

# Dermatology and Venereology Consultation Pattern from Inpatient and Emergency Department in Tertiary Hospital Setting Before and During COVID-19 Pandemic

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**Background/Purpose:** COVID-19 pandemic has compromised healthcare services in dermatology and venereology. Given such circumstances, studies investigating the consultation pattern of related fields in hospitals were relatively scarce. The present study aimed to delineate such matter from tertiary hospital viewpoint.

**Methods:** Details concerning referred patients from the emergency room, inpatient wards, intensive care unit, and nursery to the Department of Dermatology and Venereology, Dr. Cipto Mangunkusumo Hospital were retrospectively collected from electronic health records. Cases admitted in the 17 months span before and during COVID-19 global outbreak were included. The obtained data were presented descriptively, and Chi-squared test was performed upon attributes of interest at a significance level of 0.05.

**Results:** A slight increase of total consultation was found in the COVID-19 era with an initial reduction at the beginning (April–May 2020). One-time consultation was the most inquired to our department in both periods of which dermatitis was the most prevalent case and Gram staining was the most common examination. Topical antibiotics and emollient were the most prescribed medications before and during the outbreak, respectively. The conformity of initial-final decision, appropriateness of initial-final diagnosis, and consult response time were significantly different ( $p < 0.05$ ) between the two groups.

**Conclusion:** There were changes of the number of consultation requests in the pandemic era with statistically significant change of decision conformity, diagnoses, appropriateness, and consult response time. Although some changes appeared, the most prevalent diagnoses remained.

**Keywords:** consultation pattern, COVID-19, dermatology, venereology

## Introduction

Coronavirus disease 2019 (COVID-19) pandemic is currently the leading worldwide issue, caused by an infection of severe acute respiratory syndrome, coronavirus 2 (SARS-CoV-2).<sup>1</sup> First reported in Wuhan, China, in December 2019, this ongoing pandemic has resulted in 754,816,715 positive cases and 6,830,232 deaths around the world by 7 February 2023.<sup>2</sup> As of 8 February 2023, the COVID-19 National Management Task Force announced 6,731,959 confirmed cases and 160,852 deaths in Indonesia.<sup>3</sup> Due to the rapid mutation and transmission rate of the virus, the eradication of COVID-19 is yet to be achieved, even though preventive and curative measures such as health protocols, vaccines, early detection and advancements in treatment are undertaken.<sup>4–7</sup>

COVID-19 has profoundly devastating effects on global health care, including services related to dermatology and venereology.<sup>8</sup> Several studies indicate distinctive dermatology characteristics and consultation patterns in the inpatient and emergency departments before and during the COVID-19 pandemic.<sup>9,10</sup> Moreover, the outbreak has hindered hands-on training and clinical learning of dermatology residents and also negatively impacted the mental health of the dermatologists.<sup>11,12</sup> Despite present situation, World Health Organization (WHO) suggested perpetual essential health care, especially for special populations such as pediatric and geriatric patients, pregnant women, emergency care, and patients with chronic diseases or comorbidities.<sup>13</sup> Nevertheless, to the best of our knowledge, only national recommendations for dermatology clinical practice and guidelines or standard operating procedures existed made by the Indonesian Society of Dermatology and Venereology (INSDV).<sup>14</sup>

Therefore, we attempted to further expand the available studies regarding dermatology and venereology (DV) consultation in COVID-19 pandemic era with Dr. Cipto Mangunkusumo Hospital (RSCM), national tertiary and teaching hospital of Faculty of Medicine, Universitas Indonesia (FKUI). Even though the current COVID-19 outbreak is relatively controlled in several regions, through this study, we look forward to a better understanding of DV consultation pattern in hospital settings as a foundation to develop a patient-centered guideline for clinical practice, should a similar pandemic situation is happening again in the future.

## Methods

### Study Population and Sample Selection

This study incorporated all patients consulted from the emergency room, inpatient wards, intensive care unit (ICU), and nursery to the Department of Dermatology and Venereology, RSCM, before and during the COVID-19 pandemic. The referrals to our department from August 2018 to December 2019 constituted the former group, while the latter comprised of those admitted from April 2020 to August 2021. We excluded consultations from January 2020 to March 2020 as they were in the transition period between the index case of COVID-19 (31 December 2019) and the global outbreak declaration by WHO (11 March 2020).

### Data Collection and Analysis

The data regarding referred patients and relevant information were retrieved from electronic health records. Recorded attributes of every presented case included referral date, consultation and response time, name, age, medical record number, gender, payment source, location, referring department, initial request and final decision, initial and final diagnoses and treatments, as well as requested supporting examinations. Initial assessments were issued by the referring department, while the final evaluations were established by dermatologists at RSCM. Entries with any missing essential details were eventually eliminated for further analyses. We also obtained data concerning the total number of confirmed COVID-19 patients admitted to RSCM (from both inpatient and emergency units) during April 2020 to August 2021 period for comparison.

