Will teledermatology be the silver lining during and after COVID-19?

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Abstract
The novel coronavirus disease (COVID-19) has limited traditional consultation and minimized health care access. Teledermatology (TD) has come to the rescue in this situation by extending consultation for nonessential conditions to the comfort of patient’s homes. This limits the risk of exposure of both doctors and patients to the coronavirus (SARS-CoV-2). And while there is a reported increase in teleconsultations during the ongoing pandemic, there are some demerits that avert the shift to virtualized health care. The authors conducted an online survey to further understand the hesitancy, limitations, merits, and the demographic of dermatologists who were conducive to TD and these data were analyzed and presented in this article. While TD might never replace physical consultation, it definitely serves an adjunctive role in the post-COVID era, provided adequate regulatory measures are in place.

KEYWORDS
artificial intelligence, COVID-19, SARS-Cov-2, survey, teledermatology, teledermatopathology, teledermoscopy

1 | INTRODUCTION
The ongoing coronavirus disease (COVID-19) has made access to health care a crucial challenge, especially since the outbreak was reclassified as a pandemic in March 1, 2020. Face-to-face dermatology consultations have been limited almost exclusively to emergent conditions, in conjunction with World Health Organization1 guidelines on social distancing and quarantine to prevent disease transmission.2 Particularly in this extraordinary situation, teledermatology makes it feasible to continue to connect with quality health care providers and receive care for nonessential ailments and issues, without exposing either the health care provider or the receiver to the undue risk of infection. This is facilitated by data collection, exchange, and analysis over a long distance by different methods of communication like audio, video, and imagery that comprise a virtual consultation.

2 | METHODS
Telereadiness has evolved as a game changer during COVID-19, and all specialties are leveraging it to further their purpose—be it for diagnostic, prognostic, therapeutic monitoring, or simply education. Dermatology, which requires astute visual recognition, is no exception to this virtualized movement. Teledermatology (TD) is in fact a frequently used subset of telemedicine which can be enabled in the following permutations—direct consultation (patient-dermatologist), indirect consultation (patient-remote clinician-dermatologist), and specialist opinions (dermatologists seeking opinions on dermatopathology, dermoscopy, etc.).3 TD may be done in an instantaneous real-time manner or as a store-and-forward method, offering the benefits of convenience and flexibility to the providers.4 TD has made consultation accessible, convenient, expedient, personalized, comfortable, and cost-effective. Countries have
reported a 10- to 15-fold increase in teleconsultations during the pandemic. And yet, virtualized consultations have their own demerits and may not be in vogue in the post-COVID era, as per unpublished reports.

The authors conducted an online survey of 20 questions to understand the hesitancy, limitations, trade-offs, demographic, and general notion regarding TD usage among dermatologists. The initial questions were on demography of the dermatologist such as age, gender, type of employment, country, and city tier of practice to understand which cohort was more likely to leverage TD. The next segment of the survey had questions related to their relative experience with TD in terms of patient profiles, platform(s) being used for TD, duration of a consult, remuneration, ease of diagnosis, challenges faced, their suggestions to improve the service, and if they would continue to use TD after COVID-19.

A total of 216 dermatologists were sent the survey through electronic mail, social media platforms, and online messengers. A number of 184 dermatologists completed the survey, of which a staggering 88.5% (n = 163) were practicing TD at the time of the survey. TD was most commonly utilized by doctors in the age groups of 30 to 35 years (34.9%, n = 57) and 25 to 30 years (24.5%, n = 40) while only a handful of doctors over the age of 50 (9.8%, n = 16) used it. Dermatologists practicing in tier 1 and metropolitan cities comprised the major chunk utilizing TD (51.5%) and it was least popular in tier 3 cities (17.1%). The difference may be attributed to the fact that patients in metropolitan cities are more technologically savvy. Only a small fraction of dermatologists in government institutes (22.6%) were using TD as compared to their colleagues in private practice.

Dermatologists were asked as to who was making requests for online consultations, and the distribution in descending order was as follows: family members and relatives (43%), old patients (39%), and 17.1% new patient enquiries.

