

## ORIGINAL ARTICLE

**Hair, Nail, and Skin Changes during COVID 19 Era****<sup>1</sup>Anfal L. Al-Harbawi\*, <sup>1</sup>Hala N. Alsalmi, <sup>1</sup>Qasim S. Al Chalabi, <sup>2</sup>Mohammad S. Saeed**<sup>1</sup>Department of Medicine/Dermatology section, Mosul University<sup>2</sup>Dermatology section, Al Sadir Teaching Hospital in Maysan**ABSTRACT****Key words:***Coronavirus, Hair, Disinfectant, Allergens***\*Corresponding Author:**

Anfal L. Al-Harbawi  
 Department of Medicine,  
 Dermatology section, Mosul  
 University  
 Tel.: 07740853161  
[anfalqasid@uomosul.edu.iq](mailto:anfalqasid@uomosul.edu.iq)

**Background:** In December 2019, unexplained cases of viral pneumonia caused by a new coronavirus pathogen (SARS-CoV-2) began to be reported in China, and the disease was called Coronavirus Disease 2019 (COVID-19). Guidelines issued by WHO and other agencies have been consistent about the need for physical distancing, respiratory protection with a face mask, hand wash, and the use of disinfectant to clean frequently touched surfaces daily. **Aim** to identify the possible effect of the protective measures against COVID19 virus on the hair nail, and skin. **Methodology** This study was conducted as a prospective cross sectional study using an online questionnaire. The participants were from different Iraqi cities. The study was carried out from the first of June to the end of August, 2020. **Results:** There were 1893 cases that reported different skin complains, 55% complained of hand dermatitis, and about 64% of cases showed mask marks and rashes. And more than 64% patients complained of notable hair loss. A 56% of participants reported nails brittle and dullness. **Conclusion:** For balancing the benefits and the harm it is essential to support strategies to protect the skin (using products devoid of common allergens, using products with added moisturizers, and applying moisturizers immediately after hand washing or before gloves use and healthy diet).

**INTRODUCTION**

In December 2019, unexplained cases of viral pneumonia caused by a novel Coronavirus pathogen ((SARS-CoV2)) began to be reported in China, and it was called Coronavirus Disease 2019 (COVID-19)<sup>1</sup>. On the 24<sup>th</sup> of February 2020 first case of COVID19 positive had been reported in Iraq<sup>2</sup>. On March 11, 2020, World Health Organization (WHO) reported COVID-19 as a pandemic disease. At the end of July 2020, Iraq was the second place in the rank of coronavirus in Arabian world, with about 134,722 cases and 5,017 death<sup>1</sup>.

All the world try to fight the disease till now no definite treatment has been recommended, but the only way to prevent the virus spread is to use protective methods and recently the COVID 19 vaccines to use the Herd immunity stratige . The guidelines for Coronavirus protection dispensed by WHO, the US CDC “Centers for disease control and prevention”, and other agencies have been recommended physical and social distancing of (1–2 m), usage of a face mask, hand wash(with soap and water for at least 20 seconds) and use disinfect to clean frequently touched surfaces daily<sup>3</sup>.

Hand and body cleansing products are presented in various forms (liquid, bar soaps, synthetic detergents, antiseptic one, alcohol-based hand sanitizers, and so on), even though their effectiveness to fight the virus they have a significant harmful effect on the skin by

altering skin-barrier integrity and function and increase the possibility of skin disease<sup>4</sup>.

**Aim of the study:**

To identify the possible effect of the protective methods against COVID19 virus on the hair, nail and skin.

**METHODOLOGY**

This study was an observational cross-sectional study. It was fulfilled by using an online questionnaire. The participants were from different Iraq cities. The study was carried out from the first of June to the end of August, 2020. The questionnaire had the general information of all the individuals such as age, gender, residence, occupation, questions about number of hand wash, detergent use, hair loss, nail changes, skin changes, and if previous skin disease had been recorded. All the participants were asked questions about the hair,nail and skin before and after the era of pandemic disease and any comment add and picture sent for any suspicious lesion. We use Google Forms to make the questionnaire three dermatologists and family medicine physicians were shared to prepare the proper questions. Exclusion criteria were patient had COVID positive, had any previous dermatological disease, use any drug, and if have any medical disease.

