Patient-reported quality of life and aesthetic satisfaction continues to improve for 1-year after Mohs surgery: A multicenter prospective cohort study

Inge J. Veldhuizen, MD, PhD,[a] Stephen W. Dusza, DrPH,[a] Alyce Kuo, MD,[a] Abdullah Aleisa, MD,[b] Elliot Blue, MD,[c] Sushmita Adhikari, BS,[c] Umer Nadir, BS,[d] Kim Le, BS,[d] Soroush Kazemi, MD,[e] Adam V. Sutton, MD,[c] Rajiv I. Nijhawan, MD,[d] Daniel B. Eisen, MD,[e] Anthony M. Rossi, MD,[a] Divya Srivastava, MD,[d] Ashley Wysong, MD,[c] Kishwer S. Nehal, MD,[a] and Erica H. Lee, MD[a]

Background: Despite the growth in patient-centered care, multicenter prospective studies investigating satisfaction after skin cancer surgery are limited.

Objective: To assess trends in esthetic satisfaction, symptoms, and quality of life over 1 year in facial skin cancer patients.

Methods: Patients with facial skin cancer who underwent surgery were enrolled at 4 hospitals across the United States. A total of 990 patients were included. The FACE-Q Skin Cancer questionnaire was administered before surgery, at 2-week, 6-month, and 1-year intervals postsurgery.

Results: Patients reported increased satisfaction with FACE-Q scales over 1 year. Significant factors influencing outcomes included sex, age, history of facial skin cancer, cosmetic surgery, defect size, and cancer location. Males reported higher satisfaction with appearance ($P = .003$) and scar ($P < .001$), and reduced psychosocial distress ($P < .001$). Larger defects were associated with greater psychosocial distress ($P = .037$) and lower scar appraisal ($P = .008$). Patients with nose skin cancer reported lower satisfaction with appearance and scars ($P = .026$, $P < .001$), higher psychosocial distress ($P = .004$), and increased cancer worry ($P = .045$). Patients with cancer near the eyes reported increased cancer worry ($P = .004$). Reconstruction types did not influence satisfaction.

Conclusions: Clinical and patient characteristics significantly influence patient-reported outcomes, highlighting the need for personalized treatment approaches to optimize outcomes in dermatologic surgery. (J Am Acad Dermatol https://doi.org/10.1016/j.jaad.2025.03.022.)

Key words: patient-reported outcomes; patient satisfaction; skin cancer; surgery.

From the Dermatology Division, Memorial Sloan Kettering Cancer Center, New York, New York[a]; Department of Dermatology, King Saud University, Riyadh, Saudi Arabia[b]; Department of Dermatology, University of Nebraska Medical Center, Omaha, Nebraska[c]; Department of Dermatology, University of Texas Southwestern Medical Center, Dallas, Texas[d]; and Department of Dermatology, UC Davis, Sacramento, California.[e]

Funding sources: American College of Mohs Surgery Foundation Grant and National Institutes of Health/National Cancer Institute Cancer Center Support Grant P30 CA008748. The funding source had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review or approval of the manuscript; and decision to submit the manuscript for publication.

IRB approval status: Reviewed and approved by UT Southwestern, UC Davis, the University of Nebraska Medical Center, and Memorial Sloan Kettering Cancer Center.

Patient consent: Not applicable.

Data availability statement: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Accepted for publication March 12, 2025.

Correspondence to: Erica H. Lee, MD, Dermatology Division, Memorial Sloan Kettering Cancer Center, 530 East 74th St, New York, NY 10021. E-mail: leee@mskcc.org.

Published online April 26, 2025.

