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Pediatric teledermatology: a tool for combating dermatology care disparities

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Abstract

Social distancing requirements associated with the COVID-19 pandemic have allowed for the expansion of different healthcare delivery modalities. Namely, there has been an increase in the utilization of remote diagnostic services for both primary and specialist care. Dermatology care has traditionally been inaccessible to many pediatric patients; this is due in part to a limited number of practicing pediatric dermatologists, as well as a maldistribution of the pediatric dermatology workforce with the majority of providers located in large metropolitan areas. There is therefore a need for an accessible alternative for care to reach underserved patient populations. This commentary highlights evidence from recent studies on remote dermatology care (teledermatology) and how it has not only improved access to dermatologic care but also quality of care. Although teledermatology does not completely replace traditional in-person visits and is limited by poor broadband access in traditionally underserved areas, teledermatology can, in some instances, be a cost-effective and efficient alternative for pediatric patients otherwise lacking dermatologic care.

to over 75 million children [1]. Many communities lack access to pediatric dermatologists, as the majority (approximately 98%) of pediatric dermatologists practice in academic hospitals within larger metropolitan areas [2]. A pediatric dermatologist is present in 82% of states but only 4.4% of individual counties in the United States. This maldistribution of pediatric dermatologists has created a dramatic need for pediatric dermatology services, particularly within nine states, and the multiple counties that lack a pediatric dermatologist entirely [2].

The spread of COVID-19 has resulted in significant changes to our current healthcare system, including increased utilization of teledermatology. Teledermatology is the employment of telecommunication technology for the purpose of exchanging medical data relevant to the diagnosis, treatment, and prevention of skin disease [3]. A persistent problem within dermatology has been the lack of readily available and accessible services by pediatric dermatologists. Teledermatology serves as a potential solution to this problem.

Keywords: COVID-19, internet access disparity, pediatric dermatology, rural medicine, teledermatology

Introduction

In the United States, there are fewer than 300 board-certified pediatric dermatologists that provide care

Discussion

Prior to the COVID-19 pandemic, telehealth services were limited, with health systems performing less than 100 telehealth video visits per day [4]. During the pandemic, however, utilization of telehealth services increased markedly, with many health systems performing more than 600 telehealth video visits daily [4]. In addition, recent studies have shown

increased access to teledermatology services among Medicaid-insured, resource-poor, and elderly populations owing to the COVID-19 pandemic, which resulted in reduced wait times and improved, cost-effective care [5]. Teledermatology addresses the issue of wait times by expanding geographical access and utilizing tele-triage systems to reduce the time required for in-person visits [6-8]. One example of how the COVID-19 pandemic has impacted pediatric dermatology management is in the treatment of infantile hemangiomas. During the pandemic, consensus guidelines developed by the Society for Pediatric Dermatology recommended considering use of telehealth services for patients with standard risk infantile hemangiomas, even without an in-person visit, when initiation of topical or systemic beta blocker therapy is indicated [9]. Although a complete exploration of the criteria for standard risk infantile hemangiomas in this context is beyond the scope of this commentary, an important criterion includes that caregivers should be able to understand management instructions through the teledermatology service. Moreover, patients with high-risk infantile hemangiomas should still be evaluated in person, unless exceptional personal circumstances make this impossible [9].

Atopic dermatitis/eczema, molluscum contagiosum, common warts, and acne are dermatologic conditions that are frequently seen in both in-person and teledermatology visits. Given the relative ease with which these conditions can be visually identified, even via telehealth modalities, children with these diagnoses can typically be managed appropriately in either context [10]. An assessment of store-and-forward teledermatology among patients 0 to 19 years old in San Paulo, Brazil, demonstrated that teledermatology allowed specialists to manage 63% of cases without in-person appointments [11]. The study found that patients 0-2 years old frequently had problems such as eczema and benign congenital lesions. In patients 3-12 years old, eczema still predominated, followed by warts and molluscum contagiosum. In patients 13-19 years old, acne was the most significant complaint addressed, followed by eczema, nevi and warts. Teledermatology allowed these young patients to receive appropriate care more quickly. Moreover, these patients kept visits with their primary care provider, thereby limiting the

requirement for a dermatologist to be physically present. Since in-person visits with a dermatologist could be allocated to complex cases that required greater attention, this study concluded that teledermatology improved care delivery significantly. During the year this study was conducted, wait times were reduced by 78% (from 6.5 months to 1.5 months), [11]. By decreasing these wait times, teledermatology provided a novel solution to access problems in a system with a healthcare provider shortage.

