

Hand dermatitis among nurses during the COVID-19 pandemic: frequency and factors

ABSTRACT

Objective To determine the frequency of hand dermatitis among nurses during the COVID-19 pandemic and factors affecting its prevalence.

Methods The research sample consisted of 175 nurses working in state hospitals. Research data were collected via Google Survey between October and September 2020. The data were collected using a Sociodemographic Data Collection Form, and a self-assessment form was used to determine dermatologic symptoms.

Results The frequency of hand dermatitis among nurses was 70.9%. A statistically significant difference was found between sex, allergy history, and increased frequency of handwashing and the frequency of hand dermatitis. No significant difference in terms of the frequency of hand dermatitis was found between the nurses who provided care to patients who were COVID-19 positive versus the nurses who did not provide care to patients who were COVID-19 negative. However, the frequency of washing hands and using hand disinfectants and hand creams was found to have increased significantly during the COVID-19 pandemic compared to the prepandemic period.

Conclusions The frequency of hand dermatitis increased among nurses during the pandemic. The increased frequency of handwashing during the pandemic poses a risk for hand dermatitis among nurses, although this should not discourage nurses from appropriate hygiene.

Keywords COVID-19, dermatitis, handwashing, hygiene, nursing, wound care

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INTRODUCTION

The World Health Organisation has declared COVID-19 a global pandemic. According to the latest data, approximately 230

million people have been infected and 4.7 million have died.¹ Nonpharmacologic preventive practices such as maintaining social distance, wearing face masks, and washing hands have been recommended to hinder the spread of the virus.² These practices play an important role in reducing the risk of transmission by preventing the spread of aerosols and protecting vulnerable populations. Studies suggest that hand hygiene is an important prevention strategy for healthcare professionals and societies in places where the pandemic is most prevalent. Hand hygiene remains a critical element of infection control.³⁻⁵

The COVID-19 pandemic has also had the effect of reminding nurses about the need for regular hand hygiene with soap, water, or alcohol-based sanitisers. Handwashing is recommended as an inexpensive and common preventive measure to protect oneself from a number of viral infections and prevent disease spread in general.⁶

Proper handwashing technique is a part of effective hand hygiene.⁵ The CDC recommends handwashing with soap because it reduces the amount of germs and chemicals on the hands.² The World Health Organisation (WHO) also

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recommends handwashing with soap for 40 to 60 seconds using an appropriate technique when hands are noticeably dirty.⁷ When soap and water are not available, a hand sanitiser with at least 60% alcohol can be used.² If hands are not visibly soiled, using an alcohol-based hand disinfectant for 20 to 30 seconds with the appropriate technique is preferred to provide hand hygiene.⁷ Washing hands with an alcohol solution can reduce the risk of infection in medical staff and others in the community by reducing the number of bacteria and viruses on hands.^{2,8}

However, the solutions used, frequency of handwashing, level of moisture, and hand drying process may disrupt the skin barrier and lead to symptoms of hand dermatitis.⁹⁻¹² Accordingly, the aim of this study was to determine the frequency of hand dermatitis among nurses during the COVID-19 pandemic and the factors affecting its incidence.

METHODS

Sample

The research population consisted of nurses working in three different state hospitals in Bursa, Turkey. The research sample consisted of 175 nurses who voluntarily agreed to participate in the study.

Data Collection

The study data were collected by the researchers between September and October 2020 via Google Survey. Data collection tools included two forms prepared by the researchers: one form collected sociodemographic information and the other assessed dermatologic symptoms.

Sociodemographic Data Collection Form. This form consisted of questions about the sex, age, and education level of the nurses who participated in the study, as well as about the hospital and clinic they worked in, and their total years of employment.

Form to Determine Dermatologic Symptoms. This form included questions about allergy history, medication use, the COVID-19 status of the nurse's patients, frequency of handwashing, and use of hand disinfectants and hand creams. In the last part of the form, nurses were asked to self-assess any dermatologic symptoms specific to hand dermatitis. The form was translated into Turkish by a researcher and a native English speaker. The translations were compared, the most appropriate terminology was selected, and the final version was then translated back into English. The translated text was compared with the original form and revised accordingly. The authors of the study have previously used this self-assessment form with pediatric nurses and nursing students.^{11,12} The form co-evaluates the symptoms of irritant and allergic contact dermatitis and was designed according to the criteria of Smit et al.^{13,14} Permission was obtained from Coenraads et al for the use of this form.^{13,14}

Questions were posed about the presence of any of the following symptoms over the last 12 months:

1. Scaling and redness on the hands and between the fingers
2. Fissures and redness on the hands
3. Irritation or itching on hands
4. Swelling and redness of the hands
5. Vesicles between hands and fingers

Participants who answered "Yes" to one or more of these questions were diagnosed with symptoms of hand dermatitis.

