

# Maskne: A potential entity during the COVID-19 pandemic

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### Abstract

**Background:** Maskne is a current issue among professionals as well as in the general public due to the regular wearing of face masks. **Objective:** To see the frequency of maskne among doctors serving at different hospitals during the COVID-19 pandemic. **Methods:** A cross-sectional survey was conducted among 61 doctors over 3 months by self-administered semi-structured survey questionnaire and also by google formed questionnaire. Means with standard deviations (SD) were used to describe continuous variables and for categorical variables frequency distribution was done. Categorical data were compared using the Chi-square. A p-value less than 0.05 was deemed to represent significance for all comparisons. **Results:** About 90.2 % of doctors under study developed facial dermatoses due to masks and 39.3% of them suffered from maskne. Female doctors (87.5%) were commonly affected, mostly those who had pre-existing acne, and these two factors were statistically significant (p-value< 0.05). **Limitations:** Studies related to maskne are limited. **Conclusions:** To facilitate maskne diagnosis and its prompt treatment, a dermatological guideline is needed.

**Key Words:** Maskne, Acne, Acne mechanica, COVID-19

### Introduction

The COVID-19 outbreak has affected personal habits and individual lifestyles globally.<sup>1</sup> The Center for Disease Control and Prevention and WHO has implored people to cover their mouth and nose with a mask as a preventive measure to mitigate the spread of the virus.<sup>2</sup> Everyone is wearing masks more often and longer than before, especially health workers who are working at a higher risk of transmission of infection. Thus, it leads to a local acne outbreak in the area of the face covered by a mask, which is popularly called “maskne” or “mask acne.” Maskne is a recognized subtype of acne mechanica. It is likely a disorder of follicular occlusion, directly

related to mechanical stress (pressure, occlusion, friction) and microbiomedysbiosis (heat, pH, moisture from biofluids). Both of these are afflicted by the increased duration of mask wear.<sup>3-4</sup> Tropical climates and outdoor exposure (increased sweating) are risk factors for acne-susceptible populations (active young adults, seborrhea, and genetic predisposition).<sup>3-4</sup>

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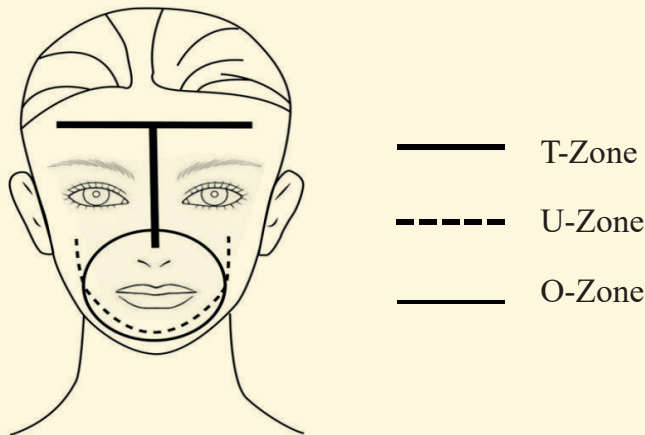
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**Fig 1: Distinct acne pattern seen in the T zone of physiologic acne, the U zone of adult acne and O zone of Maskne**

Maskne should be diagnosed in case of (a) de novo acne occurred 6 weeks after regular mask wear or (b) worsen of pre-existence acne over the masked area, a distinct pattern, referred to as the O-zone in this report (Fig 1 ) (c) after exclusion of the main differential diagnoses including perioral dermatitis, seborrheic dermatitis, pityrosporum folliculitis, and acne rosacea.<sup>5</sup>

The lesions are mostly found in the area covered by the mask, and the severity varies from mild to severe in different literatures.<sup>6-8</sup> Increased humidity and temperature in the covered area are the two possible factors of this particular localized outbreak. High temperature can affect the rate of sebum secretion and increased humidity progress the amount of squalene in the skin.<sup>9</sup> Rising humidity and excess sweating also lead to swelling of the epidermal keratinocytes.<sup>10</sup> All these alterations lead to acute obstruction and acne aggravation.<sup>9</sup> Moreover, prolonged mask-wearing not only affects acne outbreak but also ascent the temptation of touching the face due to annoying acne or itch, which may increase the risk of COVID-19 transmission through the respiratory tract.<sup>11</sup>