Teledermatology is also a more cost-effective method of providing care. Not only are conventional in-person care overhead costs avoided, but there are also decreased personal costs to patients [5]. A 2016 study highlighted that a store-and-forward pediatric teledermatology program potentially saved approximately \$24,000 over the course of three years for payers and patients. In addition, the average patient wait time prior to initiation of this teledermatology program was 54 days, which decreased to 37 days for an initial face-to-face dermatology appointment following teledermatology consult [12]. Additional benefits of teledermatology for children include eliminating travel time for patients, as well as a decreased amount of time away from work or school to see a dermatologist [13]. Taken together, the rapid deployment and positive changes associated with teledermatology indicate that it could also be a durable solution to addressing healthcare accessibility and equity within the field of pediatric dermatology.

Other studies conducted among children and adolescents have shown that teledermatology improves ease of access for pediatric populations. In one study, a pediatric teledermatology mobile application was evaluated as a means to provide remote care. Users were surveyed on accessibility and impact at the conclusion of the study; among respondents, 83% found the application easy to use, 97% felt that submitting a case took "the right amount of time," 87% were satisfied, and 93% would use the application again. Without the application, 44% would have waited for primary care, 32% for a dermatology appointment, and 7% would have visited urgent care. These results illustrate that pediatric teledermatology can improve wait times

and allow for improved healthcare utilization with preserved patient satisfaction [14].

Questions regarding the efficacy and reliability of treating children remotely have been addressed in a separate, retrospective study in which the authors compared patient and dermatologist satisfaction with different formats of consultation (both virtual and in-person examinations). The authors showed that the diagnostic accuracy of teledermatology in treating pediatric patients was equivalent to diagnostic accuracy in adults, supporting the application of this treatment modality [15]. Importantly, parents are essential partners in ensuring the accuracy and efficacy of pediatric teledermatology encounters. For example, a randomized controlled trial by O'Conner et al., showed the incorporation of smart phone photos taken by parents to be invaluable in arriving at accurate diagnoses [16].

Despite its advantages, teledermatology should not be viewed as a replacement for traditional in-person visits [11]. Notable weaknesses of teledermatology include limitations in triaging, as analyzing multiple individual photographs does not replace a full body examination. Moreover, diagnostic clues elicited by palpation and simple in-clinic tests or treatments are incompatible with teledermatology, resulting in less comprehensive care [17]. Employment of teledermatology may also be difficult for select populations that lack the technology required for such visits. The Society for Pediatric Dermatology states that optimal use of teledermatology video visits should include having high speed internet access as well as a device with a functional microphone and camera [13]. Thus, although telemedicine is frequently touted as a potential solution for increasing access in underserved areas, its feasibility is undermined by deficiencies including a lack of broadband access [18].

Moreover, teledermatology may exacerbate healthcare disparities in populations where language barriers exist. A recent study assessing the use of pediatric teledermatology in Spanish-speaking patients found that they were less likely to have an Email address documented in their medical

record and less likely to have an active online patient portal account necessary for teledermatology services. These findings suggest that Email communication may be a deterrent in accessing pediatric teledermatology care for Spanish-speaking patients, and may be relevant to other communities composed of non-native English speakers [19].

Conclusion

Teledermatology has the potential to improve accessibility for children requiring dermatology services by reducing wait times and increasing accessibility for children of parents with incompatible work hours, limited transportation, or restricted financial means. We recommend that expanded pediatric teledermatology services continue after the COVID-19 pandemic, including the provision of teledermatology services by pediatric dermatologists and appropriate insurance coverage. Teledermatology appointments would ideally be used for conditions in which it is easy to visualize lesions remotely, such as atopic dermatitis and acne. These conditions are common in pediatric populations, further supporting the expansion of telemedicine modalities in this group.

Nevertheless, teledermatology cannot address every obstacle to care. Select populations, including rural communities, face the greatest shortages of in-person care but also tend to have limited broadband access, meaning that pediatric teledermatology will not serve as a panacea. Despite this, teledermatology may be able to alleviate some of the need for pediatric dermatology services within these populations. Focusing on solutions that improve access to computer hardware and broadband, while addressing technological literacy and language barriers, will allow teledermatology to become an important tool in reducing healthcare disparities within the field of pediatric dermatology now and in the future.

Potential conflicts of interest

The authors declare no conflicts of interest.

