks since the beginning of the pandemic, that is, for 6 months as in all over the world, because there was an obligation to use masks indoors and in social environments in our country.

The mask types (surgical masks, N95 and ffp2 face masks, cloth mask and double layer surgical mask), total daily mask usage times, frequency of daily mask replacement, and the presence of symptoms due to mask use, such as itching, rash, drying and peeling, discomfort, redness, burning, scar formation, pain and tingling, swelling, acne, oily skin symptoms, and previous history of facial dermatological disease of the patients, whether this disease increased with mask, itching in the nose after mask use, discharge, sneezing, shortness of breath, cough and breathing difficulties were questioned.

The diagnosis made after dermatological examination and the dermatological examination findings were evaluated with the results of the survey. Global acne score was used for acneiform dermatoses. Those with a global acne score of <30 were considered low disease severity acne and those with a global acne score of >30 as high disease severity acne. Scale, inflammation and itching were graded for inflammatory dermatoses. (1 = weak, 2 = mild, 3 = moderate, 4 = significant, and 5 = severe) and scores <10 were considered as low disease severity, and those >10 were considered high disease severity acne.

3 | STATISTICAL METHODS

The study was a descriptive study in prospective and cross-sectional design. All the data were evaluated with the statistical package program. The descriptive statistics were expressed with numbers and percentages. The chi-square or Fischer's exact chi-square test was used to evaluate the mask usage duration, and the type of the mask, which were among the categorized variables. The binary logistic regression analysis method was used to determine the relation between itching, redness, and acne complaints that might occur after mask use in patients of acne vulgaris, acne rosacea, contact dermatitis, and seborrheic dermatitis. The results were evaluated in 95% Confidence Interval, and $P < .05$ value was considered significant.

4 | RESULTS

Our study consisted of 150 patients, including 91 volunteering women and 59 men admitting to our dermatology clinic due to any dermatological symptoms. The mean age of the participants was 28.6 ± 10.35 years. Among the admitting patients, 50 had acne vulgaris (33.3%), 23 had seborrheic dermatitis (15.3%), 13 contact dermatitis (8.7%), 14 had acne rosacea (9.3%), 6 had atopic dermatitis (4%), and 44 had other diseases (29.3%) (ie, diseases with non-facial involvement) (Table 1). No statistically significant differences were detected between the groups in terms of male and female distribution ($P > .05$).

The most common finding in all patients was itching after mask use with a rate of 64.7%. Similar rates were detected for other

TABLE 1 Distribution of dermatological diseases by gender

	Gender		Total
	Male	Female	
Other dermatologic disease (without facial involvement)	16; 36.4%	28; 63.6%	44; 100.0%
Seborrheic dermatitis	15; 65.2%	8; 34.8%	23; 100.0%
Acne vulgaris	16; 32.0%	34; 68.0%	50; 100.0%
Allergic contact dermatitis	5; 38.5%	8; 61.5%	13; 100.0%
Acne rosacea	5; 35.7%	9; 64.3%	14; 100.0%
Atopic dermatitis	2; 33.3%	4; 66.7%	6; 100.0%
Total	59; 39.3%	91; 60.7%	150; 100.0%

symptoms. Itching in the eyes complaints among eye symptoms and itching in the nose among respiratory symptoms were the most complained symptoms (Table 2).

A statistically significant difference was detected in acneiform dermatosis (ie, acne vulgaris and acne rosacea) and inflammatory dermatoses (ie, seborrheic dermatitis, contact dermatitis, and atopic dermatitis) when the severity of the disease was compared before and after face mask use (Table 3). After the mask use, a significant increase was detected in the severity of acneiform and inflammatory dermatosis ($P < .05$).

When the complaints of the patients with and without facial lesions were compared after mask use, patients with facial lesions had increased itching, redness, rash, dryness, peeling, swelling, numbness, pain, tingling, oily skin, and acne formation after mask use at statistically significant levels compared to those without lesions on their face ($P < .05$). However, no significant differences were detected between the two groups in terms of facial indentation formation and skin burning complaints ($P > .05$) (Table 4).

About 50 of the patients (33.3%) used one mask a day, 68 (45.3%) used two masks a day and 32 (21.3%) used two or more masks per day. 20 patients (13.3%) used mask 0 to 2 hours per day, 15 patients (10.0%) used mask 2 to 4 hours per day, 64 of them (42.6%) used mask 4 to 6 hours per day, 26 patients (17.3%) used mask 6 to 8 hours per day and seven of them (4.6%) used mask more than 8 hours per day.

