

## Teledermatology in alopecia: A systematic review



*To the Editor:* Teledermatology has rapidly expanded during the pandemic, enabling healthcare providers to extend their services to the virtual realm. In the postpandemic era, teledermatology continues to have valuable use in dermatologic care. Within the spectrum of dermatological concerns, hair loss emerges as a predominant motive for seeking dermatologic evaluation, with approximately 72.4% of patients consulting dermatologists within a year of its onset.<sup>1</sup> Despite this, few investigations have systematically explored the utilization of telemedicine in the context of alopecia. To address this gap, we undertook a systematic review to assess the use of teledermatology in patients with hair and scalp disorders.

On June 7, 2023, we searched the PubMed/MEDLINE databases for “telehealth,” “teledermatology,” “telemedicine,” “digital health,” and “hair alopecia,” or “scalp alopecia.” A total of 237 records were screened for inclusion, and after a thorough screening process, 11 studies were included in the analysis. Our review was completed per Preferred Reporting Items for Systematic and Meta-Analysis (PRISMA) guidelines.

We identified a cohort of 9622 patients assessed for alopecia through telemedicine (Table 1). The prevailing forms of alopecia were androgenetic alopecia (AGA), accounting for 93.5% ( $n = 9004/9622$ ) of cases, followed by alopecia areata (AA), which comprised 1.1% ( $n = 109/9622$ ). Cicatricial alopecia and loose anagen syndrome were found in a small subset of patients, constituting 0.02% ( $n = 2/9622$ ) and 0.01% of patients ( $n = 1/9622$ ), respectively. The categorization of alopecia was absent in the remaining patients, totaling 5.3% ( $n = 506/9622$ ). Where reported, diagnosis of alopecia type through telemedicine had a diagnostic accuracy of 100% ( $n = 19/19$ ). Among patients monitored for hair loss through telemedicine, 52% ( $n = 1779/3416$ ) experienced hair growth or showed improvement in their condition. Of note, one study detailed the successful utilization of teletrichology evaluation employing macro imaging applications and handheld microscopes, enabling assessments of hair shaft variability, vellus hair, yellow dots, broken hairs, and more.<sup>5</sup> We also identified that a mere 0.06%

( $n = 328/5381$ ) of total teledermatology visits were for hair loss.

For patients grappling with alopecia, teledermatology offers an accessible and cost-effective avenue for specialized dermatologic care. Notably, certain reports suggest that when coupled with teletrichoscopy, telemedicine not only enables the diagnosis of hair disorders but also eliminates barriers to in-person consultations by facilitating the initiation of treatment plans.<sup>5</sup> This approach becomes even more significant for patients with AA undergoing treatment with Janus kinase inhibitors, where telemedicine allows effective follow-up to assess treatment efficacy and potential side effects (Fig 1). Furthermore, teledermatology allows healthcare providers to titrate dosages after starting treatment for patients on oral minoxidil. High patient satisfaction ratings and patient-reported improvement in hair loss suggest that teledermatology can play a valuable role in managing patients with alopecia.<sup>2</sup> However, the frequency of teledermatology visits for alopecia compared to other dermatologic conditions remains low.<sup>3,4</sup> Therefore, further research is needed to establish guidelines and leverage teledermatology's untapped potential in monitoring and follow-up for hair loss treatments.

Limitations of this study include lack of reported data on individual sex and age. English-only articles with full texts were included.

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**Table I.** Characteristics and results of 11 original articles reporting the use of teledermatology in 9622 patients with hair loss disorders

