

Investigating the Prevalence of Contact Dermatitis and its Related Factors Among Hospital Staff During the Outbreak of the COVID-19 Epidemic: A Cross-Sectional Study

Abstract

Background: Frequent hand washing and prolonged mask use during the Coronavirus disease (COVID-19) pandemic may cause contact dermatitis in hospital staffs. This study was conducted to investigate the prevalence of contact dermatitis and its related factors among hospital staff during the COVID-19 pandemic. **Materials and Methods:** The present cross-sectional study was conducted among the hospital personnel of Aligoudarz Shahid Valian Hospital, Lorestan, Iran, from March to June 2020. Sampling was performed using the complete enumeration method and 142 hospital staff (physicians, nurses, service personnel, nurses' aides, secretaries, and laboratory and radiology experts) participated in the study. Data were collected using a 3-part questionnaire containing a demographic characteristics form, job information form, and the Nordic Occupational Skin Questionnaire (NOSQ). The obtained data were analyzed using descriptive statistics, Chi-square, and Spearman's correlation coefficient in SPSS. **Results:** The prevalence of hand dermatitis in participants was 88.02%, and facial dermatitis with the surgical mask was 71.83% and with n95 mask was 81.69%. The most-reported symptom was dryness of the hand. The most common symptom observed after prolonged use of surgical (55 Samples; 38.73%) and n95 masks (79 Samples; 55.63%) was redness. The frequency of hand washing ($F = 8$; $p = 0.017$) and the use of liquid soap ($F = 4$; $p = 0.047$) had a significant interrelation with the severity of dermatitis. **Conclusions:** Planning for preventive actions and management of the current situation should be a priority among the policies of hospital managers given the high prevalence of hand and face dermatitis among hospital staff.

Keywords: Dermatitis, Contact, COVID-19, hospitals, Iran, medical staff, prevalence

Introduction

Irritant contact dermatitis, which is the most common cause of hand eczema, is a non-immunological inflammatory reaction that is caused when the skin contacts any chemical and physical agents.^[1] Improper exposure to soaps, detergents, and other irritants such as frequent hand washing (> 20 times/day) and the use of occlusive gloves are all well-known risk factors of disease onset or exacerbation.^[2] Contact dermatitis constitutes the largest component of work-related dermatitis that has a significant impact on workers' Quality of Life (QOL), ability to perform their jobs, and health service utilization,^[3] and accounts for 70 to 90% of all occupational skin diseases.^[4] Moreover, 4 to 7% of cases referred to dermatologists are patients with contact dermatitis,^[5] because this disease tends to become chronic.^[6]

The outbreak of a new coronavirus called COVID-19 and its rapid spread has caused countries to struggle with extremely high infected rates.^[7] This has called into question the readiness of countries to effectively control the disease,^[8] so it is necessary to prioritize prevention over treatment at the present time.^[7] However, given the pandemic nature of COVID-19 disease, the need for a vaccine is undeniable.^[9] Experts have estimated that a duration of 1 year is needed to produce enough vaccines for all people, so the main emphasis is now on observing personal hygiene and its most important dimension is observing hand hygiene.^[10] The goal of washing hands with disinfectants is to eliminate transient microorganisms and reduce permanent types.^[11] Removal of the

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oily protective layer of the skin by soaps, disinfectants, and chemicals leads to disruption in the skin barrier function.^[12] The prevalence of contact dermatitis varies among hospital staff in different communities and was reported between 15 and 82% before the outbreak of COVID-19 disease^[10,13] and more than 80% during the outbreak of the disease.^[14,15] Regarding the side effects of masks, most studies have reported cases among health staff during the SARS epidemic between 2002 and 2004, and most of them attributed adverse skin reactions to n95 masks.^[12]

Due to the side effects, the rate of protective equipment used by hospital personnel is reduced and the risk of disease is increased. Hence, as medical environments are at greater risk of COVID-19, and due to the high importance of hand washing and the use of masks in the prevention of disease, this study is an attempt to investigate the prevalence of contact dermatitis and its related factors among hospital personnel during the outbreak of the COVID-19 epidemic.