0190-9622/$36.00

https://doi.org/10.1016/j.jaad.2025.03.022

INTRODUCTION

Patient-centered care is gaining momentum as a critical component of health care quality. While clinical outcomes, such as morbidity and complications, have traditionally been used to evaluate oncological treatment methods, patient-reported outcomes are now recognized as important outcomes. This shift is exemplified by the Patient Protection and Affordable Care Act, which includes patient outcomes as a criterion for reimbursement.[1] However, the subjective nature of measuring quality of life poses a challenge.[2] To address this issue, patient-reported outcome measures (PROMs) are developed as validated questionnaires designed to quantify patient experience and expectations.[3]

CAPSULE SUMMARY

- Surgical treatment of facial skin cancers can have a notable impact on the patients' psychosocial and emotional well-being.
- Appearance satisfaction and quality of life improves over a 1-year period after Mohs surgery with patient and clinical characteristics significantly influencing patient-reported outcomes.

Skin cancer, a common and growing malignancy among fair-skinned individuals, presents a significant challenge due to its rising incidence.[4] Predominantly affecting the face, skin cancer is primarily treated through surgery, which can leave visible scars and alter appearance. Given the face's central role in identity, communication, and social interaction, facial surgery can significantly impact a patient's emotional well-being and social functioning, underscoring the need for quality of life assessments. In this regard, disease-specific PROMs play a crucial role, especially for diseases with high incidence and high impact.[5] Various disease-specific PROMs have been developed specifically for skin cancer, offering valuable insights into the patient experience.[6-8] However, most existing studies are cross-sectional or single-center, highlighting the need for large-scale, prospective multicenter studies using validated PROMs.[7-10]

The Satisfaction with Closing Defects after Skin Cancer Resection study (SCAR study) fills this gap as the first comprehensive, prospective multicenter study to assess patient satisfaction and quality of life over a 1-year period using a validated disease-specific PROM. This study represents a significant step forward in understanding long term outcomes of skin cancer surgery and has important implications for improving patient-centered care.

METHODS

Study oversights

The SCAR study is a multicenter, prospective cohort study conducted at 4 hospitals in the United States: Memorial Sloan Kettering Cancer Center, University of Texas Southwestern, University of California Davis, and the University of Nebraska Medical Center. From April 2020 until April 2022, patients with facial skin cancer who underwent surgery were enrolled. All hospitals performed the same surgical technique for skin cancer resection, Mohs micrographic surgery (MMS).

Patients were eligible to participate if they were ≥18 years old and proficient in English. Patients were excluded if they had more than one facial skin cancer resection performed on the same day. The SCAR study was conducted in accordance with the guidelines of Good Clinical Practice and the declaration of Helsinki.[11] Institutional review board approval was obtained at each study enrollment site.

Study participants and data collection

All patients underwent MMS. The reconstruction was performed by dermatologic surgery or by plastic and reconstructive surgery in the same hospital. During enrollment, the participating sites completed a daily questionnaire to assess patients' eligibility for the study. If the patients were eligible, they received an email at home or an e-tablet in the clinic with an invitation to participate. Patients who consented received the FACE-Q Skin Cancer before MMS and by email 2 weeks, 6 months, and 1 year postprocedure. If patients did not respond, automatic reminders were sent up to 3 times. If there was no response to a specific time-point, the patient still received an invitation for the next study time point. At each time point, patients had the opportunity to withdraw from the study.

Study measurements

The primary outcomes were patient-reported quality of life measures assessed over a 1-year period measured with 4 FACE-Q Skin Cancer scales[9,12]: Satisfaction with Facial Appearance (pre- and postoperative), Appearance-related Psychosocial Distress (pre- and postoperative), Cancer Worry (pre- and postoperative), and Appraisal of Scars (postoperative). Each scale consists of 8 to 10 questions, with 4 response options on a Likert-type scale. The responses are summed and converted to a Rasch score ranging from 0 to 100. Higher scores represented greater satisfaction with facial

Abbreviations used:

MMS: Mohs micrographic surgery
MSKCC: Memorial Sloan Kettering Cancer Center
PROMs: Patient-Reported Outcome Measures

appearance, increased distress, greater cancer worry, and greater satisfaction with the scar, respectively.

