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Descriptive Report

Success and Challenges of Establishing a Teledermatology Pilot Service at a Student-Run Clinic

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Abstract

Background: Dermatologic issues are the primary reason people experiencing homelessness (PEH) seek care.[1] Furthermore, the closure of clinics and shelters during the coronavirus disease 2019 (COVID-19) pandemic highlighted care disparities and the need for telehealth services.[2,3] Though teledermatology is feasible and reliable, many PEH do not have access to dermatologists, often due to few dermatologists accepting public health insurance programs.[4] This study investigated the challenges and successes of a teledermatology pilot within an existing student-led clinic for PEH, the diagnostic concordance between onsite primary care providers (PCP) and teledermatologists, as well as the quality of life of PEH with dermatologic issues to better understand the impact of cutaneous conditions of the unhoused.
Methods: A teledermatology consultation service was established at a student-led clinic in Austin, Texas. Teleconsultations were conducted with offsite dermatology residents using a secure messaging platform. PCP diagnoses were recorded prior to the teledermatologist consultation. Patients completed the Dermatology Life Quality Index survey upon visit completion.
Results: We had several successes in implementing this teledermatology pilot service, including smooth integration of the service, sustainability through cross-class collaboration, earlier in-person follow-up, and dermatologic education for PEH. However, we also encountered challenges, including limited patient volume with ongoing construction and remote site location, inadequate patient access to medication with no onsite pharmacy, and limited medical literacy.
Conclusions: In this pilot program, reasonable patient volume suggests this model is sustainable for both student-led clinics and dermatology residents. PCPs can limit use of this service to diagnostic and therapeutic dilemmas given the high concordance in diagnoses. Future directions include increasing the magnitude of patients served and collaborating with the student-run clinic team to address upstream social determinants of health. We hope this pilot study provides evidence that this teledermatology model is replicable in other clinic settings and potentially with other specialties.

Introduction

Housing instability and homelessness is a complex societal problem that impacts communities across the United States (US). Homelessness affects more than half a million individuals in the US.[5] After gradual decreases in homelessness rates between 2007 and 2016, there has been an annual increase in homelessness since 2017.[5] Five states (California, Florida, New York, Texas and Washington) account for more than half of people experiencing homelessness.[5] High housing costs, inadequate shelters, the criminal justice system, and a lack of

affordable health care for mental illness and substance use have all contributed to varying degrees to the gradual increases in unhoused populations. High housing costs and a dearth of affordable rental options are a major driver in urban areas such as Los Angeles, San Diego, and our local community of Austin, Texas.[6,7]

According to a 2023 estimate by Community Homeless Coalition, more than 5,000 individuals are unhoused on a given night in Austin.[8] While up to 80% of this population suffer from a chronic condition, it is estimated that 60% of those unhoused did not visit a primary health center in the 5 previous years.[9] Furthermore, dermatologic needs are high in this population, with 54% suffering from a cutaneous disease.[10] Unhoused individuals are particularly susceptible to staph aureus infections, eczema, foot ulcers, rashes, and inflammatory skin conditions.[11] They are also more likely to have scabies and body louse than the general population.[11] These skin problems can cause itching, pain, embarrassment, and further social isolation.[12]

