



Attitudes and perceived barriers toward store-and-forward teledermatology among primary care providers of the rural Mississippi

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Abstract

Telehealth expands the capacity to care for patients in rural and underserved settings. Store-and-forward teledermatology is a simple and effective approach which enables remote dermatological diagnosis and treatment. Implementing store-and-forward technology in rural Mississippi has the potential to expand access to dermatology services at locations, where an in-person dermatologist is not available including: emergency rooms, urgent care centers, and primary care practices. A survey study was conducted to assess perceived obstacles and attitudes about store-and-forward teledermatology among primary care providers in Mississippi's rural areas. Most providers are very interested in the telehealth program and the opportunities it provides them to best treat their patients. Key barriers to engagement in teledermatology were (1) primary non-adherence: this is rooted in misconception about teledermatology, the investment in time required to master the technology and establish digital links between primary care provider and consultant; and, (2) secondary non-adherence: this is related to the time required to submit a teledermatology consult which disrupts busy offices. Emphasizing the benefits of teledermatology to primary care physicians and simplification of the teledermatology consult submission process may increase the use of teledermatology in rural Mississippi and serve as a model for other academic teledermatology programs throughout the United States.

Keywords Attitudes · Barriers · Teledermatology · Primary care providers · Rural

Introduction

The use of telehealth is becoming more prevalent throughout the United States, especially during the Covid-19 pandemic. As the pandemic wanes, it will continue to transform the ability of dermatologists to provide care to patients in rural and underserved settings [1–3].

Store-and-forward teledermatology offers an easy and reliable approach to remote dermatological treatment [2]. To date there are only 67 dermatologists actively practicing in the state of Mississippi. The Mississippi Delta encompasses about 7000 square miles of land between the Mississippi

and Yazoo Rivers. It is the most underserved area of the state, having the highest poverty rates and lowest rankings for multiple health indicators [4]. Patients from the Delta are required to travel over 70 miles to see the nearest dermatologist. Time constraints, transportation difficulties, and lack of financial resources are obstacles faced by rural patients when considering a visit to a distant physician. Of patients from the Delta who scheduled appointments with dermatologists, only 14% arrived for their appointment due to office average wait times of 12 weeks. Thus, implementation of store-and-forward technology in rural Mississippi has the potential to increase access to dermatology care in this region in emergency rooms, urgent care centers, and primary care practices.

In 2016, the University of Mississippi Medical Center (UMMC) Department of Dermatology and Center of Telehealth initiated a store-and-forward teledermatology program to expand dermatology access to Mississippi's underserved populations. Store-and-forward teledermatology enables patients to facilitate a teledermatology consultation

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during a visit to their primary care provider. Within 24–72 h, dermatologists at the UMMC review the patient information sent by primary care providers across the state and give their diagnosis and plan of action through the telehealth program. After implementing this program in 2016, we determined that there were several barriers that were preventing tele dermatology from being utilized in more primary care providers' offices across the state of Mississippi, specifically in the Delta. In addition, some referring physicians sent only one or a few tele dermatology consultations after they were recruited.

The state of Mississippi has several advantages related to provision of telehealth services. A state law requires all insurance companies to pay for telehealth services at the same rate they pay for in-person services [5]. Mississippi Division of Medicaid of Mississippi also agreed to cover tele dermatology services at their standard payment rates. Only Medicare patients do not have coverage [6]. This study was designed to explore the attitudes of primary care physicians in rural Mississippi toward store-and-forward tele dermatology to better understand barriers to its use and develop solutions to increase adoption of this technology to improve healthcare in underserved communities.

Methods

In the summer of 2019, 34 of 52 (65.4%) primary care providers (family practice doctors, emergency room doctors, and nurse practitioners) in the rural areas of Mississippi contacted via telephone agreed to participate in this study. All 34 providers who agreed to participate completed the study. A medical student engaged in an in-person visit at rural primary care offices and recorded the providers' responses to the survey questions on an iPad™. The survey included questions pertaining to the provider's tele dermatology practice, barriers to the use of tele dermatology, and the advantages/disadvantages of tele dermatology over an in-person doctor's visit. After completion of the survey, each provider was given the opportunity to sign up for the program and to receive more detailed instruction to most effectively use the technology. Frequencies and percentages of the responses were obtained using SPSS (Version 26).

Results

Thirty-two (94.1%) of the thirty-four primary care providers were new users of tele dermatology and had never submitted a store-and-forward tele dermatology consultation to the UMMC. Only seven (20.6%) out of the thirty-four providers had heard of store-and-forward tele dermatology consultations, including the two that had previously used the UMMC

Table 1 Provider concerns (% of providers) with initiating tele dermatology referrals in primary care practice

No concerns/reservations	41.2
HIPAA violations/confidentiality or insurance coverage	23.5
Misdiagnosis due to poor imaging	17.7
Time required for consultant response	8.8
Corporate constraints/bureaucracy	8.8

Table 2 Perceived benefits (% of providers) of tele dermatology by primary care providers

Provide the best diagnosis	55.9
Faster dermatology consultation	29.4
Reduce patient travel distances	5.9
Would not be helpful	2.9

program. In the past, 12 providers (35.3%) had texted or emailed an image of a patient to another physician to obtain help with the management of a skin condition.

