JPDS Journal of the Philippine Dermatological Society

ORIGINAL ARTICLE

Teledermatology at a tertiary government hospital in Davao City during the COVID-19 pandemic: a retrospective descriptive study

Anna Cristina L. Cuenca, MD, DPDS,[1] Lalaine R. Visitacion, MD, FPDS,[1] Jen-Christina Lourdes Q. Segovia, MD[1]

ABSTRACT

INTRODUCTION Telemedicine is the practice of remote consultations that utilize computer-mediated communication. Given the visual nature of dermatology, it is most well-suited to adopt telecommunication practices. This enables remote medical care during public health emergencies like the current COVID-19 pandemic; limiting the risk of exposure for both patients and doctors alike.

OBJECTIVES This study aimed to describe the demographic and clinical profile of teledermatology patients from April to August 2020. Data were also compared with face-to-face consultations during the same period in 2019 in order to establish whether telemedicine can be a viable and reliable substitute to face-to-face consultations during a pandemic.

METHODS We retrospectively analyzed chart data during a 5-month period in 2020; wherein the number of online consultations were observed to be the highest. We noted demographic and clinical features and compared some of these data to those obtained in the same period in 2019.

RESULTS A total of 1,632 patients were seen via teledermatology in 2020 versus 7,219 face-to-face patients in 2019. Mean age for both groups were 26.59 and 36.89 respectively. Most patients in both years were from Davao. However, there was an increase in consults from other regions in 2020. Overall, the majority of cases for both periods were non-urgent inflammatory conditions.

CONCLUSION This study showed that providing remote dermatologic care is now possible with the advent of technology even during a pandemic. Teledermatology may serve as an effective adjunct to traditional consultations.

KEYWORDS telemedicine, dermatology, COVID-19, pandemic

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious illness caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Despite efforts to halt the rapid rise of infection rates, it has since progressed into a pandemic. Public health authorities have urged health care facilities to optimize alternative consultation options especially for non-COVID-19 cases. In response to this need, telemedicine, specifically teledermatology, with various studies supporting claims of its efficiency has then been put to the forefront.[1,2]

The World Health Organization (WHO) defines digital health as the use of digital technologies for health purposes. This encompasses the increasing use of technologies for health services.[3] Telehealth is the most basic engagement of eHealth, involving telecommunications and virtual technology to deliver health care outside of traditional facilities.[3] Telemedicine by definition is remote information and communication technology-mediated healthcare services delivered by healthcare professionals. This includes but is not limited to the "exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and continuing education of health care providers. All of these in the interest of advancing the health of individuals and their communities."[4] These terms have minor differences but are important to recognize as relevant to our study.

Teledermatology is the application of telemedicine methods in the field of dermatology. Dermatologists were encouraged to shift to this practice because face-to-face dermatological consultations can serve as potential vectors for disease transmission.[5] Studies have shown that dermatology may be the best-suited field to adopt telemedicine because of its "visual character."[1,6,7] Armstrong and Kwong et al. in 2011 found that the majority of doctors who participated in their study believed that all skin conditions may be accurately diagnosed by teledermatology. They concluded that this system of health care is efficient in providing dermatologic care.[8] The nature and effectiveness of teledermatology prompted some providers to utilize it. This enables patients

[1]Department of Dermatology of the Southern Philippines Medical Center

Corresponding author
Anna Cristina L. Cuenca, MD, DPDS

Conflict of interest
None

Source of funding
None

Cite as
Cuenca ACL, Visitacion LR, Segovia JCLQ. Teledermatology at a tertiary government hospital in Davao City during the COVID-19 pandemic: a retrospective descriptive study. J Phil Dermatol Soc. 2022;31(1):1-6.

to have access to services without having a risk of exposure in medical facilities.[9]

As many studies attest to telemedicine as an effective and efficient way to provide care during the COVID-19 outbreak, our institution officially established our teledermatology services beginning in April of 2020. This was maximized during the nationwide enhanced community quarantines implemented by the Inter Agency Task Force (IATF) for the Management of Emerging Infectious Diseases.[10]

OBJECTIVES

The general objective of this study was to describe the demographic and clinical profile of patients who sought teleconsultations at the Dermatology Department of a tertiary government hospital in Davao City from April to August 2020. The specific objectives of this study were; (1) To describe the following profiles of patients who availed of the Dermatology Department's teledermatology services: age, sex and location; (2) To determine the clinical features of these patients in terms of diagnosis and dispositions (completed consult, admitted, referred to or from other departments); (3) To determine the number of teledermatology consultations and follow-ups done through: a) teledermatology consultations only (single consultation only, no follow-ups done), b) teledermatology consultations requiring follow-ups; (4) To compare teledermatology consultations seen from April 2020 to August 2020 to face-to-face consultations from April 2019 to August 2019 in terms of demographic profile, total number of consultations, and top 10 cases of skin problems reported; (5) To determine the outcome of treatments (improved or not improved) of teledermatology consultations upon follow-up.

