

Research Article

Knowledge, Attitude, and Practice Regarding COVID-19 Skin Manifestations among Doctors Working at Khartoum Dermatology and Venereology Teaching Hospital, 2021

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Abstract

Background: COVID-19 is a global pandemic caused by SARS_COV2. The symptoms of covid-19 include: fever, dyspnea, fatigue, a recent loss of smell and taste, sore throat, cough, and cutaneous lesions. In addition, some skin manifestations were reported to be associated with COVID-19.

Methods: The study design is a descriptive cross-sectional hospital-based study. The study aimed to evaluate the level of knowledge and practice about skin manifestations of COVID-19 among doctors working at Khartoum dermatology and venereology teaching hospital. A self-administrated questionnaire was used for data collection after an informed consent was taken.

Results: Among 140 doctors working in the dermatology and venereology teaching hospital, 75.7% of the doctors had knowledge that COVID-19 can present with skin manifestations. The study results showed that about half of the participants have poor knowledge about COVID-19 skin manifestations while 25% have no knowledge, and that 35 (25%) doctors have good knowledge. From a total of 140 doctors; 46.4% reported that when patients present with COVID-19 skin lesions, they will isolate them in separate rooms and call the epidemiology center, whereas, 61 doctors (43.6%) did not know if they have a protocol for COVID-19 suspected cases. This study reported a significant association between job category and level of knowledge toward COVID-19 skin manifestations measured by Chi-square test, the *P*-value was 0.003 (significant at 0.05), and the same significant association was found between the year of rotation and knowledge.

Conclusion: Half of the doctors covered by this study had poor knowledge about COVID-19 skin manifestations, and therefore, educating doctors in dermatology hospitals about skin manifestations of COVID-19 is recommended, besides clear and precise guidelines and protocols for diagnosis and management.

Keywords: COVID-19, coronavirus, skin manifestations, Sudan Medical Specialization Board

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1. Introduction

The COVID-19 (covid) pandemic was caused by SARS_COV2. The virus emerged in Wuhan city, Hubei province, China, in 2019. More than 72 countries were then affected by the pandemic [1].

SARS-COV2 is a single-stranded RNA virus that belongs to coronavirus family. The lung is the first organ to be affected. The virus enters the cells by binding to angiotensin-converting enzyme2 receptors (ACE2) on cell surfaces [2].

WHO confirmed around 219 million cases of COVID-19 worldwide, with 4.55 million deaths. In Sudan, confirmed cases of COVID-19 were 38.824 cases, including 2.951 death [3].

The spread of covid-19 is mainly by inhalation of droplets from an infected patient and contaminated surfaces such as tables and doors. The virus incubation period is 2–14 days. There is no specific recommended treatment for covid-19 and mainly symptomatic management. The spread of the virus is limited by mask-wearing, frequent hand washing, social distancing, avoidance of crowding in places with poor ventilation, and using topical antiseptics. The presenting symptoms of covid-19 include: cough, fever, dyspnea, sore throat, malaise, fatigue, a recent loss of taste and smell, and skin lesions [4].

The pathophysiology of skin lesions in covid-19 is unclear, however, complement activation, hyperactive immune system, and microvascular involvement with injuries have been suggested [5]. The presence of skin findings in covid-19 puts dermatologists in a pertinent position, mainly since cutaneous lesions can occur before the respiratory symptoms and fever [6].

The skin manifestations of COVID-19 could be divided into specific and non-specific rashes, considering COVID-19 if the patient presented with

a chilblain-like rash on hands and feet without other causes of painful inflammatory conditions [7]. In 12.5% of the patients, the skin manifestations may precede the respiratory symptoms and impulsively heal within 10 days. The most typical skin manifestation of covid-19 is maculopapular (morbilliform) exanthema, and the least is petechiae (Table 1) [8]. Lesions mainly localized on the trunk (66%) and over the hands and feet (19.4%) [8].