Afterwards, several attributes of interest were compared between the two groups (before and during COVID-19 pandemic) in terms of the conformity of initial request and final decision, the appropriateness of initial and final diagnoses, as well as consultation response time. For each admission, they were categorized as “match”, “partially match”, or “not match”, determined by the agreement between initial assessment and final evaluation. In addition, every consultation was considered having the “ideal” response time if answered within 30 minutes, otherwise they were classified as “not ideal”. Analyses were performed with an appropriate statistical test (Chi-squared or Fisher’s exact) at a significance level of 0.05, utilizing Statistical Package for the Social Sciences (SPSS)<sup>®</sup> version 23.0 software for Microsoft Windows.

## Results

For the 17 months period before and during COVID-19 global outbreak, a total of 946 and 1037 patients were presented to the Department of Dermatology and Venereology, RSCM, respectively. During the pandemic interval, two patients supposedly referred to urology and digestive surgery were incorrectly consulted to our department, while the other three had their data about initial requests and final decisions missing. The demographics of the final 946 (before pandemic) and 1032 (during pandemic) patients who were eligible for subsequent analyses are shown in [Table 1](#).

**Table I** Characteristics of Patients Consulted to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

Parameter	Before COVID-19 Pandemic (August 2018-December 2019)		During COVID-19 Pandemic (April 2020-August 2021)	
	N	%	N	%
Total case	946	100.0	1032	100.0
Gender				
Male	464	49.0	520	50.4
Female	482	51.0	512	49.6
Age group				
Newborns (<2 months old)	67	7.1	54	5.2
Infants (<1 year old)	52	5.5	58	5.6
Children (1–17 years old)	147	15.5	202	19.6
Adults (18–59 years old)	513	54.2	521	50.5
Elderly (>59 years old)	167	17.7	197	19.1
Consultation time <sup>a</sup>				
Working hours	661	69.9	720	69.8
Non-working hours	285	30.1	312	30.2
Payment source				
National health insurance	921	97.4	970	94.0
Personal payment	18	1.9	18	1.7
Ministry of Health insurance <sup>b</sup>	N/A	N/A	35	3.4
Hospital coverage <sup>c</sup>	7	0.7	9	0.9
Location				
Emergency room	233	24.6	179	17.3
Inpatient ward	528	55.8	582	56.4
ICU	138	14.6	151	14.6
Nursery	47	5.0	57	5.5
Inpatient ward for COVID-19	N/A	N/A	33	3.2
ICU for COVID-19	N/A	N/A	30	2.9
Referring department				
Internal medicine	367	38.8	407	39.4
Pediatrics	244	25.8	298	28.9
Anesthesiology	88	9.3	100	9.7
Obstetrics and gynecology	33	3.5	21	2.0
Neurology	50	5.3	52	5.0

(Continued)

Table 1 (Continued).

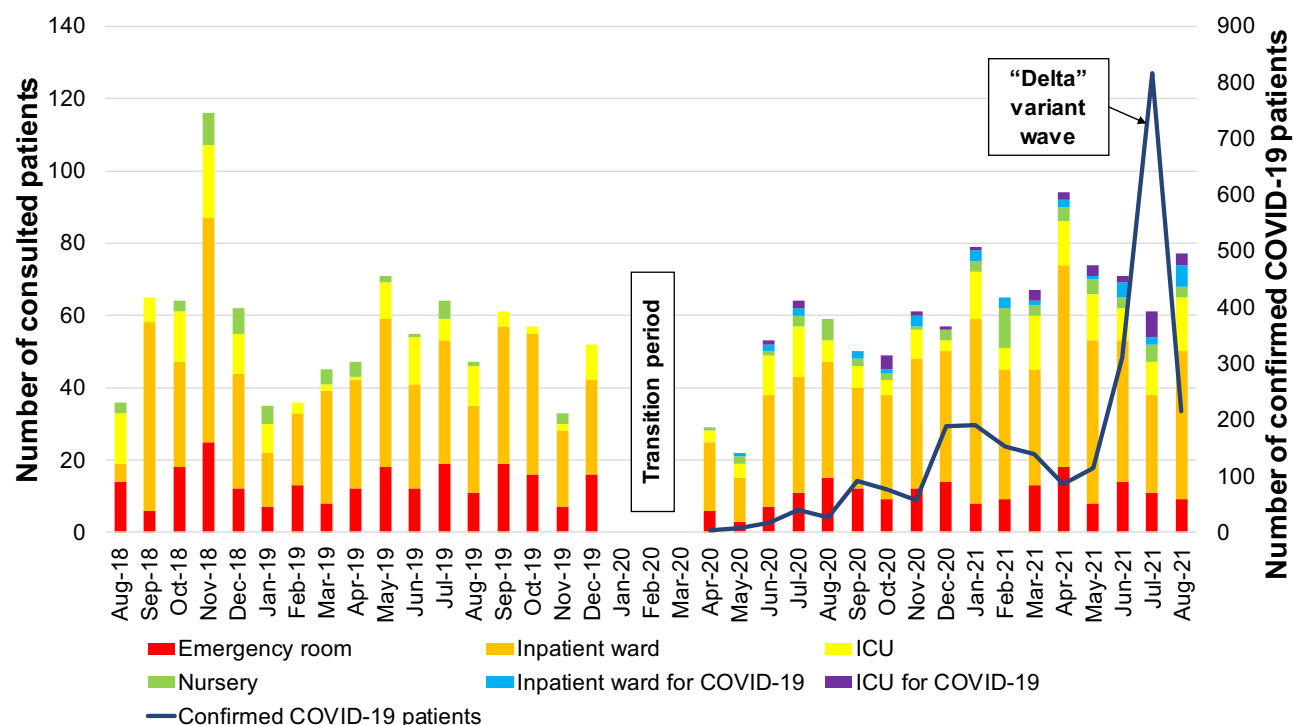
Parameter	Before COVID-19 Pandemic (August 2018-December 2019)		During COVID-19 Pandemic (April 2020-August 2021)	
	N	%	N	%
Psychiatry	20	2.1	25	2.4
Ophthalmology	13	1.4	21	2.0
Triage	58	6.1	58	5.6
Others <sup>d</sup>	73	7.7	50	4.8