All thirty-four providers (100%) reported that they had the technical expertise to perform store-and-forward dermatology consultations and owned a smart phone or smart device to do so. In addition, all providers thought that tele dermatology consultations were equally effective in managing both newly diagnosed skin conditions and managing chronic skin conditions. Finally, all participants believed that tele dermatology consultations would help ease the financial burden that many of their patients face when having to travel to a non-local healthcare clinic.

As shown in Table 1, providers were asked about their reservations about using tele dermatology consultations or telehealth in general. None of the providers believed that telehealth, and store-and-forward tele dermatology specifically, creates additional malpractice risk for their practice.

As shown in Table 2, when asked about the benefits of tele dermatology consultation in clinical practice, providers were very optimistic about the potential benefits of implementing tele dermatology. In addition, twenty-eight (82.4%) providers believed that store-and-forward tele dermatology consultations have advantages over traditional in-office dermatology visits. Twenty-six (76.5%) providers reported that they did not think it would be challenging to incorporate store-and-forward tele dermatology consultations as part of their daily workflow.

Both providers that had previously used tele dermatology believed that the program helped them make correct diagnoses for patients with difficult skin problems. They also reported that the tele dermatology consult reports routinely arrived back at their office within one business day, and that their patients felt comfortable with the store-and-forward tele dermatology consultations. Advantages of

store-and-forward teledermatology included provision of quicker appointment scheduling. Both providers had the technical expertise to utilize the technology, though one suggested that additional training on the software would be helpful. It was noted that completing the consultation requisition was a long and difficult process that takes 15–20 min of physician or staff time. It was suggested that there should be a more efficient way to upload pictures and shift the provision of patient specific information from the referring physician to the patient.

Discussion

This study demonstrated that teledermatology is an underutilized resource among rural primary care providers in Mississippi. Just a few barriers tend to significantly impeding the implementation of store-and-forward teledermatology. First, concerns about misdiagnosis and privacy are important. Education would be expected to allay these fears.

The complex regulatory framework in the United States promotes patient and provider reservations about the security of health data. [7] Personal mobile phones or other smart devices used by providers are also used to capture clinical images or relay patient information. Standards have been developed in other countries that regulate patient education, consent, proper documentation of consent, close control of mobile devices, and swift deletion of patient data after storage. [8] In the United States, laws regulating telemedicine encounters and privacy vary by state. With the advent of COVID-19, regulations impeding the adoption of synchronous teledermatology in the United States were eased to allow use of encrypted independent platforms (e.g., Doximity, Zoom Healthcare, or Doxy.me) or unencrypted modalities, if needed (e.g., FaceTime, Zoom, Skype). The ensuing boom in use of telehealth services demonstrated that adjustments of the regulatory environment by government entities along with increased compensation outweighed privacy fears among patients or providers.

A minority of survey participants expressed a second concern, the accuracy of store-and-forward teledermatology, and these concerns are unfounded. Research has demonstrated that telemedicine is efficient and effective in delivering care to underserved areas. A recent published study [7] claimed an 80% accuracy of diagnoses related to recognition of potential carcinoma and melanoma via teledermatology images. Increasing image resolution has been shown to increase diagnostic accuracy of store-and-forward teledermatology [9]. Both the resolution of the digital camera and the skill of the photographer determine image quality. High-resolution camera equipment increases in availability and decreases in cost every year. Another recent study [10], found that providers believed

that a store-and-forward teledermatology consult was of sufficient quality to make a diagnosis. The overall diagnostic correlation between teledermatologists and dermatologists in clinic was found to be 90.6%. Teledermatology was found to have better diagnostic accuracy at 71% versus only 49% of accuracy in a primary care office. All participants in our study reported having a capable device for teledermatology and the technical expertise to use these devices in the clinical setting. Thus, participants in our survey are well-primed for rapid adoption of store-and-forward services.

The primary focus of our efforts to remove barriers to teledermatology focuses on minimizing the time required by physician and staff to enter a teledermatology consultation. The current protocol takes 20–25 min to submit patient specific data, insurance information, and images. It is hoped this can be reduced to 5 min of primary care physician plus staff time to obtain and transmit images of (1) clinical finding; (2) the patient's insurance card; and, (3) the medical record for the primary care visit including a chief dermatologic complaint. Clinical imaging guideline education will be provided to maximize image quality, efficiency, and diagnostic yield [11]. With these improvements it is hoped that implementing teledermatology into the daily primary care workflow will be less challenging.

In summary, a key advantage of teledermatology is increased access to specialist services for rural providers and their patients. Caring for patients in conjunction with their local primary care physicians has distinct advantages over direct-to-consumer teledermatology. These advantages include: (1) the safety and error prevention offered by working with “the captain of the team” who knows the patient well and (2) the availability of a local physician contact if there are treatment side effects or the patient does not respond to the treatment. Generally, diagnostic agreement and accuracy between teledermatology consultations and follow-up dermatology clinic visits has been excellent [12]. Due to the use of store-and-forward teledermatology, 25% of additional clinic appointments can be averted. Store-and-forward teledermatology increases both patient and referring physician satisfaction. In fact, the physicians who completed this survey recognized the benefits of teledermatology consultations. Simplification of the submission process is expected to lead to the emergence of teledermatology as a key piece of the rural dermatology access to care puzzle.

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Compliance with ethical standards

Conflict of Interest None.

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