In a question asking about the virtual platform used to perform TD consultations, the most common response was the social media messenger service WhatsApp (n = 131) followed by audio calls (n = 113) and video calling software. It is pertinent to point out that despite aggressive marketing and a promise of “all-in-one-solutions,” only 34 respondents were using a paid digital platform for the same (Figure 1). As compared to conventional consultation, 71.1% (n = 116) dermatologists found TD to be “slightly difficult” for making a diagnosis as compared to physical consultation, 9.2% respondents did not find any significant difference whereas only 3.6% (n = 6) felt TD was easier. Among the various skin disorders, ease of diagnosis was reportedly maximum in acne, followed closely by tinea, alopecia, bacterial infections, eczema, viral infections, pigmented disorders, and the least in inflammatory dermatitis (n = 43) (Figure 2). 70% dermatologists opined that TD was more time consuming than traditional consultation while 20.8% (n = 34) felt no noteworthy difference between the two. Dermatologists of 58.2% believed that TD was more convenient for most patients (n = 95) as they do not have to travel and wait in a queue, while 8.5% (n = 14) believed otherwise. From a financial point of view, 58.2% (n = 95) dermatologists charged the same as for physical consultation, 35% (n = 57) charged less while 6.7% (n = 11) charged more than regular consultation.

To understand the inherent hesitancy that begets TD, the authors asked the cohort to choose multiple responses in a question on the

FIGURE 1 A two-dimensional bar chart showing the distribution of the various platforms used for teledermatology (TD) by dermatologists.
limitations thereof. The vast majority of the cohort questioned whether TD would suffice to tackle various skin disorders (n = 119). Medicolegal uncertainties and fallacies posed as a hindrance to more than half of the respondents (n = 97), while inability to do additional testing, prescription misuse, lack of patient contact, improper reimbursement, technical aspects, unfamiliarity, and the “requirement of another doctor at the other end to prescribe” were cited by dermatologists as reasons that would deter them from supporting TD (Figure 3). The cohort was asked to rate their overall experience with TD (at present) on a Likert scale between 1 and 10 to which the calculated mean average was 5.9. The survey culminated with dermatologists being asked to foresee their utilization of TD after COVID-19. Over 70% dermatologists planned to use it in conjunction with physical consultation, 15% claimed to not use it at all, while 10% said they would limit physical consultation while using more of TD in their foreseeable practice.

The survey delineates some encouraging facts. Respondents of 85% were using TD and 71% planned to keep using it in the future. The majority of the users were young dermatologists, employed in private institutes in tier 1 cities. It seems imperative to encourage the use of online consultation by dermatologists working in government institutes and teaching hospitals and those practicing in tier 2 or 3 cities as they experience higher patient volumes and are relatively resource constrained. These data regarding conditions that are easy to diagnose via TD were consistent with a survey conducted by Eber et al on similar lines. WhatsApp messenger is the commonest platform used for TD, as also cited in other studies by virtue of its ease of use and familiarity. Adequate and appropriate remuneration is a gray area, as brought out in the survey, reflected in a prior study as well. The major challenges that limit the use of TD include diagnosis of all types of skin conditions and medicolegal implications as also reported by a survey done by Lee et al.
3 | CONCLUSIONS

While not a replacement for traditional practice, telemedicine has proven to be an excellent tool for triage and disaster management, especially when it comes to calamities like the ongoing pandemic when a majority of the population is under lockdown and access to health care has been minimized. TD itself has grown leaps and bounds with the incorporation of teledermoscopy and teledermatopathology as diagnostic aids. TD has expedited good quality health care to remote areas and quarantined patients especially during COVID-19 both primarily and as an adjunct to conventional consultation. The integration with other factions of artificial intelligence shall only improve upon the existing TD model. Having said that it is imperative to regulate TD and telecare on the whole, especially from the viewpoints of medicolegal liability and data privacy/security to provide better standards of communication and alleviate the major challenges faced by dermatologists. This would go a long way in keeping TD relevant even in the post-COVID era.

CONFLICT OF INTEREST
The authors declare no potential conflict of interest.

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