The following questions were also asked:

1. Did two or more of these symptoms last longer than 3 weeks?
2. Did two or more of these symptoms occur more than once?

Participants who answered "Yes" to either of these questions were diagnosed with recurrent or severe hand dermatitis. The Cronbach α coefficient of the form was 0.888.

Data Analysis

Numeric and percentile distributions were used for sociodemographic data and Mann Whitney U test, Wilcoxon Sign rank test, and Pearson χ^2 test were used for comparisons. The SPSS for Windows Version 23.0 of was used for data analysis.

Ethical Considerations

Ethical approval for the research was received from Bursa Uludağ University Health Sciences Research and Publication Ethics Committee (date and decision number: 29.07.2020; 92662996-04). Legal permission was obtained from the relevant health institutions. Consent was obtained from the nurses who participated in the study via the Google Survey.

RESULTS

Table 1 shows the personal characteristics of the nurses participating in the study. The frequency of hand dermatitis among the nurses was 70.9% (124 of 175). The frequency of hand dermatitis was significantly higher in women than in men. The frequency of hand dermatitis was significantly higher among nurses who had a history of allergies compared with those without an allergy ($P < .05$). The mean age of the nurses participating in the study was 29.14 ± 7.22 , and the mean years of employment were 6.68 ± 8.02 . No significant difference was found in the frequency of hand dermatitis among nurses by mean age or years of employment. When the incidence of hand dermatitis was examined by unit where the nurses worked, the frequency was higher among nurses working in pediatric (76.1%), surgical (76%), and COVID-19 wards (69.5%). However, no significant difference was found by unit ($P > .05$).

The most frequently reported symptoms were redness and fissures (sharply defined linear tears in the epidermis and dermis; 77.1%), irritation and itching (76%), and scaling/rash (67.4%; Figure 1).

The frequency of hand dermatitis was 71.5% among nurses who provided care to patients who were COVID-19 positive,

Table 1. Participant characteristics

Characteristic	Hand dermatitis yes, n (%)	Hand dermatitis no, n (%)	P
Sex			
Female	107 (78.7)	29 (21.3)	$\chi^2 = 18.069$ $P = .000^a$
Male	17 (43.6)	22 (56.4)	
Allergy history			
Yes	63 (80.8)	15 (19.2)	$\chi^2 = 6.695$ $P = .012^b$
No	61 (62.9)	36 (37.1)	
Unit			
Internal medicine	10 (50)	10 (50)	$\chi^2 = 5.516$ $P = .138$
Surgical	38 (76)	12 (24)	
Pediatric	35 (76.1)	11 (23.9)	
COVID-19	41 (69.5)	18 (30.5)	
Age, y (mean \pm SD)	29.14 \pm 7.22		$U = 2681.5$ $P = .111$
Total work years, (mean \pm SD)	6.68 \pm 8.02		$U = 2782.5$ $P = .192$

^a $P < .001$

^b $P < .05$

whereas the frequency of hand dermatitis was 66.7% among nurses who did not provide care to COVID-19 positive patients. This difference was not significant (Table 2).

Nurses' hand hygiene behaviours before and during the COVID-19 pandemic were examined (Table 3). It was determined that the frequency of handwashing per day, the use of disinfectants, and the use of hand cream/moisturiser had increased significantly during the pandemic ($P < .001$). In terms of handwashing frequency, 48% (84 of 175) of the nurses washed their hands more than 25 times a day. The frequency of hand dermatitis significantly increased with the frequency of handwashing (Table 4; $P < .05$). The frequency of hand disinfectant and hand cream use did not significantly affect hand dermatitis ($P > .05$). The most frequently used handwashing substances were liquid soap, liquid soap and alcohol-based gel, chlorhexidine-based gel, and alcohol-based gel (Figure 2).