Secondary outcomes were postoperative adverse effects, measured with the FACE-Q Skin Cancer − Adverse Effects checklist, and complications. The Adverse Effects checklist comprises 10 symptoms (eg, itchiness, tingling, and numbness) with 4 response options (1-not at all bothered, 2-a little, 3-moderately, 4-extremely bothered). Following the surgery, relevant demographic and clinical information was collected from electronic medical records. After the patient completed the 6-month time-point, information regarding interim complications was obtained by each respective site.

Complications were registered if the surgeon designated the adverse outcome as a complication. The Clavien-Dindo classification of complications was utilized for categorization.[13] All data were collected in REDCap, and data coordination was performed at Memorial Sloan Kettering Cancer Center, New York.

Statistical analysis

All patients that completed at least 1 scale of the FACE-Q Skin Cancer pre- or postoperative, were included for analysis. Descriptive analyses were conducted using means, medians, frequencies, and relative frequencies to assess characteristics of the participants and their FACE-Q Skin Cancer scale responses at each time point. In this analysis, the 4 FACE-Q scales were the outcome measures of interest and the change in each of these scales was evaluated independently. Correlation and covariance matrices were estimated to assess the interrelationship of the scales over the course of evaluation time points. Due to the correlated nature of the data, the unequal periods of time between evaluations, and the sporadic or varied number of responses at each evaluation time point, multi-level regression models were used to assess the change in FACE-Q scales over time while controlling for other study covariates. Marginal estimates were calculated to help visualize the change in scales over the course of evaluation. Analyses were performed using Stata MP v16.1 (Stata Corporation).

RESULTS

A total of 1007 patients received the FACE-Q Skin Cancer questionnaire; 17 did not complete any pre- or postoperative scale and were therefore excluded from the analysis (Fig 1). Demographic and clinical characteristics of the study population are presented in Table I. Out of the 990 patients included in the analysis, at least one pre-operative FACE-Q Skin Cancer scale was completed by 974 patients (98.4%). Subsequently, 701 patients (70.8%), 587 patients (59.3%), and 598 patients (60.4%), completed a FACE-Q Skin Cancer scale at the 2-weeks, 6-months, and 1-year postoperative time points, respectively.

Table II presents the mean FACE-Q Skin Cancer scores over the course of the study evaluation time point. The results demonstrate significant changes in the Appraisal of Scars scale (change from all time-points; $P < .01$), Appearance-related Psychosocial Distress scale (change from all time-points; $P < .01$), and Cancer Worry scale (change from all time-points; $P < .02$). While the Satisfaction with Facial Appearance scale remained unchanged from baseline to 2 weeks ($P = .587$), an increase at all subsequent time-points was seen after 6 months and 1 year following surgery (change from all time-points; $P < .01$).

When comparing sex, males had significantly higher levels of satisfaction with facial appearance than females ($P = .003$) (Supplementary Table I, available via Mendeley at https://data.mendeley.com/datasets/g326dr3jtg/1). Males also reported higher scar appraisal ($P < .001$) and experienced reduced psychosocial distress ($P < .001$). However, this group did not show a significant decrease in cancer worry compared to their female counterparts ($P = .267$). In addition, age was found to be a notable factor, with older patients demonstrating higher levels of satisfaction with facial appearance, reduced scar bother, decreased psychosocial distress, and lower cancer worry.

Individuals with a history of facial skin cancer showed improved trends over time, reporting increased satisfaction with facial appearance ($P = .023$), scar appraisal ($P = .017$), reduced psychosocial distress ($P = .003$), and lower cancer worry ($P = .003$) when compared to those without prior skin cancer. Whereas individuals with a history of cosmetic surgery exhibited lower levels of scar appraisal ($P = .031$) and displayed a trend toward reduced satisfaction with facial appearance ($P = .059$). However, no differences were observed between these patients in terms of psychosocial distress ($P = .419$) or cancer worry ($P = .799$).

