Virtual Journal Club

Nocturnal scratch: A study bringing patient input into development of novel digital measures

September 20, 2023, 11 am ET
But first, housekeeping

• Please note today’s session is being recorded

• To ask a question for discussion during Q&A, please:
  • Either ‘raise your hand’ in the participant window and come off mute when the moderator calls on you, or
  • Type your question into the chat box

• Slides and recording will be available after today’s session
Key Points

1. What matters to patients
2. Methods
3. Study population
4. Inclusion & Exclusion Criteria
5. Results
6. Discussion
7. Publication contents
NOCTURNAL SCRATCH

Digital Measures Development

Advancing nocturnal scratch as a digital endpoint for atopic dermatitis

Source: https://dimesociety.org/access-resources/digital-measures-nocturnal-scratch/
Patient Research

- Data and evidence from mixed methods research
- Conceptual framework

Measures Terminology & Ontology

- Data and evidence supporting technical definition
- Evidence-based ontology

Deployment to Clinical Trials

- 10 tools supporting successful operational implementation
- Case studies

Payer Acceptance

- Translating patient value to commercial value
- Modeling potential increases in drug utilization
- Key insights & action items

Source: https://dimesociety.org/access-resources/digital-measures-nocturnal-scratch/
Digital Measures That Matter to Patients: A Framework to Guide the Selection and Development of Digital Measures of Health

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Meaningful Aspect of Health
Aspect of a disease that a patient \textsuperscript{a} does not want to become worse, \textsuperscript{b} wants to improve or \textsuperscript{c} wants to prevent
- May be shared across some conditions and diseases

Concept of Interest
Simplified or narrowed element that can be practically measured
- Patients may have different symptoms
- Symptoms may vary over time
- Symptoms relevance may vary over time

Outcome to be measured
Specific measurable characteristics
- Measures may be relevant to multiple symptoms
- Assess technical specification of sensor and whether it is suitable for measuring this outcome in this population

Endpoint
Health research only; Precisely defined, statistically analyzed variables
- Sensors may support multiple measures & endpoints

What do you wish that you could do, but your condition prevents you from doing it?

What part of your life is most frustratingly impacted by your condition?

What are the symptoms that most impact your ability to do these activities?

Do these measures make sense to you?

How much change do we need to see in this symptom before it really starts to make a positive difference in your life?
What matters to patients

**Meaningful Aspect of Health**
Aspect of a disease that a patient a) does not want to become worse, b) wants to improve or c) wants to prevent

- May be shared across some conditions and diseases

What do you wish that you could do, but your condition prevents you from doing it?
What part of your life is most frustratingly impacted by your condition?

**Concept of Interest**
Simplified or narrowed element that can be practically measured

What are the symptoms that most impact you ability to do these activity?

**Outcome to be measured**
Specific measurable characteristics

Do these measures make sense to you?

**Endpoint**
Health research only; Precisely defined, statistically analyzed variables

How much change do we need to see in this symptom before it really starts to make a positive difference in your life?

This figure was adapted from original work by Evidation Health, with permission. This figure illustrates patient considerations that should drive digital measure selection and development, these should precede technical considerations [8]. Additional information on subsequent technical considerations are available at [36, 37, 38].
Why is it important?

FDA rejects Verily filing for wrist-worn Parkinson’s clinical trial device

Published June 14, 2021

“A change in rigidity or finger tapping in the MDS-UPDRS Part III cannot be directly interpreted as being meaningful to patients. However, a change in speech, eating and dressing (as assessed in the MDS-UPDRS Part II) represents meaningful change in how patients function in daily life,” FDA wrote.