Moreover, covid-19 can exacerbate pre-existing skin diseases such as eczema, rosacea atopic, and neurodermatitis rash [5]. Both Varicella-like and zosteriform blisters could be subordinate to viremia and cytopathic result. The development of microthrombi or deposition of the immune complex has been related to the pathogenesis of covid feet, livedoid lesions, and vasculopathy [9]. The skin presentations of Covid-19 patients, which are suggestive of viral exanthem, include morbilliform, urticarial, chicken pox-like cutaneous lesions, and petechiae, which can also be found in other diseases; therefore, they are not specific evidence for the diagnosis and prognosis of COVID-19. Meanwhile, livedo reticularis /racemose, chilblain-like lesions, retiform purpura, dry gangrene, and acrocyanosis, which are cutaneous manifestations related to vasculopathy, can provide the prognostic values representing serious complications of COVID-19 and monitoring disease severity.

Also, telogen effluvium (TE), which can be triggered by many factors, such as drugs, febrile illness, stress, trauma, endocrine disease, and nutritional deficiencies, was reported after severe covid-19 infection [10]. It was reported that the initial detection of skin signs related to disease severity could improve patient outcomes [11].

The study aimed to evaluate the level of knowledge and practice about skin manifestations

TABLE 1: Skin manifestations among covid-19 patient, according to Sachdeva et al. [8].

Skin manifestation	Percentage
Maculopapular (morbilliform) exanthema	36.1%
Papulovesicular rash	34.7%
Urticaria	9.7%
Painful acral red-purple papules	15.3%
Livedo reticularis	2.8%
Petechiae	1.4%

of COVID-19 among doctors working in the dermatology teaching hospital.

2. Methods

The study design is a cross-sectional descriptive hospital-based study [12]. It was conducted at Khartoum dermatology and venereology teaching hospital (KDVTH) from November 2020 to October 2021. The study populations were doctors working at the hospital. Those who refused to participate or were in annual vacations were excluded from the study. The sample size was calculated using the equation: $n = N / (1 + N(e \wedge 2))$, where N = total population, e = margin of error = 0.05. The total number of participants was 140 (Table 2).

The sampling technique employed a stratified sampling technique. Data were collected through a self-administered questionnaire. The questionnaire was tested through a pilot study, and some modifications were applied.

The obtained data were tabulated and analyzed using the SPSS V25. The result was presented as descriptive statistics. The chi-square test assessed the levels of associations between the different variables. P -value < 0.05 was considered significant.

The research committee of the Sudan medical specialization board and the ethical board of the dermatology hospital approved the study. Informed consent was taken from all participants,

and the questionnaire was considered acceptable in participation. Furthermore, all the participants were informed that participation in the study would not affect their work or training program in the dermatology hospital. The questionnaires were filled out anonymously, and the participants' identities were kept confidential.

3. Results

The response rate in the study was 100%. A total of 140 participants were included; of them, 95 were dermatology residents, 23 were family medicine residents, 12 were pediatric residents, and 10 were general practitioners (Table 2). The study found that 87% of the studied group were females, and most of the participants were aged between 30 and 35 years (49.3%). In addition, among the dermatology residents, 53 doctors were in their fourth year of training (Table 2).

Among all participants, 106 knew that COVID-19 could present with skin manifestations. Most doctors knew that Covid-19 skin lesions appear on the trunk (50%), and 49.5% of the participants knew that COVID-19 skin lesions appear before other cardinal symptoms (Figure ??). In addition, about 50% (70) of the doctors knew that morbilliform rash is one of the COVID-19 skin manifestations. Meanwhile, 45% (63) of the participants did not know if COVID-19 skin lesions could indicate a prognosis.

According to the scoring method, about 50% of all participants had poor knowledge regarding COVID-19 skin manifestations. Meanwhile, 50 dermatology registrars (35.7%) had poor knowledge about COVID-19 skin manifestations. Most pediatric registrars had poor knowledge of COVID-19 skin manifestations (66.7%). Most general practitioners did not know about COVID-19 skin manifestations (70%), and 56.5% of family medicine residents knew about COVID-19 skin manifestations.

In order to determine the depth of doctors' knowledge and practice about the skin manifestations of covid-19, six questions of the constructed questionnaire were scored. The maximum score for the six questions is 8 (Table 3). The score was coded as (0) = no knowledge, 1–4 = poor knowledge, and 5–8 = good knowledge (Table 3).

