SKIN

RESEARCH LETTER

The Need for Objective and Remote Tracking of Chronic Skin Diseases

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ABSTRACT

Importance: Managing chronic skin disease is often frustrating for both providers and patients, sometimes resulting in delayed diagnosis, inadequate therapy, and inconsistent care.

Objective: This study performs stakeholder analyses to identify unmet clinical needs in chronic skin disease management.

Methods: Survey of 33 providers and 25 patients at Stanford Health Care Dermatology department.

Results: When evaluating a chronic skin conditions (such as psoriasis), 79% of dermatologists rely solely on subjective documentation (gestalt, body surface area, descriptive exam). Objective documentation (photographs or scoring assessment tools) is used by 21% of providers upon initial assessment and by 7% of providers to assess change in disease between office visits. While 83% of providers are comfortable assessing change in disease severity based on prior document by oneself, only 31% are comfortable assessing change based on prior documentation by another provider (p <0.001). Dermatologists expressed the need for better documentation modality in clinic (94%), and in between office visits by patients (91%). While 90% of patients reported it is moderately to extremely important to track their disease, only 16% of patients consistently do. Most patients preferred to monitor their disease at home (92%) using cameras (80%) or by smartphone (59%). Patients were willing to spend 5-30 minutes weekly to monthly to document their disease.

Conclusions and Relevance: This study identifies that dermatologists and patients need a solution that objectively and remotely monitors chronic skin diseases to guide treatments, empower patients, and provide more cohesive care in a complex healthcare system.

INTRODUCTION

Chronic skin diseases constitute a large proportion of dermatology visits and have a substantial economic burden on our healthcare system.[1] While neoplasms can be tracked via measurements or photographs, chronic inflammatory skin diseases can have a prolonged and dynamic course that fluctuates in presentation, severity, and distribution. During significant wait times for new dermatology referrals,[2] patients are frequently evaluated by multiple providers and have significant change in their disease. Unfortunately, subjective, fragmented documentation and imperfect memories may result in delayed diagnoses, inadequate control of disease burden, and inconsistent care. This study 1) identifies unmet clinical needs in management of chronic skin diseases, and 2) specifies characteristics of any potential solutions based on the relevant stakeholder analyses.