Title, author and year published	Design, patients, patients with hair loss	Measurements	Outcomes	Types of teledermatology used
Can a correct diagnosis be established using the teledermatology method? Taslidere et al 2022	Survey 546 patients (mean age: 32.72, 338/546 male) with dermatologic chief complaints presenting to dermatology clinic for initial visit and diagnosis via telemedicine or face to face Hair loss patients: 18 (AA: 12, AGA: 4, CA: 2)	Diagnostic agreement between teledermatology diagnosis and FTF diagnosis Total agreement: same first diagnoses Partial agreement: same second and third diagnoses No agreement: no same diagnoses	AA (n = 12) total agreement = 12 AGA (n = 4) total agreement = 4 CA (n = 2) Total agreement = 2	Asynchronous (store-forward)
Diagnosis of hair disorders during the COVID-19 pandemic: an introduction to teletrichoscopy Randolph et al 2021	Cohort Study 235 patients with hair loss disorder Hair loss patients: 235 (AA, AGA, CA FFA, TE, other scaring alopecias)	Ability of 2 teletrichoscopic methods, macro-imaging app and handheld microscope, to demonstrate clinical findings specific to each hair loss condition	AA findings: Yellow dots Broken hairs Exclamation mark hairs AGA findings: Hair shaft variability CA findings: Hair shaft variability FFA findings: Absence of vellus hair TE findings: Lack of hair shaft variability Other scaring alopecias: Absence of follicular openings Peripilar casts	Teletrichoscopy: Macro-imaging app Handheld microscope
Digital health platforms expand access and improve care for male androgenetic alopecia Young et al 2023 <sup>2</sup>	Survey 8983 patients (8983/8983 male) with AGA using digital health platforms for hair loss treatment. Hair loss patients: 8983 patients (AGA: 8983)	Patient reported hair regrowth, medication compliance, and telemedicine satisfaction	Hair regrowth (n = 3359) A lot of hair growth: 268/3359 (8%) Some hair growth: 1475/3359 (44%) Medication compliance (n = 3359) Never miss taking my medication: 1475/3359 (43%) Miss my medication 50% of the time or more: 52/3359 (1.54%) Telemedicine satisfaction (n = 5642) more convenient because everything is online: 3378/5642 (60%)	Keeps digital health platform

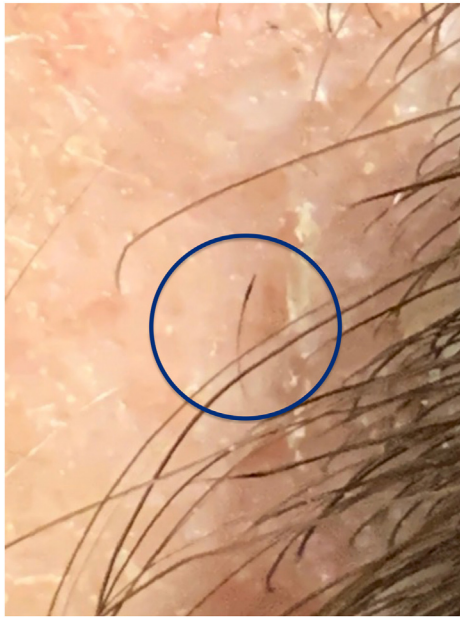
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Table I. Cont'd

Title, author and year published	Design, patients, patients with hair loss	Measurements	Outcomes	Types of tele dermatology used
Comparison of pediatric dermatology conditions across telehealth and in-person visits during the COVID-19 pandemic Duan et al 2022	Cohort study 1488 patients (mean age: 32.72, 338/546 male) with dermatologic chief complaints presenting to teledermatology clinic for initial visit and diagnosis. Hair loss patients: 53 patients (AA: 40, Nonscarring hair loss: 13)	In-person visit, or telehealth visit frequency per dermatologic condition	AA ( $n = 40$ ) In-person: 39/40 Telehealth: 1/40 Nonscarring hair loss ( $n = 13$ ) In-person: 12/13 Telehealth: 1/13	Synchronous telehealth video visits
COVID-19 Pandemic impact on severe alopecia areata patients Gheisari et al 2021	Survey 57 patients (mean age: 30.95, 26/57 male) diagnosed with alopecia previously receiving systemic therapy. Hair loss patients: 57 patients (AA: 5, Alopecia totalis: 12, Alopecia universalis: 40)	Patient reported hair loss progression during management via telemedicine	AA ( $n = 57$ ) Experienced hair loss progression: 21/57 patients (36.8%) Did not experience hair loss progression: 36/57 patients (63.2%) The odds of hair loss progression were significantly higher in patients who had altered drug dose.	Telephone call
Teledermatology service during the COVID-19 pandemic in China: a mobile application-based retrospective study Mu et al 2021 <sup>3</sup>	Cohort study 698 patients (mean age: 26, 315/698 male) with dermatologic chief complaints presenting to teledermatology clinic for initial visit and diagnosis. Hair loss patients: 17 (AGA: 17)	Frequency of dermatologic condition seen among telehealth visits	AGA: 17/698 (2%)	Haodaifu telemedicine platform (mobile app that offers synchronous, asynchronous, and hybrid telemedicine)
Teledermatology services during COVID-19 pandemic: experience of a tertiary care center in Western India Bains et al 2022 <sup>4</sup>	Cohort study 2117 patients (mean age: 35.59, 1372/2117 male) with dermatologic chief complaints presenting to teledermatology clinic for initial visit and diagnosis. Hair loss patients: 239 (AGA, TE)	Frequency of dermatologic condition seen among telehealth visits	Hair disorders: 239/2117 (13.48%)	Asynchronous (store-forward) teleconsultation using WhatsApp

