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Content Validity of a Novel Scar Assessment Tool Evaluating the Career and Sexual Well-being Impact of Scars

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Background: Currently, patient reported outcome scales used to assess scar impact focus solely on psychosocial well-being, symptoms, and appearance. There remains a need to develop a broadened measure of scar impact on patients, focusing on sexual and career aspects. This study investigates the content validity of the novel Career and Sexual Well-being (CS) Scar Impact Scale.

Method: The CS scale contains five questions and was developed from previous patient thematic analysis interviews describing scar impact, and covers self-conscious behavior, new partners, hiding of the scar, being hindered in the workplace, and concerns regarding unprofessional appearance. Cognitive interviews and established guidelines were used to ensure that the scale was comprehensive, reproducible, and easily understandable.

Results: In total, 86 patients completed cognitive interviews. Patients had a clear understanding of the questions and elicited their intent in the interviews. An estimated 86% of patients rated the CS scale coverage of scar impact on career and sexual health at a three or above out of four; 95% said the specific instructions were clear, and 92% stated it took them less than 4 minutes to complete the scale. After the first round of interviews, a question about "perception/self-consciousness in a professional environment" was added based on patient suggestions.

Conclusions: The CS scar scale demonstrated face validity, acceptability, and field-readiness through cognitive interviewing of patients at our institution. Sexual well-being and career performance are important yet often neglected themes with which scars should be assessed. Usage of these tools would serve to improve current scar scales. *(Plast Reconstr Surg Glob Open 2023; 11:e5118; doi: 10.1097/GOX.0000000000005118; Published online 12 July 2023.)*

INTRODUCTION

It is evident that scars can negatively impact patients through lowered self-confidence and body image, anxiety and depression, as well as worsened social interactions.[1] To better understand the effect of scarring on patients after surgery, patient reported outcome (PRO) measurements are utilized. There are many existing scales that focus on psychosocial well-being, symptoms, and appearance, such as the Patients and Observer Scar Assessment Scale, Bock Quality of Life Questionnaire for Patients with Keloid and Hypertrophic Scarring (Bock), Patient Scar Assessment Questionnaire, and Patient-Reported Impact of Scars Measure.[2]

Content elicitation is the first step in the creation of a PRO tool. Our team recently created a framework of scar-impact themes directly from patient interviews to cover a broadened spectrum of quality-of-life themes, including psychosocial well-being, social well-being, attempts to conceal, determinants of opinion of scar, sexual well-being, health/physical well-being, career, and overall satisfaction with scar.[3] Scar themes related to career and sexual well-being, which included the subthemes of sexual self-conscious, new partners, hiding, hindered, and unprofessional appearance, were elicited.[3] There remains a need to develop a broadened measure of scar impact on patients

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focusing on sexual and career aspects that have not been studied before.

This study focuses on the next steps of PRO development, which include questionnaire creation and content validation. In this study, CS scale questions were constructed in a manner that was consistent with patient expressions recorded in the content elicitation process, deemed important by other studies.[2,4,5] The questions also reflect different levels of magnitude, represent a single concept, and can change with treatment. Content validation is required to determine whether an assessment tool is comprehensive in a patient population, and is conducted through cognitive interviews. Cognitive interviews serve as an excellent method of evaluating content validity of PRO assessment tools by assessing how subjects interpret questions in the questionnaire. Guidelines have been established for the evaluation of question wording, instructions, and response options.[4]

This study investigates the content validity of the Career and Sexual Well-being (CS) Scar Impact Scale developed from overarching themes related to career and sexual well-being. Future steps will be field testing of the scar scale for analysis of psychometric properties. The objective of the study is to conduct a content validation analysis of the questionnaire to ensure that the instrument is comprehensive in the target population.

Takeaways

Question: What is the content validity of a new scar assessment scale covering the career and sexual well-being impact of scars?

Findings: The Career and Sexual Well-being Scar Impact Scale was adapted and demonstrated face validity, acceptability, and field-readiness through cognitive interviewing of patients at our institution.

