

# Frequency of hand dermatitis in relation to frequent hand washing with antiseptics during COVID - 19 pandemic

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## Abstract

**Objective:** The aim of this study is to assess the skin changes that may occur in people as a result of frequent hand washing with topical antiseptics to protect themselves during COVID -19 pandemic. **Methods:** This is a cross sectional descriptive study done in Alkadhimia Teaching Hospital in Baghdad during COVID- 19 pandemic from the period 1st of November 2020 to 1st of march 2021. Three hundred participants attending the dermatology outpatient clinic were enrolled, each one was interviewed by questionnaire & examined by dermatologist. **Results:** The most common skin change is dryness s(52.66%) & most commonly affected site is the dorsum of hands (43%) of participants. Forty three (14.33%) of participants diagnosed as having hand dermatitis. Female patients compromise (65.11%) of them & house wives were more involved (46.51%) & the age group (21-30 years) is more affected (34.88%). **Conclusion:** skin changes & dermatitis are related to antiseptic materials used rather than number of hand washing per day.

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## Keywords

COVID-19; antiseptics; hand hygiene

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Corona disease (COVID-19) pandemic is a worldwide emerging infection in late 2019 & affecting millions of people & still considered a serious health problem .It is mainly affecting respiratory system but may affect any body organ leading to morbidity & even death. The main route of transmission is through respiratory droplet but may be transmitted by direct contact through skin.

As with any health problem ,certain preventive measures was considered ,the corner stone of these measures is hand washing & use of topical antiseptics materials in a form of wash, soaps ,gel & others. These materials if frequently used may be harmful & may lead to

skin changes like dryness & even hand dermatitis.

Prolonged exposure to water and chemicals may induce some pathological changes like epidermal barrier disruption & impairment of keratinocytes[1].Also the immune system may be activated with recruitment of inflammatory cytokines.

Water alone can remove the free amino acids, the components of the natural moisturizing factor responsible for maintaining sufficient hydration for stratum corneum .[2]

The pH of the skin also increases after contact with water . An acidic pH is important for the enzymes responsible for stratum corneum

synthesis and metabolism of skin lipids.[3] The end results is many structural & functional changes like disruption of the lipid bilayer composition, epidermal inflammation, and increased permeability.[4] So if we are frequently wash our hands & use topical chemical antiseptic materials during hand washing, this habit may accelerate these changes & leading to unpleasant skin changes.

## Material/Subjects/Patients and methods

This is a cross sectional descriptive study done in Alkadhimia Teaching Hospital in Baghdad during COVID- 19 pandemic from the period 1<sup>st</sup> of November 2020 to 1<sup>st</sup> of march 2021.

Three hundred participants attending the dermatology outpatient clinic were enrolled, each one was interviewed by questionnaire & examined by dermatologist.

The questionnaire include the following questions :age, sex, occupation, history of previous skin problems, number of hand washing with topical antiseptics daily, types of topical antiseptics used, & if there is any additional daily use of water like showering, cleaning & others.

Examination the skin of hands & searching for any changes like erythema, dryness, scaling, fissuring & other changes with demonstration of common sites involved.

Statistical analysis were performed using SPSS version 28.

Values of  $P < .05$  were considered to indicate statistical significance.

Tests: Chi squared test

Diagrams: bar charts

## Results

A total number of 300 participants were enrolled. There were 229(76.33%) female and 71(23.67%) male participants. Their ages ranged from 6 -70 years with a mean of 31.9 years.

The majority of participants were house wives (51%) followed by students (20%), the employers (15.33%) & then the private jobs(8.33%). There were( 3.67%) with jobs dealing with excess water like cooks & farmers & only(1.67%) were medical staff who deals with excess topical antiseptics.

Regarding the number of daily hand washing

with soaps & antiseptics during the COVID-19 pandemic, the majority( 52.33%) of participants wash their hands more than 10 times daily, followed by(32.33%) who wash their hands 3-6 times daily & the rest(15.33%) wash their hands less frequently up to 3-5 times only by a day.

Regarding the materials used in hand washing, the majority 293( 97.7%) were use plain soap followed by alcohol (48%); chlorhexidine (26%); dettol (15.7%) & the least used material was medical soaps( 9%) of the sample. Nearly third of the patients(35.6%) used one type of materials;( 38.3%) use two materials;(20%) use 3 materials & only(6%) use 4 materials in their daily hand washing.