Several preventive measures can be implemented. Frequent break time of wearing a mask is highly recommended to shorten the duration and exposure of the mask. The surgical mask should be replaced after 4 hours and the N95 mask should be replaced after 3 days.<sup>7</sup> Before wearing a mask, it is important to wash the face routinely with an appropriate cleanser; a strong alkaline soap is not recommended.<sup>12</sup> It is advisable to avoid any cosmetics or use light

cosmetics only. Finally, mild lesions can be treated with topical antibiotics or retinoids and moderate to severe conditions might be treated with systemic minocycline or isotretinoin.<sup>13</sup>

### Methodology:

A cross-sectional survey was conducted to find out the mask-related skin conditions or maskne among the doctors working in different COVID and Non-COVID hospitals during COVID 19 pandemic in Bangladesh. Participation was voluntary and anonymous. Informed consent was taken from the participant before collecting the data. As it was a cross-sectional survey, there was no more than minimal harm to the study participants. No identity of the participants was disclosed and only group data was used in the study results.

### Survey instrument:

The survey target population was all doctors of any discipline or training background or level who are either directly involved in the management of COVID-19 patients in a general ward or critical care setting or working in a non-COVID hospital during the COVID 19 pandemic. A self-administered semi-structured study-specific survey questionnaire was designed and also a Google form was created using the questionnaire. The questionnaire had 2 parts. In the first part, questions surrounding basic demographic and institutional work characteristics were elicited. No specific identifying data was requested. The second part comprised a series of questions regarding the use of PPE, along with skin conditions or maskne developed due to the use of PPE.

### Survey administration:

The hard copy of the questionnaire was supplied to some doctors and they filled it up immediately and for the others, the Google form of the questionnaire was emailed and they filled it up and mailed it back. Questions were developed and the survey was pre-tested for ease of administration, flow, and content by some volunteers. Following interactive revisions, the final survey was developed. The questionnaire was prepared in English.

### Data management and analysis:

Survey results were exported to and analyzed using the latest version of SPSS. Means with standard deviations (SD) were used to describe continuous variables and for categorical variables frequency

distribution was done. Categorical data were compared using the Chi-square. A p-value less than 0.05 was deemed to represent significance for all comparisons.

