

Daily Quality-of-life Impact of Scars: An Interview-based Foundational Study of Patient-reported Themes

Ji-Cheng Hsieh, BA
Amanda L. Maisel-Campbell, MD
Chitang J. Joshi, MD
Eric Zielinski, MD
Robert D. Galiano, MD, FACS

Background: Scars negatively impact mental health. Prior patient interview studies on cutaneous scars have elicited opinions pertaining to psychosocial effects, appearance, and symptoms. There remains a need for patient-reported opinions in broader contexts, including career and sexual well-being, to better understand patients' experiences with their cutaneous scars.

Methods: In this qualitative study, patients with cutaneous scars participated in semi-structured interviews. Transcripts were analyzed using a constant comparative approach using the data software QDAMiner, to generate a thematic framework encompassing patients' experience with cutaneous scars.

Results: In total, 37 patients aged 25–79 years (mean 45, SD 17.9) were interviewed. Patients presented with keloid (2/37, 5%), hypertrophic (5/37, 14%), atrophic (4/37, 11%), and linear surgical (18/37, 49%) scars. Opinions fell under 8 overarching themes. Patients spoke commonly about psychological and social well-being (references to the frequency of thinking about a scar and talking about scars with others were mentioned 56 times by 26 patients and 103 times by 29 patients, respectively, for example). Discussions of sexual well-being and career were elicited but rarer (references to feeling uncomfortable when naked and negative impacts on professional networking were mentioned 17 times by 7 patients and 5 times by 3 patients, respectively, for example).

Conclusions: The relationship between determinants of patients' opinions of their scars and their impact on quality-of-life is complex. These results expand upon the existing knowledge of the effects scars have on quality-of-life and can contribute to the development and validation of future scar outcome measures. (*Plast Reconstr Surg Glob Open* 2021;9:e3522; doi: [10.1097/GOX.0000000000003522](https://doi.org/10.1097/GOX.0000000000003522); Published online 15 April 2021.)

INTRODUCTION

Skin injury can trigger imperfect tissue repair, leading to scar formation.¹ In plastic surgery, the goal of most surgical interventions is improving quality-of-life rather than improving mortality, with outcomes research often measuring patient satisfaction.^{2,3} Assessment tools necessitate patient-centered analyses to measure subjective patient-reported outcomes. Mundy et al's⁴ review of patient-reported outcome measures (PROMs) for surgical and traumatic scars found 4 scales with a measure of quality-of-life: the Patient and Observer Scar Assessment

Scale,⁵ Bock Quality of Life Questionnaire for Patients with Keloid and Hypertrophic Scarring,⁶ Patient Scar Assessment Questionnaire,⁷ and Patient-Reported Impact of Scars Measure.^{4,8} No scale, however, was both constructed from patient interviews and included measures of scar appearance and symptoms.⁴ As described in Cano et al,⁹ patient interview data are the foundation of a modern PROM, and effective scar scales necessitate detailed patient interview data.

In prior interview studies, the assessment of quality-of-life in patients with cutaneous scarring has focused on psychosocial effects, scar appearance, and physical symptoms.^{10–12} Across multiple different scar types, locations, and etiologies, Brown et al¹⁰ reported 4 major psychosocial themes: low self-confidence, low mood, anger, and anxiety. In burn patients, Simons et al¹¹ reported 5 themes: physical and sensory symptoms, impact of burn scar

From the Division of Plastic and Reconstructive Surgery, Northwestern University, Chicago, Ill.

Received for publication May 15, 2020; accepted January 7, 2021.

*Drs Hsieh and Campbell contributed equally to this work.

Copyright © 2021 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of The American Society of Plastic Surgeons. This is an open-access article distributed under the terms of the [Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 \(CCBY-NC-ND\)](https://creativecommons.org/licenses/by-nc-nd/4.0/), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

DOI: [10.1097/GOX.0000000000003522](https://doi.org/10.1097/GOX.0000000000003522)

Disclosure: All the authors have no financial interest in relation to the content of this article.