**Notes:** <sup>a</sup>Considered as “working hours” if presented between 07:30 a.m. and 03:30 p.m. during business days (Monday to Friday, except national holiday); <sup>b</sup>Granted to COVID-19 patients as the national health insurance did not cover for the disease; <sup>c</sup>For underprivileged patients with special cases that were not covered by insurance, which required approval from the director board of RSCM; <sup>d</sup>Including forensics, neurosurgery, otorhinolaryngology, orthopedics, pediatric surgery, plastic surgery, urology, and vascular surgery.

**Abbreviations:** N, number of patients; N/A, not available.

Distribution of patients was analyzed as depicted in Figure 1. The consultations from both before and during the pandemic were varied, even though there was an initial reduction in April–May 2020. There were additional emergency rooms, ICU, and inpatient wards in the COVID-19 building. Domination of one-time consultation requests, as presented in Table 2, was seen in both eras.

There were no changes in consultation cases to our department comparing both periods as presented in Table 3. Dermatitis was the most common diagnosis found in pre- and during the pandemic. The most requested examinations were Gram staining, followed by KOH test in both eras (Table 4). Topical antibiotics were the most utilized therapy before COVID-19 outbreak, meanwhile emollient was most often prescribed in the pandemic era, as shown in Table 5.



**Figure 1** Monthly distribution of patients consulted to the Department of Dermatology and Venereology before (August 2018-December 2019) and during (April 2020-August 2021) COVID-19 pandemic (bar chart) in relation to the number of confirmed COVID-19 cases presented to emergency unit and inpatient ward of RSCM (line graph).

**Table 2** Initial Request and Final Decision of Cases Presented to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

Request/Decision	Before COVID-19 Pandemic (August 2018-December 2019)				During COVID-19 Pandemic (April 2020-August 2021)			
	Initial		Final		Initial		Final	
	N	%	N	%	N	%	N	%
One-time consultation	333	35.2	556	58.8	401	38.9	754	73.1
Collaborative inpatient care	486	51.4	156	16.5	571	55.3	186	18.0
Chief/in charge transfer	127	13.4	150	15.9	60	5.8	38	3.7
Outpatient follow-up	-	-	84	8.9	-	-	54	5.2

**Abbreviation:** N, number of patients.

**Table 3** Initial and Final Diagnoses of Patients Admitted to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

Diagnosis <sup>a</sup>	Before COVID-19 Pandemic (August 2018-December 2019)				During COVID-19 Pandemic (April 2020-August 2021)			
	Initial		Final		Initial		Final	
	N	%*	N	%*	N	%*	N	%*
Immunological disorder	21	2.2	44	4.7	46	4.5	76	7.4
Psoriasis	14	1.5	6	0.6	21	2.0	20	1.9
Contact dermatitis	47	5.0	166	17.5	28	2.7	195	18.9
Other dermatitis	32	3.4	108	11.4	87	8.4	124	12.0
Allergic drug eruption	31	3.3	64	6.8	43	4.2	47	4.6
Other non-infectious skin disease	28	3.0	74	7.8	24	2.3	136	13.2
Lymphatic disorder	-	-	-	-	3	0.3	6	0.6
Hair loss	2	0.2	3	0.3	3	0.3	5	0.5
Skin and soft tissue neoplasm	1	0.1	1	0.1	8	0.8	25	2.4
Primary bacterial infection	74	7.8	106	11.2	87	8.4	89	8.6
Ulcer	59	6.2	62	6.6	66	6.4	100	9.7
Nail disorder	1	0.1	6	0.6	10	1.0	16	1.6
Secondary infection	2	0.2	13	1.4	19	1.8	168	16.3
Tuberculous skin manifestation	-	-	3	0.3	3	0.3	10	1.0
Leprosy	4	0.4	7	0.7	13	1.3	14	1.4
Herpes zoster	4	0.4	8	0.8	36	3.5	41	4.0
Viral infection	53	5.6	65	6.9	13	1.3	31	3.0
Parasitic infestation	8	0.8	41	4.3	18	1.7	33	3.2
Fungal infection	82	8.7	147	15.5	113	10.9	189	18.3
Syphilis	3	0.3	3	0.3	19	1.8	26	2.5

