Teledermatology in Atopic Dermatitis: A Systematic Review

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Background

Telemedicine use has been increasing especially during the COVID-19 pandemic. Various studies have outlined benefits of telemedicine including improving health equity, reducing wait times, reducing risk of infection spread, and cost effectiveness. Skin diseases affect 1/3 of the world's population with atopic dermatitis (AD) ranked as the skin disease with the highest global burden. It requires ongoing care to adjust and monitor treatment plans, prevent complications and enhance quality of life. Telemedicine has been shown to be beneficial in managing AD. However, there are no evidence-based recommendations or a gold standard for best practices in telemedicine for supporting patients with AD.

Results

Of 1196 identified records, 5 reports were included. Two reports used a direct access online model, 1 used web-based consultation, 1 used e-health by a personal eczema portal and 1 used an online platform and mobile application. In all of the included reports, teledermatology for the follow-up of patients with AD appeared to be clinically effective and equivalent when compared to in-person appointments or standard treatment for their respective key outcome measures. However, due to significant heterogeneity between the studies included in the paper, it is unclear which teledermatology model is the most effective.

Table 1. Characteristics of the Identified Studies and Teledermatology Models

Teledermatology Model	Study ID	Study Design	Sample Size	Study Target
Direct-access online model (online visits)	Armstrong 2015	Randomized controlled equivalency clinical trial	156 children and adults	To compare effectiveness of a direct-access, online model for follow-up in dermatologic care in AD patients with that of in-person office visits.
	Kornmehl 2017	Randomized controlled equivalency clinical trial	156 children and adults (same sample as Armstrong 2015)	To compare the AD patients' quality of life with a direct-access, online model with that of in-person office visits.
Web-based consultation	Bergmo 2008	Randomized controlled trial	98 parents of children with AD	To compare self-management behavior, health outcome, health resource use and family costs of web-based consultation with standard treatment (without specialist care).
e-health by a personal eczema portal	Os-Medendorp 2012	Randomized controlled study with economic evaluation	199 adults and parents of children with AD	To compare the cost-effectiveness of individualized e-health compared with usual face-to-face care for children and adults with AD.
Online platform and mobile application	Giavina-Bianchi 2020	Retrospective cohort study	30,976 individuals participated in the tele-dermatology project, and 55,012 lesions were analyzed	To evaluate the proportion of AD patients who could be managed with the support of telemedicine and its accuracy.

Table 2. Study Conclusions of Various Teledermatology Models

Teledermatology Model	Study Conclusion
Direct-access Online Model (Online Visits) *Armstrong 2015 and Kornmehl 2017*	Adult and pediatric AD patients receiving direct- access online care had equivalent quality of life outcomes and equivalent improvements in AD clinical outcomes as who received in-person care
Web-based consultation *Bergmo 2008*	This study showed that web consultations are feasible and were non-inferior to standard treatment, but more research is needed to determine its effect on self-management skills, health outcome and resource use.
e-health by a personal eczema portal *Os-Medencorp 2012*	After initial diagnosis and treatment through face-to-face contact, e-health during follow-up of patients with AD is as effective as usual face-to-face care with regards to quality of life and severity of disease. E-health also is likely to result in substantial cost savings. Therefore, e-health is a valuable service for patients with AD.
Online platform and mobile application *Giavina-Bianchi 2020*	Telemedicine was an accurate method and helped primary care physicians treat 72% of the AD lesions, thereby optimizing the availability of in-person appointments with Dermatologists for more severe cases.

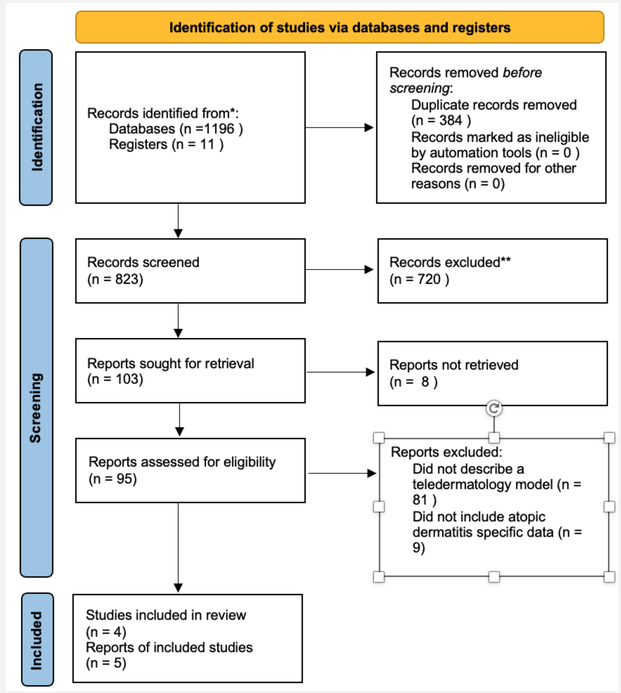
Methods

Objectives

The objective of this systematic review is to assess and summarize current evidence on different telemedicine modalities for atopic dermatitis. This review will evaluate several patient outcomes of various telemedicine models for atopic dermatitis.

Protocol

A review protocol was developed according to the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRIMSA) statement. Two reviewers independently screened potential studies and extracted data. Studies were included if they evaluated any telemedicine assessment for primary atopic dermatitis.



Discussion

Teledermatology has emerged as a valuable tool for triaging AD patients, Giavina-Bianchi et al. demonstrated that virtual platforms are effective in triaging individuals with lesions suspicious for AD, and determining which patients require an in-person appointment with a Dermatologist. This finding is crucial, as it implies that teledermatology may be effective as a screening tool to determine which patients require in-person assessment, and to which healthcare provider the case should be referred. Through streamlining the referrals, teledermatology can decrease the overall backlog to see a Dermatologist in the community. Armstrong et al., highlighted that teledermatology was effective in managing AD in a follow-up setting. It is particularly helpful for patients who have achieved control over their AD, reducing the need for frequent in-person visits. There are also potential cost-saving benefits as patients can avoid traveling to see their Dermatologist for follow-up appointments Despite reassuring findings, our analysis of the benefit of teledermatology was limited by the small number of papers which met our inclusion criteria.

Conclusion

Teledermatology may serve as an important tool for screening/triaging along with follow-up of patients suffering from atopic dermatitis. More randomized control trials are needed to determine which teledermatology models are most effective for virtual assessment of atopic dermatitis.