

Patterns and barriers of teledermatology in resource-limited settings in COVID-19 pandemic: A descriptive cross-sectional survey of Nepalese dermatologists



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Background: The COVID-19 pandemic has limited in-person consultations and disturbed easy health care access. Teledermatology (Td) is used to provide services in such situations.

Objective: To find the pattern and barriers of Td during the COVID-19 pandemic in resource-limited settings.

Methods: An online survey focused on dermatologists and residents in dermatology in Nepal was conducted. The online form with the prepared questionnaire was sent to the potential participants.

Results: A total of 86 responses were received, with 60% response rate. Approximately 62.8% ($n = 54$) of the participants were involved in COVID-19 care. The most common method used was a store-and-forward technique. Approximately 90% of the participants used smartphones for Td, and Viber was the most commonly used application. The straightforward diagnoses in Td were fungal infections, acne, alopecia, pyoderma, and viral infections. The common barriers were poor image quality, inability for further test, and unsuitability for all patients. The majority of the participants believed that there is a need for guidelines for Td.

Limitations: A small sample size and associated technical difficulties.

Conclusion: Td has proven to be an excellent tool; however, it may never replace the in-person consultation. A newer guideline must be prepared to regulate Td in the future. (JAAD Int 2022;7:62-6.)

Key words: coronavirus; COVID-19; dermatology; pandemic; skin diseases; teledermatology.

INTRODUCTION

The world is dramatically changing along with the changes in the COVID-19 scenario in the recent years.¹ With this change, lives have become full of challenges and opportunities.^{2,3} Although teledermatology (Td) was in practice before the COVID-19 pandemic, it was used infrequently.⁴ Fundamentally, Td helps connect the dermatologist and patients without the undue risk of infection.⁵

With the increasing use of Td during the COVID-19 pandemic, it is important to address the various merits and demerits, limitations, and associated difficulties of Td.¹ Td is more accessible, more convenient, comfortable, and cost-effective, yet virtual consultations have their own drawbacks.⁶ Considering the higher burden of skin problems than the limited number of skin care experts, Td could be an effective tool in skin

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Funding sources: None.

IRB approval status: Reviewed and approved by the institutional review committee of the National Medical College (approval number: NMC/425/075/076).

Accepted for publication February 25, 2022.

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<https://doi.org/10.1016/j.jdin.2022.02.011>

care even in the postpandemic era in rural and inaccessible areas.^{6,7}

The objectives of the current study were to investigate various aspects of Td among registered dermatologists and dermatology residents of Nepal during the COVID-19 pandemic. Besides, the study also focused on determining the common platform, mode, uses, and limitations of Td.

METHODS

An online, cross-sectional, descriptive study was conducted among the registered Nepalese dermatologists, postgraduate residents pursuing MD Dermatology, and those who were involved in at least 1 Td session with patients during the COVID-19 pandemic in Nepal. The study duration was 2 months from July 1, 2020, to August 30, 2020. Ethical approval (reference number: NMC/425/075/076) was obtained from the institutional review committee of the National Medical College before the study started. A Google form–based questionnaire was developed focusing on the objectives of the study. Pilot survey was conducted among 25 participants known to the investigator. The results of pretesting were used to prepare the final questionnaire. The responses from the pilot survey were also included in the final analysis. The final survey questionnaire with an URL was sent to the potential participants via email and/or social media accounts. The email addresses of dermatologists were obtained from the list of National Society of Dermatologists. Nonprobability sampling technique was used to select the sample. Consent was taken online from each participant before enrolling into the study. The participants in the study were informed about the study in detail in the participant information sheets. Confidentiality of all information was maintained throughout the study.

