

A Telemedicine-Based Approach for Acne Management: Method Overview and Demographic Profile of Early Participants

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Introduction

The COVID-19 pandemic accelerated telemedicine adoption, particularly in dermatology, where integrating synchronous (real-time video/audio) and asynchronous (store-and-forward, digital photographs) methods addresses challenges like restricted access to in-person care.¹

The synchronous approach enables real-time communication, while the asynchronous method allows for the collection and forwarding of medical data to specialists for diagnostic and treatment advice. Combining both allows for a more comprehensive patient evaluation.²

Acne vulgaris was significantly impacted by the pandemic, with psychological factors such as isolation, stress, and disrupted routines exacerbating the condition. These challenges, along with limited access to traditional care, emphasized the need for telemedicine.^{3,4}

Post-pandemic, telemedicine remains relevant for acne management, improving access to care in underserved or remote areas and supporting follow-ups, with acne severity typically assessed through standardized grading scales applied to patient-submitted digital photographs. Outcomes are comparable to in-person visits, and patient satisfaction is high, despite slightly lower adherence in remote settings. Challenges include standardizing acne assessments via photos, addressing digital access disparities, the impact on adherence and prescribing. Further research is needed to refine telemedicine models for acne care.^{5,6}

This study introduces a new telemedicine-based approach for acne management, combining synchronous and asynchronous methods to offer flexible, ongoing care. Preliminary data on patient demographics and platform usage are presented.

Materials and Methods

The Acne Revolution Method

A telemedicine-based approach was developed for acne management, using an online platform for virtual consultations and continuous support via a consumer care system.

The acne care program (Acne Revolution) consists of 5 steps (pre-visit, first consultation, control visits, last consultation, maintenance phase), providing personalized treatment protocols, integrating medical therapy and skincare treatments.

The pre-visit phase gathers comprehensive patient data to individualized care planning.

This includes nine questionnaires (six mandatory), taking approximately 3 minutes each to complete. These questionnaires cover all relevant aspects of the patient's health and lifestyle to ensure comprehensive data collection, such as:

Skin health: acne (affected areas, prior/current treatment, and progression), skin type, habits and behaviors, family history, other dermatological conditions.

Skin and nutrition: gastrointestinal health, dietary habits, and potential food intolerance.

Skin and lifestyle: lifestyle habits such as smoking, alcohol consumption, daily sun exposure, physical activity, and skin care routine.

Therapies and allergies: supplements/medications use, and any allergies to drugs, cosmetics, or environmental factors.

Stress test: psychological impact of physical appearance and expectation.

Gynecological history: pregnancy status, contraceptive use, plans for future pregnancies, any gynecological conditions, and menstrual cycle pattern.

Metabolic history: bowel habits, diabetes or sugar intolerance, thyroid disorders, blood or hormonal tests, hypercholesterolemia, and frequent abdominal bloating.

For remote dermatological assessment, patients must upload three standardized facial photographs (frontal, left-side, and right-side views), and additional images of any other affected areas of the body. Using mobile phones, patients follow standardized instructions for image quality. The system relies on manual image verification without automated quality control. Clinicians review all photos before consultation and contact patients to retake and re-upload them if the quality is insufficient.

To support a thorough clinical assessment, patients are asked to upload recent lab tests (within 6 months) including complete blood count, cholesterol and triglycerides, liver function tests (aspartate aminotransferase, alanine aminotransferase, gamma-glutamyl transferase, and bilirubin), and muscle enzymes (creatine phosphokinase and lactate dehydrogenase). While the evaluation mainly relies on patient questionnaires, these results are reviewed by the physician beforehand, and any missing tests are prescribed during the visit.

Once all materials have been submitted, patients can register on the platform and access the dashboard, where they can easily schedule the first consultation (second step), recommended within two weeks.

The dashboard advanced customer care to assist patients throughout their therapeutic and skincare journey, secure document storage, and tools for scheduling appointments and payments. It also provides access to skincare advice, educational material, and medical reports, keeping patients informed about their ongoing therapies and offering tools to support effective treatment.

Based on pre-visit data regarding involvement of facial thirds, past acne treatments, family history, positive dysmorphophobia questionnaire (stress test), and body involvement, patients are assigned a preliminary acne severity score and pre-staged into non-acne, mild acne, moderate acne, or severe acne categories. This structured pre-assessment tool allows healthcare providers to review the patient's skin condition and medical history thoroughly before the consultation, ensuring a focused and informed discussion.

During the first live or online consultation, healthcare provider further assesses patient's needs, addresses any additional relevant health factors, and provides a diagnosis using a customized acne severity scale. This tool builds up on the Global Acne Grading System (GAGS) and adds parameters such as psychological stress, family history, and previous treatments to allow for more personalized staging and treatment planning.

Based on this comprehensive evaluation, a tailored treatment protocol is created, typically combining medical therapy (topical or oral) and skincare routines, such as cleansers, toners, and micellar water. Additional treatments like peels, biostimulation, laser, or needling are recommended 2–3 times a year to speed healing, minimize scarring, and improve compliance. The final treatment plan and recommendations are shared with the patient at the end of the consultation, then uploaded to the platform for access via the patient's personal dashboard.

