

# Exploring tele dermatology in managing common inflammatory skin conditions: a systematic review

Şule Gençoğlu

<sup>1</sup>Department of Dermatology, Private Gözde Hospital, Malatya, Türkiye

**Cite this article as:** Gençoğlu Ş. Exploring tele dermatology in managing common inflammatory skin conditions: a systematic review. *J Health Sci Med.* 2024;7(3):341-345.

Received: 17.04.2024

Accepted: 23.05.2024

Published: 27.05.2024

## ABSTRACT

This investigation delves into the advancing domain of telemedicine within dermatology, highlighting its potential to reshape forthcoming healthcare paradigms. Specifically focusing on the utilization of tele dermatology for prevalent inflammatory skin conditions, this study synthesizes literature comprising meta-analyses, comprehensive reviews, editor correspondences, real-world investigations, case collections, and detailed reports. Adhering to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) standards, manuscript selection and data extraction were meticulously executed. Initially, 121 relevant records were identified through database surveys. Following screening, 110 articles met the criteria for in-depth evaluation, with 92 articles ultimately included in our comprehensive review. Tele dermatology, bolstered by the exigencies of the pandemic, emerges as a viable alternative for dermatological consultations in the foreseeable future. The rapid uptake and refinement observed during the crisis underscore its potential for further substantive advancements. Nonetheless, the establishment of structured guidelines governing its implementation and ongoing refinement remains imperative.

**Keywords:** Tele dermatology, inflammatory skin conditions, telemedicine, healthcare dynamics, pandemic adaptation

## INTRODUCTION

Defined by the World Health Organization (WHO), telemedicine encapsulates the utilization of information and communication technologies to deliver health care services when distance remains a pivotal factor. It encompasses diagnosis, treatment, prevention of diseases, research, evaluation, and continual education of health providers, all aimed towards enhancing the health of communities.<sup>1</sup>

Dermatology, alongside radiology and pathology, stands as one of the profoundly visual disciplines in medicine. The compatibility of these fields with telemedicine's modus operandi is evident through several studies accentuating the feasibility and reliability of such integrative approaches.<sup>2,3</sup> Notably, telemedicine often mirrors the diagnostic and management efficacy of in-person consultations.

While dermatology had previously acquainted itself with telemedicine,<sup>2</sup> its practicality was constrained due to limited applications, skepticism, and inexperience from both practitioners and patients.<sup>4</sup> The onset of the COVID-19 pandemic, however, drastically reshaped conventional paradigms. Mandated government interventions and lockdown protocols not only altered daily living but also necessitated a shift in clinical methodologies. Amidst this reshuffling, telemedicine re-emerged, not just as an alternative but as a vital armamentarium against the pandemic.<sup>5</sup>

In dermatological terrains, telemedicine assumed multifaceted roles: ensuring adherence to biologic treatments,<sup>6</sup>

facilitating uninterrupted patient care, clarifying potential skin manifestations related to COVID-19,<sup>7-9</sup> and managing chronic inflammatory skin conditions.<sup>10-15</sup> This review delves into telemedicine's adaptability in dermatology during the COVID-19 onslaught, advocating its potential as the future's cornerstone.

## METHODS

Literature for this study was culled from databases including PubMed, EBSCO, Embase, Google Scholar, Cochrane Skin, and MEDLINE (up to 20 September 2023). Search constructs combined terms like "SARS-CoV-2," "COVID-19," "telemedicine," "tele dermatology," "skin manifestations," "acne," "psoriasis," and "hidradenitis suppurativa" among others. Adhering to the PRISMA guidelines, identified manuscripts underwent screening, extraction, and validation processes, visually summarized in Figure.

Inclusions were restricted to English-language manuscripts specifically addressing telemedicine's application in dermatology. Manuscripts exploring telemedicine outside dermatology or delving into other skin conditions (e.g., rosacea, skin cancers) were excluded.

Our focus spotlighted conditions including acne, psoriasis, atopic dermatitis, and hidradenitis suppurativa, reflecting the higher research density surrounding these diseases.

