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Laryngoscope. Author manuscript; available in PMC 2005 December 20.

Published in final edited form as:
Laryngoscope. 2005 July ; 115(7): 1178–1185.

Creation of a Quality of Life Instrument for Nonmelanoma Skin Cancer Patients

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Abstract

Objective—Malignancies of the skin are the most common cancers among humans. The cervicofacial region is most affected by cutaneous malignancies, with approximately 80% of nonmelanoma skin cancers (NMSC) occurring in the head and neck. Treatment of cervicofacial skin cancers also is more likely to result in significant patient morbidity, because of the functional and cosmetic importance of this region. Unlike other malignancies, skin cancer has not been well investigated in terms of patient quality of life (QOL) assessment. Furthermore, no validated disease-specific QOL instrument currently exists for skin cancer. The aim of this study was to construct a new QOL instrument, The Facial Skin Cancer Index (FSCI), that captures the relevant QOL issues for NMSC patients.

Study Design—Cross-sectional study of patients presenting to a dermatologic surgery clinic with NMSC of the head and neck.

Methods—For stage I, item generation, a sample of 20 patients with cervicofacial NMSC and six health care providers specializing in the care of NMSC patients completed semistructured interviews. For stage II, item reduction, a second sample (n = 52) of NMSC patients rated the items in terms of their importance for QOL among skin cancer patients. Domains of the FSCI were evaluated in terms of data quality, item variability, internal consistency, and range and skewness of scale score on aggregation and floor and ceiling effects.

Results—A total of 71 distinct items were generated in stage I. After using the outlined item reduction techniques in stage II, the FSCI was reduced from 71 to 36 items, representing 6 domains. With the exception of Physical Functioning (alpha = 0.63) that suggested adequate reliability, all subscale scores showed excellent reliability coefficients, with Cronbach's alpha ranging from 0.78 (Lifestyle) to 0.87 (Social/Family).

Conclusions—A new disease-specific QOL instrument for patients with NMSC of the head and neck has been created. Validation studies are currently underway. Future directions will include sensitivity analysis to determine whether the FSCI is sensitive to change over time among patients undergoing treatment for NMSC.

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Presented as a Candidate's Thesis (J.S.R.) to the Triological Society.

Presented at The Annual Meeting of the Triological Society, COSM, Boca Raton, FL, May 16, 2005.

This research was in part funded by an educational grant from the American Society for Dermatologic Surgery and the National Institutes of Health/National Cancer Institute R03 CA108271.

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Keywords

Skin cancer; quality of life; basal cell cancer; squamous cell cancer

INTRODUCTION

Epidemiology and Clinical Relevance

Malignancies of the skin are the most common cancers of humans. Nonmelanoma skin cancers (NMSC), basal cell carcinoma (BCC), and squamous cell carcinoma (SCC) have reached epidemic proportions in the United States and are now a major public health concern. Recent estimates predict 1.3 million new cases of NMSC annually in the United States, with the incidence of NMSC expected to double in the next 30 years.[1,2] For white Americans, the lifetime risk of NMSC is estimated at 28% to 33% for BCC and 7% to 11% for SCC.[2] Approximately 80% of all NMSC is BCC, whereas the remainder is mostly SCC.[3] Men are slightly higher risk for NMSC, but the incidence appears to be rising sharply in women, especially young women.[4] Despite this increase in NMSC, deaths are comparatively uncommon (1200–2500 per year) and account for just 0.1% to 0.3% of the total incidence of NMSC.[5]

Unfortunately, NMSC occur in the most conspicuous location of the body, with approximately 80% occurring in the cervicofacial region; the nose alone accounts for roughly 25% of all cutaneous malignancies and is followed closely by the external ear and surrounding skin.[3] Collectively, the H-shaped region of the face containing the nose, midface, and auricular-preauricular skin has been designated the H-zone. Not only is NMSC most common within this anatomic region, the H-zone is also associated with the highest rate of tumor recurrence.[3] Treatment of NMSC arising in these high-risk locations is also more likely to result in significant patient morbidity, owing to the functional and cosmetic importance of the H-zone. Attempts to minimize the morbidity of skin cancer treatment, especially BCC, using narrow treatment margins may in part explain the propensity for recurrence within the H-zone.