Control visits (third step) are scheduled every 3 months to monitor progress, adjust treatment plan, and ensure acne improvement. This interval aligns with guidelines recommending follow-ups up to 12 weeks for mild acne, with more frequent visits typically advised for moderate to severe cases. However, the 3-month interval has been adapted to leverage telemedicine's advantages for continuous online support and immediate access to care, allowing safe extension of visit intervals while reducing the need for in-person appointments. Appointments can be conducted either live or online, providing flexibility for patients. The therapy cycle typically lasts 6–12 months, depending on the patient's

progress. At the end of the acute phase therapy, a final consultation (fourth step) is conducted (live or online) to assess the overall outcome. Upon healing, patients enter the maintenance phase (fifth step), with semi-annual follow-up visits to ensure continued management and prevent relapse.

Research Methods

The online platform launched on 20th February 2024, with data collected over a 10-month period, until 31st December 2024. This descriptive, observational study analyzes early users' demographics. It includes all individuals who created an account and submitted any part of the pre-visit questionnaires. No sample size calculation was performed due to the exploratory nature of the study. The aim was to describe early adoption, usage trends, and user profiles during the platform's early implementation phase.

Data collection complied with the General Data Protection Regulation (GDPR). Users gave explicit consent via the platform's privacy policy, which outlines the objectives of data collection and the potential use of anonymized data for research purposes. The platform allows legal guardians or parents to register and manage accounts on behalf of minors, enabling access for patients unable to independently use digital tools. All analyses were conducted on anonymized datasets, with complete removal of identifying information. As a result, no additional informed consent was required for secondary use of data.

Results

As of 31st December 2024, 16,800 subjects registered on the online platform completing at least part of the pre-visit questionnaires. One subject was excluded due to an error related to the lack of validation of the tax code and date of birth. Of the 3305 visits completed, most were first visits (75.5%), followed by second (19.0%), third (5.0%), fourth (0.4%), and fifth (0.03%) visits (Table 1). Table 2 summarizes preliminary patient demographics. Most patients were female (96.9%) with a mean age of 26.6 years (standard deviation [SD] 6.6; range, 11–68 years). Most patients were aged 20–40 years, with 39.6% and 46.8% aged 20–25 and 26–40, respectively. Regarding lifestyle habits, 1518 patients (17.3%) reported smoking occasionally, 2042 patients (23.3%) smoked regularly, and 5215 patients (59.4%) never smoked. Alcohol consumption was occasional in 67.1%, regular in 2.6%, and absent in 30.3%. Allergies were reported by 21.8% (1878) of patients, while 13.3% (1147) were unsure, and 64.9% (5603) had none. Acne history was prevalent in 87.5%

Table 1 Platform Data Overview

Variable	Value
Launch date (date)	20/02/2024
Cut-off date (date)	31/12/2024
Registered patients (n)	16,800
Pre-visit submission (n)	16,800
Included in the analysis (n)	16,799
Total completed visits (n)	3305
Visit, n (%)	
1 st visit	2495 (75.5)
2 nd visit	629 (19.0)
3 rd visit	165 (5.0)
4 th visit	15 (0.5)
5 th visit	1 (0.03)

Table 2 Demographics and Comorbidities, Factors for Preliminary Acne Severity Assessment, Preliminary Acne Severity Score

Variable	Value
Demographics and lifestyle habits	
Sex, n (%) [n = 16,799]	
Male	522 (3.1)
Female	16,277 (96.9)
Age (years) [n = 7614]	
Mean (SD)	26.6 (6.6)
Min/Max	11/68
Age range, n (%) [n = 7614]	
< 14 years	2 (0.03)
14 - 19 years	764 (10.0)
20 - 25 years	3017 (39.6)
26 - 40 years	3563 (46.8)
41 - 65 years	267 (3.5)
65 years	1 (0.01)
Smoking, n (%) [n = 8775]	
Occasionally	1518 (17.3)
Regularly	2042 (23.3)
Never	5215 (59.4)
Alcohol consumption, n (%) [n = 8775]	
Occasionally	5886 (67.1)
Regularly	230 (2.6)
Never	2659 (30.3)
Allergies, n (%) [n = 8628]	
Yes	1878 (21.8)
No	5603 (64.9)
Unknown	1,147 (13.3)
Previous acne history, n (%) [n = 16,291]	
Yes	14,260 (87.5)
No	947 (5.8)
Unknown	1084 (6.7)

(Continued)

Table 2 (Continued).