Methods

- **Qualitative patient interviews**
  - 1-hour interview with unbiased associated sociology researchers

- **Quantitative survey**
  - Web-based electronic survey

Source: https://onlinelibrary.wiley.com/doi/10.1002/ski2.262
Study population

• **Qualitative patient interviews**
  • “Adults” - adults with AD ≥18 years old
  • “Partners” - adult caregivers/spouses/partners of adults with AD
  • “Children” - children 7–17 years old with AD
  • “Parents” - adult primary caregivers of a child with AD

• **Quantitative survey**
  • “Adults”
  • “Parents”

Study population

Qualitative patient interviews

Adults invited (with their Partners) (n = 32)

Excluded:
• Ineligible (n = 4)
• Lost to follow-up (n = 5)
• Follow-up ceased after enrolment goal reached (n = 8)

Adults without partner (n = 9)

Completing interview:
• n = 15 Adults
• n = 6 Partners

Children invited (with their Parents) (n = 59)

Excluded:
• Ineligible (n = 8)
• Lost to follow-up (n = 14)
• Follow-up ceased after enrolment goal reached (n = 23)

Completing interview:
• n = 14 Children
• n = 14 Parents
Study population

Quantitative survey

- Adults invited (n = 18,490)
  - Responded (n = 1416)
    - Excluded:
      - Ineligible (n = 522)
      - Noncompletion (n = 136)
  - Adults surveyed (n = 758)

- Parents invited (n = 9150)
  - Responded (n = 1653)
    - Excluded:
      - Ineligible (n = 921)
      - Noncompletion (n = 141)
  - Parents surveyed (n = 591)
Inclusion & Exclusion Criteria

• **Inclusion Criteria:**
  • Patients self-reported with atopic dermatitis, and caregivers for patients diagnosed with atopic dermatitis
  • Patient's itch self-assessment (overall) => 1 on itch numerical rating scale (NRS)
  • Ability to perform study assessments in English language & provide informed consent

• **Exclusion Criteria:**
  • Patients with other skin condition than atopic dermatitis
  • Patients with overall itch self-assessment =0
  • Patients who fail to provide informed consent

Source: https://onlinelibrary.wiley.com/doi/10.1002/ski2.262
Results & Analysis

- **Qualitative interviews**
  - 49 interviews
  - 15 Adults, 6 Partners, 14 Children, 14 Parents
  - Analyzed according to FDA guidance for patient centric drug development "Methods to Identify What is Important to Patients"

- **Quantitative survey**
  - 1349 survey participants
    - 758 Adults, 591 Parents
  - Descriptive statistics
  - Raw data available: [https://dimesociety.org/access-resources/digital-measures-nocturnal-scratch/#research](https://dimesociety.org/access-resources/digital-measures-nocturnal-scratch/#research)

Meaningful Aspects of Health: Conceptual Model for Nocturnal Scratching in Atopic Dermatitis (AD) Patients

### Meaningful aspects of health relative to AD patients
- Appearance of skin
- Good quality of sleep
- Ability to form & maintain relationships
- No limitations in daily activities (work, school, sport, leisure, social gatherings, etc.)

### Concepts of interest relevant to AD patients
- Nocturnal scratch*
- Quality of sleep
- Psychosocial wellbeing
- Signs & symptoms of AD
- Feeling of itch

### Related concepts
- Producing new scratch marks, bleeding, flakes, etc.
- Poor sleep affecting daily activities
- Worsened sleep quality
- Mental health impacts
- Tiredness, lack of concentration
- QoL impacts

### Outcomes to be measured
- Total scratching time
- Frequency of scratching
- Frequency of waking
- Quality of life measures
- Observed new signs of AD post-sleep
- Reported new symptoms of AD post-sleep
- Unidimensional itch intensity scale
- Multidimensional itch & quality of life assessments
- Electronic diaries (ItchApp)

### Available measurement tools
- Digital measures
  - ObsRO
  - PROs (not validated)
- PROs
  - Direct methods (PSG, EEG, etc.)
- QoL PROs
- PROs
  - ClinROs
  - ObsRO
- PROs

### Effects & impacts of nocturnal scratch
- Proximal impacts:
  - Reducing severity score
  - Reduction of signs & symptoms (lesions, redness, etc.)
- Distal impacts:
  - Reduction of nocturnal scratching

### Treatment benefits
- Improvement of quality of life
- Reduction of nocturnal scratching

*AD induced
Results: close look
During the past two weeks, how burdensome did you find (Adults) / what is your impression of how burdensome your child found (Parents on behalf of Children) the following?