Meaning: Sexual well-being and career performance are important yet often neglected themes with which scars should be assessed. Usage of the Career and Sexual Well-being Scar Impact Scale would serve to improve current scar scales.

METHODS

Study Subjects

The study was reviewed and approved by the institutional review board (STU00212545). The population of subjects being interviewed was a representative sample of patients having scars from different cosmetic surgery procedures and coming from different backgrounds. The ages of the patient population ranged from 19 to 93 years and averaged 47 years. Patients were of female and male gender and Asian, Black/African American, Hispanic or Latino, and White ethnicity/race. The population underwent a variety of procedure types, including breast reduction, nose reconstruction, blepharoplasty, abdominoplasty, lipectomy, and other procedures involving the face and lower extremities. Articles outlining cognitive interview suggest that seven to 10 interviews would be sufficient to confirm patient comprehension; however, due to the diversity of the population and complexity of the concepts elicited from the interviews, 87 patients were interviewed in this process.[5] Subjects were recruited from the institution's hospital by directly emailing patients. Patients who were English-speaking and at least 18 years of age were included in the study.

Cognitive Interviews

Tables 1 and 2 depict the development of the CS scale. Two interviewers trained in the cognitive interview design and protocols conducted the interviews. Cognitive interviews were completed for online questionnaires as well as questionnaires completed over the phone. The goal of the interviews was to understand subjects' interpretations and understanding of the questions being asked of them. Table 3 describes questions that were asked for each aspect of the scar questionnaire, including the instructions, ability of patients to recall experiences, question comprehension, response options, content coverage, format, and the length of the questionnaire from the guidelines by Patrick et al.[4] The questions encouraged subjects to use the "think aloud" technique when going through questionnaire items to understand patients' perceptions of item focus and comprehension.[5] The interviews were recorded and transcribed.

Revision of PRO Instrument

The first round of 15 interviews was conducted and revisions were made. The next round of 50 interviews was conducted and suggestions were identified. An additional question was added, and revisions were made to the questionnaire. A final round of 22 cognitive interviews was conducted. Cognitive interviews concluded when there was sufficient evidence that no concerns remained regarding

Table 1. Creation of Career and Sexual Well-being Scale from Scar Themes

Theme[3]	Question to be Converted to CS Scale	Subthemes[3]
Sexual well-being	Do you feel self-conscious or uncomfortable during sexual encounters due to the scar?	Sexual self-conscious, new partners
	Do you make attempts to cover the scar during sexual encounters or make the scar less visible, such as with lighting adjustments?	Hiding
Career	Do you feel that you have been hindered or held back in your career due to insecurities about your scar?	Hindered
	Do you feel that your scar causes you to appear unprofessional?	Unprofessional appearance

Table 2. Career and Sexual Well-being Scar Impact Scale (Instructions: Please Answer Questions with How You Feel in the Present)

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
Sexual well-being				
1. I feel self-conscious or uncomfortable during sexual encounters due to the scar	1	2	3	4
2. I make attempts to cover the scar during sexual encounters or make the scar less visible, such as with lighting adjustments	1	2	3	4
Career				
3. I feel that I have been hindered or held back in my career due to insecurities about my scar	1	2	3	4
4. I feel that my scar causes me to appear unprofessional.	1	2	3	4
5. I feel self-conscious about my scar in a professional environment	1	2	3	4