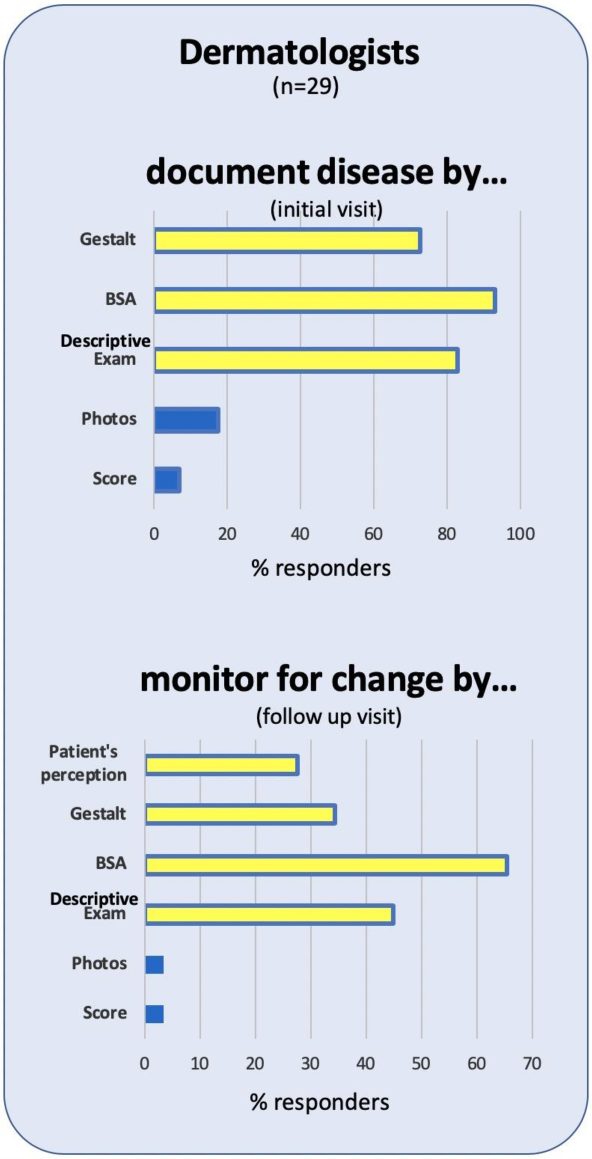
METHODS

Institutional review board approval was received. Patients with chronic dermatologic diseases (n=25, mean age 48.5 +/- 17.9 years) and two overlapping cohorts of 29 and 33 dermatologists were anonymously surveyed at the Stanford Health Care dermatology clinic (July 2018 to December 2018). Patients surveyed had psoriasis (9), atypical nevi or skin cancer history (7), lichen sclerosis (2), atopic dermatitis (1), tinea pedis (1), cysts (1), mycosis fungoides (1), acne (1), multiple conditions (1) and preferred not to say (1). Statistical analyses were performed using 2-tailed fisher's exact test in Excel. Survey questionnaires are available from the corresponding author.

RESULTS

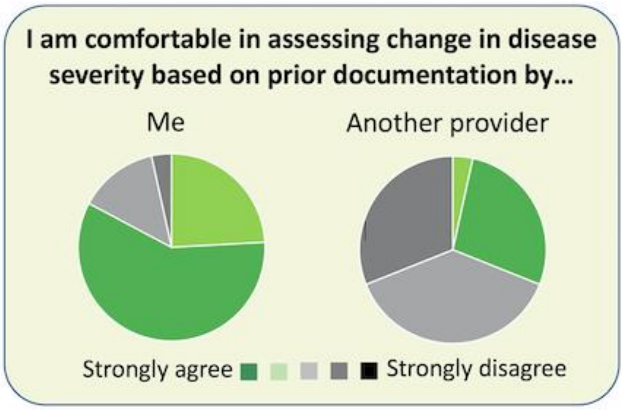
Dermatologists use subjective measures to document and assess for change in chronic skin diseases. Upon initial evaluation of patients with psoriasis, 79% (23/29) providers document their exam and assessment using subjective measures (such as gestalt, body surface area, and descriptive exam) (Figure 1). 21% (6/29) of providers supplement their subjective assessment with objective documentation (such as photographs or scoring assessment tools) (Figure 1). When monitoring for change in disease activity between office visits, dermatologist also rely on patient perception of disease progression. For assessment of disease severity between office visits, 91% (27/29) rely solely on subjective measures and 7% (2/29) of providers use additional objective measures (Figure 1).

Figure 1. Documentation of psoriasis by dermatologists (n=29). Yellow = subjective measures. Blue = objective measures. BSA = body surface area. Score = Clinical assessment tools such as PASI (psoriasis area and severity index).



Clinical handoffs decrease the ability to assess for change in disease severity. When dermatologists were asked if they were comfortable assessing change in disease severity based on their own prior documentation, 83% (24/29) agreed or strongly agreed. If, however, prior documentation was by another provider, only 31% (9/29) agreed or strongly agreed that they were comfortable assessing change in disease (p<0.001, Figure 2).

Figure 2. Dermatologists' (n=29) assessment of change in disease severity between visits.

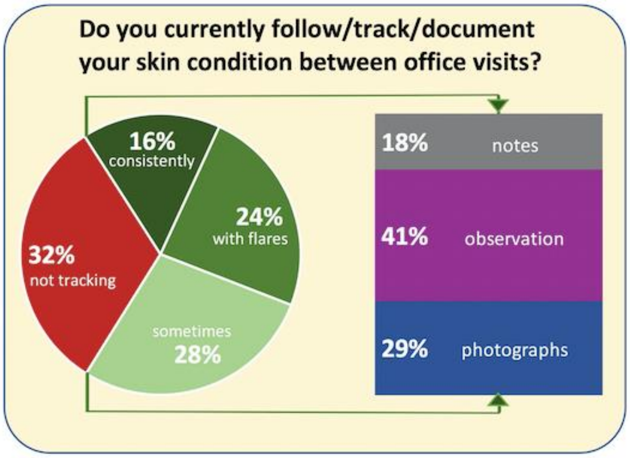


Dermatologists reported they needed better documentation of chronic skin diseases in the office (94%) and at home (91%). They were willing to spend less than 1 minute (mean = 30 seconds) on capturing or interpreting captured data.