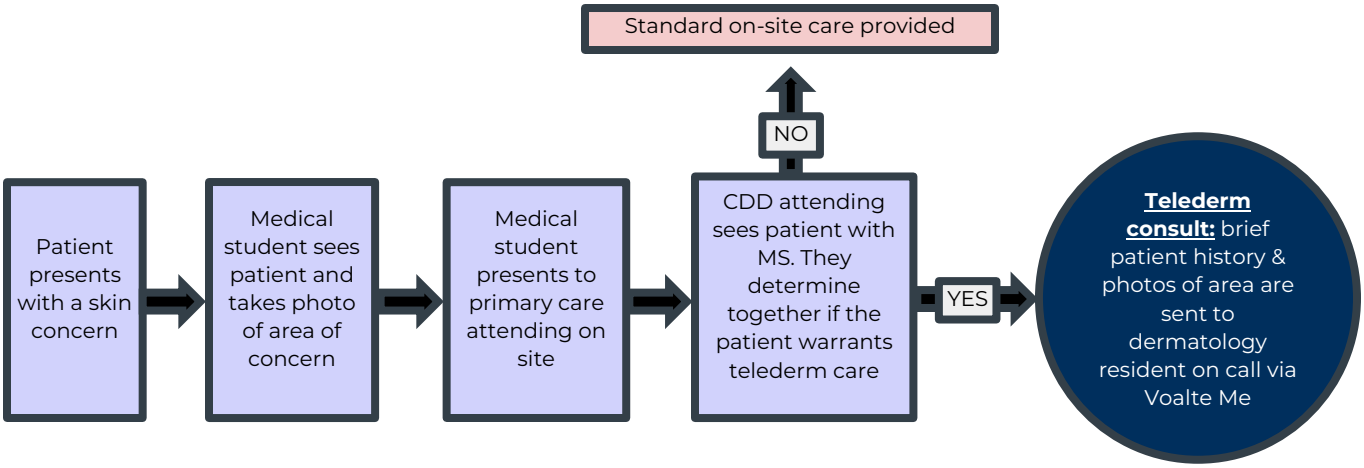
Health care for people experiencing houselessness (PEH) in Austin is currently fragmented, consisting of mental health services, emergency departments, hospitals, shelters, and individual clinics. These services sometimes exist under different organizations and care is often not coordinated nor patient centered. The coronavirus disease 2019 (COVID-19) pandemic highlighted care disparities with the closure of many clinics and shelters and prompted a need for the use of integrated telehealth services for all populations.

Telemedicine is a new technology defined by the World Health Organization as "The delivery of health care services, where distance is a critical factor…using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities".[13] The expansion of telemedicine to include teledermatology, a visually dependent specialty, has been demonstrated to be feasible and reliable.[14] Teledermatology has been shown to provide many benefits, including shortened wait time, increased accessibility to dermatologic care, and educational benefits for cost-effective teaching.[15-17]

Despite these benefits, teledermatology has limitations. Although teledermatology and telemedicine as a whole has expanded, especially during the COVID-19 pandemic,[18] many patients still do not have access to specialized dermatologic care. This is particularly true of Medicaid-insured and uninsured patients, who make up 5% of patients in dermatology practices while accounting for 27% of the US population.[19] Additionally, patients with Medicaid often experience longer wait times to see a dermatologist than those with private insurance.[20] Fortunately, many patients are able to access their primary care physician (PCP) who can accurately and appropriately diagnose and treat many skin-related complaints.[21] However, for more complicated and less common cutaneous diseases, PCPs may seek out dermatologist input in their management plan.[4] However, with limitations in insurance coverage and extended wait times, dermatologists may not always be available and/or accessible to all patients, especially in underserved populations. As a result, PCPs treating vulnerable populations may be left with limited access to dermatologic consultation. Cases in which dermatologist input may be most needed is in the diagnosis of biopsy-proven melanoma, in which dermatologists have an 87% diagnostic accuracy compared to 22% in PCPs.[14,15] This diagnostic accuracy is not limited to cutaneous oncology and includes autoimmune diseases such as psoriasis, in which concordance between PCP and dermatologists is 56%.[16] However, data are limited on the agreement between dermatology and primary care on a wider spectrum of dermatologic diseases. While there is some evidence of variable diagnostic concordance between PCP and dermatologists in specific diseases, this has not been clearly elucidated among a diverse population and a variety of dermatologic diseases.[14-16]

This teledermatology pilot model is a post-COVID-19 expansion of a previously published dermatologic service providing skin examinations at C.D. Doyle for those experiencing homelessness.[22] The authors recommended integration of more comprehensive dermatologic care into this student-led clinic.

Figure 1. Clinic flow of teledermatology consult service



CDD: C.D. Doyle ; MS: medical student.

Objectives

The purpose of this pilot and study is multifold. First, we implemented a telehealth model into an existing student-led clinic for people experiencing homelessness (PEH). Second, there is a need to evaluate PCP and teledermatology diagnostic accuracy in a diverse population, especially among PEH. This study evaluates the diagnostic concordance between PCP and teledermatologists to allow for further recommendations regarding when teledermatology or additional follow-up is appropriate. We also evaluated dermatology quality of life among PEH to better understand the impact of cutaneous conditions on the unhoused. Finally, this study evaluates the successes and challenges in the implementation and operation of the teledermatology service at the student-led clinic so that other free student-led clinics might learn from our experiences in establishing a similar service.