**Corresponding Author:** Şule Gençoğlu, [sulegencoglu2309@gmail.com](mailto:sulegencoglu2309@gmail.com)



This work is licensed under a Creative Commons Attribution 4.0 International License.

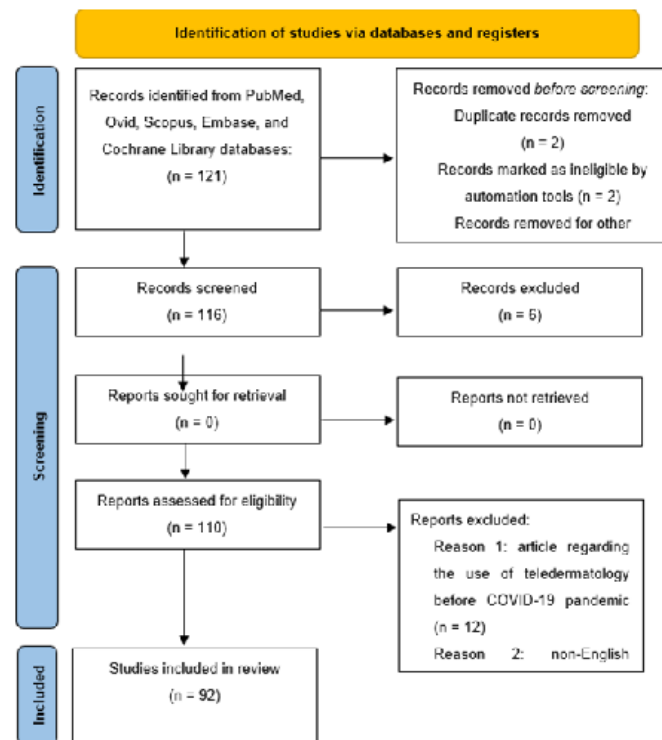


Figure. PRISMA Checklist

Gleaning from pre-existing studies, this article eschews primary human or animal research. Extracted data revolved around demographics, participant count, treatment strategies, and outcome measures, with DLQI as the primary outcome. A comprehensive risk bias evaluation, encompassing study methodologies, was performed by the author.

## RESULTS

From the comprehensive database search, 121 records were culled. Post exclusion of duplicate and irrelevant articles, 110 were deemed eligible. Ultimately, after considering the inclusion and exclusion criteria, 92 articles were assimilated for this review. The focus predominantly hinged on chronic inflammatory skin disorders such as acne, psoriasis, atopic dermatitis, and hidradenitis suppurativa. These were emphasized not just due to their chronic nature, necessitating consistent follow-ups,<sup>16-17</sup> but also their substantial prevalence in the population.

### Psoriasis

Affecting up to 3% of the global populace, psoriasis stands as a chronic inflammatory skin ailment mandating recurrent monitoring and sustained treatments to mitigate relapses. Particularly, the moderate to severe spectrum of the disease often necessitates systemic treatment with immunosuppressive or biologic agents.<sup>18</sup>

During the pandemic, telemedicine emerged as a lifeline for these patients, ensuring uninterrupted treatment regimes and monitoring potential treatment-related adversities.<sup>19-20</sup> In the context of psoriasis management during the pandemic, various studies were assessed:

One of the study underscored the indispensability of teledermatology, particularly in remote regions like the Faroe