**Results:**

**Figure 2 A-C: Sociodemographic characteristics of the study participants**

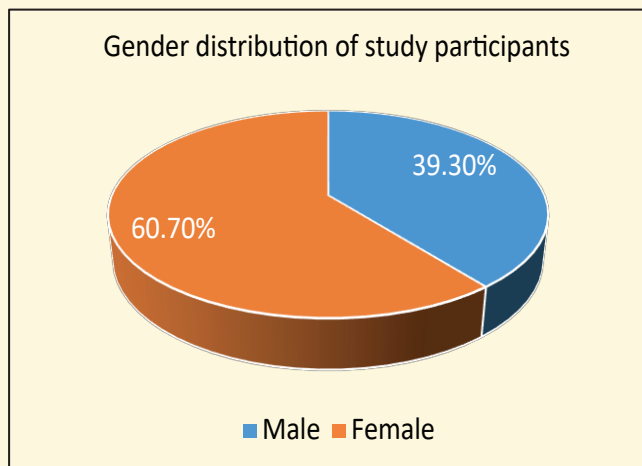


Figure 2A

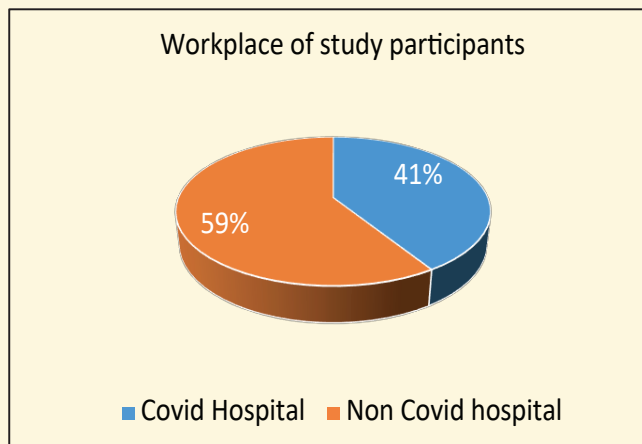


Figure 2B

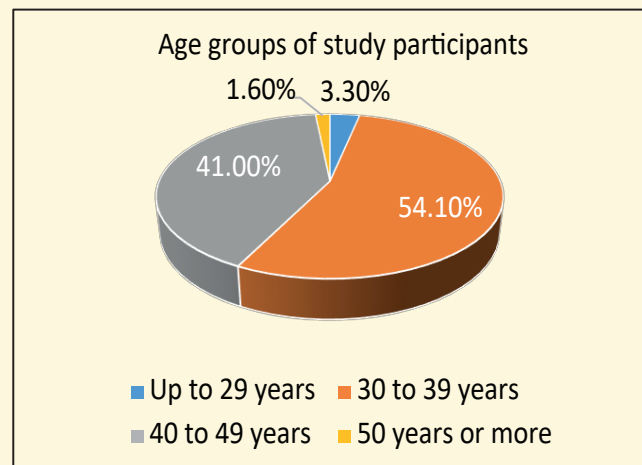
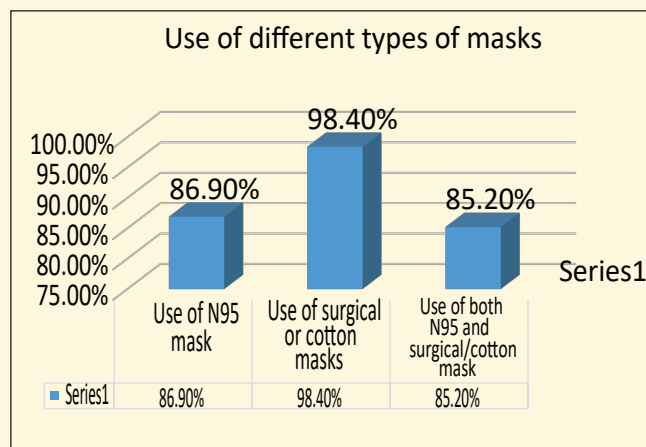


Figure 2C

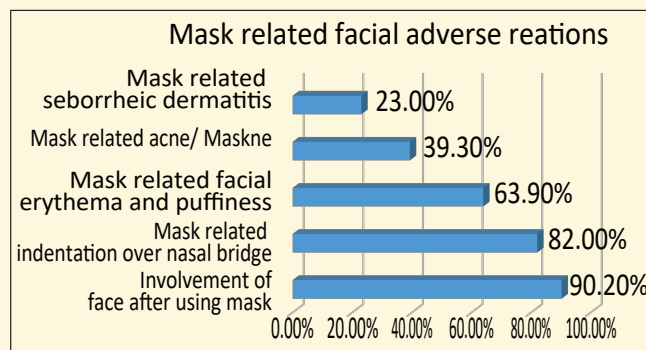
Among 61 doctors majority of the participants were female (60.7%) and most of them (54.1%) were between the age group of 30 to 39 years. The mean age of study participants was 38.22+4.49 years. 41% of doctors were from COVID hospitals, rest of the doctors were from different non-COVID hospitals and institutions. Most of the participants (72.1%) worked in a non-air conditioned environment.

**Figure 3: Masks used by the participants**



98.4% of doctors used surgical masks, 86.9% used N95 masks and among them, 85.2% used both types of masks. In most cases (47.5%) their average duration of mask-wearing was between 4 to 6 hours.