METHODS

This descriptive and retrospective study conducted a review of charts. This included teledermatology patients who consulted in between April 2020 through August 2020. The patients who underwent teleconsultations via the Dermatology Department's Facebook, SMS, Viber, and Webex were included in the evaluation except for those with incomplete demographic data and diagnoses. No face-to-face consultations were done during the study period. During this time, the outpatient department was non-operational because of the pandemic restrictions. The census of the outpatient consultations from April 2019 to August 2019 was also taken and reviewed for comparison.

All data gathered in this study belonged to the Dermatology Department of the institution. Records from teledermatology consultations from April to August 2020 were gathered, sorted, and scrutinized based on completeness. Demographic data were collected and encoded on Microsoft Excel.

The accuracy, authenticity, consistency, legibility, and completeness of all information acquired were ensured by comparing charts with information from the database of the medical records department. Data collection forms were signed by the primary researcher together with the co-author to attest that the data gathered were true. Corrections or modifications in the entries were dated, initialed, and rechecked to ascertain accuracy. Once data collection was completed, a comparison to the census from the previous year was made. All data were analyzed by a statistician.

VARIABLES AND OUTCOME MEASURES

INDEPENDENT VARIABLES

1. **Demographic profile** - a profile filed in terms of age, sex, and location
2. **Clinical Impression** - written diagnosis as found in the chart

MAIN OUTCOME

The main outcome of the study included the disposition of the consultations, the improvement measured via self-assessment of the patient, as well as the analysis of photos submitted to the physician through follow-up.

STATISTICAL ANALYSES

This study used descriptive statistics. Continuous data were analyzed using mean and standard deviation, while categorical data sets were analyzed using frequency rates and percentages. Comparative analyses were done through two statistical tests: (1) T-test for two proportions to compare the significant difference between two percentages and (2) T-test for two means to compare the significant difference between two different means.

ETHICS REVIEW

The study was reviewed and approved by the Department of Health XI Cluster of Ethics Review Committee.

PRIVACY AND CONFIDENTIALITY

In compliance with confidentiality policies to protect research participants, personal information such as names, contact details, and any information that may lead to identification were not used in this study. Moreover, all collected data remained with the researchers only until the completion of the study. All data gathered were disposed through drive reformatting for soft copies and burning for hard copies.

RESULTS

This study examined a total of 9,251 charts. Patients seen from April 1 to August 31 of 2019 amounted to 7,619 while 1,632 were seen from April to August of 2020. Average monthly consultations were 1,524 for 2019 and 326 for 2020, a 78.6% decrease.

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A comparative analysis of the demographic profile of patients who sought face-to-face consultations prior to the pandemic, in contrast with virtual consultations during the pandemic, showed statistical differences in terms of age, sex, and location (Table 1). Cases were distributed in the age brackets 0-18 years old, 19-39 years old, 40-59 years old and 60+ years old in both years. In 2019, cases were ranked by number of consultations per age bracket in the following decreasing order: 19-39, 40-59, 0-18 and 60+. In 2020, cases were ranked in the same manner as follows: 19-39, 0-18, 40-59 and 60+. Relatively younger age groups were recorded to have sought consultations in 2020 than in 2019. The mean value of both years landed at 26.59 and 36.89, respectively. However, when cases in both years were grouped in terms of case distribution by age, no statistical differences were noted.

The percentage of cases of male patients was higher in 2019 while female patients outnumbered males in 2020.

A statistical difference was noted in the case distribution among the Philippine regions between 2019 and 2020. While data from face-to-face consultations in 2019 showed that most patients were from the Davao Region, data from teledermatology consultations in 2020 showed a wider case distribution among all Philippine regions. Davao Region had the most cases while the rest were sparsely distributed among regions from Luzon to Mindanao.

The teledermatology cases in this study were categorized under three (3) types: single teledermatology consultations without follow-ups (82%), teledermatology consultations that required face-to-face follow-ups (1%), and teledermatology consultations with teledermatology follow-ups (17%). An average of

Table 1. Demographic profile of patients seen in 2019 and 2020.