Islands, while also highlighting its selective application in urbanized regions.<sup>21</sup> Another of the study reported patients not only acclimatizing to online consultations but also showcasing a preference for them over traditional visits.<sup>22</sup> However, pinpointed the limited telemedicine adoption among the elderly, emphasizing the imminent need to make this platform more geriatric-friendly.<sup>23</sup> Studies also spotlighted clinicians' inclination towards telemedicine, resonating its pivotal role in curbing COVID-19 spread and concurrently economizing time and resources.<sup>24</sup> A substantial study encompassing 246 patients under biologics, revealed a 48% preference for teledermatology—underscoring its role in minimizing COVID-19 risk.<sup>25</sup> Another of study presented findings from 424 psoriasis patients consulting via phone calls, highlighting significant patient contentment.<sup>26</sup> One of the study explored telemedicine's psychological ramifications on psoriasis patients, concluding its mental health and depression outcomes were congruent with traditional visits. Conclusively, teledermatology has indisputably manifested as an efficient, reliable instrument in psoriasis management, ensuring therapeutic continuity during the pandemic. While enhancements are inevitable, the pandemic has accentuated the potential of telemedicine, advocating its permanency in future dermatological practices.<sup>27</sup>

### Acne and Hidradenitis Suppurativa

Acne and hidradenitis suppurativa stand as predominant chronic inflammatory skin disorders impacting a vast spectrum of the population, with a consequent influence on life quality.<sup>28</sup>

Acne, which demands tailored therapies and consistent follow-ups, witnessed telemedicine as an indispensable tool during the COVID-19 era. Existing literature, even pre-pandemic, demonstrates teledermatology's effectiveness and safety for acne management.<sup>29-30</sup> Notably, Kazi et al.<sup>31</sup> showcased a significant patient preference for synchronous teledermatology for complex acne management. With isotretinoin prescription, topical drugs were more frequently advised than systemic ones, as evidenced.<sup>32</sup> Also delved into the feasibility of isotretinoin prescriptions and virtual visit modes, respectively. So that one of the study concluded a notable 50% patient preference for telematic services over conventional in-person visits.<sup>33</sup>

Hidradenitis suppurativa, however, presented unique challenges. Its affliction on intimate areas, like the groin, axillary, and scrotal regions, raised privacy concerns. The studies found a significant preference for in-person visits among patients, majorly due to discomfort in revealing intimate regions on camera. The literature suggested room for improvement in teledermatology privacy measures for such conditions.<sup>34-36</sup>

### Atopic Dermatitis

Characterized by skin inflammation, redness, itching, and irritation, atopic dermatitis or atopic eczema affects a considerable portion of both children (up to 30%) and adults (up to 10%), severely impacting life quality.<sup>37</sup> The pandemic posed challenges for these patients requiring

regular specialist visits, especially those on biotechnological drugs. Telemedicine emerged as a vital solution.<sup>38</sup> The European Academy of Allergy and Atopic Dermatitis Clinical Immunology proposed telehealth's utility for various facets, from disease severity monitoring to medication reminders.<sup>39</sup> However, privacy concerns persist. Atopic patients, majorly children, raise concerns for parents who are wary of sharing their child's images on virtual platforms. Encrypted platforms ensuring secure image transmission are essential, especially given the frequent affliction of intimate regions in atopic dermatitis. In essence, while telemedicine emerged as a lifeline for various dermatological conditions during the pandemic, considerations of privacy, especially for conditions affecting intimate areas, must be prioritized.

## CONCLUSION

In our examination, we started with the WHO's definition of telemedicine, which, in our perspective, encapsulates the core objectives of this discipline aptly. This modality gained pivotal importance amidst the COVID-19 pandemic, facilitating patient-doctor communication, bolstering preventive measures, and acting as a catalyst for ongoing medical training.

To conclude, telemedicine's prime contribution isn't limited to assisting patients with chronic skin inflammations; it's also pivotal in identifying dermatological repercussions post COVID-19 infection or vaccination. Numerous accounts attest to the onset or exacerbation of skin conditions related to these circumstances, emphasizing telemedicine's indispensable role in fostering patient assurance. Despite the pandemic waning, telemedicine's imprint on clinical practice remains indelible. Going forward, its utilization should be harmonized with universally recognized protocols and guidelines. Addressing privacy remains paramount; pursuing medico-legal avenues, like obtaining digitally-signed consents, might be the way forward. Lastly, an imperative need exists for platforms that marry superior image quality with user-friendliness, especially catering to the senior demographic.