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.

interventions, impact of burn scar symptoms, personal factors, and change over time. Klassen et al,¹³ in publishing patient interview data for their novel scale (the Scar-Q), reported subthemes organized under themes of scar appearance, psychosocial effects, and symptoms.¹³ Prior interview studies, however, are limited in scope. Factors such as attractiveness and obesity affect career success; sexual well-being has been tied to overall subjective well-being and quality-of-life; and some PROMs (such as the Body-QOL) do include a measure of sexual well-being.¹⁴⁻¹⁸ There remains a critical need to explore how scarring, especially in intimate or exposed/public areas, impacts patients' sexual well-being and career performance.

Our study serves to be primarily expository. Our study uses the face-to-face, one-on-one patient interview to elicit a broad framework of common quality-of-life themes and subthemes that patients living with cutaneous scars experience. The terms "theme" and "subtheme" were chosen to convey a nested structure. The framework includes psychological, social, appearance, and symptom themes; it also has themes in career and sexual well-being that have not been well explored.¹³ The goal of our study is to present interview data that draw more attention to the effects of scarring outside psychosocial and symptom themes. A wider understanding of quality-of-life factors leads to the creation of more comprehensive and appropriate scar assessment scales.

METHODS

Framework Construction

According to patient-reported outcome guidelines, a literature search of databases (including MEDLINE, PSYCHINFO, and PROQOLID) was completed, identifying quality-of-life questionnaires and issues relevant to scarring.¹⁹ Based on the issues identified in the literature search, a framework of themes and subthemes was constructed.

Study Subjects and Recruitment

Subjects were recruited via fliers placed around the Northwestern Medical Campus and at local businesses in Chicago, Illinois. Subjects were invited to participate if they were English-speaking, at least 18 years of age, and had at least 1 traumatic or surgical scar. The study was reviewed and approved by the Northwestern University IRB (Protocol #STU00097252).

Interviews

One trained interviewer conducted each one-on-one, semi-structured, qualitative interview according to the procedure outlined in Brédart et al.²⁰ Interviews were audio-recorded and transcribed verbatim for analysis. Questions were non-directed and open-ended. Interviewees were encouraged to describe their experience with their scar(s). Follow-up questions were asked to elicit further details regarding any unique aspects of a patient's experience. Interviews were loosely structured by a topic list inspired by the literature search to maintain consistent and adequate coverage of topic areas. Interviews concluded when all relevant topics had been adequately covered.

Data Analysis

Three readers (AM, KL, JH) reviewed the de-identified interview transcripts, with each interview read by at least 1 reader. Interviews were analyzed line-by-line, and all applicable quotations were coded with the appropriate subtheme. As the interviews were coded, new themes were added to the codebook; the codebook was appropriately reorganized; and older interviews were re-coded when necessary. The qualitative text analysis software QDA Miner, version 5 (Provalis Research, Montreal, Canada) was used to analyze the frequency of each subtheme. Each total count by subtheme represents the number of statements coded with that subtheme summed across all patient interviews. Total counts by theme were also determined by summing the subtheme frequencies in each theme. QDAMiner was chosen due to its prior use in multiple qualitative patient interview studies.²¹⁻²⁴

RESULTS

Subject recruitment aimed to maximize diversity in ethnicity, age, scar etiology, scar type, anatomic location of scar, and income status. Thirty-eight patients consented but 1 did not complete the interview. Of the 37 subjects interviewed, 76% (n = 28) were women, and the mean age was 45 (SD 17.9). Scars were most commonly postsurgical (68%) and located at the extremities (27%). Demographic and scar information from the study sample is summarized in [Tables 1 and 2](#).