Power analysis revealed (2029) respondents in the study which were larger than the acceptable sample size to increase the reliability of the findings from this study. The qualitative results were given as number and percentage, a value of ( $P < 0.05$ ) was accepted as statistically significant. all data had been analyzed using Excel windows 10 and the P-value measured

## RESULTS

This study was conducted as a prospective cross-sectional study. There were 2029 participants from 18 Iraqi cities. From the 1<sup>st</sup> of June to the 31<sup>st</sup> of August. About 32 patients had coronavirus and 104 participants had COVID19 positive patients at home had been excluded, so the total number of cases were 1893 participants, 832 (56.1%) were men, while 1061

(43.9%) were women. The average age was found as 25 ± 12.4 (age range 16-55) years.

We sort the information according to parts affected as shown in table 1,2,3,4 and 5 we found if there was any complain or skin lesions appeared in the era of COVID associated with the use of protective measures frequent hand wash, face mask, detergent use and number of hair wash in a week and so on).

There were 1893 cases that reported different skin lesions complain so we sort them according to number of hands wash for less than or more than 4 times per day to identify a possible effect of frequent hand wash on the skin as it is shown in (table 1). Also, we reported that there were about 66% of the participant change their ordinary hand wash with alcohol-based hand sanitizers, and 54% of cases use the disinfectant gel more than 6 times per day.

**Table 1: The effect of frequent hands wash on the skin**

Frequent hands wash / day	More than 4 times		less than 4 times		P-value
	Number of cases	%	Number	%	
Skin dryness	1042	55	851	45	< 0.05
Skin redness	348	18.3	1545	81.7	
Skin sensitivity	1345	71	548	29	
Itching skin	756	39.9	1137	60.1	
Swelling of skin	426	22.5	1467	77.5	

Also, we tried to evaluate the effect of mask used in this era as a protective measures with possible skin effect as shown in (table 2).

**Table 2: The effect of the use of face mask for more or less than 3 hours per day.**

Using of mask for every time went outside for 3 hours variant	More than 3 hours/day		Less than 3 hours per day		P-value
	Number of cases	%	Number of cases	%	
Mask marks	1210	64	683	36	< 0.05
Commedon and acne lesions under the mask	1231	65	662	35	

Then we asked if there were any hair complaint, then we asked he individual who complained about these symptoms about the number of hair wash per week as shown in table (3,4).

**Table 3: The hair affection in this era.**

The dermatological condition	Yes		No		P-value
	Number of cases	%	No	%	
Hair loss	1228	64.8	665	35.1	<0.05%
Loss of hair brightness	1107	58.5	786	41.5	
Broken hair	1274	67.3	619	32.7	
Scalp itching	1036	54.7	857	45.3	

**Table 4: The effect of frequent hair washes per week on hair loss.**

Hair loss	Once / week	Twice	More than 2
yes	124	209	895
no	312	198	155

Then we assessed the effect of hand wash, wearing gloves and using detergent on the nail integrity and characters as shown in table (5)

**Table5: Show the effect of frequent hand wash on the nail integrity and character.**

Frequent hands wash / day	More than 4 times		Less than 4 times		P-value
	Number of cases	%	Number of cases	%	
Easily brittle nails	1059	55.9	834	44.1	
Dull color of nail	984	51.9	909	48.1	
Thinning in the nail	1139	60.2	754	39.8	

## DISCUSSION

The emergence of novel pathogens has always postured significant challenges to global health around the world.<sup>5</sup> With excessive use of many products with effects on the skin barrier we found that there was a significant effect on hair, skin, and nail. One of the many ways which were recommended to prevent the spread of COVID 19 virus was frequent and effective hand washing and WHO recommended guidelines for the prevention of this virus.<sup>6</sup>

Allison et al found in their Meta analysis that the usage of the soap with hand-hygiene education is advisable to prevent both GIT & respiratory illnesses, but many side effects had been observed<sup>7</sup>. One of the major components of a healthy skin barrier is the stratum corneum, which is composed of keratin and lipids and acidic PH of the skin "acid mantle" ( PH 4.7)<sup>4,8</sup>, according to Lloyd Arnold<sup>9</sup> and Michaels et al<sup>10</sup>, the structural integrity and the buffer toward harsh environmental substances (including soaps and detergents, cold water or hot water, mild lubricant, long time gloves usage, friction, wet environment, and thick paper towels) can undesirably affect skin \_barrier functions and its bacterial flora<sup>9,10</sup>.