Anatomic location of the skin cancer was significantly associated with patient perception and satisfaction. Specifically, when skin cancer affects the nose, patients reported significantly lower levels of

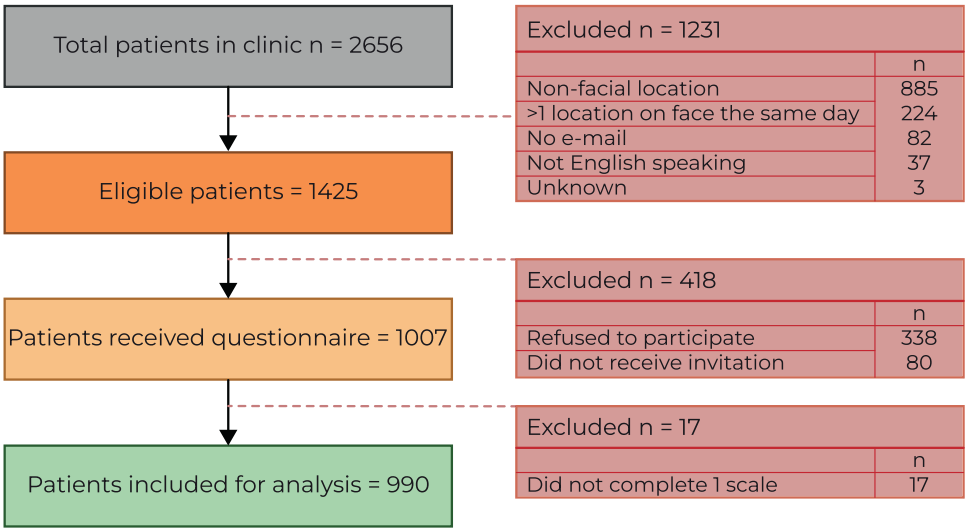

Fig 1. Study enrollment flowchart.

satisfaction with their facial appearance (P = .026), decreased satisfaction with their scar (P < .001), higher levels of psychosocial distress (P = .004), and increased worry about their cancer (P = .045). Similarly, when the skin cancer was located on the upper cutaneous lip, patients experienced less satisfaction with their scar (P = .001), higher levels of psychosocial distress (P = .001), and increased cancer worry (P = .035). However, no statistically significant difference was observed in satisfaction with facial appearance in this group (P = .191). Patients who had skin cancer proximal to the eyes reported higher levels of cancer worry (P = .004). Regarding different reconstructive procedures, no significant differences were found between reconstruction type and the FACE-Q Skin Cancer scales. However, patients who underwent combination repairs (eg, flap and graft reconstruction) demonstrated increasing levels of cancer worry over time (P = .006).

Surgical defect size emerged as a significant factor, with larger defect sizes associated with greater psychosocial distress and reduced scar appraisal over time (P = .037 and P = .008, respectively). For every 1 cm increase in defect size, there was a drop of −2.69 in scar appraisal and an increase of +2.27 in psychosocial distress. Importantly, there were no significant differences in the number of Mohs stages and patient responses to the scales.

Seventy-seven percent of the participants completed the Adverse Effects checklist. From those participants, sensitivity (n = 459, 67.4%), itchiness (n = 372, 54.8%), and discomfort (n = 334, 49.0%) were the most common reported adverse symptoms 2-weeks after surgery. Although the proportions reporting an adverse effect were high, >75% of the responses were only "a little bothered." By the 6-month postsurgical time point, the most common reported adverse effects were numbness (n = 170, 29.7%), sensitivity (n = 164, 28.7%), and tightness (n = 125, 21.8%). As with the 2-week postsurgical checklist, the vast majority of the positive responses were mild in nature. At the 1-year mark, numbness (n = 127, 22.0%), sensitivity (n = 108, 18.7%), and tightness (n = 87, 15.1%) continued to be the most common adverse events reported with low patient-reported burden.