Materials and Methods

The present cross-sectional study was conducted in Aligoudarz Shahid Valian Hospital, Lorestan, Iran, in March-June 2020. The selected staff included individuals who were in contact with the patients (physicians, nurses, service personnel, nurses' aides, secretaries, and laboratory and radiology experts). The study inclusion criteria included having at least 3 months of employment history in this hospital, lack of any chronic inflammatory disease such as psoriasis, lack of immunosuppressive drugs intake, willingness to participate in the study, and lack of history of previous contact dermatitis. The minimum required sample size based on a similar study,^[15] which reported the prevalence of dermatitis as about 82%, and considering $\alpha = 0.05$, $d = 0.1$, $z = 1.96$, $p = 0.82$, and $q = 0.18$ was estimated for 57 individuals. Finally, considering the design effect, the size of the final sample was multiplied by 2 and calculated to be 114 people. Since the number of hospital personnel in the hospital was almost the same as the required number, the complete enumeration method was used instead of sampling and 142 participants entered the study.

The data collection tool used was a 3-part questionnaire. The first part included a demographic information form with nine items, the second part included six items related to job characteristics, and the third part was the Nordic Occupational Skin Questionnaire (NOSQ),^[16] which has been translated into Persian by Sadeghian *et al.*^[17] Its content validity has been confirmed using a survey with a dermatologist, four faculty members of Aligoudarz School of Nursing, Lorestan University of Medical Sciences, and three clinical supervisors of the hospital (CVR = 0.86), and its reliability has been confirmed using a pilot study by calculating Cronbach's alpha coefficient ($\alpha = 0.82$). The NOSQ includes seven options related to skin symptoms on the hands (none: 0; dryness: 1, dryness, redness, and

erythema: 2; dryness, redness, and itching: 3; dryness, redness, itching, scaling, fissures, and pain: 4; dryness, redness, itching, scaling, fissures, pain, and rash: 5 and dryness, Itching, redness, scaling, fissures, pain, vesical: 6). These disorders were assessed on the palms, fingers, back of the hands, and wrists and forearm, and were self-reported by hospital personnel under the supervision of a dermatologist. The symptoms of hand and face dermatitis were confirmed by a dermatologist in the hospital and medication was prescribed if needed. Symptoms in the face area following the use of n95 and surgery masks were also assessed. The answers to the questions in this section were yes (score = 1) and no (score = 0). A score of 1 was given to any symptoms reported, and no sign was given a score of 0.

Data were analyzed in SPSS software (version 21; IBM Corp., Armonk, NY, USA). To describe data, descriptive statistics (frequency and percentage, mean and standard deviation, or median) were used, Chi-square test with Monte Carlo simulation was used to assess the relationship between 2 variables, and Spearman's correlation coefficient test was used to assess the linear relationship between 2 ordinal variables. The significance level for data was less than 0.05.

Ethical considerations

After obtaining the code of ethics (IR.LUMS.REC.1399.026 on 26 Apr. 2020) from Lorestan University of Medical Sciences and obtaining the samples consent and explaining the objectives of the research to them, the questionnaires were completed by one of the nurses working in Shahid Valian Hospital. It was also explained to the samples that the questionnaires were anonymous, and their information would remain confidential.

Result

The results of this study showed that out of 142 Samples, 87 (61.26%) were women and 55 (38.73%) were men with a mean age of 33.86 (8.06) years. The majority of Samples were in the age groups of <30 years 58 (40.84%) and 30-39 years 58 (40.80%), 97 individuals (68.30%) were married, and 108 (76.05%) individuals had a bachelor's degree. Moreover, 70 (49.29%) samples were undergoing a commitment period and most of them 72 (50.70%) had less than 5 years of work experience [Table 1]. Were nurses, 14 (9.85%) laboratory experts, 14 (9.85%) service personnel, 11 (7.74%) radiology experts, 7 (4.92%) secretaries, 6 (4.22%) general practitioners, 4 (2.81%) specialists, and 4 (2.81%) assistant nurses, respectively.

Furthermore, around 117 (82.39%) of the hospital personnel worked three shifts and most 89 (62.67%) of them worked more than 50 hours per week. In terms of the type of solution for washing hands, 114 (80.28%) used one type of solution and 28 (19.71%) used two types of solution or more. Most of the participants did not use moisturizers