(Continued)

**Table 3** (Continued).

Diagnosis <sup>a</sup>	Before COVID-19 Pandemic (August 2018-December 2019)				During COVID-19 Pandemic (April 2020-August 2021)			
	Initial		Final		Initial		Final	
	N	%*	N	%*	N	%*	N	%*
Acneiform eruption	1	0.1	11	1.2	3	0.3	22	2.1
Other infectious skin disease	3	0.3	1	0.1	2	0.2	4	0.4
Pruritus	16	1.7	28	3.0	34	3.3	6	0.6
Erythematous macules	19	2.0	4	0.4	85	8.2	4	0.4
Erythroderma	7	0.7	13	1.4	6	0.6	11	1.1
Non-erythematous macules	15	1.6	21	2.2	17	1.6	55	5.3
Solid skin lesion	4	0.4	1	0.1	37	3.6	23	2.2
Non-solid skin lesion	3	0.3	7	0.7	47	4.6	9	0.9
Edema	-	-	-	-	5	0.5	4	0.4
COVID-19 skin manifestation	N/A	N/A	N/A	N/A	6	0.6	7	0.7
Unspecified skin lesion	168	17.8	10	1.1	22	2.1	19	1.8
Hemorrhagic skin lesion	13	1.4	51	5.4	11	1.1	50	4.8
Unspecified skin wound	26	2.7	33	3.5	41	4.0	13	1.3
Scar	1	0.1	2	0.2	1	0.1	18	1.7
Urticaria/angioedema	14	1.5	17	1.8	7	0.7	7	0.7
Urethral/vaginal discharge	9	1.0	6	0.6	19	1.8	13	1.3
Necrotic skin lesion	1	0.1	3	0.3	1	0.1	3	0.3
Xerotic skin	6	0.6	23	2.4	16	1.6	73	7.1
No initial diagnosis	182	19.2	-	-	138	13.4	-	-
Normal condition	-	-	4	0.4	-	-	6	0.6

**Notes:** <sup>a</sup>One patient may have multiple diagnoses; \*Calculated relative to the total number of patients before and during COVID-19 pandemic (946 and 1032, respectively).

**Abbreviations:** N, number of patients with the diagnosis; N/A, not available.

**Table 4** Requested Supporting Examinations for Patients Consulted to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

Supporting Examination <sup>a</sup>	Before COVID-19 Pandemic (August 2018-December 2019)		During COVID-19 Pandemic (April 2020-August 2021)	
	N	%*	N	%*
Gram staining	484	51.2	397	38.5
KOH test	199	21.0	332	32.2
Tzanck test	11	1.2	19	1.8

(Continued)

**Table 4** (Continued).

Supporting Examination <sup>a</sup>	Before COVID-19 Pandemic (August 2018-December 2019)		During COVID-19 Pandemic (April 2020-August 2021)	
	N	%*	N	%*
Skin biopsy	17	1.8	64	6.2
Serology	22	2.3	57	5.5
Others <sup>b</sup>	15	1.6	162	15.7
No tests ordered	235	24.8	345	33.4

**Notes:** <sup>a</sup>Multiple tests may be ordered for one patient; <sup>b</sup>Including blood tests, radiological examinations, and microbial cultures; \*Calculated relative to the total number of patients before and during COVID-19 pandemic (946 and 1032, respectively).