This study reported a significant association between doctors' specialty and the level of knowledge ($P = 0.003$). Among dermatology residents, a significant association was found between the year of the training and the level of knowledge about COVID-19 skin manifestations ($P = 0.012$). In this study, 46.4% of the participants isolated the suspected COVID-19 patient and called the epidemiology center. About 43.6% of the participants did not know if they have a protocol for managing covid-19 and skin manifestations and how to act. The majority (57%) had read about covid-19 and its skin manifestations

4. Discussion

COVID-19 presents with respiratory symptoms, including fever, dry cough, shortness of breath or respiratory distress, myalgia, and loss of smell [13]. Skin manifestations of COVID-19 were reported in only 20% of the confirmed cases [14] and

described as rare by others [8]. Most of the skin manifestations of covid-19 described in the literature were case reports or review articles [8].

The majority of participants (75.7%) answered that COVID-19 could present by skin manifestation. Among all participants, dermatology residents were the majority (68%), and most (55.8%) were in their fourth year of training. Compared to dermatology residents, 43.5% of family medicine and 16.7% of pediatric residents did not know about COVID-19 skin manifestations. Meanwhile, 70% of the general practitioners did not know about COVID-19 skin manifestations. This result reflects that in general, doctors in the Khartoum Dermatology and Venereology teaching hospital have good knowledge about skin manifestations. On the other hand, dermatology residents have more knowledge due to their specialty, and the majority of them are in their final years of training. This study reported that there was a significant association between doctor specialty and level of knowledge toward COVID-19 skin manifestations measured by chi-square test; the P -value was 0.003 (significant at <0.05).

When the participants were asked what to do if the patient comes with a skin lesion suggesting COVID-19, most of them answered that they would isolate the patient in a separate room and call the epidemiology center, only 17.1% answered that they have a protocol for COVID-19 suspected cases, this point is very important to be taken seriously by the ministry of health and dermatology teaching hospital managers. The majority of doctors, 57.1%, read about COVID-19 skin manifestations; more reading with updated lectures should be encouraged and included in the training programs for all doctors in different specialties.

TABLE 2: The number of study participants according to specialty.

Participants	Number	Percentage
Dermatology residents	95	68
Pediatric residents	12	9
General practitioners	10	7
Family medicine residents	23	16
Total	140	100

TABLE 3: Questions included in the questionnaire and scores.

Question	Marks
Can covid-19 present with skin lesions?	1
What is the distribution of covid-19 skin lesions?	2
What is the type of skin lesions present in covid-19?	2
Do covid-19 skin lesions appear before other cardinal symptoms?	1
Can covid-19 skin lesions indicate prognosis?	1
Can covid-19 present with itching?	1