Table 3. Cognitive Interview Questions Asked to Patients

Aspect of Scar Scale	Cognitive Interview Questions
Instructions: Patients' understanding and interpretation of instructions given for questionnaire	How easy were the instructions to understand? (scale of 1–4) Was any part of the instructions confusing? If so, please explain. Are there specific words or phrases that you would change about the instructions? If so, please explain.
Recall: How patients retrieve relevant information from memory	What time period did you think of when reading the instructions?
Question comprehension: Patient's perception of question clarity	What does statement [item #] on the CS scale above mean to you in your own words?
Response options: How patients understand response options and select response choice	What does the 1–4 scale mean to you? What does a 1 versus 2 versus a 3 versus a 4 represent? In thinking about your own experiences, which numbers would you choose for each question and why?
Content coverage: Evaluate whether content is comprehensive and ensure concepts are not missing	What other experiences with scarring and career or sexual health were not covered in these questions? How well did the Career and Sexual Well-being (CS) Scar Impact Scale cover your career and sexual health related experiences with scars? (scale 1–4)
Format: Patient's difficulty with presentation of the questionnaire	Would you change anything about the CS scale to make it easier to complete?
Length: Patient's perception of length of time to complete questionnaire	Approximately how long did it take you to answer the CS scale? What did you think about the amount of time it took to complete only the CS scale? (scale 1–4)

patient comprehension. We used *t* tests to calculate significant differences between the means of cosmetic and reconstructive patient data.

RESULTS

A total of 87 patients were interviewed, of which 65 patients underwent cosmetic and 22 patients underwent reconstructive procedures. Ninety-one percent of patients were women and 9% were men. Thirty-five percent of patients were between the ages 20 and 35, 34% were between 35 and 50, and 31% were older than 50. Supplemental Digital Content 1 presents a summary of patient responses to the CS scale instructions, recall, content coverage, format, and length. (**See table, Supplemental Digital Content 1**, which shows a summary of responses to inquiries regarding instructions, recall, content coverage, format, and length. **http://links.lww.com/PRSGO/C654**.)

Instructions

Patients were asked how easy the instructions were to understand on a scale of 1 to 4, with 4 being "extremely easy" and 1 being "extremely difficult. Cosmetic patients on average rated them 3.6 out of 4 and reconstructive patients 3.9 out of 4 (P = 0.087; Fig. 1). Furthermore, 95% of cosmetic patients and 100% of reconstructive patients said the instructions were not confusing. Ninety-seven percent of cosmetic patients and 100% of reconstructive patients said that they would not change any parts of the instructions. Only one suggestion was given for the instructions, which was to include an explanation of which number correlates to which level of agreement (**Supplemental Digital Content 1, http://links.lww.com/PRSGO/C654**).

Content Coverage

When responding to how well the CS scale covered their experiences on a scale of 1 to 4 (where 4 represented "well" and 1 represented "poorly"), cosmetic patients rated the coverage 3.2 on average out of 4 and reconstructive patients rated 3.5 out of 4 (P = 0.224; Fig. 2).

Length

Of respondents to questions regarding length, 95% of cosmetic patients and 88% of reconstructive patients said that it took them less than 4 minutes to complete the CS scale (Fig. 3). Cosmetic patients rated the length of the CS scale a 3.5 out of 4, and reconstructive patients a 3.7 out of 4, where 1 represented "too long" and 4 represented "not too much time" (P = 0.489).