Seventy subthemes emerged within a total of 8 themes: (1) psychological well-being, (2) social well-being, (3) attempts to conceal, (4) determinants of opinion of scar, (5) sexual well-being, (6) health/physical well-being, (7) career, and (8) overall satisfaction of scar. The comparable sizes between each theme are best represented in Supplemental Digital Content 1, with each cut representing the total counts by theme. Initial subthemes were inspired by the literature search, and additional subthemes were developed as interviews were coded to represent patterns of notable statements made by interviewees. (See [figure 1, Supplemental Digital Content 1](#), which displays the

Table 1. Demographics

Subject Demographic	Count	%
Gender		
Men	9	0.24
Women	28	0.76
Race		
White, non-Hispanic	17	0.46
African American	10	0.27
Asian American	3	0.08
Hispanic	4	0.11
Mixed	3	0.08
Education		
Secondary/high school	5	0.14
Some college	5	0.14
College degree	14	0.38
Postgraduate degree	13	0.35
Occupation		
Full-time employed	26	0.70
Part-time employed	2	0.05
Retired	6	0.16
Unemployed	1	0.03
On disability	2	0.05

Table 2. Scar Information

Scar Measure	Count	%
Fitzpatrick skin type		
Type I	0	0.00
Type II	2	0.05
Type III	7	0.19
Type IV	15	0.41
Type V	9	0.24
Type VI	3	0.08
Not collected	1	0.03
Scar etiology		
Surgery	25	0.68
Accidental injury	6	0.16
Acne scar	5	0.14
Other medical condition	1	0.03
Scar location		
Face	9	0.20
Neck	1	0.02
Extremities	12	0.27
Trunk	10	0.22
Breasts	7	0.16
Unknown	6	0.13
Scar type		
Keloid	2	0.05
Linear	18	0.49
Hypertrophic	5	0.14
Atrophic	4	0.11
Multiple	5	0.14
Not collected	2	0.05
Other	1	0.03
Degree of scar impact		
Low	11	0.30
Moderate	15	0.41
Moderate-severe	7	0.19
Severe	4	0.11

total counts by theme. Total counts by theme were calculated by summing the total counts of all subthemes within a theme. This figure more accurately illustrates the size, in terms of total count per theme, of each theme relative to others. <http://links.lww.com/PRSGO/B617>.)

Table 3 contains the most frequently appearing 10 subthemes with the highest total counts, in descending order. Supplemental Digital Content 2 illustrates total counts by subtheme, and Supplemental Digital Content 3 illustrates the percentage of patients by subtheme who had made a reference to that subtheme at least once. (See **figure 2**, **Supplemental Digital Content 2**, which shows that each interview was coded by assigning one or more subthemes to relevant quotations throughout the entire interview transcript. The figure illustrates all 70 subthemes with their corresponding frequencies, represented as a total count. Subthemes are organized by color into the 8 major themes. <http://links.lww.com/PRSGO/B618>.) (See **figure 3**,

Supplemental Digital Content 3, which displays illustration of the percentages of patients, by subtheme, who made at least 1 statement referencing that subtheme during their interview. Subthemes are organized by color into the 8 major themes. <http://links.lww.com/PRSGO/B619>.)

Supplemental Digital Content 4 contains the final codebook of themes and subthemes. (See **table 1**, **Supplemental Digital Content 4**, which displays the themes and subthemes list. <http://links.lww.com/PRSGO/B620>.) Example quotations under specific common subthemes are located in Supplemental Digital Content 5.) (See **table 2**, **Supplemental Digital Content 5**, which displays selected patient quotations. <http://links.lww.com/PRSGO/B621>.)

Theme #1: Psychological Well-being

Psychological well-being contained 20 subthemes. The most common subthemes were frequency of thinking about the scar, scar as a reminder, and impact on self-image. References to the frequency of thinking about a scar were mentioned 56 times by 26 of 37 patients.

The scar serving as a reminder of a past injury or other (often traumatic) experience that resulted in the scar was mentioned 53 times by 24 patients. Effects on self-image were commonly reported (mentioned 67 times by 22 patients), with patients reporting a negative impact such as feeling ugly and ashamed that others have to see them.