A total of 49 patients (4.9%) recorded complications. Among them, 28.6% had a stage 1 complication, 49.0% had a stage 2 complication, and 22.4% had a stage 3a complication. The most common complications were hypertrophic scarring (n = 19, 38.8%), followed by infection (n = 12, 24.5%). Patients who experienced complications were found to be less satisfied with facial appearance over time (P = .002). However, there were no significant differences in scar appraisal (P = .385), psychosocial distress (P = .108), or cancer worry (P = .493), albeit an exploratory objective that was not powered a-priori.

DISCUSSION

We prospectively investigated patient satisfaction and quality of life outcomes following MMS for facial skin cancer over a 1-year period using a validated PROM, the FACE-Q Skin Cancer. Our study shows heightened satisfaction with facial appearance, an increase in scar appraisal, and a decrease in cancer

Table I. Patient and clinical characteristics

Patient characteristics	Value* (%)
Hospital	
MSKCC	353 (35.7)
Nebraska	288 (29.1)
UT Southwestern	221 (22.3)
UC Davis	128 (12.9)
Sex	
Male	579 (58.5)
Female	411 (41.5)
Mean age ± SD, y	65.6 ± 12.4
Race†	
White Non-Hispanic	971 (97.7)
Hispanic	9 (0.9)
Asian or Pacific Islander	3 (0.3)
Native American	3 (0.3)
Black/African-American	1 (0.1)
Other (eg, mixed, unknown, white Hispanic)	7 (0.7)
Skin type†	
1	199 (19.9)
2	562 (56.1)
3	225 (22.5)
4	15 (1.5)
5	0 (0.0)
6	0 (0.0)
Disease history†,‡	
Diabetes	132 (13.3)
Immunosuppression	80 (8.0)
Bleeding/coagulation disorder	14 (1.4)
None of the above	785 (79.3)
Marital status	
Single, never married	51 (5.2)
In a long-term, committed relationship	42 (4.2)
Married	708 (71.5)
Separated	9 (0.9)
Divorced	100 (10.1)
Widowed	80 (8.1)
Blood thinner§	
Yes	325 (32.8)
No	665 (67.2)
Facial skin cancer history‖	
Yes	535 (54.0)
No	445 (46.0)
Cosmetic surgery history	
Yes	78 (7.9)
No	912 (92.1)
Smoking	
Yes	55 (5.6)
No, stopped	374 (37.8)
No, never	561 (56.7)
Specialists doing the reconstruction	
Dermatologist	823 (83.1)
Plastic surgeon	161 (16.3)
Unknown	6 (0.6)
Cancer type	
Basal cell carcinoma	680 (68.7)
Squamous cell carcinoma	266 (26.9)
Melanoma	16 (1.6)
Other (eg, sebaceous carcinoma, lentigo maligna, dermatofibrosarcoma protuberans)	21 (2.1)
Unknown	7 (0.7)
Tumor status	
Primary tumor	940 (95.0)
Recurrent tumor	39 (3.9)
Unknown	11 (1.1)
Number of Mohs stages	
1	458 (46.3)
2	394 (39.8)
3	97 (9.8)
4	26 (2.6)
5	3 (0.3)
>5	6 (0.6)
Unknown	6 (0.6)
Mean defect size ± SD, cm	
Length	1.6 ± 1.3
Width	1.4 ± 1.2
Location	
Forehead	265 (26.8)
Cheek	264 (26.7)
Nose	261 (26.4)
Ear	66 (6.7)
Upper lip	52 (5.3)
Eye	47 (4.7)
Chin	15 (1.5)
Lower lip	13 (1.3)
Reconstruction	
Second intention healing	105 (10.6)
Primary closure	465 (47.0)
Local flap	273 (27.6)
Graft¶	106 (10.7)
Interpolated flap/regional flap	14 (1.4)
Free flap	0 (0.0)
Other (eg, combination of above)	19 (1.9)
Unknown	8 (0.8)