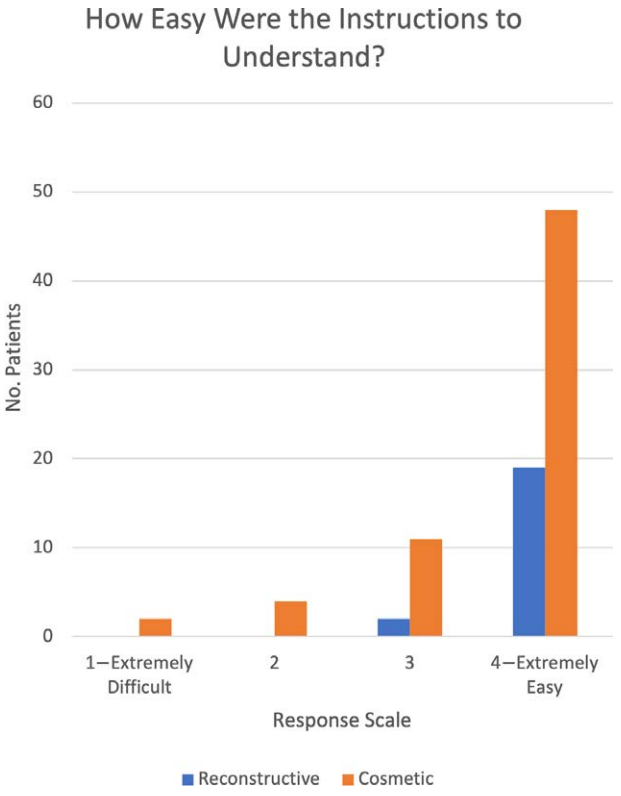

Fig. 1. Patient responses to instructions comprehension.

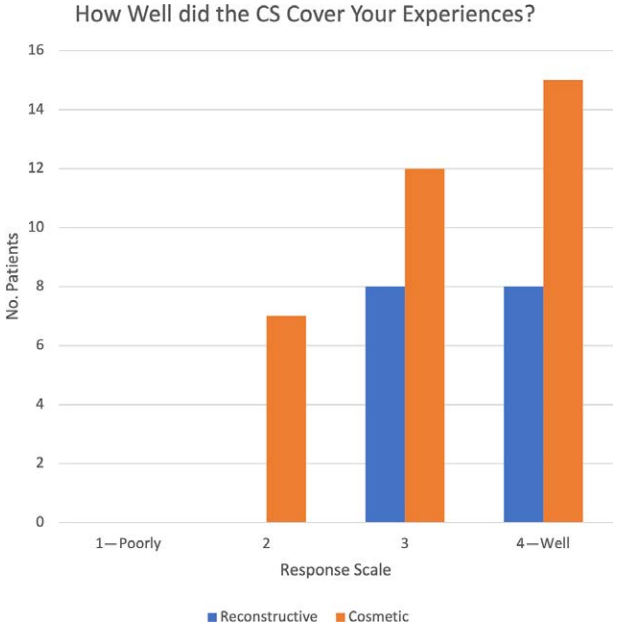

Fig. 2. Patient responses to CS scale coverage.

Item Comprehension and Revision Process

Patient interpretations of items and suggestions are presented in Supplemental Digital Content 2. (**See table, Supplemental Digital Content 2,** which shows summary of responses to inquiries regarding item content and comprehension. http://links.lww.com/PRSGO/C655.) During round two of the cognitive interviews, a suggestion was given to include a new question regarding self-consciousness in a professional environment. No suggestions for revision were given by any patient for the first four items.

DISCUSSION

Prior literature has demonstrated the negative psychosocial impact of scars.[6–8] Even mild scarring can evoke substantial emotional, social, and functional concerns.[6] The present study demonstrated the face validity and acceptability of our career and sexual well-being scar scales. In prior interview studies, the assessment of quality-of-life in relation to scarring has primarily focused on psychosocial effects, physical symptoms, and scar appearance.[8,9] Klassen et al provided an excellent PROM scar scale (SCAR-Q) suitable for accessing these three factors.[10] However, in prior interview studies by our team within our patient population, unique themes such as determinants of opinion of scar, career, and sexual well-being were elicited.[3] Sexual well-being and career performance are important yet often neglected themes with which scars should be assessed. For the ability to assess a wide population with our PRO, our study included patients of a variety of backgrounds. Patients ranged from 19 to 93 years old, were of female and male gender, and were of Asian, Black/African American, Hispanic or Latino, and White ethnicities. The scar themes of career and sexual well-being can apply to a wide range of adults with a scar. The current career and sexual well-being scale consists of five questions built upon a qualitative thematic analysis from patient interviews. Subthemes represented within sexual well-being included self-conscious behavior, new partners, and hiding of the scar. Subthemes portrayed in the career-based questions included being hindered in the workplace as well as concerns regarding unprofessional appearance. Therefore, the purpose of this validation study is emphasizing the importance of career and sexual well-being and thus continually improving existing scar scales.