The samples were selected as per the following inclusion and exclusion criteria. Inclusion criteria included registered dermatologists and postgraduate residents of dermatology of Nepal involved in at least 1 Td session for patients and those consenting for the study. Exclusion criteria were those participants not practicing Td and those not willing to enroll in the survey. There was a possibility of nonresponse bias, and it was minimized by sending notification emails, personalized phone calls, and personalized invitations, as well as sending a survey reminder. These

response biases were made to reduce anonymity. The study variables were age, sex, marital status, province, qualification, occupation, work place, area of expertise, and the clinical variables were skin diseases, COVID-19 hospital, Td, application/software, limitations, medicolegal aspects, and guidelines. The data extracted from Google form were

used in Statistical Program for Social Sciences SPSS.20 and Microsoft Excel Sheet was used for analysis. Descriptive statistical measures and inferential statistics were used for analysis of the data. Quantitative data were measured in terms of frequency and percentage. The χ^2 test was used to find the level of significance with a *P* value of <.05.

CAPSULE SUMMARY

- Teledermatology was established as an important tool in the developing world during the COVID-19 pandemic. It has many barriers in resource-limited settings.
- Teledermatology has opened a new horizon in resource-limited settings for the management of dermatologic disorders.

RESULTS

A total of 86 responses from participants of different parts of Nepal were received between July 1, 2020, and August 30, 2020, with a response rate of approximately 60%. Demographics of the study population are depicted in Table I. The mean and median ages of the participants were 36.4 years (SD \pm 7.6 years) and 36.7 years, respectively. Td was used commonly by the age groups of 31 to 40 years (47.67%, *n* = 41) and 41 to 50 years (22.1%, *n* = 19), whereas only a small proportion of participants aged >50 years (3.5%, *n* = 3) used it. More than half (55%) of the respondents were women. Approximately 43% of them were dermatologists working in non-academic sector, and approximately 20% of the participants were resident dermatologists. Majority of the participants (64%, *n* = 55) were inhabitants of the central zone of Nepal where the national capital Kathmandu is situated.

Only a minor fraction of dermatologists working in government hospitals (10.5%) were using Td compared with those in medical colleges (60.5%, *n* = 52) and private practitioners (29%, *n* = 25). Among all participants, 62.8% (*n* = 54) were involved in COVID-19 care; however, only 13% of them were private practitioners, and the rest were from government hospitals and medical colleges (Table II).

The most common method used was the store-and-forward technique (61.6%, *n* = 53), followed by the hybrid technique. Twenty-nine percent (*n* = 25) of the participants were not using Td before the pandemic; however, there is a significant change in using Td during this pandemic. (*P* = .03) (Table III).

Abbreviation used:

Td: tele dermatology

More than 90% of the participants used a smartphone as a means of Td in which Viber and Facebook were the commonly used applications. There has been a rise of newer consultation applications such as Mero Doctor, Hamro Doctor, and Jeevee in Nepal, whereas only 3% of the total participants had access to telemedicine center at their hospitals or clinics. The most common use of Td during pandemics was for follow-up of the patients and for friends and relatives. Approximately 71% of the participants provided Td service free of charge. Regarding the challenges of Td, a multiple-responses questionnaire was asked and the vast majority (79%) of the cohort questioned about the limitation of Td to tackle multiple skin disorders. The other common limitations were image quality, inability to perform further tests, possibility of medicolegal uncertainties, problems, technical difficulties, and the lack of patient contact. Two-thirds of the cohort raised an issue regarding the image quality that may hinder the diagnosis of the disease (Fig 1). The survey also highlights the ease of diagnosis of common dermatologic disorders using Td. The common disorders were fungal infections, acne vulgaris, alopecia, pyoderma, pigmentary disorders, viral infections, and eczema (Fig 2).

The other highlights and facts of the survey were as follows: Td has opened new doors to virtual consultation, and it was evident that 97% of the clinicians are willing to continue it in the future even after the COVID-19 pandemic is over. Almost 95% of the participants agreed on the need of Td guidelines to minimize the limitations associated with it.