Theme #2: Social Well-being

Social well-being contained 11 subthemes. The most common subthemes were talking about the scar with others, reaction of others, and clothing limitations. References to talking about their scars totaled 103 times by 29 patients. Some patients felt that scar-related questions from others were intrusive. Unsolicited opinions offered by others, no matter how well intentioned, often made the patient uncomfortable (mentioned 13 times by 5 patients). A few patients welcomed the opportunity to discuss their scar with others (mentioned 4 times by 3 patients).

References to the reactions of others had totaled 53 times by 22 patients. Negative comments made by both loved ones or strangers intensified patients' desires to hide their scars and avoid social interaction. References to clothing limitations totaled 56 times by 16 patients. Patients often reported feeling limited in the clothing that they could wear to social events.

Table 3. Top 10 Subthemes with the Greatest Total Count of Times Mentioned

Theme	Subtheme	Total Count of Times Mentioned	Total Count of Patients Who Mentioned the Theme
Determinants of opinion of scar	Scar parameters/aesthetic features	359	34
Determinants of opinion of scar	Noticeability of scar	175	32
Overall satisfaction with scar	Dislike/dissatisfied	146	30
Determinants of opinion of scar	Scar etiology	118	32
Health/physical well-being	Negative impact of underlying condition	118	30
Attempts to conceal or improve	Scar treatment	117	28
Social well-being	Talking about scar	103	29
Determinants of opinion of scar	Location of scar	103	33
Determinants of opinion of scar	Duration of time passed	95	30

Theme #3: Attempts to Conceal

Attempts to conceal contained 5 subthemes. The most common subthemes were scar treatment; conceal with clothing, make-up, hair, or other temporary measures; and inability to conceal. Patients often spoke about the various scar treatment modalities they have tried in an effort to improve their scar (mentioned 117 times by 28 patients). Patients also discussed measures to make sure their scars were concealed in public and the burden of ensuring the scar remained covered (mentioned 59 times by 23 patients). Some patients with certain scars, particularly those on the face, were frustrated by the inability to effectively conceal them (mentioned 15 times by 8 patients).

Theme #4: Determinants of Opinion of Scar

Determinants of patients' opinions of their scars contained 15 subthemes. The most common were scar parameters/aesthetic features, location of scar, and noticeability of scar. All references to the physical and aesthetic appearance of the scar totaled 359 times by 34 patients.

The most commonly mentioned physical scar attributes included:

- Color (mentioned 116 times by 27 patients);
- Size (mentioned 91 times by 28 patients);
- Shape (mentioned 26 times by 13 patients), texture/contour (mentioned 24 times by 10 patients), asymmetry (mentioned 13 times by 9 patients);
- Bulging of surrounding skin (mentioned 11 times by 3 patients);
- Shininess (mentioned 5 times by 3 patients); and
- Lack of hair (mentioned 3 times by 3 patients).

All references to the location of the scar totaled 103 times by 33 patients. Some patients discussed their scar being in a frequently exposed (mentioned 51 times by 21 patients) or intimate area of the body (mentioned 20 times by 11 patients). Some patients spoke about how noticeable their scar was to others (mentioned 175 times by 32 patients).

Theme #5: Sexual Well-being

Sexual well-being contained 7 subthemes. The most common subthemes were discomfort when naked, sexual self-consciousness, and scar location. Patients reported feeling self-conscious, particularly when undressing. An estimated 7 patients mentioned feeling uncomfortable when naked 17 times; 7 patients mentioned 13 times feelings of self-consciousness, inadequacy and unattractiveness during intimate moments. Scar location was also brought up by patients (mentioned 9 times by 6 patients) in the context of sexual well-being, especially by those with scars on the face or in intimate areas of the body.

Theme #6: Health/Physical Well-being

Health/physical well-being contained 6 subthemes. The most common subthemes were the negative impact of the underlying condition, symptoms, and functional abilities. In total, 26 patients acquired their scars as a result of illness or surgery. Patients often discussed the other negative effects of underlying health conditions or treatments

that were associated with or contributed to their scarring (mentioned 118 times by 30 patients). Symptoms of scars were mentioned 53 times by 25 patients. The most commonly reported physical symptoms pertaining to the patients' scars were itchiness and pain (mentioned 8 times by 7 patients and 10 times by 6 patients, respectively). Limitation of functional ability was often brought up (mentioned 12 times by 5 patients) in the context of scars causing pain or decreased range of motion due to skin tightness.

