The Adverse Cutaneous Effects of Hand Hygiene Practices among Individuals Other than Non-Healthcare Providers During Coronavirus-19 Pandemic: A Cross-Sectional Online Survey

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Sir,

The current SARS-CoV-2 (Severe acute respiratory syndrome coronavirus-2) pandemic has levied significant lifestyle modifications to curb its transmission, most notable of all being hand hygiene practices, sneezing etiquettes, and social distancing. Significant emphasis on hand hygiene measures has resulted in an upsurge of dermatology consultation for hand eczema (HE) in the general public and health care workers (HCW).[1,2] The present study is being undertaken to assess the effect of hand hygiene practices on the skin in the community, with a possible attempt to correlate it with age, gender, frequency of hand hygiene, and application of moisturizers. Institutional review board approval was obtained before the commencement of the study.

This online cross-sectional survey was conducted using Google forms (link: https://forms.gle/SqyxnUpoAQWAqFuD7) sent to potential study participants through social media (Whatsapp). Inclusion criteria were age above 18 years and written consent to participate in the study voluntarily. Healthcare workers were excluded from the study. Suitable subjects were directed to the questionnaire composed of fifteen closed-ended questions validated and optimized by pretesting among five experts. Data was collected over three months (June 2020 to August 2020), and statistical analysis was done using SPSS software version 22. Those having skin changes suggestive of HE were compared to those not having them using the Chi-square test for categorical variables and student t-test for continuous variables. The *P* value of less than 0.05 was considered significant. The study is being reported based on CHERRIES (checklist for reporting results of internet E-surveys) reporting guidelines.[3]

A total of 200 valid responses were analyzed. 113 (56.5%) respondents were men and 87 (43.5%) were women. Their mean age was 37.34 ± 11.10 years. Only non-HCW were selected to prevent the possible bias of frequent hand washing by HCW. Pre-existing allergies, including HE and rhinitis, were observed in 35 (17.5%) respondents. Almost all (94.5%) reported an increase in the frequency of handwashing or sanitization for last 3-4 months due to the ongoing coronavirus-2019 pandemic. 81% (162) participants were using soap for washing hands, 59% (118) alcohol-based sanitizers, and 12% (24) herbal sanitizers. Maximum (45.5%) respondents washed/sanitized their hands 6-8 times per day, and 20% reported hand washing/sanitizing every hour. Involvement in household chores, including washing utensils, clothes, and cleaning floors with detergents/soaps/floor cleaners, was reported by 61%. More than half (59.5%) of the study respondents denied using gloves for routine activities. Excessive dryness of hands was noticed by 68 (34%) subjects, with 81 (40.5%) reporting additional changes [Table 1] ranging from itching and exfoliation of skin to maceration and redness. Nearly half of the respondents never applied moisturizers over their hands, and only 11.5% used them more than three times daily. A comparison of the study subjects with and without skin changes suggestive of HE was performed [Table 2] to assess different factors' effects. There appears to be no effect of age on the development of skin changes (*P* = 0.190). The female

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gender appeared more at risk, with a *P* value of 0.001. A statistically significant association was also seen with pre-existing allergies (*P* = 0.03), more than six times hand washing/sanitization (*P* = 0.007), and infrequent use of moisturizers (*P* = 0.001).

The current pandemic can exponentially increase the incidence of HE in the community, predominantly attributed to stringent hand hygiene measures. This has been reflected lately by emergent reports of HE in HCW and the general public. A study from Wuhan (China) reported HE in 74.5% HCW involved in COVID-19 patients' care with more than ten times per day frequency of handwashing being a strong predictor.[4] Most studies enroll HCW as study subjects; however, community-based data are mostly unavailable. This study was planned as an electronic Internet survey using Google forms for easy access to study participants. Most respondents belonged to the 30-49 years age group. However, there was no statistical association of HE with age suggesting all ages to be equally vulnerable. Females were more prone to develop HE (*P* = 0.001); this could result from their frequent involvement in household chores requiring the use of soaps and detergents. The frequency of handwashing was significantly associated with HE. It has been repeatedly reported to strongly associate with HE in HCW, and the same hold for the general public.[4] A prolonged period of wearing gloves has been established as an independent risk factor in HCW by producing a state of occlusion that causes maceration, increasing penetration of soaps, and alkalis.[5] However, using gloves did not correlate with the development of HE (*P* = 0.726) in the present study. 34% of the respondents felt that their hands were

Table 1: Frequency of skin changes in study respondents (*n*=200)

Clinical signs/symptoms	Number (%)
Dryness/tightness	68 (34%)
Itching	19 (9.5%)
Exfoliation of skin	17 (8.5%)
Tenderness	6 (3%)
Burning	5 (2.5%)
Redness	5 (2.5%)
Maceration of skin	1 (0.5%)
No skin changes	119 (59.5%)

Table 2: Comparison of selected characteristics in study participants with or without skin changes (% Represent that within hand eczema)

Parameter	Hand eczema present	Hand eczema absent	*P*
Age in years (mean±SD)	37.28±10.29	37.37±11.67	0.955
Gender (%)			0.001
Male	42.0%	66.4%	
Female	58.0%	33.6%	
Preexisting allergies (%)			0.030
Yes	22.2%	10.9%	
No	71.8%	89.1%	
Frequency of handwashing (%)			0.020
Every hour	24.7%	16.8%	
6-8 times/day	51.9%	41.2%	
3-5 times/day	19.8%	40.3%	
<3 times/day	3.7%	1.7%	
Involvement in household chores (%)			0.025
Yes	70.4%	54.6%	
No	29.6%	45.4%	
Wearing gloves (%)			0.726
Yes	42.0%	39.5%	
No	58.0%	60.5%	
Use of moisturizer (%)			0.001
Never	30.9%	61.3%	
1-2 times/day	56.8%	27.7%	
3-5 times/day	7.4%	5.9%	
6-8 times/day	1.2%	1.7%	
After every hand wash	3.7%	3.4%	
Use of alcohol-based hand sanitizer (%)			0.384
Yes	54.3%	60.5%	
No	45.7%	39.5%	
Use of soap for washing hands (%)			0.213
Yes	85.2%	78.2%	
No	14.8%	21.8%	

dry and experienced a feeling of tightness with a myriad of other symptoms ranging from redness, exfoliation, tenderness, and maceration. Guertler *et al*. reported 90.4% HCW involved in the care of COVID-19 to have symptoms of acute hand dermatitis. Thus in HCW, the statistics are incredibly high. Nonetheless, the general public is also facing the brunt alike.[1] Moisturizers contain humectants, fats, and oils that replace depleted skin lipids, improving the skin's barrier function. Unfortunately, these advantages of moisturizers in HE prevention are not well acknowledged, as is represented in the present study, with only 10.5% of participants using moisturizers more than three times a day. There was significantly less incidence of HE in those using moisturizers regularly (P = 0.001), and this needs to be highlighted. In the current situation, when not adhering to hand hygiene practices can be detrimental, this single readily practiced preventive measure can be extremely useful.

Thus the present study reinforces female gender, frequency of handwashing, and pre-existing allergies to be significant risk factors for HE development. Further, it also strengthens the benefits of regular moisturization as the only practical and cost-effective preventive measure, which, if propagated, has the potential to bring down the risk of hand eczema appreciably.

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Conflicts of interest

There are no conflicts of interest.

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