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Incorporating patient-reported outcomes as a vital sign for dermatologic clinical care and clinical investigations

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Abstract

Patient-reported outcomes (PROs) provide quantitative assessments of patients' experiences with their skin diseases. PROs are usually much more comprehensive than what can be gleaned from a brief clinical history and more informative than what dermatologists can gather on clinical examination. Correlations between PROs and clinician assessments (e.g., investigator's global assessment, psoriasis area and severity index) are poor to moderate at best, so data from each source are not redundant and can complement one another. PROs should serve as skin vital signs in dermatology. PROs can offer snapshots of the intensity of a symptom as well as the effects of symptoms, emotions, and functioning on a patient's skin-related quality of life. Just as clinicians obtain a baseline blood pressure prior to starting antihypertensives, dermatology-specific PROs serve as a baseline from which clinicians can monitor (even remotely) for improvement or side effects with treatment and for flares. Both PROs and conventional vital signs are usually normal. It is when they are abnormal or different than expected that they become informative. We conclude by offering a roadmap for investigators to conduct the next steps in PRO research necessary to establish guidelines for transitioning PROs from clinical research and trials to routine clinical use.

Keywords

patient-reported outcomes; symptoms; health-related quality of life; DLQI; Skindex-16; mental health; patient-centered care; value-based care

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INTRODUCTION

Value-based care, a movement gaining momentum since the 1960s, was codified in the United States by the 2010 Patient Protection and Affordable Care Act (ACA). (Strokoff and Grossman 2010) ACA established the Center for Medicare and Medicaid Innovation to test new pay models focused on measuring and improving the quality of patient care. Objective measures of care quality were initially dichotomous (e.g., mortality or morbidity), then transitioned to simple measures from hospital billing statements (e.g., length of stay, readmission).

At the recommendation of the Institute of Medicine and with technologic advances, more patient-centered outcomes have been included as quality measures to identify improvements in symptoms, functioning, and patient well-being or quality of life (QOL). (Institute of Medicine 2013; Institute of Medicine 2001) Face-to-face time during clinic visits are often limited, and clinicians are unable to understand the full impact of their patients' skin conditions on their QOL. (Snyder et al. 2021) An internal, time-stop study of dermatology visits at University of Utah Health (UUH) found that while appointments were scheduled every 10–15 minutes, face-to-face time with the clinician averaged between 3–8 minutes (personal communication, Mark Eliason, MD, October 29, 2021). Also, many patients admit to omitting or withholding relevant clinical information. (Levy et al. 2018).

In this piece we offer a roadmap for investigators to conduct the next steps in PRO research necessary to establish guidelines for transitioning PROs from clinical research and trials to routine clinical use.

RATIONALE FOR PROs

Patient-reported outcomes (PROs) are structured assessments directly from the patient of their experiences of both health and illness (how they feel and function). PROs have been an important outcome for U.S. clinical trials since 2006, (US FDA, 2006) and a core set of PROs has been standardized recently for use in cancer clinical trials to allow for comparative effectiveness studies and clinical applications. (US FDA 2021)

Oncology has demonstrated the unique value of PROs, showing that routine PRO use improves communication, symptom control, QOL, and patient satisfaction. (Kotronoulas et al. 2014; Stover et al. 2021) In a landmark, randomized trial of 766 cancer outpatients on chemotherapy, half were asked weekly to rate their symptoms on laptops and half received standard oncologic care. Weekly PRO capture led to better QOL, fewer emergency room visits, longer chemotherapy duration (i.e., fewer stopped early due to side effects), and a median survival improvement of 5 months. (Basch et al. 2017; Basch et al. 2016) A similar trial with curable solid-organ cancers found that weekly online symptom reporting improved physical well-being without increasing healthcare utilization (e.g., emergency visits, interruptions in chemotherapy delivery). (Absolom et al. 2021)

WHY PROs ARE VITAL IN DERMATOLOGY

Most skin diseases do not affect easily-measured clinical or laboratory variables. Measures of clinical status (e.g., PASI, BSA, IGA scores) can be inaccurate or misleading because estimates of extent of clinical disease may be unreliable,(Goldfarb et al. 2021) and skin diseases can affect patients in highly personal ways, regardless of clinical status.(Alpsoy et al. 2017; Kjeldstrup Kristensen et al. 2020) Clinical disease severity (e.g., PASI, IGA) correlates poorly to moderately with QOL,(Abeni et al. 2002; Barbieri and Gelfand 2021) meaning that clinician-reported outcomes (CROs) and PROs are not redundant, and we need both to provide the most appropriate care and patient counseling. Redundancy (high correlation) between PROs and CROs is not optimal as it suggests that no new information would be gained by measuring both clinical disease severity and PROs.