DISCUSSION

This survey revealed some important aspects of Td among the Nepalese dermatologists and postgraduate residents. The common age group among the users of Td was 31 to 40 years, which is similar to that of another online survey conducted in India during the COVID-19 pandemic, in which 30 to 35 years and 25 to 30 years (24.5%, $n = 40$) were the most common age groups using Td.⁸ Only a handful of participants aged >50 years (9.8%) were using Td, whereas, in our study, it was even less (3.5%). The possible reason could be the technical difficulties faced by older dermatologists who practiced only in-person consultations. Dermatologists and residents practicing in cities comprised the majority of

Table I. Demographics of participants using tele dermatology

Characteristic	Total (N = 86)	Percentage
Age group, y		
20-30	15	17.4
31-40	49	57.0
41-50	19	22.1
51-60	1	1.2
61-70	2	2.3
Sex		
Male	48	55.8
Female	38	44.2
Profession		
Resident	17	19.7
Consultant dermatologist (nonacademic)	37	43.02
Lecturer/assistant professor	20	23.2
Associate professor	10	11.6
Professor	2	2.3

Table II. Participants and use of tele dermatology before the COVID-19 pandemic

Primary work institute	Involved in COVID-19 care		Total	Percentage
	No	Yes		
Private practice	18	7	25	29.06
Government hospitals	3	6	9	10.46
Medical colleges	11	41	52	60.46
Total	32	54	86	100
Percentage	37.2	62.8	100	...

Table III. Change in the practice of tele dermatology during the COVID-19 pandemic

Method of Td	Use of Td before the COVID-19 pandemic		Total	P value
	No	Yes		
Store and forward	17	36	53	.036
Real time	6	6	12	
Hybrid	2	19	21	
Total	25	61	86	

Td, Tele dermatology.

participants who used Td, which is similar to our study. The differences in findings may be attributed to the fact that clinicians and residents working in cities and medical colleges are more used to technological advances and more availability of internet facilities in cities. A small number of dermatologists in government hospitals were using Td compared with those in private practice. More than 60% of the total participants were directly involved in

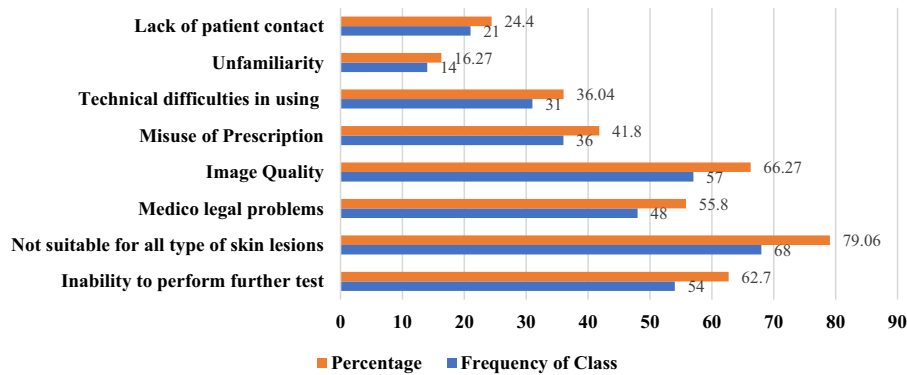


Fig 1. Barriers for teledermatology.

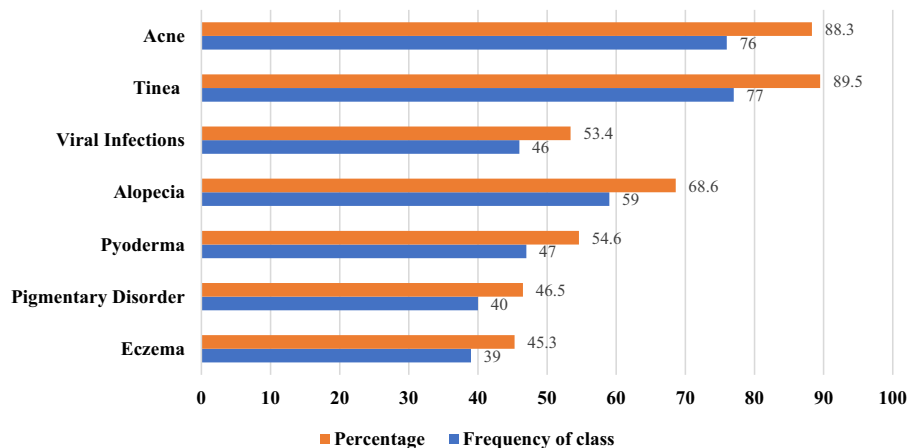


Fig 2. Ease of diagnosis in teledermatology.