Theme #7: Career

Career contained 3 subthemes. Hindrance of professional aspirations was the most common subtheme. Patients discussed the negative effect their scar had on professional networking and workplace interactions (mentioned 5 times by 3 patients).

Theme #8: Overall Satisfaction with Scar

Overall satisfaction with scar contained 3 subthemes. Negative comments outnumbered positive comments [146 mentions by 30 patients (81.08%) as opposed to 54 mentions by 16 patients (43.24%)]. Positive comments focused on accepting the existence of the scars and growing to like them over time (mentioned 5 times by 2 patients).

DISCUSSION

Prior studies have illustrated the negative psychosocial impact of scars.^{10,25,26} Our study sought to elicit the effects scars have on patients to create a more comprehensive framework of commonalities, or themes, reported by patients living with various types of cutaneous scars. Our study confirmed that scars impact patients' psychological, social, physical, and sexual well-being. Our results are also the first to report the long-lasting impacts cutaneous scars can have on patients in regard to career advancement and performance in the workplace, as well as sexual intimacy and relationships. Additionally, our study explored symptoms of scarring not related to the scar itself, but the underlying illness or treatments related to scarring. This finding encourages future PROM development specifically measuring the effect of scarring on career and sexual intimacy, particularly for contextually relevant inguinal, breast, and facial scars. Our findings of the determinants of satisfaction with a scar also offer important insights to physicians and may improve patient scar consultation.

A variety of patients were interviewed, who presented with scars of various etiologies, types, and anatomical locations, with both positive and negative views, to encompass the broad spectrum of patient experiences. The face-to-face, one-to-one semi-structured patient interview with quantitative data analysis was utilized as recommended by Cano et al⁹ and in line with prior studies utilizing the same method.^{11,13} The program QDAMiner was chosen for several reasons. QDAMiner has been utilized in multiple prior contexts to analyze interview data.^{21-24,27} Since our study collected interview data and our data analysis required measuring frequencies of particular themes associated with specific wording and contextual

meaning, QDAMiner was an appropriate choice for the data. Ultimately, our interview data serve to complement literature reviews, such as that by Ziolkowski et al.²⁸

Our qualitative study benefitted from a sample of >30 patients, ensuring that >99% saturation of themes had occurred.²⁹ However, there were several limitations of this study. The sample size was objectively small, with a wide variety of scar etiologies and locations represented. Subjects were volunteers who presented to a single academic center from a midwestern urban area. Cultural differences across different communities in the United States can affect patients' experience with their scars, and the findings should be confirmed with other populations.³⁰ Although this study provides a preliminary initial framework for scars as a whole, additional qualitative studies are needed to further investigate differences between specific populations and scar types, with more stringent inclusion criteria for factors such as patient age, scar location, scar size, and scar etiology.

The data generated leave many avenues for future study. For certain themes, such as social well-being and overall satisfaction of scar, there were opposing subthemes. Examples include feeling open to discussing one's scar with others versus feeling insecure about any mention of one's scar and having an overall positive versus negative perception of the scar. However, just how exactly are people open to conversation regarding their scar, or just how much do they like (or hate) their scars? Certain subthemes can be adapted into a scale with negative and positive values that produce quantifiable data that can be subject to more rigorous statistical analyses, similar to that done in a prior study by Robert et al with burn scars.²⁶