PROs add value to the clinic visit by permitting us to understand and measure the effects of disease and therapy and to *measure how the patient is doing*. Patients do not experience the same skin disease in the same way. Thus, a patient serves as their own control. Just as a baseline weight assists when starting a weight loss program, a baseline PRO score serves as a reference for monitoring both improvement with treatment and flares.(Secrest et al. 2019; Secrest and Hess 2018) In doing so, PROs serve as a “vital sign” for skin disease. Vital signs (e.g., temperature, pulse, respiratory rate, blood pressure) are “snapshots” of health presented in pre-defined ways that can be readily and rapidly interpreted. Skin vital signs assess the experience of skin disease on a patient, including the intensity of a symptom (e.g., pruritus, pain) as well as the effects of symptoms, emotions, and functioning on a patient’s skin-related QOL.

Two skin-specific QOL measures are most commonly used: Skindex-16 and the Dermatology Life Quality Index (DLQI).(Chren et al. 2001; Finlay and Khan 1994) Both assess the effects of skin disease on various aspects of patient QOL, but have very different scoring systems. As with conventional vital signs, skin vital signs need to be presented to clinicians in an easily interpretable way. Early attempts with routine PRO use at UUH dermatology clinics failed because clinicians felt the DLQI scoring system was non-intuitive, despite laminated scorecards being affixed to every clinic computer.(Secrest et al. 2019) Switching to Skindex-16, which has a more intuitive scoring system, led to an immediate increase in clinician use. Many other generic, quality of life, disease-specific, and symptom-specific PROs exist, but nearly all need additional testing for both psychometric and clinimetric validation.(Carrozzino et al. 2021; Pattinson et al. 2021)

PROs offer clinical insights that are prescient for routine clinical care. Patients frequently ask their chances of and how quickly they will see improvement after starting a new treatment. Our recent work with Skindex-16 has provided this answer for acne patients taking isotretinoin. A clinician can now say, “by month 2, patients report that they are at least 50% better.”(Secrest et al. 2020)

A key criticism of PRO use in dermatology is that often PRO scores are not relevant or value-adding for some patient visits.(Taliercio et al. 2021) The same argument can be used for conventional vital signs. Both PROs and conventional vital signs are usually normal

in the outpatient setting. It is when they are abnormal or different than expected that they become informative. Also, every patient has their own “normal,” (e.g., patients who have a low resting heart rate), so establishing each patient’s baseline PROs helps the clinician monitor treatment effects and possible side effects.

DIGITAL TECHNOLOGY AND PROs

PROs can be given to patients on paper or electronically, but technology increases their clinical utility. Figure 1 plots nearly four years of Skindex-16 scores for a patient with cystic acne, which, combined with investigator global index (IGA) scores from each visit, helped the clinician know both the severity of each acne flare and the target level of improvement one can expect (shown at the end of each course of isotretinoin, when her IGA score was 0 (clear)). Written, informed consent was obtained. This work was approved by the University of Utah Institutional Review Board (#104995).

Clinicians armed with both clinimetric skin measures (e.g., PASI, IGA) and PROs can deliver more personalized medicine. Electronic PRO applications can deliver regular longitudinal assessments via web or telephone to patients and alert clinicians when concerning symptoms arise. Recent efforts have enumerated features to optimize selection of an electronic PRO application for atopic dermatitis, from usability on mobile devices to how questions are displayed on the screen, to how patient data are protected and presented back to their clinician.(de Groot et al. 2021)

NEXT STEPS FOR PROs IN DERMATOLOGY

For PROs to prove useful in improving dermatologic care, they must be standardized, measured accurately and consistently, and their scores must be understood by clinicians and patients.(Chren 2020) Clinicians will need to see their value. Research should show that PROs simplify the process of obtaining a clinical history, establish each patient’s baseline “skin vital sign,” and help clinicians quickly understand the patient journey when assuming care from another clinician. Investigators need to identify normal ranges for dermatology-specific PROs (Skindex-16 and DLQI)—both for the general dermatologic population (similar to the normal ranges for temperature and pulse) and for those with specific skin conditions, especially chronic inflammatory processes. Then, abnormal PRO scores can alert clinicians to ask further questions, alter treatment plans or order tests. (Secrest and Dermatology PRO Consortium 2021)