When the itching, redness, facial indentation after mask were compared in those with a mask usage time of more than 4 hours per day, and those under 4 hours per day of mask usage time, there were increases at statistically significant levels ($P < .05$). There was an increase in post-mask rash, drying and peeling, burning, swelling and numbness, oily skin formation, and acne formation in those with a mask use duration of over 4 hours compared to those who used masks under 4 hours per day; however, but this increase was not at a statistically significant level ($P > .05$) (Table 5).

A total of 97 (64.7%) of the participants used surgical masks, 23 (15.3%) used cloth masks, 16 (10.7%) used N95 and ffp2 face masks, and 14 patients (10.7%) used double surgical masks. Among these masks, the most commonly used surgical mask consists of polypropylene spunbond nonwoven fabric, polypropylene meltblown

TABLE 2 Dermatological, respiratory and eye symptoms due to mask use

Skin symptoms after mask use	Frequency	Percent (%)
Discomforts caused by mask	96	64.0
Acne	64	42.7
Itching	97	64.7
Redness	72	48.0
Facial indentation	66	44.0
Dry skin and desquamation	47	31.3
Burning	75	50.0
Oily skin	71	47.3
Respiratory track symptoms		
Itching in the nose	28	18.7
Sneezing	3	2.0
Runny nose	8	5.3
Shortness of breath	8	5.3
Cough	3	2.0
Difficulty in breathing	15	10.0
Eye symptoms		
Itching in the eyes	20	13.3
Watering in the eyes	6	4.0
Redness in the eyes	3	2.0
Swelling in the eyelashes	2	1.3

nonwoven fabric, and n95 masks consist of polyurethane, polypropylene, polyester materials. Fabric masks are made of cotton. No statistically significant differences were detected between the type of the mask and the formation of itching, redness, rash, dryness and peeling, and acne after using the mask ($P > .05$) (Table 6).

In the logistic regression analysis, it was shown that the use of masks did not have a significant effect on itching in acne vulgaris, acne rosacea, contact dermatitis, and seborrhea dermatitis patients. However, the risk of redness was found to be significantly increased after mask use in acne rosacea and contact dermatitis patients. Also, the likelihood of acne after mask use significantly increased in acne vulgaris and acne rosacea patients ($P < .05$) (Table 7).

TABLE 3 Disease severity of acneiform and inflammatory dermatoses due to mask use

	Low disease severity after mask use	High disease severity after mask use	Total	P value
Acneiform dermatoses	9	35	44	.043
• Low disease severity before mask	14.1%	54.7%	68.8%	<.05
• High disease severity before mask	9	11	20	
	14.1%	17.2%	31.3%	
Inflammatory dermatosis	4	27	31	.024
• Low disease severity before mask	9.5%	64.3%	73.8%	<.05
• High disease severity before mask	511.9%	614.3%	1126.2%	

TABLE 4 Dermatological symptoms occurring after using a face mask

	No dermatologic lesion in the face	Dermatologic lesions in the face	P value ^a
Itching	22; 22.7%	75; 77.3%	<.05
Facial indentation	16; 24.6%	49; 75.4%	>.05
Redness	10; 13.9%	62; 86.1%	<.001
Rash	4; 10.8%	33; 89.2%	<.05
Drying and desquamation	7; 14.9%	40; 85.1%	<.05
Burning	18; 24.0%	57; 76.0%	>.05
Swelling and numbness	1; 6.7%	14; 93.3%	<.05
Pain and tingling	8; 17.4%	38; 82.6%	<.05
Oily skin	10; 14.1%	61; 85.9%	<.001
Acne	7; 10.9%	57; 89.1%	<.001

^aP < .05 is statistically significance.

TABLE 5 Relationship between mask usage time and dermatological symptoms

	Mask wearing duration 0–4 hours per day (n and %)	Mask wearing duration 4 hours and over per a day (n and %)	P value ^a
Itching	27; 27.8%	70; 72.2%	<.05
Facial indentation	16; 24.2%	50; 75.8%	<.05
Redness	14; 19.4%	58; 80.6%	<.001
Rash	11; 29.7%	26; 70.3%	>.05
Drying and desquamation	12; 25.5%	35; 74.5%	>.05
Burning	22; 29.3%	53; 70.7%	>.05
Swelling and numbness	7; 46.7%	8; 53.3%	>.05
Pain and tingling	13; 28.3%	33; 71.7%	>.05
Oily skin	23; 32.4%	48; 67.6%	>.05
Acne	20; 31.3%	44; 68.7%	>.05

^aP < 0.05 is statistically significant.