Ohman and Vahlquist<sup>11</sup>identified that there are many enzymes in the skin work in optimal PH (5.6) which will change with the use of cleansing agents because it induces inflammatory reaction with PH (9.6) that lead to skin dryness and desquamated which had been seen significantly in our research and about 18.3% of cases showed redness and 71% complained from skin sensitivity whichhad been increased with number off hand wah and the time they expand in washing all the patients didn't complain from it before the era of COVID-19 and the excessive use of disinfectant, and 55% of patient reported skin dryness, which Chandlerat et al<sup>12</sup> supported in their research that contact dermatitis might increase in the possibility of occurrence with frequent hand washing, combined with chemical and physical irritants (like detergents & hot water) results in keratinocyte release of pro-inflammatory cytokines that instigate skin barrier disruption, cellular changes, additional cytokine release & proteins are denatured. When the barrier of the skin is disturbed, this will exhibit increased trans-epidermal water loss (TEWL) and more irritant and allergen can penetrate the epidermal, leading to propagation of an inflammatory response all that lead to hand dermatitis<sup>4,11,12</sup>.

To moderate the probable increase in the incidence of dermatitis from frequent hand cleaning in response to COVID-19 protection roles, good hand hygiene skill is energetic in combination with the usage of emollient. The CDC preferred that every person should wash their hands with soap and water for at least twenty seconds<sup>13,14</sup>.

In this study, we tried to assess the possible effect of face mask, we found that 65% of participants complain from comedons and acne and about 54% of them also complained from rash due to mask pressure that was supported by Techasatian et al<sup>15</sup> in their literature reported that about (54%) of the participant reported face mask adverse skin reactions. The most significant adverse skin reaction was acne followed by rash, also Kaihui Hu<sup>16</sup> supported that in their research<sup>11</sup>.

Hair is a focal part of the body petition and its looks like a health pointer, on a side, hair texture & shine are mostly related to hair surface properties, on the other hand, the integrity of the hair is due to its cortex, possibly washing the hair too frequent in a week might remove an extra amount of sebum from the hair follicles, which then becomes harmful to the next hair growth cycle, also we found a long time exposing Rhesus Monkey hair to shampoo materials reduced hair cortisol content, likely due to leakage of a part of the hormone from the interior of the hair shaft<sup>17,18</sup>. Our results support that there was a significant relationship between number of bathing per week and hair loss (about 68% of the patient complained of hair loss. And we found that most of the patients complain from brittle hair and loss of its brightness as shiny hair and having smooth feel & fresh-cut ends is generally directed toward healthy hair, as it shown in our research, that more than 50% of the patient had brittle, dry and dull hair.

Regarding nail involvement and affection by recurrent hand washing and using sensitizers, about 60% of cases showed brittle nails. Brittleness of the nails is identified as nails that split, flake, and crumble, become soft and lose elasticity as Chessa etat<sup>19</sup> gave the definition in their work and reported that normal nails contain 5% lipids, as we mention before frequent hand wash effect the hand PH also decrease water content in the nail plate (< 16%)<sup>11</sup>.

Kerkhof et al<sup>20</sup> reported that frequent moisturizing and drying may play an important role in housewives, hairdressers, and healthcare employees who habitually wet & dry their hands lead to fractures between nails plate "onychocytes"<sup>21</sup>.

## CONCLUSION

The hand wash, wearing masks, using detergents and disinfectants are necessary to lower the COVID-19 transmission. But due to the effects of these measures, we have to balance between the benefits and the harm, with support of simple strategies to protect the skin (using substances that devoid of common allergens and irritant materials, usage of different emollients applying them after hand washing or before putting gloves). Lastly, a healthy diet & lifestyle changes to improve the immune system responses.

This manuscript has not been previously published and is not under consideration in the same or substantially similar form in any other reviewed media. I have contributed sufficiently to the project to be included as author. To the best of my knowledge, no conflict of interest, financial or others exist. All authors have participated in the concept and design, analysis, and interpretation of data, drafting and revising of the manuscript, and that they have approved the manuscript as submitted.

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