Table 1: Job characteristics of the participants

Variable	Category	n (%)
Place of service	Emergency	35 (24.65)
	Surgical	26 (18.31)
	ICU*-CCU**-NICU***	33 (23.24)
	Laboratory	16 (11.27)
	Radiology	13 (9.15)
	Internal ward	11 (7.75)
	Pediatric ward	8 (5.63)
Shift type	One-turn	5 (3.52)
	Two-turn	20 (14.09)
	Three-turn	117 (82.39)
Work hours per week	Less than 50 hours	53 (37.32)
	More than 50 hours	89 (62.68)
Frequency of hand washing in each shift	≤5	17 (11.97)
	6-10	74 (52.11)
	>10	51 (35.92)
Frequency of wearing gloves in each shift	≤3	23 (16.19)
	4-6	57 (40.14)
	>7	62 (43.67)
Type of hand washing solution used	Liquid soap	123 (86.61)
	Septic acid	25 (17.60)
	Alcohol	24 (16.90)
Use of moisturizing lotion after washing	Yes	39 (27.47)
	No	103 (72.53)
Type of mask used	Surgical mask	57 (40.14)
	n95 mask	85 (59.86)

*Intensive Care Unit **Cardiac Care Unit ***Neonatal Intensive Care Unit

103 (72.53%) after hand washing and 123 (86.66%) used liquid soap [Table 1].

The prevalence of hand dermatitis was 88.02%, and 87.60% of nurses, 93.70% of laboratory staff, and 84.60% of radiology staff reported dermatitis. The prevalence of face dermatitis with a surgical mask and n95 mask was 102 (71.83%) and 116 (81.69%), respectively. The most reported symptom was hand dryness 50 (35.21%). Most people reported it in one area of the hand 97 (68.30%) and the back of the hand 104 (73.23%). The most common reported symptom of dermatitis following the use of surgical (38.70%) and n95 masks (55.60%) was redness [Table 2].

The results of Chi-square and Spearman's correlation coefficient tests showed that there was no significant relationship between the severity of dermatitis and age groups, gender, level of education, type of employment, employment history, marital status, place of work, type of shift, working hours per week, frequency of using solutions, type of solution used (alcohol and septicidine), frequency of wearing gloves during each shift, use of moisturizing lotion, and type of mask used. However, a significant relationship was found between the frequency of washing hands ($p = 0.017$) and the use of liquid soap ($p = 0.047$) [Table 3].

Discussion

The present study aimed to investigate the prevalence of contact dermatitis and its related factors among hospital personnel during the outbreak of the COVID-19 epidemic. The prevalence of hand dermatitis in samples was 88.02% and the mostly reported symptom was dryness of the hand. In terms of the relationship between the prevalence of dermatitis and demographic and occupational characteristics, only the relationship between the frequency of hand washing and the use of liquid soap was significant. The prevalence of facial dermatitis with the surgical mask was 71.83% and with the n95 mask was 81.69%

The prevalence of hand dermatitis in the present study was 88.02%, which is lower than the prevalence of dermatitis in the study conducted by Lan *et al.*,^[14] who reported a prevalence of 97% during the COVID-19 epidemic in China. This difference may be due to the fact that the study by Lan *et al.* was conducted at the onset of the disease outbreak and the number of hospitalized patients had been high. However, it should be noted that its rate in the present study is higher than that of previous studies conducted before the outbreak of COVID-19; the rate of dermatitis in previous studies varied from 15 to 82%.^[7,10,15,18] In terms of symptoms of dermatitis in the present study, the most common symptoms on the hands were dryness, itching, and redness. This finding is in line with a study conducted by Guertler *et al.*,^[15] in which more than 80% of the staff reported redness in their hands. The high percentage of dry hands, in the study conducted by Guertler *et al.*, was because samples were selected from the surgery ward and intensive care unit (ICU) for COVID-19 patients, while in the present study, staff of all wards participated in the study. In a study conducted by Lan *et al.*,^[14] the most common symptoms of hand dermatitis were dryness, roughness, and scaling, which is consistent with the results of the present study.

Taking preventive health measures can cause acute and chronic dermatitis, resulting in infection and exacerbation of skin diseases. A large epidemiological study conducted in Sweden showed that prolonged contact with water irritates the skin.^[15] Many studies have also reported a relationship between the frequency of hand washing and the prevalence of dermatitis.^[18] One of the ways to prevent the transmission of COVID-19 is to observe hand hygiene, and hospital personnel should wash their hands in five situations (It includes before touching a patient, before any aseptic procedure, after potential exposure to patient's body fluid, after touching a patient, and after touching a patient's surroundings or items that might be contaminated) each for 20 seconds.^[19] The use of cleansing solutions can also remove the oily layer of the skin and cause dryness.^[12] In the present study, a significant relationship was found between the frequency of hand washing and the prevalence of dermatitis, which is in line