Furthermore, studies have demonstrated that patients with NMSC are at a higher risk for developing another NMSC or melanoma.[6–8] Marcil and Stern[6] reported that the 3-year risk of subsequent SCC after an index SCC is 18%, at least a 10-fold increase compared with the incidence of first tumors in a comparable general population. For BCCs, the 3-year risk cumulative risk is 44%, also at least a 10-fold increase in incidence compared with the rate in a comparable general population. The risk of developing a SCC in patients with a prior BCC has been more controversial, with cumulative 3-year risks reported ranging from 1% to 19%.[6–8] Furthermore, the relative risk for developing malignant melanoma in patients with a history of NMSC has been recently reported as high as 17.[9] Older studies have reported relative risks ranging from 2.8 and 6.6.[10,11]

In summary, NMSC is a very common disease often occurring in a visibly conspicuous location of the body. Although the cure rate is high and death rates low, patients with NSMC are more likely to develop second primary tumors of the skin, NMSC or melanoma.

Skin Cancer Quality of Life and Psychologic Research

The potential morbidity of the disease and treatment is widely variable, depending on various patient-related factors. Adverse consequences may include both physical dysfunctions and psychosocial dysfunctions related to issues of disfigurement. Potential physical adverse sequelae of the disease or treatment include lower eyelid ectropion, epiphora, corneal abrasions/erosions from incomplete eyelid closure, nasal obstruction, oral incompetence, oral

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microstomia, inability to use hearing aids or eyeglasses because of auricle loss, and facial nerve paralysis.[3] Other potential negative effects may be related to degree of disfigurement, which may have ramifications from a psychosocial, marital, sexual, or medical personnel interaction standpoint.[12–14]

Health-related quality of life (QOL) outcomes research places an emphasis on the influence of disease and therapeutic intervention on a patient’s daily life. Unlike other malignancies, the subject of skin cancer has not been well investigated in terms of patient QOL assessment. QOL is potentially an important endpoint for this disease process because morbidity and not mortality is the overriding issue. NMSC is a unique “cancer” in that its pattern can be best described as acute exacerbations of a chronic disease. As previously described, patients who develop a NMSC have a high likelihood to development a second primary within the next several years.

Currently, there is no validated, reliable QOL instrument specifically tailored for NMSC or skin cancer, in general. The only QOL instrument that has been used to study NMSC patients is the Dermatology Life Quality Index (DLQI), which is a validated general dermatologic questionnaire developed in the United Kingdom.[15] In a study using the DLQI, 44 patients with BCC were prospectively evaluated, using the DLQI at baseline, 1 week after treatment and 3 months after treatment.[15] They found little handicap associated with the disease at baseline and after treatment. The shortcomings of this study, however, included the small cohort of patients, the exclusion of SCCs, failure to stratify low- and high-risk NSMCs, and the overlooking of the possibility that the instrument itself may be too nonspecific. The items of the DLQI are more tailored for chronic, benign skin conditions such as psoriasis or eczema because they emphasize physical complaints of itchiness and irritation and do not capture issues related to scarring, disfigurement, and worry about recurrence or new lesions.

A potential comparative model for NMSC QOL research is the work that has been performed on melanoma. Currently, most of the existing QOL research on melanoma has focused mainly on advanced metastatic melanoma, evaluating the effects of chemotherapy such as interferon treatment.[16] A recent cross-sectional study of nonstage IV melanoma patients revealed wide variability in the level of distress in patients presenting to a melanoma clinic before treatment.[17] Patients were evaluated for general QOL, level of anxiety, and coping strategies. Scores from the Medical Outcomes Study Short Form 36-item Health Survey (SF-36) subscales were found to be consistent with levels of physical functioning, bodily pain, vitality, and general health perceptions reported by minor medical patients. Interestingly, approximately one third of the patients were found to report high levels of distress. This subgroup of “distressed” individuals reported poorer QOL and used maladaptive coping strategies, such as escape-avoidance coping.