The most common skin change is dryness( 52.66%) & most commonly affected site is the dorsum of hands (43%) of participants.

Forty three (14.33%) of participants diagnosed as having hand dermatitis.

Female patients comprise( 65.11%) of them & house wives were more involved (46.51%) & the age group (21-30 years) is more affected (34.88%).

## Discussion

Discussion :During COVID-19 pandemic there is an increase awareness of hand hygiene as this simple maneuver may reduce the probability of disease transmission up to 31%. [5]

The World Health Organization (WHO) recommend frequent hand washing and indicate that hand hygiene procedures are one of the methods to prevent the COVID-19 transmission. [6,7,8]

Many people use chemical topical antiseptics & soaps & increase their daily hand washing more than actually required to overcome the risk of acquiring infection making them more prone to skin changes & increase the susceptibility of hand dermatitis because of the loss of protective mantle of the skin. [9]

Hand hygiene primarily involves washing the hands with water alone or with water & soap or use other materials like alcohol, dettol, chlorhexidine & other antiseptic materials with water.

Water alone can remove the free amino acids, which regarded the main factor responsible for maintaining stratum corneum

hydration.[10,11]

Worldwide many studies done to evaluate the effect of hygienic processes such as frequency of hand washing greater than 10 to 20 times/day, wearing gloves, & topical antiseptics use on the hands, some of them are internet based studies & others are questionnaire-based studies & most of the participants were health workers[12,13,14]. In this study we try to study the relation between the occurrence of hand dermatitis & the hand hygiene habits like number of daily hand washing & the use of certain topical antiseptics in a sample of general populations.

In the present study, forty three (14.33%) of participants diagnosed as having hand dermatitis. This figure is lower than another 2 previous studies where hand dermatitis was found in (20.87%) & (21%) of cases respectively [13,14].

Also it is lower in comparison to another study of skin done in China.[15] However, the mentioned study included all types of skin damage related to use of protective measures including the use of gloves & others equipment. Studies on Danish children found hand dermatitis prevalence to range between 38% and 50.4% during the pandemic.[16,17]

The most common skin change in our sample is dryness (52.66%) of participants. Another study also found that dryness was the most frequent symptom in studied population but in a less percentage (14.5%).[15]

Regarding the number of hand washing per day, the majority (52.33%) of participants wash their hands more than 10 times daily, the same previous study [15] showed that (89.81%) of the study population increased the frequency of hand washing. Also we noted that the risk of hand dermatitis is increase when people wash the hands more than 10 times daily. A recent study showing that there is a 2.17-fold increase in the risk of skin changes when hand washing was more than 10 times per day.[11]

When studying the variables of these patients with hand dermatitis in regard to number of hand washing per day, the result is not statistically significant (table no.1)

In regard to materials used by those participants who have hand dermatitis, it is evident that there is an association between hand dermatitis & the materials used in hand

washing especially if use multiple materials. (table no.2)

Since COVID-19 is still a health problem, hand hygiene is still a simple & effective maneuver to protect against transmission of infection, so we should learn how to practice perfect hand washing through the use of less irritant antiseptic materials in order to protect our skin & decrease the occurrence of hand dermatitis.

## Conclusion

skin changes & hand dermatitis are related to antiseptic materials used rather than number of hand washing per day.

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**Table 1: Diagnosis of dermatitis & number of hand washing per day Cross tabulation**

		no of hand washing per day			Chi-Squared	p-value	
		3-5 times	6-10 times	> 10 times			
Diagnosis of dermatitis	No	Count	35	85	4.067	0.131	
		% within Diagnosis of dermatitis	13.6%	33.1%			53.3%
	Yes	Count	11	12			20
		% within Diagnosis of dermatitis	25.6%	27.9%			46.5%

**Chi-squared Test**

Null hypothesis: there is no association between dermatitis and no of hand washing per day

Alternative hypothesis: there is association

between dermatitis and no of hand washing per day

Since p-value = 0.131 > 0.05, we can not reject the null hypothesis, so there is no association between dermatitis and no of hand washing per day.