**Figure 4: Mask related adverse skin reactions**



Indentation over the nasal bridge, the most common (82%) mask-induced cutaneous effect found during this survey. Maskne was found among 39.3% of doctors.

**Table 1: Association of maskne with socio-demographic and other variables**

Variables		Maskne		Pearson Chi-Square test
		Yes N(%)	No N(%)	P-value
Age group	Up to 39 years	17(70.8)	18(48.6)	0.087
	40 years and above	7(29.2)	19(51.4)	
Gender	Male	3(12.5)	21(51.4)	0.001
	Female	21(87.5)	16(43.2)	
Workplace	COVID	8(33.3)	17(45.9)	0.328
	Non-COVID	16(66.7)	20(54.1)	
Housing condition of the working place	Air-conditioned	4(16.7)	13(35.1)	0.116
	Air-conditioned	20(83.3)	24(64.9)	
The average duration of using a mask	A Less than 4 hours	2(8.3)	5(13.5)	0.663
	4 to 6 hours	13(54.2)	16(43.2)	
	More than 6 hours	9(37.5)	16(43.2)	
Users of N95 mask	Yes	23(95.8)	30(81.1)	0.095
	No	1(4.2)	7(18.9)	
Users of surgical mask	Yes	24(100)	36(97.3)	0.417
	No	0(0.0)	1(2.7)	
Users of both N95 and surgical mask	Yes	23(95.8)	29(78.4)	0.060
	No	1(4.2)	8(21.6)	
Pre-existing acne	Yes	9(37.5)	5(13.5)	0.030
	No	15(62.5)	32(86.5)	

\*1P value of Pearson Chi-Square test

Female doctors (87.5%) commonly suffered from Maskne, especially those who had pre-existing acne, and these two factors were statistically significant (P-value < 0.05).

### Discussion:

The epidemiology of skin diseases due to masks has been rarely documented in the past, with most publications being case reports in the health care settings during the severe acute respiratory syndrome (SARS) pandemic between 2002 and 2004.<sup>14</sup> In this study, we observed that 90 % of doctors developed skin diseases due to masks and 39.3% of them suffered from maskne. A study discovered that 59.6% of individuals wearing masks regularly have experienced acne outbreak.<sup>15</sup> This finding is supported by several literature resources highlighting this phenomenon.<sup>7,16-17</sup>

Prolonged wearing of N95 and surgical masks can easily generate excessive sweating, moisture, and friction. Although N95 masks have an advantage over surgical masks in protecting against acute

respiratory infections, they are associated with more skin reactions than surgical masks, probably due to the higher air impermeability and more pronounced local pressure.<sup>18</sup> But our survey didn't find any significant difference between the two in the case of maskne. Yu et al stated that allergic and irritant contact dermatitis is the most common mask-induced occupational dermatitis, followed by the acneiform eruption and contact urticaria.<sup>20</sup> In our study acneiform eruption was the 3<sup>rd</sup> common presentation of facial dermatoses following nasal indentation and facial erythema.

The present study showed that maskne was more prevalent in female doctors mostly those who had a history of pre-existing acne. In the case of pre-existing facial dermatoses, preventive equipment should not be used for long periods; non-comedogenic moisturizers should be applied before donning and after doffing masks and previous treatments should be continued under the guidance of dermatologists.<sup>19</sup> Zuo et al suggested a higher prevalence of mask-related symptoms among female health workers might be related to a lower threshold for reporting adverse reactions.<sup>20</sup> Although it does not represent a life-threatening condition, maskne can have a significant impact on compliance and work performance in doctors. The quality of life and emotional well-being may be seriously impaired as a result of disfiguring facial lesions.

### Conclusion

Moreover, not only doctors fighting against COVID-19 are at increased risk, but other healthcare workers and the general population wearing different typed masks for prolonged periods are also prone to maskne. Appropriate guideline on mask-wearing and proper treatment under the supervision of dermatologists is obligate to lessen "The Maskne burden" in future.

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