Methods

A group of Dell Medical students, dermatology faculty, and dermatology residents sought to address the gap in dermatologic care for the unhoused. A teledermatology consultation service was established at C.D. Doyle. This clinic is run by medical students at Dell Medical School and supported by local volunteer physicians. Operating on Sunday afternoons, the clinic currently offers primary care and intermediate care services aiming to prevent emergency room visits and provide a source of accessible continuous care. C.D. Doyle has an on-site PCP during times of clinic hours.

In our teledermatology model, all patients who presented to C.D. Doyle with a dermatologic medical concern were first seen by the onsite PCP, who then determined whether to proceed with a teledermatology consultation. Once a dermatology consultation was warranted, the medical student captured photographs of the area of concern, as well as a history of present illness and physical exam description and sent this information to the on-call dermatology resident via Voalte Me (v.3.9, Voalte, Sarasota, FL), a secure messaging platform. The dermatology resident recommendations were then relayed to the primary team via Voalte Me after agreement with the dermatology attending. The preliminary diagnosis by the PCP as well as the assessment and plan provided by the teledermatologist were recorded. A follow-up phone call was conducted with the patient to assess their ability to access and utilize their medications, and to clarify any questions. An in-person dermatology referral process was initiated to Community Care, a federally qualified health center in Austin, when medically indicated (Figure 1).

To understand the impact of dermatologic disease on quality of life in this population, patients utilizing the teledermatology service were also

administered the Dermatology Life Quality Index (DLQI) survey upon visit completion. First created in 1994, the DLQI is a 10 question self-reported, validated questionnaire that measures the quality of life of adult patients with skin diseases and has been previously used in PEH.[23-25] Successes and challenges were assessed through discussions with stakeholders of the clinic, including clinic leadership, on-site physicians, and volunteer medical students.

This study was approved by the University of Texas at Austin's Institutional Review Board (STUDY00003711).

Results

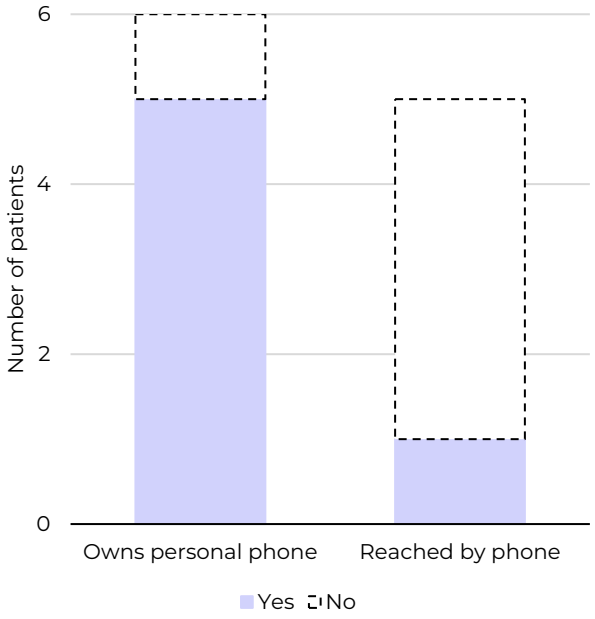
Data collection is ongoing and the C.D. Doyle teledermatology service has provided care to six patients (n=6). Most PCP diagnoses were concordant with the teledermatologist diagnosis (n=5). Only one patient had different diagnoses (clavus vs. chronic scar tissue, see Table 1), however the recommendations for surgical follow-up were the same for both the PCP attending and teledermatologist. Nearly all (n=5) patients have a personal phone but none of the patients have been reachable by phone for follow-up after their initial visit (Figure 2). The average DLQI was 7.83, and 4 patients scored at least 6 points, while only 2 fell directly in this range, suggesting that for these patients, their skin condition had a moderate effect on their life (Figure 3).