Importantly, patients were asked to comment on question-and-answer choice clarity. Among the 86 patients, 95% said the instructions were not confusing, and 97% said they would not alter the instructions of any questions. Overall, patients found the scales easy to answer and denied any confusion with the phrasing of the instructions. Within the first round of interviews, only one suggestion was given, which was for the scale to include a more thorough explanation of which number correlates to which level of agreement. Similarly, given the five-question nature of the scale, format and length were not concerns, with 92% stating it took them less than 4 minutes to complete the scale in its entirety. A majority of patients felt that the scale did not take too much time and, thus, we feel that the time investment is acceptable to fill out the CS scale to create a better understanding of scar impact for the patient and physician. Most importantly, patients had a clear understanding of the questions' intent. They

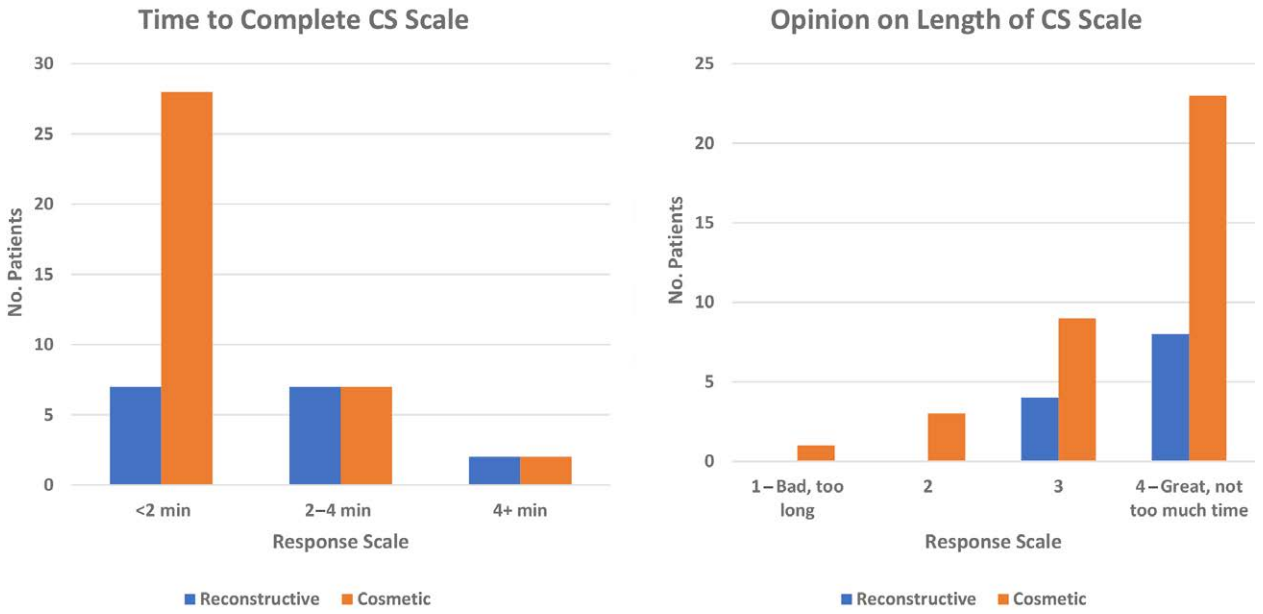

Fig. 3. Patient responses on time to complete CS scale.

elicited how questions asked about scars affecting their self-conscious attitudes, affecting their workplace environment, and resulting in people making subconscious judgments about them. No patient required clarification for question interpretation.