DISCUSSION

Hand dermatitis is a common disease that can progress either acutely or chronically and has different etiologies.¹⁵ In the current study, the frequency of hand dermatitis among nurses during the COVID-19 pandemic was 70.9%. The results of the current study were similar to those obtained in other studies conducted on hand dermatitis in health workers during the COVID-19 pandemic. One study conducted during the pandemic revealed that 84.6% of health workers had unwanted skin reactions on their hands.¹⁶ Another study reported that 74.5% of primary health workers had skin damage on their hands.¹⁰ A study conducted at the beginning of the pandemic found that 90.4% of health workers had acute symptoms of hand dermatitis.¹⁷

In a study conducted before the pandemic in the same region as the current study, 47.5% of the nurses working in pediatric clinics were reported to have hand dermatitis.¹¹ The frequency of hand dermatitis was found to be 12%,¹⁸ 21%,^{19,20} and 22.1%²¹ in other studies conducted before the pandemic. Given these results, it is clear that the frequency of hand dermatitis had increased among health workers during the pandemic.

In this study, the frequency of hand dermatitis was significantly higher in women than in men. Alluhayyan et al²² conducted a study with

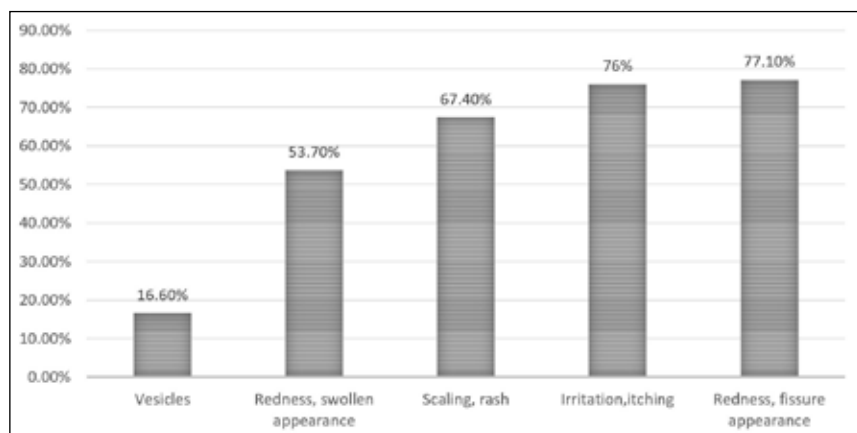


Figure 1. hand dermatitis symptoms

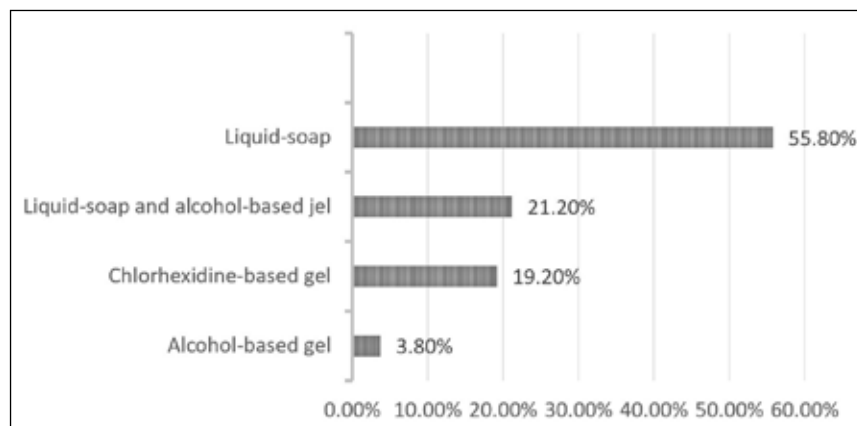


Figure 2. substances used by nurses for handwashing

Table 2. Frequency of hand dermatitis based on whether nurses cared for patients positive for COVID-19

Population	Hand Dermatitis Yes, n (%)	Hand Dermatitis No, n (%)	P
COVID-19 positive	108 (71.5)	43 (28.5)	P = .634 Df = 1 $\chi^2 = 0.237$
COVID-19 negative	16 (66.7)	8 (33.3)	

Table 3. Hand hygiene behaviors of nurses before and during the pandemic

Hygiene	Before COVID-19	During COVID-19	P ^a
Hand washing	2.69 ± 0.86	3.41 ± 0.61	Z = -9.194 P = .000
Hand disinfection	2.13 ± 1.05	3.12 ± 0.91	Z = -9.185 P = .000
Hand cream	1.49 ± 0.74	2.14 ± 1.05	Z = -7.810 P = .000

Note: Hand washing, hand disinfection, and hand cream frequency, 0 to 5 times per day = 1, 5 to 15 times = 2, 15 to 25 times = 3, over 25 times = 4; Z = Wilcoxon Test.