**Abbreviation:** N, number of patients with the requested supporting examination.

**Table 5** Initial and Final Treatments of Cases Presented to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

Treatment <sup>a</sup>	Before COVID-19 Pandemic (August 2018-December 2019)				During COVID-19 Pandemic (April 2020-August 2021)			
	Initial		Final		Initial		Final	
	N	%*	N	%*	N	%*	N	%*
Topical antibiotics	5	0.5	322	34.0	10	1.0	249	24.1
Topical antifungal	1	0.1	159	16.8	13	1.3	234	22.7
Topical antiparasitic drug	-	-	11	1.2	-	-	32	3.1
Topical corticosteroid	1	0.1	162	17.1	1	0.1	203	19.7
Systemic antibiotic	27	2.9	76	8.0	86	8.3	142	13.8
Systemic antifungal	-	-	43	4.5	8	0.8	31	3.0
Systemic corticosteroid	4	0.4	57	6.0	19	1.8	106	10.3
Antihistamine	2	0.2	97	10.3	4	0.4	111	10.8
Emollient	1	0.1	225	23.8	1	0.1	412	39.9
Keratolytic agent	-	-	13	1.4	-	-	9	0.9
Wound dressing	-	-	8	0.8	-	-	8	0.8
Compression with saline water	1	0.1	315	33.3	2	0.2	390	37.8
Topical zinc	3	0.3	25	2.6	8	0.8	122	11.8
Discontinuation of agents/drugs	-	-	69	7.3	-	-	249	24.1
Others <sup>b</sup>	352	37.2	275	29.1	34	3.3	213	20.6
No initial treatment	556	58.8	-	-	878	85.1	-	-
No definitive treatment	-	-	9	1.0	-	-	60	5.8

**Notes:** <sup>a</sup>One patient may be prescribed with multiple treatments; <sup>b</sup>Including fluid resuscitation, electrolyte correction, analgesics, proton pump inhibitors, antiemetics, and biologic agents; \*Calculated relative to the total number of patients before and during COVID-19 pandemic (946 and 1032, respectively).

**Abbreviation:** N, number of patients subjected to the specific treatment.

**Table 6** Attributes of Interest from the Admitted Patients to the Department of Dermatology and Venereology, RSCM, Before and During COVID-19 Pandemic

Attribute of Interest	Before COVID-19 Pandemic (August 2018-December 2019)		During COVID-19 Pandemic (April 2020-August 2021)		p value <sup>a</sup>
	N	%	N	%	
<i>Initial request and final decision conformity<sup>b</sup></i>					
Match	556	58.8	558	54.1	0.035*
Not match	390	41.2	474	45.9	
<i>Initial-final diagnoses appropriateness<sup>c</sup></i>					
Match	219	23.2	263	25.5	<0.001*
Partially match	44	4.7	189	18.3	
Not match	683	72.2	580	56.2	
<i>Consultation response time</i>					
Ideal (≤30 min)	645	68.2	856	82.9	<0.001*
Not ideal (>30 min)	301	31.8	176	17.1	

**Notes:** <sup>a</sup>Calculated with Chi-squared test; <sup>b</sup>Determined as “match” if the initial request from the referring department was appropriate with the final decision from our department; <sup>c</sup>Classified as “match” and “partially match” if the initial diagnoses from the referring department were all correct and if at least one of them was correct, respectively; \*p < 0.05.

**Abbreviation:** N, number of patients.

Our interests, categorized into three variables which were initial-final decision conformity, initial-final diagnosis appropriateness, and consult response time, showed a statistically significant difference between the two groups (Table 6; p < 0.05).

## Discussion

Table 1 shows the characteristics of patients consulted to the Department of Dermatology and Venereology before and during the COVID-19 pandemic era. In the two periods, the total case was higher by 9.1% during pandemic era. However, it contradicted the number of visits in the dermatology outpatient settings which showed a decline in several places.<sup>15,16</sup> This might be due to lockdown and/or limitation of mobilization as well as non-emergency clinic visits. However, between April and May 2020, we counted an initial decline of consultations which may draw attention. In this period of time, Indonesia had a relatively low number of infected patients with a total case of 139 to 557 patients. Our government's strict rules were also introduced and implemented which resulted in the limitation of mobilization. This reduction was not sustained as there was a rise in June 2020 since Indonesia started to have more than 1000 COVID-19 cases.<sup>17</sup>

Among the consultation, the adult patient group had the biggest proportion of consultations, followed by the children group in both before and during the pandemic. These data represented adult and pediatric patients contributed as the two largest populations in Indonesia.<sup>18</sup> Similar finding was also found in several studies across the globe.<sup>19,20</sup> In terms of gender, the consultation of male patients was slightly higher than female by 1% in the pandemic era. Although in pre-pandemic era, women had a 1% bigger share, this fact was in accordance with the share of women and men population in Indonesia by 2018–2021.<sup>18,21</sup> Regarding healthcare payment source, our data showed that the National Health Insurance (NHI) was used by more than 90% patients. Meanwhile, there were no patients utilizing Ministry of Health Insurance (MHI) in pre-pandemic era since it was established only after the outbreak emerged. In our hospital, as the top referral national hospital of the country, every patient who was referred from other regional or private hospitals should be registered with NHI after they went through the national referral system. Other funding such as out-of-pocket and hospital coverage were only used by a little number of patients.