5 | DISCUSSION

Although there are controversies, face masks are thought to provide protection by preventing viral transmission among people through the respiratory tract.^{13,14} The face mask, mostly used by health care employees as personal protective equipment, can damage the skin.^{7,15,16} However, there are few studies on skin symptoms that occur after the use of face masks.^{4–6}

In our study, it was found that dermatological findings, such as itching, redness, facial indentation formation after face mask use

showed a significant increase in proportion to the mask use duration. However, it was found that rash, drying and peeling, burning, swelling and numbness, oily skin and acne formation increased proportionately with the duration of use of the mask; however, this increase was not statistically significant. We believe that the cause of this might be related to the small number of patients who had these complaints and due to short mask use times. In the study conducted by Zuo et al, it was found that skin symptoms, such as itching, redness, rash, burning, and swelling after mask use was 1.9 times more common in patients

TABLE 6 Dermatological symptoms depending on the type of mask use

	Surgical mask		N95, ffp2 mask		Double-layer surgical mask		Cloth mask		Total		
	N	%	n	%	n	%	n	%	n	%	
Itching											
Yes	37	69.8	4	7.5	4	7.5	8	15.1	53	100	<i>P</i> > .05
No	60	61.9	12	12.4	10	10.3	15	15.5	97	100	
Redness											
Yes	47	65.3	8	11.1	9	12.5	8	11.1	72	100	<i>P</i> > .05
No	50	64.1	8	10.3	5	6.4	15	19.2	78	100	
Rash											
Yes	26	70.3	1	2.7	4	10.8	6	16.2	37	100	<i>P</i> > .05
No	71	62.8	15	13.3	10	8.8	17	15.0	113	100	
Drying/burning											
Yes	67	65.0	10	9.7	9	8.7	17	16.5	103	100	<i>P</i> > .05
No	30	63.8	6	12.8	5	10.6	6	12.8	47	100	
Acne											
Yes	41	64.1	7	10.9	6	9.4	10	15.6	64	100	<i>P</i> > .05
No	56	65.1	9	10.5	8	9.3	13	15.1	86	100	

TABLE 7 The risk of using a mask to cause symptoms in face dermatological diseases

	Itching after mask use			Acne after mask use			Redness after mask use		
	CI95	OR	<i>P</i> value	CI95	OR	<i>P</i> value	CI95	OR	<i>P</i> value
Acne vulgaris	0.564-2.870	3.331-22.90	1.087-6.567	2.67	0.32	8.73	0.000	6.56	.56
Acne rosacea	1.200-29.99	2.803-45.15	2.900-53.59	12.46	0.001	11.25	0.001	6.00	.29
Contact dermatitis	1.179-3.391	0.946-2.132	1.747-5.178	3.00	0.000	1.42	0.091	2.00	.10
Seborrheic dermatitis	1.048-1.861	0.820-1.494	1.084-1.849	1.41	0.11	1.10	0.50	1.39	.23

with a mask wearing time of more than 4 hours.⁶ Since these common symptoms are associated with friction, increase in the temperature, pressure and increased moisture, the probability of the symptoms also increases when these factors increase. Another study reported that there were significant exacerbations in acne, which was explained by the increase in sebum secretion by closing the face of the mask.^{17,18}

During SARS pandemia, Foo et al reported high itching rates due to mask use in health care employees.¹⁵ In the current study on health care employees in China, 14.9% itching, 3.7% burning, pain and burning were detected in 3.2% of the cases.⁶ In the study conducted in Poland, it was found that the itching rate because of mask use was at a rate of 19.6%.⁹ In the study conducted in China, skin reactions associated with masks were reported in 49% of the cases, which is similar to our study.⁶

As in our study, Lan et al also found that there might be more skin symptoms (62.2%) especially in the nasal region after mask use. In our study, as in the study that was conducted by Lan et al, we found that there were higher rates of itching, redness, rash, dryness and peeling and oily skin, acne formation after mask use.⁷ We can explain the reason of this by the fact that there were patients with dermatological problems in our study. Especially seborrheic dermatitis, acne, contact

dermatitis patients are more risky in terms of dermatological symptom development after mask use. Also, it was shown that the diseases were exacerbated in 43.6% of acne patients, 100% of patients with acne rosacea, and 37.9% of patients with seborrheic dermatitis.⁶