Our study's foremost strength lies in its adherence to the PRISMA guidelines while reviewing contemporary literature. However, our approach also has certain limitations. We exclusively focused on teledermatology, excluding telemedicine's applications in other medical arenas. Additionally, we omitted studies examining teledermatology's role in managing other skin ailments beyond acne, hidradenitis suppurativa, psoriasis, and atopic dermatitis.

The global fight against the exponential spread of COVID-19 encompassed a slew of preventative strategies. Teledermatology emerged as a linchpin in this struggle. Our review accentuates the efficacy and safety of this modality but also underscores its inherent imperfections, which warrant rectification in ensuing years. We spotlighted the indispensable support this modality provided during the pandemic, particularly to patients grappling with chronic dermatological conditions such as psoriasis, atopic dermatitis, acne, and hidradenitis suppurativa. Not only were ongoing

treatments unhindered, but patients also had the luxury of accessing medical consultations digitally when required, earning their commendation.

## HIGHLIGHT KEY POINTS

Our analysis further draws attention to the challenges associated with this medium. The elderly demographic faced substantial hurdles navigating the various digital platforms, compounded by lapses in privacy protection, culminating in enhanced patient hardships. For teledermatology's long-term adoption, it's essential to ensure robust video consultation capabilities, which, in our opinion, holds an edge over conventional telephonic consultations. Our surveyed literature suggests that teledermatology excels more in follow-up consultations for patients already undergoing treatment, rather than inaugural sessions that risk diagnostic missteps. Future endeavors must focus on bolstering patient privacy, enhancing accessibility, and simplifying the user experience, especially for those less adept with digital tools. In summation, patients' overarching response to teledermatology has been overwhelmingly positive. Given the trajectory, telemedicine holds significant promise for the foreseeable future, especially if the challenges highlighted in our review are effectively addressed.

In the present context, teledermatology stands out as a promising avenue for dermatologists moving forward. The exigencies of the COVID-19 pandemic fast-tracked the evolution of digital medical services, embedding them deeper into daily clinical routines. As the echoes of the pandemic subside, we are confident that teledermatology's imprint will endure, given its demonstrated efficacy and safety credentials. Yet, further research is imperative to delineate its full potential, keeping in mind the constraints our manuscript highlights. Crafting comprehensive guidelines for teledermatology's application, coupled with relentless innovation, will chart the path for its future.

## ETHICAL DECLARATIONS

### Ethics Committee Approval

As this is a systematic review study, ethical committee approval is not required.

### Referee Evaluation Process

Externally peer reviewed.

### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

### Financial Disclosure

The authors declared that this study has received no financial support.