Variable	Value
Cosmetic skincare routines, n (%) [n = 8,676]	
Yes	6888 (78.6)
No	1879 (21.4)
Previous aesthetic consultations, n (%) [n = 7856]	
Yes	6461 (82.2)
No	1395 (17.8)
<i>Factors for preliminary acne severity assessment</i>	
Familiarity, n (%) [n = 16,282]	
Yes	8012 (49.2)
No/unknown	8270 (50.38)
Past acne treatments, n (%) [n = 16,282]	
Yes	10,273 (63.1)
No	6009 (36.9)
Facial involvement, n (%) [n = 10,336]	
At least one-third	4483 (43.4)
Two-thirds	3904 (37.8)
Three-thirds	1949 (18.9)
Acne on other body sites, n (%) [n = 16,283]	
Yes	5000 (30.7)
No	11,283 (69.3)
Stress test, n (%) [n = 7950]	
Positive	7266 [95.0]
Negative	955 [5.0]
<i>Preliminary acne severity score</i>	
Preliminary acne severity score, n (%) [n = 16,799]	
Severe acne	5290 (31.5)
Moderate acne	3434 (20.4)
Mild acne	5898 (35.1)
No data	2177 (13.0)

(14,260) of patients, with 6.7% (1084) unsure, and 5.8% (947) reporting no acne. Furthermore, 77.7% (6888) of participants followed a regular skincare routine, while 82.2% (6461) had consulted an aesthetic surgeon.

Family history was present in 49.2% of patients (8012) and 63.1% (10,273) had received acne treatment. Acne affected at least one-third of the face in 43.4% (4483) of cases, two-thirds of the face in 37.8% (3904), and all three facial regions in 18.9% (1949). Additionally, 30.7% (5000) reported acne on other body areas.

A stress test was conducted, with 95% (7552) testing positive, and 5% (398) testing negative. Preliminary acne severity assessments revealed 31.5% (5290) had severe acne, 35.1% (5898) had mild acne, and 20.4% (3434) had moderate acne, while 13% (2177) had no data on severity.

Discussion

This study highlights the feasibility and acceptance of the proposed telemedicine approach for acne management. With 16,800 registered patients and 3305 completed visits, the platform shows substantial engagement, further supported by the high completion rate of the pre-consultation questionnaires. The discrepancy between registered users and those completing consultations may be due to technical issues, personal choice, or satisfaction with initial advice, highlighting opportunities to improve retention and engagement.

Patient demographics reveal strong engagement among 20–40-year-olds, with 40% aged 20–25 and 46.3% aged 26–40, likely due to greater skin health awareness and greater familiarity with digital technologies. Despite this, platform use spans ages 11–68, suggesting broader applicability. Although younger patients are often assumed to prefer telemedicine due to digital familiarity, one study found higher dropout rates among those under 17, suggesting that the link between age and telemedicine preference is more complex and needs further study.⁶ Gender data reveals a predominance of female users (96.9%), aligning with the higher prevalence of acne in women and their greater access to dermatological care.⁷

Lifestyle data (smoking, alcohol) highlight modifiable risk factors, supporting telemedicine's role in patient education. Moreover, with 21.8% of patients reporting allergies, ongoing remote monitoring and adjusting treatments accordingly could improve patient safety and treatment outcomes.

A key feature of the platform is the structured pre-assessment tool, which categorizes acne severity based on patient-reported responses regarding facial and body involvement, past treatments, family history, and stress levels. While not equivalent to traditional assessment, this tool provides valuable preliminary data to support healthcare providers in making informed decisions during the initial consultation. Self-assessment questionnaires help minimizing diagnostic errors in teleconsultations, highlighting key aspects of the patient's condition that may be overlooked during brief consultations. They ensure a more comprehensive evaluation and provide valuable insights into the patient's emotional and physical state, improving diagnostic accuracy, provider empathy, and the overall patient experience.

In the proposed model, the asynchronous submission of images and enhances flexibility, reducing waiting times and improving accessibility. This telemedicine-based approach aids in eliminating barriers to care, reducing waiting times, and enabling ongoing monitoring. Although the results are promising, it is important to emphasize that these findings are preliminary and offer insights into users' demographics and pre-assessment, rather than on effectiveness of telemedicine model and user satisfaction.

Several methodological limitations affect the interpretability of the outcomes. Notably, the absence of a control group precludes direct comparisons with traditional in-person care. Additionally, the self-selection of participants—who voluntarily opted to use the platform—introduces potential selection bias, limiting the broader applicability of the results.

Future studies should aim to address these limitations by incorporating controlled study designs and including validated measures of clinical effectiveness and user satisfaction, such as structured patient-reported outcome and experience measures.

Conclusion

This study demonstrates the feasibility and high user engagement of a telemedicine model for acne management, combining asynchronous tools with live consultations. The structured workflow enables early severity stratification, personalized treatment, and ongoing monitoring, while reducing access barriers and waiting times. Integrated dermatologic, psychological, and lifestyle assessments enhance the comprehensiveness of the care provided. Despite limitations—including lack of a control group and clinical outcomes—the findings support telemedicine as a promising approach.

Future studies should evaluate efficacy, adherence, and satisfaction using standardized metrics to support wider implementation.

Ethics Statement

The data used in this study were collected and processed in compliance with the General Data Protection Regulation (GDPR). Explicit user consent was obtained through the platform's privacy policy, which outlines the objectives of data collection and the potential use of anonymized data for research purposes. The privacy policy complies with all aspects of local laws and recommendations.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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