COVID-19 care possibly because of the paucity of health care experts related to COVID-19. Involvement of a dermatologist in COVID-19 care was also noted in various other studies.^{8,9}

The social media platform was commonly used in Td platforms rather than the Td software. The most common responses for each platform were obtained from the social media messenger services such as Viber ($n = 70$), Facebook ($n = 60$), and WhatsApp ($n = 58$), followed by audio calls ($n = 113$), and the majority of the participants ($n = 74$) used >1 platform. However, most of the clinicians started using Td during the initial phase of the COVID-19 pandemic to help patients, as direct visits were hampered. In Nepal, there is no standard mobile application for Td. We used social media applications such as Viber, Facebook messenger, and WhatsApp. However, with the rise of COVID-19 cases during the pandemic, the use of applications such as Mero Doctor and Hamro Doctor has increased. The use of social media in Td was also reported in other studies.^{7,10-12}

Among the various skin disorders, the diagnosis was straightforward in patients with common

diseases such as acne, tinea, alopecia, bacterial infections, eczema, viral infections, and pigmentary disorders. This finding was consistent with that of a survey conducted by Sharma et al⁸ and Garcia-Romero et al.¹² Use of Td was found effective in the diagnosis and follow-up of many chronic inflammatory disorders such as acne, psoriasis, and hidradenitis suppurativa in some studies.^{13,14} Td is found to be a useful and convenient tool for the management of common ambulatory dermatoses.

Store-and-forward techniques were commonly used, followed by hybrid techniques. Store-and-forward technique has a number of advantages over real time in terms of equipment, internet speed, and timing. The fact that real-time teleconsultation, which allows synchronous interaction, does not appear to increase its diagnostic accuracy over store-and-forward technique.^{15,16}

The major barriers faced by dermatologists were that Td was not suitable for all types of patients. The study found that Td practices were more time consuming than traditional ones. Other barriers were image quality of the lesions and inability to perform further tests. Medicolegal compromises

were the major hindrance to more than half of the respondents (55.8%). The other barriers were inability to perform additional testing, possibility of misuse of prescription, less patient contact, technical difficulties, unfamiliarity, and others. Similar limitations were expressed by physicians in another study by Sharma et al,⁸ Handa et al,⁹ and Lee et al,¹⁷ in which they concluded that the major barriers were difficulty in lesion assessment, higher time for consultation, problems in establishing rapport, and technical or connectivity problems. Majority of the respondents (85%) were using Td, and 97% of them planned to continue it in the future. The results are similar to those of the study by Handa et al⁹ and another survey by Eber et al.¹⁸ Telemedicine and Td could also be incorporated in the medical education curriculum of undergraduate and postgraduate students, which could help them understand its various merits and uses in the upcoming future.^{19,20}

The main limitation of this study was the small sample size. The respondents who are more active online were more likely to answer, which might have not truly reflected the target population. This online survey could not be used to study the various aspects of Td involving nurses, medical students, and patients.

CONCLUSION

Td has proven to be an excellent tool during the COVID-19 pandemic and lockdown in which access to health care has been minimized. It has been providing quality health care to patients residing in remote areas and for those in quarantine and isolation where access to health care is difficult. Thus, it is important to regulate and ease the use of telemedicine for medicolegal liability and data privacy/security. Td would definitely be beneficial even in the post-COVID-19 era. Although Td may never replace in-person consultation and health care services, it would serve as an adjunctive even in the postpandemic era. Furthermore, this study could be of assistance in formulating major guidelines in Td.

I would like to acknowledge all participants and my colleagues Manish Bhakta Pradhan, MD and Rupa Thakur, MD for their support in conducting this study and Utkarsh Karki, DM, Bojindra Tulachan, PhD, and, my wife, Deepa Chudal, MD for language editing of the manuscript.

Conflicts of interest

None disclosed.

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