**Table 2 Diagnosis of dermatitis & materials used in hand washing Cross tabulation**

		materials used in hand washing				Chi-squared	p-value	
		one type	two types	three types	four types			
Diagnosis of dermatitis	No	Count	89	102	55	11.997	0.007	
		% within Diagnosis of dermatitis	34.6%	39.7%	21.4%			4.3%
	Yes	Count	18	13	5			7
		% within Diagnosis of dermatitis	41.9%	30.2%	11.6%			16.3%

**Chi-squared Test** Null hypothesis: there is no association between dermatitis and materials used in hand washing

Alternative hypothesis: there is association between dermatitis and materials used in hand

washing  
Since  $p\text{-value} = 0.007 < 0.05$ , we reject the null hypothesis, so there is association between dermatitis and materials used in hand washing.

**Table 3 Diagnosis of dermatitis & skin examination (morphology) Crosstabulation**

		skin examination (morphology)					Chi-squared	p-value	
		no thing	one morph.	two morph.	three morph.	four morph.			
Diagnosis of dermatitis	No	Count	142	106	9	0	251.13	<0.001	
		% within Diagnosis of dermatitis	55.3%	41.2%	3.5%	0.0%			0.0%
	Yes	Count	0	0	18	14			11
		% within Diagnosis of dermatitis	0.0%	0.0%	41.9%	32.6%			25.6%

**Chi-squared Test**

Null hypothesis: there is no association between dermatitis and skin examination (morphology)

Alternative hypothesis: there is association between dermatitis and skin examination

(morphology)  
Since  $p\text{-value} < 0.001$ , we reject the null hypothesis, so there is association between dermatitis and skin examination (morphology)  
Diagnosis of dermatitis & number of sites Crosstabulation

		number of sites					Chi-squared	p-value	
		no thing	one site	two sites	three sites	four sites			
Diagnosis of dermatitis	No	Count	139	80	34	4	97.29	<0.001	
		% within Diagnosis of dermatitis	54.1%	31.1%	13.2%	1.6%			0.0%
	Yes	Count	0	14	14	13			2
		% within Diagnosis of dermatitis	0.0%	32.6%	32.6%	30.2%			4.7%

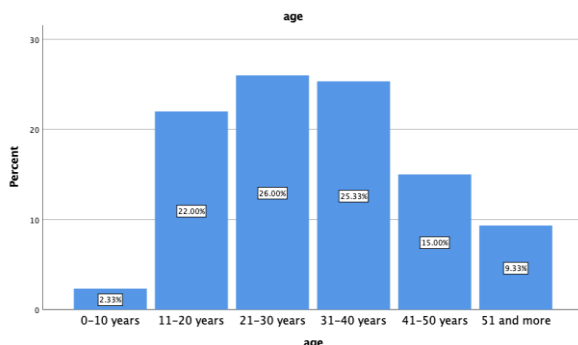
**Diagnosis of dermatitis & number of sites Crosstabulation**

**Chi-squared Test**

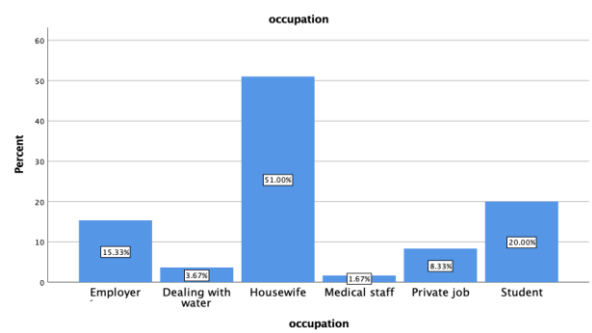
Null hypothesis: there is no association between dermatitis and number of sites

Alternative hypothesis: there is association between dermatitis and number of sites

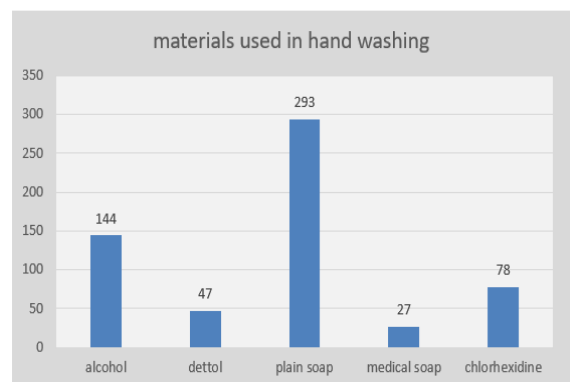
Since  $p\text{-value} = 0.000 < 0.05$ , we reject the null hypothesis, so there is association between dermatitis and number of sites



**Figure 1 Distribution of participants according to the age groups**



**Figure 2 distribution of participants according to occupation**



**Figure 3 materials used in hand washing**