Demographic Profile	2019	2020	p-value
Age (Mean age ± SD, years)	36.89±21.799	26.59±15.732	
0-18 years	1,648 (21.6%)	356 (21.8%)	
19-39	2,654 (34.8%)	1,011 (61.9%)	**<0.01**
40-59	1,745 (22.9%)	185 (11.3 %)	
60 above	1,560 (20.5%)	80 (4.9%)	
Did not state a	12 (0.2%)	0 (0%)	
Sex			**<0.01**
Male	3,335 (43.8%)	554 (34.1%)	
Female	4,284 (56.2%)	1,078 (66.1%)	
Location			
NCR	0 (0%)	189 (11.6%)	
CAR	0 (0%)	3 (0.2%)	
Region 1	0 (0%)	16 (1%)	
Region 2	0 (0%)	3 (0.2%)	
Region 3	0 (0%)	81 (5%)	
Region 4-A	0 (0%)	164 (10%)	
Region 4-B	0 (0%)	11 (0.7%)	
Region 5	0 (0%)	16 (1%)	
Region 6	0 (0%)	13 (0.8%)	<0.01
Region 7	0 (0%)	25 (1.5%)	
Region 8	0 (0%)	12 (0.7%)	
Region 9	0 (0%)	13 (0.8%)	
Region 10	0 (0%)	30 (1.8%)	
Region 11	6,762 (88.8%)	1,002 (61.4%)	
Region 12	0 (0%)	39 (2.4%)	
Region 13	0 (0%)	11 (0.7%)	
ARMM	0 (0%)	4 (0.2%)	
Did not specify[b]	857 (11.2%)	0 (0%)	

[a,b]**Age and location for an indigenous group (Badjao/Bajau) could not be accounted for but not excluded.**

55 follow-ups per month was seen. Among all the cases, the majority or 1626 (99.6%) were discharged with prescriptions given, while none required hospitalization. Among the total number of cases, only one (1) case was a referral from another department while 48 (3%) were referred to another service for co-management or further work-up.

In a comparison of top 10 skin diseases treated in 2019 and in 2020, results showed a variety of skin conditions. Psoriasis vulgaris, tinea, post-inflammatory hyperpigmentation, seborrheic dermatitis, scabies, pityriasis versicolor, pityriasis rosea, nummular dermatitis/ eczema, verruca vulgaris, and psoriatic arthritis were the top skin diseases treated in 2019. In 2020 the top cases were acne vulgaris, irritant contact dermatitis, acne scars, Hansen's Disease, acute urticaria, bite hypersensitivity reaction/ papular urticaria, dyshidrotic eczema, herpes zoster, atopic dermatitis, and lichen simplex chronicus. Most of the cases for both years are non-urgent inflammatory conditions (Table 2).

The study was not able to gauge improving or worsening outcomes for single consultations. However, out of the 273 (17%) patients who had teledermatology follow-ups, 85 (31%) reported improvement from initial consultation. None reported worsened conditions. A bulk of the follow-ups were for refill of prescriptions. These were for conditions that required prolonged management such as acne vulgaris and Hansen's disease. Over the study period, an average of one (1) to four (4) follow-ups were done depending on the nature of the disease. Patients treated for irritant contact dermatitis were seen twice on average while patients with acne and Hansen's disease had an average of three (3) and four (4) consultations respectively. It was also noted that the rest with status quo conditions followed-up for further work-up and management.

DISCUSSION

This study analyzed the demographic and clinical profiles of patients seen at a government tertiary hospital in Davao City in the beginning of the COVID-19 pandemic in 2020. Compared to 2019, there was a 78.6% decrease in the cases seen. This may be greatly attributed to the quarantine measures and lockdown procedures that were implemented throughout the country.[10] Despite the services being remotely available and free of charge, the decline in cases during the 2020 period could also be attributed to a lack of access to gadgets or to the Internet. Refusal to adapt to online consultation schemes during this time may have also been a factor, especially for patients 60 years old and above. This is supported by the findings of Almathami et al.'s systematic literature review in 2020. The authors noted barriers that influence telemedicine-based consultations such as problems in adapting to online consultations (technical issues, willingness to adapt), quarantine measures, and foregoing consultations for minor conditions.[11]

Table 2. Top 10 Diseases seen in 2019 and 2020

Top 10 Diseases in 2019	Top 10 Diseases in 2020
Psoriasis vulgaris	Acne vulgaris
Tinea	Irritant contact dermatitis
Post inflammatory hyperpigmentation	Acne scars
Seborrheic dermatitis	Hansen's disease
Scabies	Acute urticaria
Pityriasis versicolor	Bite hypersensitivity reaction
Pityriasis rosea	Dyshidrotic eczema
Nummular dermatitis	Herpes Zoster
Verruca vulgaris	Atopic dermatitis
Psoriatic arthritis	Lichen simplex chronicus