With other subthemes, such as "pictures" (having a picture taken) to "talking about scar" (having to converse about one's scar), intensity can be quantified using existing psychosocial measures such as for anxiety or depression. Assessment of the psychosocial response quantifies the subjective impact of scars on psychosocial health and can help identify the most pertinent factors involved in one's mental health and success or failure in coping. Furthermore, these data can be compared with typical objective scar measurement data, such as size, height, color, pliability, and depth with machinery.³¹ A concern remains regarding the difference between themes with a high total count versus themes that were mentioned infrequently, but at least once, by the majority of patients. A few patients repeated the same theme multiple times during the interview, with other patients never mentioning it at all. This could indicate that other background demographics or sociocultural factors led to these patients finding a particular theme highly distressing, while others did not. By comparison, a theme mentioned only once or twice per interview, but mentioned by the majority of patients, likely indicates a quality-of-life effect shared among most patients with cutaneous scarring that elicits low levels of distress. Ultimately, future research assessing the intensity of a particular mentioned theme for each particular patient can help better quantify the total, average intensity of a quality-of-life effect across all patients.

Future research may also investigate the relationship of these intensities with mental health diagnoses such as anxiety, depression, or PTSD.

With the recent development and current field testing of the Scar-Q,¹³ there is excellent work underway toward developing a PROM suitable for assessing scars. Similar to our findings, the study by Klassen et al found that psychological well-being and social well-being as well as both appearance and symptoms were important themes of the patient experience living with scars.¹³ In our patient population, however, unique themes such as determinants of opinion of scar, career, and sexual well-being were elicited. Sexual well-being and career performance are important yet neglected themes with which scars should be assessed. The construction of this preliminary framework will serve to inform clinicians and provide a suitable foundation for the development and improvement of scar scales that will better help physicians judge the effects of non-cosmetic and cosmetic surgical procedures and scar-revision surgeries, and better inform their clinical judgment regarding whether patients should undergo these procedures.

Robert D. Galiano, MD, FACS
Galter 19-250, 675 N. St. Clair St.
Chicago, IL 60611
E-mail: rgaliano@nm.org

REFERENCES

1. Bayat A, McGrouther DA, Ferguson MW. Skin scarring. *BMJ*. 2003;326:88–92.
2. Cano SJ, Browne JP, Lamping DL. Patient-based measures of outcome in plastic surgery: current approaches and future directions. *Br J Plast Surg*. 2004;57:1–11.
3. Pusic AL, Klassen AF, Scott AM, et al. Development of a new patient-reported outcome measure for breast surgery: the BREAST-Q. *Plast Reconstr Surg*. 2009;124:345–353.
4. Mundy LR, Miller HC, Klassen AF, et al. Patient-reported outcome instruments for surgical and traumatic scars: a systematic review of their development, content, and psychometric validation. *Aesthetic Plast Surg*. 2016;40:792–800.
5. Draaijers LJ, Tempelman FR, Botman YA, et al. The patient and observer scar assessment scale: a reliable and feasible tool for scar evaluation. *Plast Reconstr Surg*. 2004;113:1960–5; discussion 1966.
6. Bock O, Schmid-Ott G, Malewski P, et al. Quality of life of patients with keloid and hypertrophic scarring. *Arch Dermatol Res*. 2006;297:433–438.
7. Durani P, McGrouther DA, Ferguson MW. The patient scar assessment questionnaire: a reliable and valid patient-reported outcomes measure for linear scars. *Plast Reconstr Surg*. 2009;123:1481–1489.
8. Brown BC, McKenna SP, Solomon M, et al. The patient-reported impact of scars measure: development and validation. *Plast Reconstr Surg*. 2010;125:1439–1449.
9. Cano SJ, Klassen A, Pusic AL. The science behind quality-of-life measurement: a primer for plastic surgeons. *Plast Reconstr Surg*. 2009;123:98e–106e.
10. Brown BC, McKenna SP, Siddhi K, et al. The hidden cost of skin scars: quality of life after skin scarring. *J Plast Reconstr Aesthet Surg*. 2008;61:1049–1058.
11. Simons M, Price N, Kimble R, et al. Patient experiences of burn scars in adults and children and development of a health-related quality of life conceptual model: a qualitative study. *Burns*. 2016;42:620–632.