Table 2: Severity of hand and face dermatitis based on symptoms and area of involvement

Variable	Category	n (%)
Score of hand dermatitis	None (0)	12 (8.45)
	Dryness (1)	52 (36.62)
	Dryness, redness, and erythema (2)	25 (17.61)
	Dryness, redness, and itching (3)	28 (19.72)
	Dryness, redness, itching, scaling, fissures, and pain (4)	23 (16.20)
	Dryness, redness, itching, scaling, fissures, pain, and rash (5)	2 (1.40)
Area of involvement	Palm	21 (14.78)
	Fingers	24 (16.90)
	Back of hand	104 (73.23)
	Hand, wrist and above it	8 (5.63)
Symptoms of face dermatitis following the use of surgical mask	Dryness	20 (14.08)
	Itching	49 (34.51)
	Redness	55 (38.73)
	Acne	10 (7.04)
	Rash	8 (5.64)
Symptoms of face dermatitis following the use of n95 mask	Dryness	14 (9.85)
	Itching	39 (27.46)
	Redness	76 (53.52)
	Acne	8 (5.63)
	Rash	10 (7.00)
Involved area in the face following the use of masks	Cheek	68 (47.88)
	Forehead	5 (3.52)
	Nose	86 (60.56)
	Eyelid	0 (0)

with the studies conducted by Omrane *et al.*,^[20] Zhang *et al.*,^[21] and Mekonnen *et al.*^[22]

Furthermore, Sanchez *et al.*^[23] found that washing hands more than 20 times per day was a risk factor for hand dermatitis. Nevertheless, in another study, there was no relationship between the frequency of washing hands and the severity of dermatitis, and this is inconsistent with Perhaps it can be said that because the study of Sadeghian *et al.* Was conducted before the outbreak of COVID-19, the samples did not have to be washed frequently the results of our study.^[17] The present study revealed a significant relationship between the use of liquid soap and the prevalence of dermatitis. Concerning the use of hand cleansers, Guertler *et al.*^[15] recommended the use of disinfectants with ethanol compounds, but in the study conducted by Sanchez,^[23] nurses who used alcohol to disinfect their hands experienced more severe dermatitis compared to those who used detergents. In the study conducted by Sadeghian *et al.*,^[17] the most common cause of hand dermatitis was reported to be the use of liquid soap. It can be stated that due to the easier access to soap and water in the present study, hand washing was more acceptable for the hospital personnel. As most of the participants in this study used soap for washing their hands, it can be stated that the combination of soap and water justifies the high level of dermatitis in the form of dryness.

Another mode of transmission of the COVID-19 disease is through the mucosa and respiratory system, and it is necessary to take preventive measures in this regard. For this purpose, using different types of masks, goggles or safety glasses, and face shields can be effective. Since these devices must be completely fixed on the face, their use for a long time may result in inefficient air exchange and symptoms such as redness, dryness, acne, and rash.^[20] In a study conducted on the side effects of masks in Singapore in 2013 following the outbreak of Severe Acute Respiratory Syndrome (SARS), 35.3% of health care staff reported symptoms such as acne (59.9%), itching (51.4%), and rash (35.8%) following the use of the n95 mask, but no harmful skin reactions were observed in people who used paper or surgical masks.^[12] In the present study, the most common symptoms were redness and itching in the nose and cheeks, respectively, following the use of the n95 mask, which is in line with the study conducted by Lan *et al.*^[14] The use of masks and glasses for a long time can put pressure on the nose and cheeks and cause symptoms. A study conducted by Albadri *et al.* on one person who reacted to the n95 mask found free formaldehyde his mask.^[12] Kadivar and Belsito^[24] reported 8.5% allergic reaction to formaldehyde after the patch test among hospital personnel. Quaternium -15, 2-bromo-2-nitropane-1, and 3-diol are formaldehyde-releasing preservatives found in many cosmetic products, such as liquid soaps, moisturizers, and cleansers.