Table 1. Diagnoses of the on site primary care attending vs. the teledermatologist making the diagnosis via Voalte Me using images and history

Patient	PCP diagnosis	Teledermatologist diagnosis
1	Drug-induced eruption	Drug-induced eruption
2	Psoriasis	Psoriasis
3	Callus	Callus
4	Pressure ulcer	Pressure ulcer
5	Chronic scar tissue	Clavus
6	Secondary staph infection	Soft tissue infection

Only one patient (patient 5) had a discordant diagnosis (chronic scar tissue vs. clavus).
PCP: primary care physician.

Figure 2. Patient ownership of personal phone and number of patients reached by personal phone



Successes

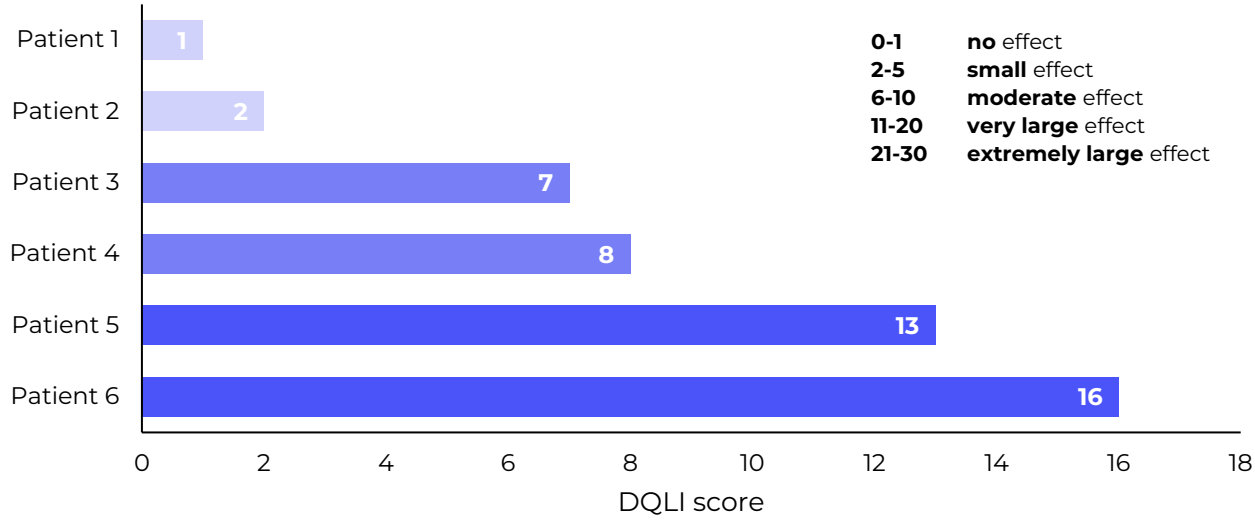
Integration into C.D. Doyle clinic flow

A key point of design of the teledermatology service was to ensure its effective integration into the general clinic flow of the student run clinic. Prior to the design of the clinic, the teledermatology team met with stakeholders, including C.D. Doyle leadership and on-site PCPs to discuss effective design of the consultation service. Potential challenges in integration of a teledermatology service were identified and modified appropriately prior to the final creation of the service. Potential challenges included barriers such as tight clinic space, limited supplies and inventory, and data collection. These challenges were addressed by selecting one trained teledermatology medical student on-site at all times, working additional hours to efficiently organize dermatologic supplies, and administering the DLQI survey after patient visit, so as not to occupy limited room availability.

Long-term sustainability of the teledermatology service at C.D. Doyle

To ensure appropriate care for PEH, the

Figure 3. Dermatology life quality index scores for patients seen by teledermatology service



DQLI: dermatology life quality index.

teledermatology service was designed with long-term sustainability in mind. This continuity was also important for the C.D. Doyle team, who wanted to ensure the service remained long after implementation. To promote sustainability, medical student volunteer training for C.D. Doyle included training on utilization of the teledermatology service. Additionally, first-year and second-year medical students were onboarded onto teledermatology project leadership to ensure appropriate and well-trained clinic handoff. Finally, while the cost of Voalte Me was provided by the medical school-affiliated hospital, this may be an important factor to consider in the future if this may change.