References

1. Gehris RP, Herman EIX. Pediatric Tele dermatology: a Review. *Curr Derm Rep*. 2020;9(2):114-122. [DOI:10.1007/s13671-020-00294-2]
2. Ashrafzadeh S, Peters GA, Brandling-Bennett HA, Huang JT. The geographic distribution of the US pediatric dermatologist workforce: A national cross-sectional study. *Pediatr Dermatol*. 2020;37(6):1098-1105. [PMID: 32951243].
3. Nami N, Giannini E, Burrioni M, Fimiani M, Rubegni P. Tele dermatology: state-of-the-art and future perspectives. *Expert Rev of Dermatol*. 2012;7(1):1-3. [DOI:10.1586/edm.11.79]
4. Wosik J, Fudim M, Cameron B, et al. Telehealth transformation: COVID-19 and the rise of virtual care. *J Am Med Inform Assoc*. 2020;27(6):957-962. [PMID: 32311034].
5. Maddukuri S, Patel J, Lipoff JB. Tele dermatology Addressing Disparities in Health Care Access: a Review. *Curr Derm Rep*. 2021;10(2):40-47. [PMID: 33747638].
6. Naka F, Lu J, Porto A, et al. Impact of dermatology eConsults on access to care and skin cancer screening in underserved populations: A model for tele dermatology services in community health centers. *J. Am. Acad. Dermatol*. 2018;78(2):293-302. [PMID: 29061478].
7. Bezalel S, Fabri P, Park HS. Implementation of Store-and-Forward Tele dermatology and Its Associated Effect on Patient Access in a Veterans Affairs Dermatology Clinic. *JAMA Dermatol*. 2015;151(5):556. [PMID: 25671336].
8. Carter ZA, Goldman S, Anderson K, et al. Creation of an Internal Tele dermatology Store-and-Forward System in an Existing Electronic Health Record: A Pilot Study in a Safety-Net Public Health and Hospital System. *JAMA Dermatol*. 2017;153(7):644. [PMID: 28423156].
9. Frieden IJ, Püttgen KB, Drolet BA, et al. Management of infantile hemangiomas during the COVID pandemic. *Pediatr Dermatol*. 2020;37(3):412-418. [PMID: 32298480].
10. Cartron AM, Aldana PC, Khachemoune A. Pediatric tele dermatology: A review of the literature. *Pediatr Dermatol*. 2021;38:39-44. [PMID: 33295665].
11. Giavina Bianchi M, Santos AP, Cordioli E. The majority of skin lesions in pediatric primary care attention could be managed by Tele dermatology. Picardo M, ed. PLoS ONE. 2019;14(12):e0225479. [PMID: 31790453].
12. Seiger K, Hawryluk EB, Kroshinsky D, Kvedar JC, & Das S. Pediatric dermatology eConsults: Reduced wait times and dermatology office visits. *Pediatr Dermatol*. 2020;37(5):804-810. [PMID: 32544276].
13. Dovigi E, McMahon P. Patient Perspectives: What is tele dermatology? *Pediatr Dermatol*. 2020;37(5):933-934 [DOI:10.1111/pde14364]
14. Fiks AG, Fleisher L, Berrigan L, et al. Usability, Acceptability, and Impact of a Pediatric Tele dermatology Mobile Health Application. *Telemed e-Health*. 2018;24(3):236-245. [PMID: 28731848].
15. Paradela-De-La-Morena S, Fernandez-Torres R, Martínez-Gómez W, Fonseca-Capdevila E. Tele dermatology: diagnostic reliability in 383 children. *Eur J Dermatol*. 2015;25(6):563-569. [PMID: 2655259].
16. O'Connor DM, Jew OS, Perman MJ, et al. Diagnostic Accuracy of Pediatric Tele dermatology Using Parent-Submitted Photographs: A Randomized Clinical Trial. *JAMA Dermatol*. 2017;153(12):1243. [PMID: 29141082].
17. Marchell R, Locatis C, Burgess G, et al. Patient and Provider Satisfaction with Tele dermatology. *Telemed e-Health*. 2017;23(8):684-690. [PMID: 28375822].
18. Drake C, Zhang Y, Chaiyachati KH, Polsky D. The Limitations of Poor Broadband Internet Access for Telemedicine Use in Rural America: An Observational Study. *Ann Intern Med*. 2019;171(5):382-384. [PMID: 31108509].
19. Blundell AR, Kroshinsky D, Hawryluk EB, Das S. Disparities in telemedicine access for Spanish-speaking patients during the COVID-19 crisis. *Pediatr Dermatol*. 2021;38(4):947-949. [PMID: 33368668].