Percentage of ideal consultations before and during the pandemic were almost similar, shared 69.9% and 69.8%, respectively. This showed constant behavior of other departments requesting a consultation to Department of



Dermatology and Venereology. Our study showed consultations either from the emergency department or other patient wards were requested from various departments, especially from the Department of Internal Medicine. This finding is in accordance with several studies<sup>22–24</sup> as well as the adult population in Indonesia<sup>18</sup> and around the globe.<sup>23</sup>

As presented in Figure 1, the peak number of consultations from the inpatient wards was observed in November 2018 (before the pandemic) and April 2021 (during the pandemic), contradicting the surge of Delta variant wave in Indonesia. Our data also showed that the consultation in non-COVID inpatient wards during a pandemic was a dominant contribution compared to other consultations. In fact, our data showed that only 63 COVID-19 patients (6.1%) consulted to our department along April 2020–August 2021 compared to our 969 non-COVID patients (93.9%). Apart from COVID-19 patients, the number of consultations was relatively similar. This might be due to the nation having built a COVID-19 center apart from the hospital so that only patients with severe disease, who had not been able to be treated in the center, would be transferred to the nearest national referral hospital.

Before the pandemic era, 486 out of the total 946 cases (51.4%) was requested to be in a collaborative care, but only 150 cases (15.9%) were approved by our department. Meanwhile, in the pandemic era, DV was requested to collaborate in a lower percentage. This might be due to non-emergent consultations that were likely to be suppressed when the pandemic began. This is in accordance with our data showing that the most requested diagnoses in the emergency unit, inpatient ward, ICU, and nursery were other dermatitis, contact dermatitis, viral infection, and non-solid skin lesions, respectively.

For diagnosis, the most prevalent consultations were contact dermatitis in both pandemic and pre-pandemic situations, while the second most in the two periods was fungal infection. There are numerous patterns of the most common diagnoses in studies. A similar study about referral pattern in a tertiary hospital in the United States showed that drug eruption, dermatitis, and viral infection contribute to most of the consultation,<sup>24</sup> while in Switzerland, inflammatory disease was the most prevalent case.<sup>25</sup> Other studies revealed that infections are the most frequent cases, which was also found in our study.<sup>22</sup> We believe that these differences are linked to the setting of the patient.

Gram staining was the most common examination before and during the pandemic (Table 4). This examination is known to be widely used in diagnosing skin infection. In numerous DV treatments (Table 5), topical antibiotics were the most commonly prescribed treatment, accounting for 34.0%, followed by compression with saline water 33.3% before COVID-19 era. During the pandemic period, the most prescribed therapy was emollient (39.9%) and the use of compression with saline water was in the second position among other treatments. This finding is comparable to another study by Samorano-Lima et al<sup>26</sup> which showed that the two most common diagnoses were dermatitis and cutaneous infection. Interestingly, topical antibiotics were used almost three times higher in frequency than our primary bacterial infection cases. This may be explained by the fact that topical antibiotics are also prescribed in other skin conditions such as acne or lesions with secondary bacterial infection. Emollients and saline water as supporting treatments for most of the skin diseases were also captured as the most frequent therapy. These patterns were also seen in numerous studies.<sup>24,27</sup>

Looking deeper to our attributes of interest from the DV consultation (Table 6), our study showed 58.8% of initial requests matched to the final decision by the dermatologist in pre-COVID-19 period, but significantly lower in the pandemic era (54.1%). The final decision of collaborative care by our department in both before and during the pandemic was lower than the initial diagnosis. Similar cutaneous manifestation of skin diseases was probably one of the factors. Current dermatological features related to COVID-19 may also have a role. These factors may contribute other specialties in choosing collaborative care over one-time consultation. Unfortunately, there are sparse studies focusing on these variables. In terms of correct diagnoses, our study found that more than half the diagnoses were incorrect in both periods but significantly lower in the pandemic era. This finding was in accordance with other studies which showed that only about 30% provisional diagnosis matched with final diagnosis by dermatologists.<sup>28</sup> The ideal response times during the pandemic were higher than that before the pandemic. This situation may be explained by the minimal duration of doctor-patient contact policy during COVID-19 outbreak in our institution, which elicited a faster response in answering the referrals.

Compared to our results, we found that the inpatient and emergency consultation patterns of other medical specialties were approximately consistent with slight exceptions. For instance, Engin et al reported an insignificant difference of the

total number of emergency unit patients consulted to ophthalmology department before and during COVID-19 times.<sup>29</sup> An observational study by Shomorony et al also unveiled a relatively stable number of inpatient consultations to otolaryngology department following the onset of COVID-19 outbreak, but a remarkable increase in the amount of intubation requests for critical COVID-19 patients was observed.<sup>30</sup> This is understandable since SARS-CoV-2 infections primarily affect respiratory system and maintaining the patency of airway is an essential and life-saving procedure amidst the situation. While skin is the secondary target organ for the virus, it may provide a probable explanation on the relatively equal number of total consultations and the most prevalent dermatology diagnoses pre- and during COVID-19 pandemic in our study. The circumstances may be different in dermatology outpatient clinic setting, as stated by Alfieri and Yogianti that the total patient visit, number of diagnostic and therapeutic procedures, and the most frequent cases were contrasted between two periods.<sup>31</sup> Nevertheless, due to the dermatology and venereology referrals from outpatient department in Indonesian tertiary hospital have been studied, we did not include the consultation from outpatient clinic of our hospital in this study.