Ability for in-person dermatology visit, earlier than may have been otherwise possible

Because of the vulnerable nature of the population that the teledermatology clinic serves, accessibility to dermatologic care is limited.[26] While data is ongoing, we have been able to schedule in-person follow up with dermatology for a few of these patients with more severe disease. This service is also a helpful way to triage patients who require an in-person dermatologic clinic visit, with an ability to schedule them for urgent visits as needed.

Education of skin health

Finally, a major success of this service has allowed for a wider reach of education in skin hygiene and health for a population in need. Even when the teledermatology service is not used, its presence has allowed for the team to educate other patients on basic skin hygiene and health. This has been achieved primarily through ad hoc dispersal to Esperanza residents of skin care kits containing moisturizers, sunscreen, aloe vera, shampoo, body wash and wipes.

Challenges

Patient accessibility of clinic

A major challenge in the implementation of the clinic is the limited patient volume due to accessibility. The C.D. Doyle clinic itself is located in Esperanza, a remote location only accessible by car. With the passing of Proposition B and HB1925 in 2021, which made it a criminal offense for anyone to sit, lie down or camp in public areas, those unhoused in downtown Austin were required to move to sites outside the city.[27,28] As a result, while the clinic is able to serve those living at the encampment, it is otherwise difficult to serve others living farther away without access to transportation. Furthermore, ongoing construction at Esperanza during the service implementation limited the potential patient population.

While this construction consisting of 200 individual shelter units will ultimately contribute to a safer and more permanent community,[29] many residents have moved out of Esperanza. The remote nature and ongoing construction have both severely limited the number of patients we have been able to see.

Patient access to medication

Because the clinic itself does not have medication disbursement capabilities as well as the lack of nearby pharmacies, many patients who receive a prescription are unable to fill it. Patients receive bus passes they can use to travel for free to the pharmacy of their choosing. However, obtaining these prescriptions still requires significant time and energy. Furthermore, many patients have limited mobility and/or pain due to chronic conditions. Given their often complex social and medical situations, many patients noted in follow-up visits that they are unable to obtain their prescribed medications, complicating appropriate care for this demographic.

Medical literacy

Medical literacy has been a significant challenge in appropriate counseling of disease and treatment plans in this demographic. Patients often are unaware of their condition, or believe their symptoms are due to other causes. This limitation results in challenging adherence to medication, as learned through follow-up phone visits. While efforts are made to appropriately counsel patients on the importance and reasons for their medication, there is still a great need for general medical education.

Future directions

While this iteration of the teledermatology service has encountered some success, it has also faced several hurdles. The future direction of this service is aimed at alleviating these challenges. First, we hope to increase the scope of the population this model serves. We have begun discussions with mobile clinics and other communities for PEH with an on-site PCP for which the integration of a teledermatology service would be beneficial. Second, a major hurdle of the success of this service has been limited due to the resources of C.D. Doyle and its population. By working with C.D. Doyle to expand services that address social determinants of health such as bus passes, some of these hurdles may be alleviated. This may also allow patients to focus their resources on non-health related needs. Finally, we hope to further our understanding on the outcomes most important to this demographic through increased completion of the validated Dermatology Life Quality Index survey. This will help us to understand the impact of dermatologic conditions on the lives of these individuals, and how to best address them.

Conclusions

PEH often seek care for skin concerns but have limited access to specialist care. Our pilot program of teledermatology care for PEH, offers encouraging early evidence that diagnostic concordance may be high between PCPs and dermatologists, and that this model may be a sustainable option for both C.D. Doyle and dermatology residents and attendings. Because concordance is high, primary care attendings can turn to this service when seeking guidance for a dermatologic concern, also limiting the burden on dermatology residents and attendings. Though nearly all patients have personal phones, these patients are difficult to reach by phone. This discrepancy highlights the need to address many aspects of care during the initial encounter. Although our team has faced a number of challenges, we were able to implement this service within the student-led clinic, targeting a previously unmet need for PEH. As the clinic continues to be refined, we anticipate expansion of this teledermatology service to other communities. Major limitations of this study include the small sample size. Though we outlined the challenges and successes of the service's implementation and sustainability, these conclusions are limited by the sample size of the study. While results are early and data collection is ongoing, we hope this study provides evidence that this teledermatology model is replicable in other clinic settings and potentially with other specialties.

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Disclosures

The authors have no conflicts of interest to disclose.

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