It was found in our study that itching, redness, rash, dryness and peeling, swelling and numbness, pain and tingling, oily skin formation, and acne were significantly increased in the group of patients with face lesions compared to those without face lesions. We believe that was because of the change of the potential skin microbiota in skin barrier dysfunction and inflammatory dermatosis because of mask use. In the study of Zuo et al, there was an increase in symptoms after mask use in those with dermatological lesions, which is similar to ours.⁶

It was found in the present study, that the rates were higher than the rates on use of masks in the eye and respiratory symptoms that were reported by Zuo et al, and we can explain the reason of the results of our study by the fact that the patients had sensitive skin atopic with allergic conditions. Sensitive skin, atopic predisposition and facial dermatosis make mask users significantly prone to develop skin, eye and respiratory symptoms.

There are a limited number of studies conducted on the effect of mask use on facial dermatosis, especially in patients admitting to

dermatology clinics.^{6,19} In our study, it was shown that the use of masks significantly increased the severity of the disease in acneiform and inflammatory dermatosis. In their study, Lue et al found that the use of masks caused increased the severity of the acne vulgaris, seborrheic dermatitis, acne rosacea, and other inflammatory dermatosis (folliculitis, contact dermatitis) because of sebum excretion.⁶ They also thought that the mask caused friction, and increase in symptoms through high temperature and respiration.²⁰ Patients often wear surgical masks, and the formaldehyde in the contents of these masks can be the reason of increased inflammatory dermatosis.⁸

Olive et al reported a case of rosacea like allergic contact dermatitis that developed due to polypropylene and formaldehyde used in surgical masks in their study during Covid-19 pandemia.⁸ There are also studies reporting that these substances increase the severity of some dermatosis (contact dermatitis, rosacea, seborrheic dermatitis).^{21,22} Similar to our findings, in a study conducted in Singapore, the dermatosis that had the highest severity after mask use was reported to be acneiform dermatosis.²³

Veraldi et al reported that the use of masks increased the severity of the disease during Covid-19 pandemia, as it was the cases in our study in patients with seborrheic dermatitis. They explained this by increased sebum secretion due to the use of masks and deterioration of the microbiota because of increased temperature and the use of masks caused malassezia spp. proliferation was explained by the deterioration of skin barrier permeability; and the increasing irritation also increased the disease severity with the sweating effect.²³

In the present study, no differences were detected between mask types and skin symptoms such as itching, redness, acne and rash symptoms because of mask use. However, Zuo et al showed that skin symptoms are increased in those who use n95 masks.⁶ It is possible to explain this because their study was conducted on health care employees; and therefore, the n95 mask usage rate and usage time were higher than the population in our study. Similar to our study, no associations were detected between skin symptoms and mask type in the study conducted in a non-health care employee population in Poland.⁹

Since previous studies were conducted on health care employees and on normal populations, this study is the first one that examined the effect of facial mask use on facial dermatosis by including dermatological examination findings in patients admitting to dermatology clinic.

Our study showed that long-term mask use causes primary skin symptoms, such as itching, redness, rash, burning and acne in individuals with dermatological diseases, and also increases the existing dermatological face diseases.

The face mask used in social areas is difficult to use for individuals with dermatological diseases during the Covid-19 pandemia. Therefore, it should be recommended to use water-based moisturizers as it may have a barrier effect and wash the face frequently with cleaners suitable for the skin, since they can reduce sebum secretion on the faces of individuals who use a face mask and have any facial dermatosis, and patients should be closely followed-up for skin diseases on the face.

The main limitations of the study are that the study was conducted in a single-center, the results of the study should not be generalized to the whole population. There is a need for studies involving larger patient groups and a control group without dermatological diseases.

It was concluded that attention should be paid in the follow-up and treatment of existing dermatological diseases, because the use of face masks may exacerbate diseases in patients with inflammatory or acneiform dermatosis.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

DATA AVAILABILITY STATEMENT

No data is available.