^aP < .001

Table 4. Frequency of hand dermatitis by hygiene behavior

Hygiene practices per day	Hand Dermatitis Yes, n (%)	Hand Dermatitis No, n (%)	P
Hand washing			
5-15	5 (41.7)	7 (58.3)	$\chi^2 = 6.167$ Df = 2 P = .046
15-25	55 (69.6)	24 (30.4)	
>25	64 (76.2)	20 (23.8)	
Hand disinfection			
<5	10 (71.4)	4 (28.6)	$\chi^2 = 0.452$ Df = 3 P = .929
5-15	15 (71.4)	6 (28.6)	
15-25	47 (68.1)	22 (31.9)	
>25	52 (73.2)	19 (26.8)	
Hand cream			
<5	36 (59)	25 (41)	$\chi^2 = 6.648$ Df = 3 P = .084
5-15	40 (75.5)	13 (24.5)	
15-25	29 (80.6)	7 (19.4)	
>25	19 (76)	6 (24)	

health workers and found that women were more prone to dermatitis. Likewise, Gupta et al²³ found that hand dermatitis was slightly more common in women than in men. However, other studies have reported that sex did not have a significant effect on the frequency of hand dermatitis.^{12,21}

Allergies are abnormal hypersensitivity reactions of the immune system against foreign substances.^{24,25} This response can be observed in early childhood as well as in adolescence and adulthood.^{25,26} The frequency of hand dermatitis was

significantly higher among nurses who had a history of allergy compared with those without an allergy, which is consistent with previous studies.^{12,19,21,23} However, Kiely et al²⁷ concluded that a history of allergy did not affect the development of dermatitis, despite reporting that the risk of developing dermatitis was significantly higher in health workers with a history of dermatitis.

One of the most common methods to prevent the spread of viruses is effective hand hygiene. In the fight against COVID-19 it is essential that effective hand hygiene habits are acquired in childhood.²⁸ Kiely et al²⁷ reported that the frequency of handwashing increased among almost all health workers (99.26%) during the pandemic. When the prepandemic and pandemic periods were compared in the current study, the frequency of handwashing and use of hand disinfectants/creams had increased significantly (Table 3). Similarly, Guertler et al¹⁷ conducted a study with physicians and nurses and found similar results. All of the guidelines for combating COVID-19 recommend thorough and frequent hand hygiene practices.^{2,5} Although the increase in the frequency of handwashing is one of the factors that contributes to the development of dermatitis, this should not dissuade health workers from appropriate hand hygiene practices during the pandemic.⁴

Nurses are the primary caregivers in a medical setting and are thus prone to infection with and transmission of the COVID-19 virus. It is vital that they comply with the guidelines for preventing and controlling infections to fight the pandemic.²⁹

In another study conducted during the pandemic, Lan et al¹⁰ concluded that the frequency of hand dermatitis increased significantly in health workers who washed their hands more than 10 times a day. Studies conducted before the pandemic reported a significant relationship between an increased frequency of handwashing and the frequency of hand dermatitis.^{12,30} However, the present study found no significant difference in the frequency of hand dermatitis by use of hand cream. However, the hand creams used by nurses may not be ideal. The use of skin moisturisers is recommended to maintain healthy skin,^{31,32} for skin protection, humectants such as topical urea and propylene glycol and occlusive emollients such as petrolatum-based products, lanolin, mineral and vegetable oils, and waxes together are recommended. Concomitant use is beneficial to keep the stratum corneum moist and soothe the skin.³³

CONCLUSIONS

This study found that the frequency of hand dermatitis among nurses during the pandemic was high. Sex, history of allergy, and increased frequency of handwashing were among the factors increasing hand dermatitis. Hand hygiene increased significantly among health workers during the pandemic. It was also found that nurses increased the measures they took to protect their skin to avoid dermatitis.

Hand disinfection plays an important strategic role in the fight against COVID-19. However, the skin and mucosa barrier are

likely to be damaged in nurses who are consistently practicing good hygiene. Nurses should take proper measures to protect their skin while carrying out their duties.

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