### Adults

- **Clear** N = 49
- **Mild** N = 222
- **Moderate** N = 323
- **Severe & Very Severe** N = 113
- **Overall** N = 707

### Children (as reported by Parents)

- **Clear** N = 41
- **Mild** N = 220
- **Moderate** N = 203
- **Severe & Very Severe** N = 55
- **Overall** N = 520

**Response:**
- Not at all
- Slightly
- Quite a bit
- Moderately
- Extremely
During the past two weeks, how burdensome did you find the following?

- Scratching
- Itchy skin because of your eczema
- Dry, rough, leathery or scaly patches of skin
- Red, inflamed skin
- Peeling or flaking skin
- Feelings of anxiety
- Issues with sleep because of your eczema
- Feelings of depression
- Oozing or crusting

Percent of Responses

During the past two weeks, how often did you experience the following?

- Dry, rough, leathery or scaly patches of skin
- Scratching
- Itchy skin because of your eczema
- Red, inflamed skin
- Peeling or flaking skin
- Feelings of anxiety
- Feelings of depression
- Oozing or crusting
- Issues with sleep because of your eczema

Percent of Responses

Source: Study data at https://dimesociety.org/access-resources/digital-measures-nocturnal-scratch/#research
Results: close look

• The **most burdensome AD symptoms** reported by Adults & Parents were itchy skin; dry, rough, leathery, or scaly patches of skin; and scratching.

• **Resting and sleeping** were the activities most limited by AD - by hours of sleep lost due to nocturnal scratching evaluated from the survey it's:
  - 1 h of sleep lost per night for Adults
  - 1.4 h per night for Children (as reported by Parents)
  - 1.2 h per night for Parents themselves

• 70% of Adults and 75% of Parents were **aware** of nocturnal scratching.

Results: close look

• Majority of Adults (85%) and Parents (91%) ranked effectiveness of a treatment in **reducing nocturnal scratching** as important.

• The ability to **measure nocturnal scratching** was ranked as valuable by 70% of Adults and 80% of Parents.

• 53% Adults and 46% of Parents indicated willingness to **use technology** for this purpose (25% and 28% were unsure whether they would or not).
  • Main concerns were physical discomfort and interference with sleep.

Discussion

- The impact of nocturnal scratching on patients' lives is substantive

- Positioning nocturnal scratching in Measures that Matter framework established it as a potential target of novel COAs that can leverage DHTs in their assessment

- Technology developers and manufacturers should strongly consider the patient experience of using the technology and data privacy

Source: https://onlinelibrary.wiley.com/doi/10.1002/ski2.262
Discussion

• Future research should address
  • **correlations** between digitally measured nocturnal scratching and measures currently used in AD to understand more fully the relationship between them.  
  • verification, analytic validation and clinical validation of a novel COA leveraging DHTs to measure nocturnal scratch.

• This novel outcome measure may aid research in **other pruritic conditions** that have substantial negative impact on patients' lives, such as psoriasis.
Publication includes

• Background, Objectives, Methods, Results, Discussion

• **Supporting information:**
  • Qualitative interview guides
  • Quantitative survey questions
  • Samples of verbatim responses from the participants' interviews
  • Selected survey data tables

• **Survey data available:**
  [https://dimesociety.org/access-resources/digital-measures-nocturnal-scratch/#research](https://dimesociety.org/access-resources/digital-measures-nocturnal-scratch/#research)
Questions for the panel:

- The patients were the center of this research into the topic of eczema and its symptoms. Especially interviews gave us raw and personal experience with this condition and its everyday burdens. Did it create a new optics towards the lives of patients and this condition within your specific scope of work?
- Were there some information from the collected data that stood out to you in particular?
- One of the implications of this research is to support development of novel digitally measured clinical outcome assessments - in this case nocturnal scratching. How do you see these published findings aiding that cause? How did this research help your specific endeavors in this space?
- What would be your advice to researchers looking to add a patient voice to their research that are thinking about doing a similar study such as this one?
- Was this kind of mixed methods research something that informed also other areas of your research and work, perhaps in other therapeutic areas?
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