### Author Contributions

All the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

## REFERENCES

- Megna M, Potestio L, Battista T, et al. Immune response to COVID-19 mRNA vaccination in patients with psoriasis undergoing treatment with biologics. *Clin Exp Dermatol*. 2022; 47(12):2310-2312.
- Frühauf J, Schwantzer G, Ambros-Rudolph CM, et al. Pilot study on the acceptance of mobile teledermatology for the home monitoring of high-need patients with psoriasis. *Australas J Dermatol*. 2012;53(1):41-46.
- Julie ZY, Reynolds RV, Olbricht SM, McGee JS. Moving forward with teledermatology: Operational challenges of a hybrid in-person and virtual practice. *Clin Dermatol*. 2021;39(4):707-709.
- Ferwerda M, Van Beugen S, Van Burik A, et al. What patients think about E-health: patients' perspective on internet-based cognitive behavioral treatment for patients with rheumatoid arthritis and psoriasis. *Clin Rheumatol*. 2013;32(6):869-873.
- Schmid-Grendelmeier P, Takaoka R, Ahogo K, et al. Position statement on atopic dermatitis in sub-Saharan Africa: current status and roadmap. *J Eur Acad Dermatol Venereol*. 2019; 33(11):2019-2028.
- Izquierdo-Domínguez A, Rojas-Lechuga MJ, Alobid I. Management of allergic diseases during COVID-19 outbreak. *Curr Allergy Asthma Rep*. 2021;21(2):8.
- Armstrong AW, Chambers CJ, Maverakis E, et al. Effectiveness of online vs. in-person care for adults with psoriasis: a randomized clinical trial. *JAMA Netw Open*. 2018;1(6):e183062.
- Martora F, Picone V, Fabbrocini G, Marasca C. Hidradenitis suppurativa flares following COVID-19 vaccination: a case series. *JAAD Case Rep*. 2022;23:42-45.
- Alexander H, Patel NP. Response to Martora et al.'s "Hidradenitis suppurativa flares following COVID-19 vaccination: a case series". *JAAD Case Rep*. 2022;25:13-14.
- Ruggiero A, Martora F, Picone V, Marano L, Fabbrocini G, Marasca C. Paradoxical hidradenitis suppurativa during biologic therapy, an emerging challenge: a systematic review. *Biomedicine*. 2022;10(2):455.
- Salvador-Rodríguez L, Montero-Vilchez T, Arias-Santiago S, Molina-Leyva A. Paradoxical hidradenitis suppurativa in patients receiving TNF- $\alpha$  inhibitors: case series, systematic review, and case meta-analysis. *Dermatol*. 2020;236(4):307-313.
- Martora MMF, Megna M, Battista T, Potestio L. Adalimumab, ustekinumab, and secukinumab in the management of hidradenitis suppurativa: a review of the real-life experience. *Clin Cosmet Investig Dermatol*. 2023;16:135-148.
- Ford AR, Gibbons CM, Torres J, et al. Access to dermatological care with an innovative online model for psoriasis management: results from a randomized controlled trial. *Telemed J E Health*. 2019;25(7):619-627.
- Haque W, Chandy R, Ahmadzada M, Rao B. Teledermatology after COVID-19: key challenges ahead. *Dermatol Online J*. 2021; 27(4):13030/qt5xr0n44p.
- Choi E, Mak WK, Law JY, Santos D, Quek SC. Optimizing teledermatology: looking beyond the COVID-19 pandemic. *Int J Dermatol*. 2021;60(1):119-121.
- Picone V, Martora F, Fabbrocini G, Marano L. "Covid arm": abnormal side effect after Moderna COVID-19 vaccine. *Dermatol Ther*. 2022;35(1):e15197.
- McMahon DE, Amerson E, Rosenbach M, et al. Cutaneous reactions reported after Moderna and Pfizer COVID-19 vaccination: a registry-based study of 414 cases. *J Am Acad Dermatol*. 2021;85(1):46-55.
- Martora F, Picone V, Fornaro L, Fabbrocini G, Marasca C. Can COVID-19 cause atypical forms of pityriasis rosea refractory to conventional therapies? *J Med Virol*. 2022;94(4):1292-1293.
- Shin SH, Hong JK, Hong SA, Li K, Yoo KH. Pityriasis rosea shortly after mRNA-1273 COVID-19 vaccination. *Int J Infect Dis*. 2022;114:88-89.
- Veraldi S, Spigariolo CB. Pityriasis rosea and COVID-19. *J Med Virol*. 2021;93(7):4068.
- Martora F, Fabbrocini G, Marasca C. Pityriasis rosea after Moderna mRNA-1273 vaccine: a case series. *Dermatol Ther*. 2022;35(2):e15225.