Dealing with suspended new routine general dermatology referrals during the COVID-19 pandemic: a virtual model from our local departmental experience Pararajasingam et al 2021	Pilot study 381 patients with dermatologic chief complaints referred to dermatology from primary care for initial visit and diagnosis. Hair loss patients: 3	Classification of dermatologic conditions assessed via telemedicine Class I: need to be seen FTF Class II: telephone consultation with clinical photographs Class III: telephone consultation without photographs	Class 1 ( <i>n</i> = 88) Alopecia: 0/88 Class 2 ( <i>n</i> = 244) Alopecia: 0/244 Class 3 ( <i>n</i> = 49) Alopecia: 3/49	Synchronous teleconsultation with or without clinical photographs
Evaluation of electronic consults for outpatient pediatric patients with dermatologic complaints Pahalyants et al 2021	Cohort study 302 patients (mean age: 4.6, 139/302 male) with dermatologic chief complaints referred to dermatology from primary care for initial visit and diagnosis. Hair loss patients: 11 (Alopecia and TE)	Recommendation for in-person follow-up evaluation	Total alopecia patients: ( <i>n</i> = 11) No follow-up: 4/11 (36.3%) Follow-up recommended: 7/11 (63.6%)	Asynchronous (store-forward)
Pediatric teledermatology consultations: relationship between provided data and diagnosis Philip et al 2013	Cohort study 395 patients (mean age: 8, 210/395 male) with dermatologic chief complaints referred to dermatology from primary care for initial visit and diagnosis. Hair loss patients: 5	Characteristics of and confidence in diagnoses made by pediatric teledermatologists	Teledermatology Diagnosis ( <i>n</i> = 350) Alopecias: 5/350 (1.4%) Diagnostic Confidence ( <i>n</i> = 395) Definite diagnosis: 189/395 Probable diagnosis: 68/395 Differential diagnosis: 38/395 Unable to diagnose 99/395	Asynchronous (store-forward)
Utility of teledermatology in the diagnosis of loose anagen syndrome Lalama et al 2023 <sup>5</sup>	Case report 1 patient diagnosed with loose anagen syndrome (LAS) via telehealth. Hair loss patients: 1	Diagnosis of hair disorder through teletrichoscopy during a telemedicine visit	Telemedicine and in-person follow up diagnosis: <i>n</i> = 1 LAS: 1/1	Asynchronous (store-forward)

AA, Alopecia areata; AGA, androgenetic alopecia; CA, cicatricial alopecia; FFA, frontal fibrosing alopecia; TE, telogen effluvium; LPP, lichen planopilaris; LAS, loose anagen syndrome; FTF, face to face.



**Fig 1.** Alopecia areata. Iphone images uploaded by a patient demonstrating exclamation mark hairs in AA.

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#### **Conflicts of interest**

AT is a consultant for DS Laboratories, Monat Global, Almirall, Thirty Madison, Eli Lilly, Bristol Myers Squibb, P&G, Pfizer, and Myovant. The remainder authors have no conflicts to declare.

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