Continued

MSKCC, Memorial Sloan Kettering Cancer Center.
*Values are No. (%) unless otherwise indicated.
†Multiple options possible.
‡Percentages of this variable are calculated separately for every disease.
§Of these patients, a total of 92 (28.3%) stopped their blood thinners before surgery.
‖Of these patients, a total of 420 (92.3%) had surgical resection of their facial skin cancer.
¶Grafts defined as full-thickness skin grafts $n = 66$, split-thickness skin grafts $n = 2$, synthetic $n = 31$, and free cartilage graft $n = 7$.

Table II. Changes in RASCH scores and the associated *P* values for each FACE-Q Skin Cancer scale by evaluation time points

Scale	Timepoint	Marginal mean	Change from baseline	*P* value	Change from 2 wk	*P* value	Change from 6 mo	*P* value
Appearance satisfaction	Baseline	72.09	—	—	—	—	—	—
	2 wk post	71.43	−0.52	.587	—	—	—	—
	6 mo post	75.72	3.66	<.001	4.18	<.001	—	—
	1 y post	78.49	6.69	<.001	7.21	<.001	3.03	.006
Psychosocial distress	baseline	18.25	—	—	—	—	—	—
	2 wk post	23.46	5.39	.001	—	—	—	—
	6 mo post	15.62	−2.34	.009	−7.73	<.001	—	—
	1 y post	12.92	−4.75	.001	−10.14	<.001	−2.41	.01
Cancer worry	baseline	40.59	—	—	—	—	—	—
	2 wk post	30.01	−9.81	<.001	—	—	—	—
	6 mo post	28.31	−11.47	<.001	−1.66	.02	—	—
	1 y post	26.14	−13.65	<.001	−3.84	<.001	−2.18	.004
Scar appraisal	2 wk post	74.15	—	—	—	—	—	—
	6 mo post	84.86	—	—	11.24	<.001	—	—
	1 y post	87.2	—	—	13.49	<.001	2.25	.01

All models included participant sex, age, and hospital contributing the data.

worry and psychosocial distress at all postoperative time-points that are clinically meaningful. These outcomes may be attributed to the tissue-sparing technique of MMS.[7,8,14-16] The continued improvement in scar appraisal over 1 year underscores the importance of long-term follow-up due to the gradual remodeling of scar tissue, resolution of postoperative inflammation, and the psychological adjustment of patients to their changing appearance with scar maturation.[17,18]

Building upon the body of knowledge in this field, our study found that females reported lower satisfaction with their scar and facial appearance, as well as higher psychosocial distress, compared to males.[8] This sex disparity can be attributed to women's greater concern with facial aesthetics, societal beauty standards,[19] and pressures to maintain a youthful appearance.[20] Additionally, our study revealed that younger patients displayed lower satisfaction, higher psychosocial distress, and greater cancer-related worry compared to older patients. This is likely due to the higher aesthetic expectations, coupled with limited medical experience, and increased social and professional demands.[21] Interestingly, patients with a history of cosmetic surgery, regardless of sex and age, reported lower levels of scar appraisal and a trend toward reduced satisfaction with facial appearance. Prior cosmetic interventions can lead to more esthetic demands, awareness of subtle imperfections or serve as a surrogate marker for those with higher baseline expectations.

Patients with nose lesions exhibited lower satisfaction with facial appearance, more scar bother, higher levels of psychosocial distress, and increased worry about their cancer. The nose is a focal point for facial esthetics; any perceived change may heighten the patient's sensitivity as seen in the rhinoplasty population.[22,23] In addition, patients with defects involving the upper cutaneous lip reported lower satisfaction with their scar, as well as higher levels of psychosocial distress and cancer worry. This is likely attributed to the visibility and functional implications of scars in this central area, which can significantly impact self-perception and quality of life. Patients with lesions near the eye reported higher cancer worry scores, which can be attributed to the proximity to critical anatomical structures and concerns about potential functional and cosmetic outcomes. These findings highlight the importance of additional counseling and support for patients with skin cancer near the nose, lip, and eyes. Patients with larger defects experienced greater psychosocial distress and reduced scar appraisal similar to a previous study.[7] Yet managing patient expectations is challenging since the extent of the tumor is often unknown before surgery, leading to unrealistic scar expectations.[24,25] Interestingly, our study found that the number of stages in MMS did not impact patient-reported outcomes.