- Martora F, Villani A, Marasca C, Fabbrocini G, Potestio L. Skin reaction after SARS-CoV-2 vaccines reply to 'cutaneous adverse reactions following SARS-CoV-2 vaccine booster dose: a real-life multicentre experience'. *J Eur Acad Dermatol Venereol*. 2023; 37(1):e43-e44.
- Avallone G, Cavallo F, Astrua C, et al. Cutaneous adverse reactions following SARS-CoV-2 vaccine booster dose: a real-life multicentre experience. *J Eur Acad Dermatol Venereol*. 2022; 36(11):e876-e879.
- Martora F, Fabbrocini G, Nappa P, Megna M. Impact of the COVID-19 pandemic on hospital admissions of patients with rare diseases: an experience of a Southern Italy referral center. *Int J Dermatol*. 2022;61(7):e237-e238.
- Martora F, Fabbrocini G, Nappa P, Megna M. Reply to 'Development of severe pemphigus vulgaris following SARS-CoV-2 vaccination with BNT162b2' by Solimani et al. *J Eur Acad Dermatol Venereol*. 2022;36(10):e750-e751.
- Solimani F, Mansour Y, Didona D, Dilling A, Ghoreschi K, Meier K. Development of severe pemphigus vulgaris following SARS-CoV-2 vaccination with BNT162b2. *J Eur Acad Dermatol Venereol*. 2021;35(10):e649-e651.
- Falcinelli F, Lamberti A, Cota C, Rubegni P, Cinotti E. Reply to 'Development of severe pemphigus vulgaris following SARS-CoV-2 vaccination with BNT162b2' by Solimani F et al. *J Eur Acad Dermatol Venereol*. 2022;36(12):e976-e978.
- Martora F, Villani A, Battista T, Fabbrocini G, Potestio L. COVID-19 vaccination and inflammatory skin diseases. *J Cosmet Dermatol*. 2023;22(1):32-33.
- Washrawirul C, Triwatcharikorn J, Phannajit J, Ullman M, Susantitaphong P, Rerknimitr P. Global prevalence and clinical manifestations of cutaneous adverse reactions following COVID-19 vaccination: a systematic review and meta-analysis. *J Eur Acad Dermatol Venereol*. 2022;36(11):1947-1968.
- Qaderi K, Golezar MH, Mardani A, et al. Cutaneous adverse reactions of COVID-19 vaccines: a systematic review. *Dermatol Ther*. 2022;35(5):e15391.
- Kazi R, Evankovich MR, Liu R, et al. Utilization of asynchronous and synchronous teledermatology in a large health care system during the COVID-19 pandemic. *Telemedicine and e-Health*. 2021;27(7): 771-777.
- Ruggiero A, Martora F, Fornaro F, Scalvenzi M, Fabbrocini G, Villani A. Reply to 'Impact of the French COVID-19 pandemic lockdown on newly diagnosed melanoma delay and severity' by R. Molinier, et al. *J Eur Acad Dermatol Venereol*. 2023; 37(2):e130-e131.
- Molinier R, Roger A, Genet B, et al. Impact of the French COVID-19 pandemic lockdown on newly diagnosed melanoma delay and severity. *J Eur Acad Dermatol Venereol*. 2022;36(3):e164-e166.
- Pasquali P, Sonthalia S, Moreno-Ramirez D, et al. Teledermatology and its current perspective. *Indian Dermatol Online J*. 2020;11(1):12-20.
- Ruggiero A, Martora F, Fabbrocini G, et al. The role of teledermatology during the COVID-19 pandemic: a narrative review. *Clin Cosmet Investig Dermatol*. 2022;15:2785-2793.
- Ruggiero A, Megna M, Fabbrocini G, Martora F. Video and telephone teledermatology consultations during COVID-19 in comparison: patient satisfaction, doubts and concerns. *Clin Exp Dermatol*. 2022;47(10):1863-1864.
- Stadler PC, Senner S, Frey S, et al. Teledermatology in times of COVID-19. *J Dermatol*. 2021;48(5):620-624.

38. Martora F, Marasca C, Battista T, Fabbrocini G, Ruggiero A. Management of patients with hidradenitis suppurativa during COVID-19 vaccination: an experience from southern Italy. Comment on: 'Evaluating the safety and efficacy of COVID-19 vaccination in patients with hidradenitis suppurativa'. *Clin Exp Dermatol.* 2022;47(11):2026-2028.
39. Ruggiero A, Martora F, Fornaro L, et al. The impact of COVID-19 pandemic on nonmelanoma skin cancers: report of a Southern Italy referral centre. *Clin Exp Dermatol.* 2022;47(11):2024-2025.