## Conclusion

Based on observation before and during COVID-19 pandemic, we found several alterations in terms of the total DV consultation number to our department, with statistically significant differences in initial request and final decision conformity, appropriateness of initial and final diagnoses, and consult response time. The most prevalent diagnoses (dermatitis and skin infections) prevailed regardless of COVID-19 outbreak situation. These findings may prompt similar observational studies in other healthcare settings and serve as a foundation to establish a patient-oriented guideline for consultation in the event of future pandemic occasion.

## Ethical Concern

This retrospective study was designed and conducted according to the Declaration of Helsinki principles. Additionally, the study approval was conferred by the Health Research Ethics Committee of the Faculty of Medicine, Universitas Indonesia on 25 October 2021 with the protocol number KET-1031/UN2.F1/ETIK/PPM.00.02/2021. As per the committee policy, the patients' data included in this research were extracted from the medical record at Dr. Cipto Mangunkusumo Hospital (the tertiary and teaching hospital of the Faculty of Medicine, Universitas Indonesia) while maintaining their confidentiality, without any additional information collected through interviews or phone calls. Therefore, written consent from the study subjects is not required.

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## Disclosure

The authors hereby declare that we have no potential conflicts of interest to disclose.

## References

1. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395(10223):497–506. doi:10.1016/S0140-6736(20)30183-5
2. World Health Organization. Coronavirus (COVID-19) dashboard; 2023. Available from: [covid19.who.int](https://covid19.who.int). Accessed February 8, 2023.
3. COVID-19 National Management Task Force. Situasi COVID-19 di Indonesia; 2023. Available from: [covid19.go.id/id/situasi](https://covid19.go.id/id/situasi). Accessed February 8, 2023.
4. Chan JF, Yuan S, Kok K, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet*. 2020;395(10223):514–523. doi:10.1016/S0140-6736(20)30154-9
5. Rothe C, Schunk M, Sothmann P, et al. Transmission of 2019-nCoV infection from an asymptomatic contact in Germany. *N Engl J Med*. 2020;382(10):970–971. doi:10.1056/NEJMc2001468
6. Phan LT, Nguyen TV, Luong QC, et al. Importation and human-to-human transmission of a novel coronavirus in Vietnam. *N Engl J Med*. 2020;382(9):872–874. doi:10.1056/NEJMc2001272
7. Holshue ML, DeBolt C, Lindquist S, et al. First case of 2019 novel coronavirus in the United States. *N Engl J Med*. 2020;382(10):929–936. doi:10.1056/NEJMoa2001191