Limitations of the study include lower response rates for the 6- and 12-month postoperative period. The reason for nonresponse or refusal is unknown, and it is uncertain whether it has any relationship with satisfaction levels. In addition, this study focused on patients undergoing MMS at academic centers, and the results may not be generalizable to

private practice. However, a prior study showed no difference between practice setting and a complex Mohs surgery case.[26] Accessibility of PROMS in the clinical setting may be a challenge; however, successful use of PROMs for patient care requires understanding of facilitators and barriers to implementation, which will vary depending on the setting.[27]

In conclusion, this large prospective, multicenter study highlight the positive long-term effect of surgical resection of skin cancers on facial and scar perception, cancer worry and appearance-related distress from the key stakeholder, the patient. The study also reveals that individual reconstruction methods did not significantly influence patient satisfaction and identifies patients who could benefit from enhanced preoperative counseling.

Conflicts of interest

The FACE-Q Skin Cancer Module is owned by Memorial Sloan-Kettering Cancer Center. Drs Veldhuizen, Dusza, Dusza, Kuo, Aleisa, Blue, Kazemi, Sutton, Nijhawan, Eisen, Rossi, Srivastava, Wysong, Nehal, and Lee, and Authors Adhikari, Nadir, and Le have no conflicts of interest to declare.

REFERENCES

1. Dowd B, Li C, Swenson T, Coulam R, Levy J. Medicare's Physician Quality Reporting System (PQRS): quality measurement and beneficiary attribution. *Medicare Medicaid Res Rev*. 2014;4(2):E1-E14. https://doi.org/10.5600/mmrr.004.02.a04
2. Pascoe GC. Patient satisfaction in primary health care: a literature review and analysis. *Eval Program Plann*. 1983;6:185-210.
3. McGrail K, Bryan S, Davis J. Let's all go to the PROM: the case for routine patient-reported outcome measurement in Canadian healthcare. *Healthc Pap*. 2011;11:8-18; discussion 55-58.
4. Cameron MC, Lee E, Hibler BP, et al. Basal cell carcinoma: epidemiology; pathophysiology; clinical and histological subtypes; and disease associations. *J Am Acad Dermatol*. 2019;80:303-317. https://doi.org/10.1016/j.jaad.2018.03.060
5. Whittal A, Meregaglia M, Nicod E. The use of patient-reported outcome measures in rare diseases and implications for health technology assessment. *Patient*. 2021;14:485-503.
6. Pusic AL, Lemaine V, Klassen AF, Scott AM, Cano SJ. Patient-reported outcome measures in plastic surgery: use and interpretation in evidence-based medicine. *Plast Reconstr Surg*. 2011;127:1361-1367.
7. Vaidya TS, Mori S, Dusza SW, Rossi AM, Nehal KS, Lee EH. Appearance-related psychosocial distress following facial skin cancer surgery using the FACE-Q Skin Cancer. *Arch Dermatol Res*. 2019;311:691-696.
8. Vaidya TS, Mori S, Khoshab N, et al. Patient-reported aesthetic satisfaction following facial skin cancer surgery using the FACE-Q skin cancer module. *Plast Reconstr Surg Glob Open*. 2019;7:e2423.
9. Lee EH, Klassen AF, Cano SJ, Nehal KS, Pusic AL. FACE-Q Skin Cancer Module for measuring patient-reported outcomes following facial skin cancer surgery. *Br J Dermatol*. 2018;179:88-94.