Patients want to track their skin disease in between office visits. A majority of patients (91%) reported that it is "moderately" (23%), "highly" (23%) or "extremely" (45%) important to have a way to "track/document disease between office visits". Most patients track their disease between office visits (68%), however only 16% of patients do it consistently (Figure 3). Of those who track their disease, most rely on observation and memory (41%), some take photographs (29%) or notes (18%). Patients who do not track their disease at home attribute it to "no flares to document", "inadequate capture modality", "forgetfulness", "unawareness."

Patients are willing to spend time at home to document disease to improve outcomes. In terms of technology competence, most patients in our cohort considered themselves to be "average" (50%) to "above average" (36%), with only 5% "below average" and 9% "expert" level. Patients were willing to spend an average of 16.5 minutes (range: 5-30 minutes) to document their disease weekly (40%), monthly (28%) or quarterly (20%). The documentation modality of choice was visual (photographs) (67%), followed by visual and written (13%) or written only (13%). Preferred tools were smartphone (45%), computer (23%) or both (14%). Patient preferred to document their disease at home (92%) rather than in an office or walk-in facility (8%). 50% of patients predicted that increased physician awareness of disease severity would result in better disease control. Patients experiencing flares were more likely to respond that increased access to a doctor would result in better disease control (OR=11.67 [0.92, 147.57], p=0.057).

Figure 3. Patient responses (n=25) regarding their skin disease tracking practices between office visits.



DISCUSSION

This study identifies that 1) most dermatologists rely on subjective measures to document chronic diseases, 2) dermatologists lack confidence in assessing disease change if patient was previously seen by another provider and 3) dermatologists and patients need a way to objectively document and track changes in chronic skin diseases in the office and at home.

Currently, the text-based physical exam is the gold standard for documenting chronic skin diseases. However, seemingly objective measures such as approximate body surface area and descriptive exam have inherent intra- and inter-provider variability.[3,4] Numerous assessment scales (53 for psoriasis,[5] 11 for atopic dermatitis[6]) lack consensus for interpretation and validity. Standard total body photography has gained little traction for documentation of rashes likely because it is inconsistent, overly cumbersome and labor-intensive for clinical workflows. This lack of objective assessment tools is problematic, especially during patient "handoffs", which can lead to diagnostic delay, inconsistent management and overall suboptimal care.

Patients are often frustrated by the inability to consistently and accurately capture disease severity and emotional burden at home. Studies have demonstrated the necessity to capture patient-reported outcomes (symptoms, emotional and functional impact).[7.8] Prior studies indicate that patients are willing to pay US$10 for mobile health app services.[9] We show that patients are committed to regularly documenting their skin disease at home.

While there are many emerging tools and mobile applications for monitoring individual neoplasms,[10] dermatologists and patients lack an objective and efficient tool to robustly document and longitudinally monitor changes in chronic and inflammatory skin conditions. Existing smartphone applications either track pre-existing and patient-defined lesions on specific anatomic body parts or have only a rough full body overlay schematic of disease. While major electronic health records systems (such as EPIC) are capable of accepting patient generated health data between visits (via MyChart portal), many offices do not provide that service, and those that do, find the between office media data difficult to integrate into the current workflow.[11] Lastly, 3D full body multi-camera imaging systems (such as Canfield) are expensive and with limited access to most patients.

As our healthcare continues to move towards value-based payment models, we will need to demonstrate the impact of our care and treatments. Individualized disease tracking tools may facilitate improved outcomes at a decreased cost to the healthcare system. Further, the Centers for Medicare & Medicaid Services, has introduced a set of reimbursement codes around remote patient monitoring and telehealth services.[12]

Limitations of this study include single institution analyses among a small cohort of patients.

There exists a need for skin monitoring solution that is robust, universal, cheap, and easily integrated into provider visits and home use to optimize treatments, empower patients, and promote personalized, engaging, and active approach to care in a complex medical system.

IRB/Consent: An appropriate institutional review board approved the project, and informed consent was appropriately obtained.

Conflict of Interest Disclosures: None

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