The greatest clinical benefit is within-individual changes in PRO scores. These will allow clinicians to see each patient’s degree of impairment, improvements with treatments, and identify scores for when each patient is satisfied with treatment to help identify flares.(Secrest and Hess 2018) As with oncology, regular use of dermatology PROs will have to show benefit in randomized trials. These benefits include 1) increasing the clinical effectiveness of systemic medications by detecting and mitigating side effects earlier; 2) switching patients off of expensive medications (e.g., biologics) sooner when efficacy wanes; 3) advocating for appropriate use of expensive medications with insurance companies and documenting patient-reported improvements with treatments more

objectively; 4) increasing intervals between follow-up visits; and 5) showing the value of dermatologic care to funding and research agencies.(Abuabara et al. 2018; Calvert et al. 2019) Researchers will also need to build on oncologic work to optimize how longitudinal skin-specific PRO data are presented to clinicians and patients to engage in collaborative care.(Smith et al. 2016; Snyder et al. 2019; Tolbert et al. 2018)

By following this roadmap, PRO researchers in dermatology will establish the foundational work from which we can establish guidelines for the routine use of PROs in dermatology and truly make dermatology-specific PROs a skin vital sign.

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Abbreviations:

ACA	Patient Protection and Affordable Care Act
BSA	body surface area
DLQI	Dermatology Life Quality Index
FDA	Food and Drug Administration
IGA	investigator global assessment
PASI	psoriasis area and severity index
PRO	patient-reported outcome
QOL	quality of life
UUH	University of Utah Health

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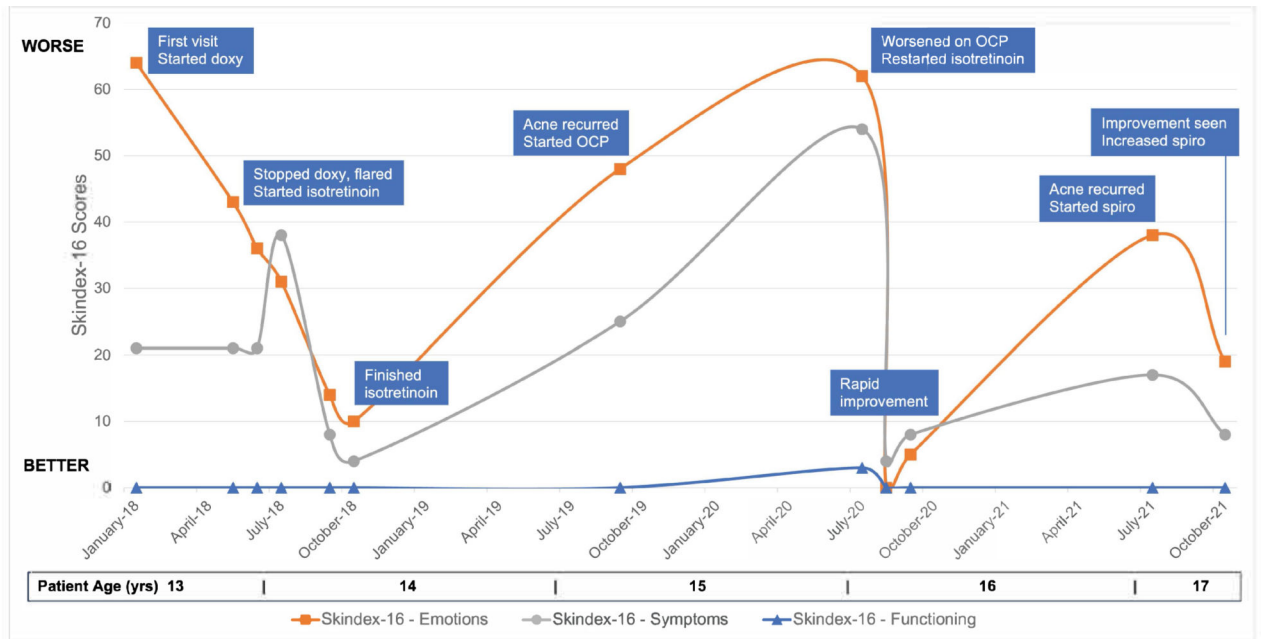


Figure 1. Example of Skindex-16 scores in a teenage female with cystic acne over 45 months. Skindex-16 is a skin-specific quality of life (QOL) measure normalized to a 100-point scale [0 is no impact on QOL, 100 is maximal impact on QOL] with three domain scores: Emotions, Symptoms and Functioning. As shown, acne usually bothers patients more emotionally than symptomatically or functionally. The notable exception was in July 2018, where the patient suffered symptomatically from severe dry lips and fissuring after being on isotretinoin for a month. Abbreviations: doxy, doxycycline; OCP, oral contraceptive pill; spiro, spironolactone.