8. Hartnett KP, Kite-Powell A, DeVies J, et al. Impact of the COVID-19 pandemic on emergency department visits – United States, January 1, 2019–May 30, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(23):699–704. doi:10.15585/mmwr.mm6923e1
9. Temiz SA, Dursun R, Daye M, Ataseven A. Evaluation of dermatology consultations in the era of COVID-19. *Dermatol Ther.* 2020;33(5):e13642. doi:10.1111/dth.13642
10. Rogers MC, Wallace MM, Wheless L, Dewan AK. Impact of the COVID-19 pandemic on inpatient dermatology consult patterns at a tertiary care hospital: a retrospective cohort study. *J Am Acad Dermatol.* 2021;84(1):156–158. doi:10.1016/j.jaad.2020.09.060
11. Das A, Sil A, Chakrabarti A. An observational survey to appraise the influence of COVID-19 pandemic on dermatology training programs in India: residents' standpoint. *Indian Dermatol Online J.* 2021;12(3):423–428. doi:10.4103/idoj.IDOJ\_657\_20
12. Sil A, Das A, Jaiswal S, et al. Mental health assessment of frontline COVID-19 dermatologists: a pan-Indian multicentric cross-sectional study. *Dermatol Ther.* 2020;33(6):e13884. doi:10.1111/dth.13884
13. World Health Organization. COVID-19: operational guidance for maintaining essential health services during an outbreak: interim guidance, 25 March 2020; 2020. Available from: [https://apps.who.int/iris/bitstream/handle/10665/331561/WHO-2019-nCoV-essential\\_health\\_services-2020\\_1-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/331561/WHO-2019-nCoV-essential_health_services-2020_1-eng.pdf). Accessed January 17, 2023.
14. American Academy of Dermatology Association. Clinical guidance for COVID-19; 2022. Available from: [www.aad.org/member/practice/coronavirus/clinical-guidance](http://www.aad.org/member/practice/coronavirus/clinical-guidance). Accessed January 17, 2023.
15. Zhang Y, Wen J, Alamgir M, et al. Impact of the COVID-19 pandemic on inpatient dermatology: a multicentre study from Hubei, China. *J Eur Acad Dermatol.* 2021;35:164–242. doi:10.1111/jdv.17041
16. Turkmen D, Altunisik N, Mantar I, Durmaz I, Sener S, Colak C. Comparison of patients' diagnoses in a dermatology outpatient clinic during the COVID-19 pandemic period and pre-pandemic period. *Int J Clin Pract.* 2020;75(4):e13948. doi:10.1111/ijcp.13948
17. Dong E, Du H, Gardner L. An interactive web-based dashboard to track COVID-19 in real time. *Lancet Inf Dis.* 2020;20(5):533–534. doi:10.1016/S1473-3099(20)30120-1
18. Indonesian National Bureau of Statistic. Jumlah penduduk menurut kelompok umur dan jenis kelamin; 2021. Available from: [www.bps.go.id/indikator/indikator/view\\_data\\_pub/0000/api\\_pub/YW40a21pdTU1cnJxOGt6dm43ZEdoZz09/da\\_03/1](http://www.bps.go.id/indikator/indikator/view_data_pub/0000/api_pub/YW40a21pdTU1cnJxOGt6dm43ZEdoZz09/da_03/1). Accessed August 2, 2022.
19. Penate Y, Guillermo N, Melwani P, Martel R, Borrego L. Dermatologists in hospital wards: an 8-year study of dermatology consultations. *Karger.* 2009;219:225–231.
20. Fernandes LC, Velho G, Selores M. Dermatology inpatient consultation in a Portuguese university hospital. *Dermatol Online J.* 2012;18(6):16.
21. The World Bank. Population, female (% of total population) – Indonesia; 2019. Available from: <https://data.worldbank.org/indicator/SP.POP.TOTL.FE.ZS?locations=ID>. Accessed August 2, 2022.
22. Mancusi S, Neto CF. Inpatient dermatological consultations in a university hospital. *Clinics.* 2010;65(9):851–855. doi:10.1590/S1807-59322010000900007
23. Uzuncakmak TK, Bayazit S, Kutlubay Z, Engin B, Kutlubay Z. Inpatient dermatology consultations during COVID pandemic in a tertiary referral center. *Dermatol Ther.* 2020;33(6):e13883. doi:10.1111/dth.13883
24. Galimberti F, Guren L, Fernandez AP, Sood A. Dermatology consultations significantly contribute quality to care of hospitalized: a prospective study of dermatology inpatients consults at a tertiary care center. *Int J Dermatol.* 2016;55(10):e547–e551. doi:10.1111/ijd.13327
25. Ruzza N, Itin PH, Beltraminelli H. Urgent consultations at the Dermatology Department of Basel University Hospital, Switzerland: characterisation of patients and setting – a 12-month study with 2222 patients data and review of the literature. *Dermatology.* 2014;228(2):177–182. doi:10.1159/000357532
26. Samorano-Lima LP, Quiterio LM, Sanches JA, Neto CF. Inpatient dermatology: profile of patients and characteristics of admissions to a tertiary dermatology inpatient unit in São Paulo, Brazil. *Int J Dermatol.* 2014;53:685–691. doi:10.1111/j.1365-4632.2012.05818.x
27. Aleem S, Sameem F, Manzoor S. Dermatology inpatient consultations: a one year experience from a tertiary care centre in Northern India. *Int J Contemp Med Res.* 2018;5(3):2457.
28. Raghuveer C, Ullas MT, Megha MS. Pattern of inpatient referrals to dermatology OPD at a tertiary care centre, VIMS, Ballari. *RFP J Dermatol.* 2019;4(1):71–75.
29. Engin CD, Ozturk T, Yagci BA, Ozcelik O, Ecer R. The impact of the COVID-19 pandemic on emergency department visits resulting in ophthalmology consultations. *Cureus.* 2022;14(10):e30598. doi:10.7759/cureus.30598
30. Shomorony A, Chern A, Long SM, et al. Essential inpatient otolaryngology: what COVID-19 has revealed. *Eur Arch Otorhinolaryngol.* 2022;279(2):1053–1062. doi:10.1007/s00405-021-06963-7
31. Alfieri A, Yogiarti F. Impact of pandemic COVID-19 on dermatology and venereology outpatient clinic in a tertiary referral hospital in Yogyakarta, Indonesia. *Dermatol Rep.* 2021;13(3):9381. doi:10.4081/dr.2021.9381