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REFERENCES

- Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Napoli RD. *Features, Evaluation and Treatment Coronavirus (COVID-19)*. Treasure Island (FL): StatPearls Publishing; 2021.
- Adhikari SP, Meng S, Wu Y-J, et al. Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review. *Infect Dis Poverty*. 2020;9:29.
- Sohrabi C, Alsafi Z, O'Neill N, et al. World Health Organization declares global emergency: a review of the 2019 novel coronavirus (COVID-19). *Int J Surg*. 2020;76:71-76.
- Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet*. 2020;395:1054-1062.
- Bhatia R, Sindhuja T, Bhatia S, et al. Iatrogenic dermatitis in times of COVID-19: a pandemic within a pandemic. *J Eur Acad Dermatol Venereol*. 2020;34(10):e563-e566. <https://doi.org/10.1111/jdv.16710>.
- Zuo Y, Hua W, Luo Y, Li L. Skin reactions of N95 masks and medial masks among health care personnel: a self-report questionnaire survey in China. *Contact Dermatitis*. 2020;83:145-147.
- Lan J, Song Z, Miao X, et al. Skin damage among health care workers managing coronavirus disease-2019. *J Am Acad Dermatol*. 2020;82:1215-1216.
- Aerts O, Dendooven E, Foubert K, Stappers S, Ulicki M, Lambert J. Surgical mask dermatitis caused by formaldehyde (releasers) during the COVID-19 pandemic. *Contact Dermatitis*. 2020;83(2):172-173.
- Szepietowski JC, Matusiak Ł, Szepietowska M, Krajewsk PK, Białynicki-Birula R. Face mask-induced itch: a self-questionnaire study of 2,315 responders during the COVID-19 pandemic. *Acta Derm Venereol*. 2020;100(10):adv00152.adv00152.
- Welz-Kubiak K, Reszke R, Szepietowski JC. Pruritus as a sign of systemic disease. *Clin Dermatol*. 2019;37:644-656.
- Yan Y, Chen H, Chen L, et al. Consensus of Chinese experts on protection of skin and mucous membrane barrier for health-care workers fighting against coronavirus disease 2019. *Dermatol Ther*. 2020;33(4):e13310.
- Zhang B, Zhai R, Ma L. 2019 novel coronavirus disease epidemic: skin protection for healthcare workers must not be ignored. *J Eur Acad Dermatol Venereol*. 2020;34(9):e434-e435. <https://doi.org/10.1111/jdv.16573>.

13. Javid B, Weekes MP, Matheson NJ. Covid-19: should the public wear face masks? *BMJ*. 2020;369:m1442.
14. Xiao J, Shiu EYC, Gao H, et al. Nonpharmaceutical measures for pandemic influenza in nonhealthcare settings-personal protective and environmental measures. *Emerg Infect Dis*. 2020;26: 967-975.
15. Foo CC, Goon AT, Leow YH, Goh CL. Adverse skin reactions to personal protective equipment against severe acute respiratory syndrome - a descriptive study in Singapore. *Contact Dermatitis*. 2006; 55:291-294.
16. Lin P, Zhu S, Huang Y, et al. Adverse skin reactions among healthcare workers during the coronavirus disease 2019 outbreak: a survey in Wuhan and its surrounding regions. *Br J Dermatol*. 2020;183: 190-192.
17. Han C, Shi J, Chen Y, Zhang Z. Increased flare of acne caused by long-time mask wearing during COVID-19 pandemic among general population. *Dermatol Ther*. 2020;33(4):e13704. <https://doi.org/10.1111/dth.13704>.
18. Giacalone S, Minuti A, Spigariolo CB, Passoni E, Nazzaro G. Facial dermatoses in general population due to personal protective masks: first observations after lockdown. *Clin Exp Dermatol*. 2020;46(2):368-369. <https://doi.org/10.1111/ced.14376>.
19. Veraldi S, Angileri L, Barbareschi M. Seborrheic dermatitis and anti-COVID-19 masks. *J Cosmet Dermatol*. 2020;19:2464-2465.
20. Donovan J, Skotnicki-Grant S. Allergic contact dermatitis from formaldehyde textile resins in surgical uniforms and nonwoven textile masks. *Dermatitis*. 2006;18(1):40-44.
21. Balato A, Ayala F, Bruze M, et al. European task force on contact dermatitis statement on coronavirus 19 disease (COVID-19) outbreak and the risk of adverse cutaneous reactions. *J Eur Acad Dermatol Venereol*. 2020;34:e353-e354. <https://doi.org/10.1111/jdv.16557>.
22. Al Badri FM. Surgical mask contact dermatitis and epidemiology of contact dermatitis in healthcare workers. *Curr Allergy Clin Immunol*. 2017;30(3):183-188.
23. Chris CIF, Anthony TJG, Yung-Hian L, Chee-Leok G. Adverse skin reactions to personal protective equipment against severe acute respiratory syndromedescriptive study in Singapore. *Contact Dermatitis*. 2006;5:291-294.

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