Table 3: Results of Chi-square and Spearman's correlation coefficient test regarding the relationship between variables and severity of hand dermatitis

Variable	Category	Severity of dermatitis					p*	p-value trend**
		0 (no) n (%)	1 (low) n (%)	2 (moderate) n (%)	3 (severe) n (%)	4 or 5 (very severe) n (%)		
Age group	<30	5 (8.61)	21 (36.21)	9 (15.51)	13 (22.41)	10 (17.24)	0.314	0.867
	30-39			15.515%	22.41%	17.24%		
	≥40	8 (13.79)	22 (37.93)	11 (18.96)	11 (18.96)	6 (10.34)		
Gender	Male	4 (15.38)	7 (26.92)	3 (11.53)	3 (11.53)	9 (15.51)	0.052	-
	Female	12 (21.81)	14 (25.45)	9 (16.36)	10 (18.18)	10 (18.18)		
Work experience (year)	≤ 5	5 (5.74)	36 (41.37)	14 (16.09)	17 (19.54)	15 (17.24)	0.480	0,089
	6-10	10 (13.88)	28 (38.88)	11 (15.27)	13 (18.05)	10 (13.88)		
	11-15	3 (8.33)	11 (30.55)	7 (19.44)	9 (25.00)	6 (16.66)		
	>15	2 (15.38)	6 (46.15)	3 (23.07)	1 (7.69)	1 (7.69)		
Place of service	Emergency	2 (9.52)	5 (23.80)	2 (9.52)	4 (19.04)	8 (38.09)	0.928	-
	Surgery	6 (17.14)	12 (34.28)	5 (14.28)	5 (14.28)	7 (20.00)		
	ICU/CCU/NICU	1 (3.84)	9 (34.61)	6 (23.07)	5 (19.23)	5 (19.23)		
	Laboratory	6 (18.18)	8 (24.24)	5 (15.15)	8 (24.24)	6 (18.18)		
	Radiology	1 (6.25)	7 (43.75)	3 (18.75)	4 (25.00)	1 (6.25)		
	Internal ward	2 (15.38)	7 (53.84)	1 (7.69)	1 (7.69)	2 (15.38)		
	Pediatric ward	1 (9.09)	5 (45.45)	1 (9.09)	3 (27.27)	1 (9.09)		
Level of education	Diploma and lower	0 (0.00)	2 (25.00)	2 (25.00)	1 (12.50)	3 (37.50)	0.861	0.752
	Bachelor's	3 (15.00)	6 (30.00)	2 (10.00)	3 (15.00)	6 (30.00)		
	Master's/GP***/PHD****	13 (12.03)	40 (37.03)	18 (16.66)	21 (19.44)	16 (14.81)		
Type of employment	Project/Contractual	1 (7.14)	4 (28.57)	3 (21.42)	3 (21.42)	3 (21.42)	0.957	-
	Contract	9 (12.85)	22 (31.42)	11 (15.71)	14 (20.00)	14 (20.00)		
	Official	4 (11.76)	13 (38.28)	4 (11.76)	7 (20.58)	6 (17.64)		
Marital status	Single	4 (10.52)	15 (39.47)	8 (21.05)	6 (15.78)	5 (13.15)	0.714	-
	Married/other	3 (6.97)	15 (34.88)	9 (20.93)	8 (18.60)	8 (18.60)		
Shift type	1 turn	14 (14.14)	35 (35.35)	14 (14.14)	19 (19.19)	17 (17.17)	0.976	0.899
	2 turn	1 (20.00)	1 (20.00)	1 (20.00)	1 (20.00)	1 (20.00)		
	3 turn	3 (15.00)	5 (25.00)	4 (20.00)	5 (25.00)	3 (15.00)		
Hours of work per week	≤50	13 (11.11)	44 (37.60)	18 (15.38)	21 (17.94)	21 (17.94)	0.204	0.264
	>50	3 (5.66)	21 (39.62)	6 (11.32)	13 (24.52)	10 (18.86)		
Hand washing times per shift	<5	14 (15.73)	29 (32.58)	17 (19.10)	14 (15.73)	15 (16.85)	0.017	0.051
	6-10	3 (17.64)	4 (23.52)	2 (11.76)	5 (29.41)	3 (17.64)		
	>10	10 (13.51)	25 (33.78)	13 (17.56)	13 (17.56)	13 (17.56)		
Hand sanitizer/Soap	≥2 Sanitizer	4 (7.84)	21 (41.17)	8 (15.68)	9 (17.64)	(9)17.64	0.047	-
	No	3 (10.71)	10 (35.71)	5 (17.85)	3 (10.71)	7 (25.00)		
Hand sanitizer/Alcohol	No	15 (12.19)	43 (34.95)	20 (16.26)	25 (20.32)	20 (16.26)	0.342	-
	Yes	15 (12.71)	40 (33.89)	21 (17.79)	24 (20.33)	18 (15.25)		
Hand sanitizer/Decosept	No	2 (8.33)	10 (41.66)	2 (8.33)	3 (12.50)	7 (29.16)	0.224	-
	Yes	14 (11.96)	43 (36.75)	16 (13.67)	25 (21.36)	19 (16.23)		
Frequency of Wearing gloves per shift	<3	3 (12.00)	7 (28.00)	7 (28.00)	2 (8.00)	6 (24.00)	0.299	0.138
	4-6	3 (13.04)	8 (34.78)	1 (4.34)	7 (30.43)	4 (17.39)		
	>7	4 (7.01)	17 (29.82)	13 (22.80)	11 (19.29)	12 (21.05)		
Use of moisturizing lotion after washing	yes	10 (16.12)	25 (40.32)	9 (14.51)	9 (14.51)	9 (14.51)	0.448	-
	no	4 (10.25)	16 (41.02)	4 (10.25)	10 (25.64)	5 (12.82)		
Mask type	Surgical Mask	13 (12.62)	34 (33.00)	19 (18.44)	17 (16.50)	20 (19.41)	0.219	-
	n95	6 (10.52)	19 (33.33)	11 (19.29)	7 (12.28)	14 (24.56)		
		11 (12.94)	31 (36.47)	12 (14.11)	20 (23.52)	11 (12.94)		