Technology is seen as a major roadblock in remote health care as it is not accessible to many.[12] Results of this study show that the sudden shift to teledermatology was advantageous to patients between 19-39 possibly due to more access to technology. The same cannot be said for patients outside of that range, specifically for patients above 40 due to difficulties adapting to the platforms.[13] Apart from technology, another key factor in the measurement of remote health care success is behavior towards health care. In 2020, the pediatric age group (0-18 years old) came second in terms of number of consultations. This can be attributed to parents' health-seeking behaviors.[14] Another factor could also be due to the assumed age of the parents. The usual reproductive age was from 15-49 years old which falls into those that sought more teledermatology consultations. Moreover, females sought more teledermatology consultations than men in the same year, which can be attributed to women's inclination towards health care response.[15] The numbers in both population groups may be attributed to these health-seeking behaviors especially since the institution's teledermatology consultations were free of charge and made more accessible through online means.

While technology can be seen as a roadblock, it can also be an advantage. Prior to the pandemic, the institution's face-to-face consultations were mostly accessible only to residents of the Davao Region. During the outbreak, telehealth consultations were encouraged; this was to avoid health and safety risks among patients and health care workers. With teledermatology consultations bridging the gap of inaccessibility, health care became available to a larger population. This may explain the rise of patients coming from formerly non-serviceable areas. A shift in the location of patients in 2020 was observed. While almost all the patients resided within Davao Region in 2019, cases were distributed among the 17 Philippine regions in 2020. However, the Davao Region still had the most cases. This may be predictable as the institution is situated in Davao City. Facebook was one of the most used platforms. It featured page sharing which made

the institution visible to patients in Luzon and Visayas. It was also assumed that word of mouth referrals played a role. Charts with narrowed down location showed similar barangays, especially in Luzon. The responsiveness of doctors, accessibility via multiple platforms, free service, as well as generic medications being prescribed may have been reasons why patients chose the institution's services over other teledermatology providers.

As COVID-19 remains to be a threat, many patients may have opted to forego follow-up consultations especially for conditions with minor symptoms. It cannot be ruled out that patients without follow-ups may be due to other teledermatology platforms that may have been preferred more by the patient. While the general outcome of the institution's teledermatology services cannot be determined with mostly single consultations only, or by the percentage of those who reported improvement, it can be assumed that non-appearance for follow-up consultations mean general improvement or non-worsening conditions where patients deemed follow-up consultations to be unnecessary.[1,7] This however does not rule out the possibility of patient non-compliance as well as non-improvement Moreover, while there is a lack of data in terms of outcomes, patients who sought repeat consultations could be attributed to patient satisfaction. This may prove that teledermatology is an efficient health care mechanism during the pandemic.[16,17]

Lastly, several factors contribute to the prevalence of skin conditions in consultation statistics especially with regards to medication or treatment-related reasons. Patients with chronic skin conditions may require multiple follow-up consultations for monitoring or refill of medications, as well as to receive in-clinic treatments which may explain the consultation statistics in 2019. In 2020, the rise in acne and dermatitis were most likely linked to safety protocols such as wearing of PPEs and frequent disinfection. The age of the patients in 2020 is noteworthy in this context in that the majority were from relatively younger age groups. This may be attributed to a shortened waiting time, more access to specialists, and free consultations. While teledermatology diagnoses may be challenging due to a limited visual presentation, instances like these reveal that teleconsultations may be more convenient for both patients and dermatologists. Referrals are reduced but direct consultation is increased by giving access to specialists. This encourages more patients with skin conditions to seek medical attention.[18]

CONCLUSION

Findings of the study show that there was an overall decrease in consultations during the pandemic, and that women between 19-39 years old sought more consultations than any other age and gender group. It also revealed that teledermatology indeed made dermatologic care more accessible as there was an influx of patients outside the institution's physically serviceable areas. Benign inflammatory skin conditions followed by chronic skin conditions were the main reasons for consultation among patients.

While results of the study currently cannot gauge the success of teledermatology, most of the patients reporting improvement may prove that the institution's teledermatology platform provided appropriate dermatologic care during the pandemic.

An in-depth analysis of treatment outcomes with a greater sample size is recommended for future studies. To improve the caliber of teledermatology, patient satisfaction surveys comparing the benefits and shortcomings of face-to-face versus teledermatology consultations may also be investigated.

ACKNOWLEDGMENTS

We would like to thank the staff of the institution for providing us the data used in this study. Also, we are grateful to the members of the hospital's dermatology department for their guidance on the direction of our research.

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