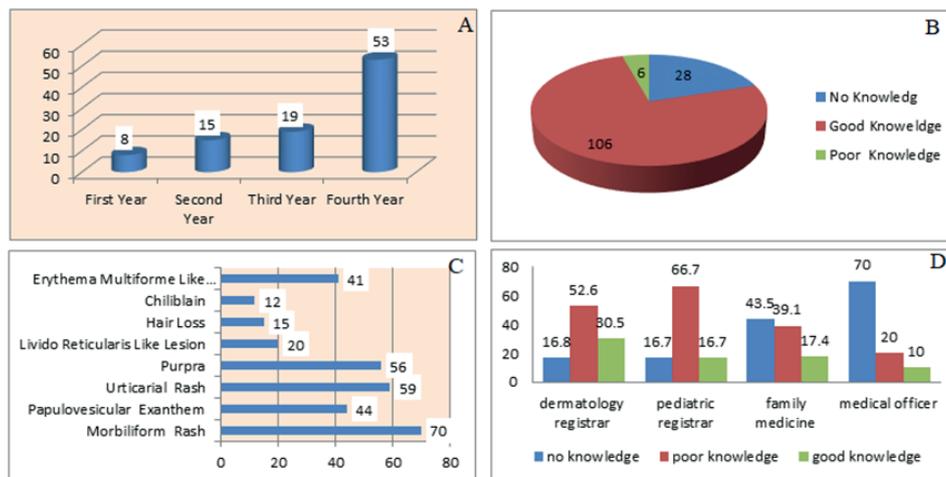


Figure 1: (A) The number of dermatology residents working in Khartoum Dermatology and Venereology Teaching Hospital (KDVTH) in 2021 according to the year of training (n = 95). (B) The knowledge of doctors working in KDVTH about the presence of COVID-19-induced skin lesions. (C) The number of doctors who answered the questions regarding the skin manifestations of covid-19. (D) Knowledge among doctors working in KDVTH regarding skin manifestations of covid-19.

TABLE 4: The practice of doctors participating in the study regarding COVID-19 suspected cases in KDVTH, 2021.

Action taken	Frequency	Percentage
Isolate the patient in a separate room and call the epidemiology center	65	46
Refer to ER	8	6
Refer to the isolation center	14	10
Refer to do PCR	53	38
Total	140	100

COVID-19 made a global impact, and many national and international reports were addressed

despite the evident defect in knowledge for non-specialized doctors.

Morbilliform rash was the most common skin manifestation described by participants (66%). This result is in agreement with the early work of Sachdeva *et al.* (2020). They described that morbilliform rash was the most common skin manifestation [8]. Meanwhile, Recalcati *et al.* reported erythematous rash as the most common manifestation [14]. Urticaria and urticarial rash are the second common manifestations in the current study and the work of Recalcati *et al.* [14]. Other manifestations reported in the current study, such as purpura, papulovesicular exanthema, and erythema multiform-like eruption are less reported by the authors [8, 14].

The majority of skin lesions were reported to be in the trunk (66%). This finding is in agreement with Muskan *et al.* [8]. Other body sites such as extremities (62.3%), scalp and face (13.2%), hair (8.5%), and genitalia (4.7%) are less reported in the literature.

About 49% of the participants reported that COVID-19 skin lesions could appear before other cardinal symptoms, the same as Joob report [6]. At the same time, the majority of participants (59.4%) did not know if COVID-19 skin lesions can indicate a prognosis.

When the participants were asked what to do if the patient comes with a skin lesion suggesting COVID-19 in a trial to measure their practice in such a situation, most of them answered that they would isolate the patient in a separate room and call the epidemiology center, only 17.1% answered they have a protocol for covid-19 suspected cases; this point is very important to be taken seriously by the ministry of health and dermatology hospital managers. The majority of doctors (57.1%) read about COVID-19 skin manifestations; more reading with updated lectures should be encouraged and

included in the training programs for all doctors in different specialties.

To the best of our knowledge, there were no published data about the assessment of knowledge, attitude, and practice of doctors regarding the skin manifestations of covid-19, so no comparable data are available.

5. Study limitation

Small sample size and single hospital study are considered as study limitations.

6. Conclusion

Among the participants, about 75% had general knowledge that covid -19 can present with skin lesions, and 50% had poor knowledge about the skin manifestations of covid-19, which may be due to lack of self-learning about this issue or otherwise due to lack of a training program for the residents that include this subject. There is an association between the specialty and the level of training and knowledge about skin manifestations. Isolation of the suspected COVID-19 cases is the primary response among residents at Khartoum dermatology and venereology teaching hospital.

7. Study recommendation

In-depth knowledge about COVID-19 protocols and common skin manifestations should be disseminated among all registrars.

Updated tutorials and lectures for dermatology doctors about the skin manifestations of COVID-19 for early diagnosis and doctor's safety are recommended.

Dermatology teaching hospitals should have clear and precise guidelines and protocols concerning COVID-19.

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Ethical Considerations

The research committee of the Sudan medical specialization board and the ethical board of the dermatology hospital approved the study. Informed consent was taken from all participants, and the questionnaire was considered acceptable for participation. Furthermore, all participants were informed that participation in the study would not affect their work or training program in the dermatology hospital. The questionnaires were filled out anonymously, and the participants' identities were kept confidential.

Competing Interests

None.

Availability of Data and Materials

All data and materials of this study are available upon request to the corresponding author.

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