10. Lee EH, Pusic AL, Cano SJ, Klassen AF. The FACE-Q Skin Cancer Module addresses post-resection aesthetic and quality of life outcomes. *Br J Dermatol*. 2019;180:953-954.
11. von Elm E, Altman DG, Egger M, et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *BMJ*. 2007;335:806-808.
12. Lee EH, Klassen AF, Lawson JL, Cano SJ, Scott AM, Pusic AL. Patient experiences and outcomes following facial skin cancer surgery: a qualitative study. *Australas J Dermatol*. 2016;57:e100-e104.
13. Dindo D, Demartines N, Clavien P-A. Classification of surgical complications. *Ann Surg*. 2004;240:205-213.
14. van Hensbergen LJ, Veldhuizen IJ, Lee EH, et al. Cancer worry after facial nonmelanoma skin cancer resection and reconstruction: a 1-year prospective study. *Psychooncology*. 2022;31:238-244.
15. D'Hondt V, Veldhuizen IJ, Theelen FFM, et al. Appearance-related psychosocial distress after facial non-melanoma skin cancer surgery: a 1-year prospective study. *Psychooncology*. 2023;32:1114-1121. https://doi.org/10.1002/pon.6165
16. Asgari MM, Warton EM, Neugebauer R, Chren M-M. Predictors of patient satisfaction with Mohs surgery: analysis of preoperative, intraoperative, and postoperative factors in a prospective cohort. *Arch Dermatol*. 2011;147:1387-1394.
17. Monaco JL, Lawrence WT. Acute wound healing an overview. *Clin Plast Surg*. 2003;30:1-12.
18. Fix WC, Etzkorn JR, Zhang J, Sobanko JF. Patient scar assessment correlates with quality of life after Mohs micrographic surgery. *Dermatol Surg*. 2020;46:1745.
19. Sezgin B, Findikcioglu K, Kaya B, Sibar S, Yavuzer R. Mirror on the wall: a study of women's perception of facial features as they age. *Aesthet Surg J*. 2012;32:421-425.
20. Kaziga R, Muchunguzi C, Achen D, Kools S. Beauty is skin deep; the self-perception of adolescents and young women in construction of body image within the ankole society. *Int J Environ Res Public Health*. 2021;18:7840.
21. Jiotsa B, Naccache B, Duval M, Rocher B, Grall-Bronnec M. Social media use and body image disorders: association between frequency of comparing one's own physical appearance to that of people being followed on social media and body dissatisfaction and drive for thinness. *Int J Environ Res Public Health*. 2021;18:2880.
22. Andretto Amodeo C. The central role of the nose in the face and the psyche: review of the nose and the psyche. *Aesthet Plast Surg*. 2007;31:406-410.
23. Heiming M, Savvas E, Rudack C, Stenner M, Spiekermann C. Discrepancy of the subjective perception of the nasal appearance between independent individuals and patients undergoing functional rhinoplasty (fRPL). *Eur Arch Otorhinolaryngol*. 2023;280:191-197.
24. Fix WC, Miller CJ, Etzkorn JR, Shin TM, Howe N, Sobanko JF. Comparison of accuracy of patient and physician scar length estimates before Mohs micrographic surgery for facial skin cancers. *JAMA Netw Open*. 2020;3:e200725.
25. Veldhuizen IJ, Lee EH, Kurtansky NR, et al. To see or not to see: impact of viewing facial skin cancer defects prior to reconstruction. *Arch Dermatol Res*. 2021;313:847-853.
26. Sahai S, Walling HW. Factors predictive of complex Mohs surgery cases. *J Dermatol Treat*. 2012;23:421-427.
27. Hyland CJ, Mou D, Virji AZ, et al. How to make PROMs work: qualitative insights from leaders at United States hospitals with successful PROMs programs. *Qual Life Res*. 2023;1:2259-2269. https://doi.org/10.1007/s11136-023-03388-z