* Chi-square test with Monte Carlo simulation was utilized to assess the relationship between two variables. ** Spearman's correlation coefficient test was used to assess the linear relationship between two ordinal variables. *** General Practitioner **** Philosophiae Doctor, ICU=Intensive Care Unit, CCU=Cardiac Care Unit, NICU=Neonatal Intensive Care Unit

Patch test was not performed in the present study and the type of allergenic substance was not identified; nevertheless, it can be stated that the liquid soap used containing substances such as formaldehyde can justify the high prevalence of dermatitis among hospital personnel. In our study, the most commonly reported side effects among hospital personnel following the use of surgical masks were redness, itching, and dryness. This is consistent with the results of a study conducted by Al Badri who reported face dermatitis following the use of a surgical mask and allergy to dibromodicyanobutane (a preservative substance in surgical masks) released from the mask of a nurse.^[12]

Due to the high prevalence of hand and face dermatitis among hospital personnel, it is recommended that lukewarm water be used to wash hands and the hands are dried after washing.^[17] Yan *et al.*^[19] recommended regular use of moisturizers after washing hands, although in a study conducted by Burke *et al.*,^[4] no association was found between the prevalence of dermatitis and the use of hand moisturizers. With an increase in the number of symptoms, identifying the cause of contact dermatitis has become crucial, and identifying acceptable alternative products for the future and preventing its recurrence is recommended. Given the high prevalence of hand dermatitis among hospital personnel, planning for preventive measures and management of the current situation should be a priority of plans of hospital managers. It is better to use high-quality and non-formaldehyde soaps containing emollients, and hospital personnel should be provided with solutions that are less harmful to the hands. Masks should be used periodically and before wearing a mask, glasses, or face shield, it is better to use moisturizers or gels on the face to reduce friction between the mask or glasses and face.^[19] Hospital personnel should be examined periodically in terms of dermatitis by a dermatologist, and high-risk individuals should be employed in wards that are less prone to dermatitis. A limitation of this study was its small sample size, so it is recommended that similar studies be conducted with larger sample size at more hospitals. Lack of performance of a test to determine the type of allergen was another limitation of this study, which was due to the time consuming nature of this procedure and the high workload of the hospital personnels.

Conclusion

In this study, the prevalence of hand and face dermatitis was high in the samples. The most common symptoms were dry in hands, and redness of the face. The results showed that the frequency of hand washing and the use of liquid soap had a significant relationship with the prevalence of hand dermatitis. The results of this study can help hospital personnels to better use hand detergents, adopt washing methods, and use personal protective equipment correctly. Consequently, due to the discrepancy in findings regarding the association between the rate of dermatitis

and the substances used to wash and disinfect the hands, and the effect of moisturizers, it is recommended that any hospital personnel with symptoms of dermatitis perform allergy tests and determine the type of allergen. Moreover, it is suggested that a study with a larger sample volume be performed to identify all the factors that are effective in causing contact dermatitis in hospital personnels in order to avoid them and minimize the risk in health care workers.

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Conflicts of interest

Nothing to declare.

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