There were a few suggestions for changes that could have been made to the scales, though few were judged to qualify for revision. A patient expressed concern that there should be a neutral option (having a five-number scale with three as a middle option). However, another patient commented that "Only four-point scales offer validity. It precludes people from using the true middle as a way to elude." This was in alignment with our team's judgment to maintain the four-point scale. In regard to question content, patients did not elicit concern about the questions being too sensitive and felt that it captured their experiences. Specifically, 86% rated the content coverage at a 3 or above out of 4. After the first round of cognitive interviews, one patient specifically requested our team to "Ask a question about the perception/self-consciousness in a professional environment." Another patient had requested to expand on our question regarding sexual confidence. They had asked to alter the question to read as follows: "To see how having plastic surgery has improved sexual confidence?" The first question was implemented into the second round of cognitive interviews (Table 2), whereby patients felt the addition of this question added to the merit of the scar scale. The latter was not implemented because the goal of the study was to assess the individual's perception of his or her scar at one point in time rather than conducting a longitudinal analysis.

This study focused on performing a content validation of the CS scale. Currently, there are no scar scales that ask patients about their career and sexual well-being. The scale adds value to the assessment of significance that the scar plays in the patient's life, which also furthers the physician's understanding of the scar impact. Clinicians must consider assessment from the patient as well. The CS scale should be used as a supplement to existing scar assessment tools to better understand the impact of a patient's scar on their quality-of-life and inform treatment decisions between the patient and physician. The SCAR-Q scale follows a similar Likert scale from 1 to 4 and would be an appropriate scale to use in conjunction with the CS scale. The SCAR-Q focuses on scar appearance, physical, and psychosocial impact entirely from the patient's perspective, and thus, the addition of the CS scale with the SCAR-Q would allow for a more holistic understanding of scar impact on quality-of-life. Future studies may delineate how scar quality and location may be a factor in determining patient perception. It is also important to investigate how a combination of scar therapy and psychological treatments may improve scar perception in patients with lower scores.

There are some limitations within our study. We performed 87 cognitive interviews, and if we had conducted more, we may have found more suggestions or alterations within our questions. Regarding scar location, it was difficult to design the study with an equal number of patients per procedure, as many patients underwent multiple procedures. Forty-five percent of procedures in our patient population had breast scars from breast reduction, 20% had abdominal scars, 23% had facial scars, and 12% had extremity scars. Although a majority of patients did not have one type of procedure, there was not an equal number of patients per procedure. A limitation of our study is that a majority of the patients were of female gender, and thus, not all genders were represented equally. There were also no significant differences between cosmetic and reconstructive patient responses in this study, which may have been due to the small

sample sizes of each group. Furthermore, there exists a possibility for response bias whereby patients may answer questions differently given a physician was present during the interview. Additionally, although we presented the complete data with all suggestions and comments, every patient did not answer every single question. This was because every patient had the option to skip any question or end the interview early without further questioning from our interview team.

CONCLUSIONS

In this study, we adapted the CS scar scale and demonstrated face validity, acceptability, and field-readiness of this scale through cognitive interviewing of patients at our institution. Sexual well-being and career performance are important yet often neglected themes with which scars should be assessed. Usage of these tools would serve to improve current scar scales.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

REFERENCES

1. Ngaage M, Agius M. The psychology of scars: a mini-review. *Psychiatr Danub.* 2018;30:633–638.
2. 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.
3. Hsieh J-C, Maisel-Campbell AL, Joshi CJ, et al. Daily quality-of-life impact of scars: an interview-based foundational study of patient-reported themes. *Plast Reconstr Surg Glob Open.* 2021;9:e3522.
4. Patrick DL, Burke LB, Gwaltney CJ, et al. Content validity—establishing and reporting the evidence in newly developed patient-reported outcomes (PRO) instruments for medical product evaluation: ISPOR PRO good research practices task force report: part 2—assessing respondent understanding. *Value Health.* 2011;14:978–988.
5. Kucan L, Beck IL. Thinking aloud and reading comprehension research: inquiry, instruction, and social interaction. *Rev Educ Res.* 1997;67:271–299.
6. Robert R, Meyer W, Bishop S, et al. Disfiguring burn scars and adolescent self-esteem. *Burns.* 1999;25:581–585.
7. Tedstone JE, Tarrier N. An investigation of the prevalence of psychological morbidity in burn-injured patients. *Burns.* 1997;23:550–554.
8. 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.
9. 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.
10. 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.