12. Klassen AF, Pusic AL, Scott A, et al. Satisfaction and quality of life in women who undergo breast surgery: a qualitative study. *BMC Womens Health*. 2009;9:11.
13. Klassen AF, Ziolkowski N, Mundy LR, et al. Development of a new patient-reported outcome instrument to evaluate treatments for scars: the SCAR-Q. *Plast Reconstr Surg Glob Open*. 2018;6:e1672.
14. Lee DM, Vanhoutte B, Nazroo J, et al. Sexual health and positive subjective well-being in partnered older men and women. *J Gerontol B Psychol Sci Soc Sci*. 2016;71:698–710.
15. O'Brien KS, Latner JD, Ebnetter D, et al. Obesity discrimination: the role of physical appearance, personal ideology, and anti-fat prejudice. *Int J Obes (Lond)*. 2013;37:455–460.
16. Dietl E, Rule N, Blickle G. Core self-evaluations mediate the association between leaders' facial appearance and their professional success: adults' and children's perceptions. *Leadership Quarterly*. 2018;29:476–488.
17. Converse PD, Thackray M, Piccone K, et al. Integrating self-control with physical attractiveness and cognitive ability to examine pathways to career success. *J Occup Organ Psychol*. 2016;89:73–91.
18. Danilla S, Cuevas P, Aedo S, et al. Introducing the body-QoL: a new patient-reported outcome instrument for measuring body satisfaction-related quality of life in aesthetic and post-bariatric body contouring patients. *Aesthetic Plast Surg*. 2016;40:19–29.
19. Aaronson N, Alonso J, Burnam A, et al. Assessing health status and quality-of-life instruments: attributes and review criteria. *Qual Life Res*. 2002;11:193–205.
20. Brédart A, Marrel A, Abetz-Webb L, et al. Interviewing to develop patient-reported outcome (PRO) measures for clinical research: eliciting patients' experience. *Health Qual Life Outcomes*. 2014;12:15.
21. Turrentine FE, Dreisbach CN, St Ivany AR, et al. Influence of gender on surgical residency applicants' recommendation letters. *J Am Coll Surg*. 2019;228:356–365.e3.
22. Ag Ahmed MA, Hamelin-Brabant L, Gagnon MP. Sociocultural determinants of nomadic women's utilization of assisted childbirth in Gossi, Mali: a qualitative study. *BMC Pregnancy Childbirth*. 2018;18:388.
23. Carabali M, Hernandez LM, Arauz MJ, et al. Why are people with dengue dying? A scoping review of determinants for dengue mortality. *BMC Infect Dis*. 2015;15:301.
24. Saré D, Pérez D, Somé PA, et al. Community-based dengue control intervention in Ouagadougou: intervention theory and implementation fidelity. *Glob Health Res Policy*. 2018;3:21.
25. Tedstone JE, Tarrier N. An investigation of the prevalence of psychological morbidity in burn-injured patients. *Burns*. 1997;23:550–554.
26. Robert R, Meyer W, Bishop S, et al. Disfiguring burn scars and adolescent self-esteem. *Burns*. 1999;25:581–585.
27. Tiwari T, Rai N, Colmenero E, et al. A community-based participatory research approach to understand urban latino parent's oral health knowledge and beliefs. *Int J Dent*. 2017;2017:9418305.
28. Ziolkowski N, Kitto SC, Jeong D, et al. Psychosocial and quality of life impact of scars in the surgical, traumatic and burn populations: a scoping review protocol. *BMJ Open*. 2019;9:e021289.
29. Turner-Bowker DM, Lamoureux RE, Stokes J, et al. Informing a priori sample size estimation in qualitative concept elicitation interview studies for clinical outcome assessment instrument development. *Value Health*. 2018;21:839–842.
30. Henry M. Cosmetic concerns among ethnic men. *Dermatol Clin*. 2018;36:11–16.
31. Perry DM, McGrouther DA, Bayat A. Current tools for noninvasive objective assessment of skin scars. *Plast Reconstr Surg*. 2010;126:912–923.