Cassileth et al.[13] found melanoma patients to be approximately equal to the general public and strikingly similar to other dermatology patients in terms of emotional well-being. In addition, their follow-up study found that the degree of surgical indentation and how closely the actual size of the scar matched presurgery expectations were associated with emotional distress in patients undergoing surgical treatment of melanoma.[14]

NMSC patients are unique in that the seriousness of the cancer is relatively less, yet the disease process often involves an area of the body that is visually conspicuous to self and others. Studies have shown that the diagnosis and treatment of many cancer types have a variety of negative psychologic effects.[18–20] Katz et al.[20] demonstrated that women with head and neck cancer who experience low social support and face disfiguring treatment are at greatest risk for psychosocial dysfunction. Also, emotional difficulties with QOL alterations have been demonstrated in nonmalignant dermatologic disorders such as acne and eczema.[21,22]

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Comparatively, psychologic and emotional implications of the diagnosis and NMSC has not been well studied.

The development of a QOL instrument that would capture the relevant issues for this patient population would be ideal to start the process of understanding how this disease and its treatment impact patients' lives.

PRELIMINARY STUDIES

Quality of Life of NMSC Patients Using Existing Standardized Measures

In light of the relatively scarce prior investigations, the selection of the appropriate instrument to measure the relevant QOL issues in NMSC patients was somewhat arbitrary. Because a disease-specific instrument for NMSC did not exist, the selection of more general instruments appeared reasonable as the initial step in evaluating this disease process: SF-36 and Functional Assessment of Cancer Therapy–General (FACT-G), version 4, and the DLQI.

Eligible participants consisted of patients who presented to a dermatologic surgery clinic of a large Midwestern teaching hospital with a biopsy-proven diagnosis of nonmelanoma cervicofacial skin cancer. The study cohort represented patients who were referred to a tertiary care, Mohs surgery clinic for removal of a high-risk NMSC. All participants were evaluated at the initial visit before discussions of therapeutic interventions. The questionnaires were then administered at the initial visit before treatment and at the 4-month follow-up appointments. These time points were chosen to correspond to the time when the majority of postoperative healing process had finished (i.e., able to evaluate the "final" postoperative result). All participants underwent Mohs surgical excision of their NMSC followed by primary reconstruction.

One hundred and twenty-one consecutive participants were enrolled in the study, with 101 participants completing the final 4-month follow-up (83% completion rate). Data collected included demographic, clinical, and sun-protective behavioral information. Demographic variables included age, sex, marital status, education level, and socioeconomic status (employment, income). Clinical variables included type of cancer, histologic subtype, location, H-zone involvement, functional area (eyelids, lips, nasal ala) involvement, size, stage (if applicable), primary versus recurrence, and concurrent comorbid conditions. Baseline (n = 121) descriptive statistics have been previously reported.[23]

The SF-36 subscale baseline scores from the patient population were consistent with levels reported by normal patients, and the baseline FACT-G scores were high compared with other malignancies, indicating higher QOL.[24,25] These findings were not surprising considering the type of questions that make up the SF-36 and FACT-G. Participants in the study frequently commented on the lack of relevance of many of the QOL items. Overall, both instruments proved to be internally consistent and were accurate measures of the impact of coexisting medical conditions on QOL.

The longitudinal data demonstrated little variation in scores on any of the standard QOL measures except for SF-36 Mental Well-Being and the FACT-G Emotional subscales, two measures that capture similar concepts.[26] These findings suggested that patients' emotional well-being was improved with treatment of NMSC, although the strength of this statistically significant finding was weakened by the multiple pair-wise comparisons. Furthermore, younger patients (<65 years old), especially those that were employed, demonstrated greater improvement in their FACT-G emotional subscale scores compared with their counterparts. This group of patients may be particularly sensitive to the conspicuous nature of the disease as it relates to potential disfigurement and scarring.

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As mentioned previously, the only QOL instrument that has been used to study NMSC patients is the DLQI, a validated 10-item general dermatologic questionnaire developed in the United Kingdom.[15,27] In reviewing available QOL instruments, this dermatologic instrument appeared to be the most applicable for NMSC patients, although the items overall appeared to be more germane to benign dermatologic conditions such as eczema and psoriasis. High scores in this instrument indicate worse QOL (range 0–30). The results indicated a trend toward an improvement in overall QOL as measured by the total DLQI score.[28] In addition, item numbers 1 and 4 demonstrated statistically significant change after treatment, with QOL improving at 4 months. Item 1 focuses on the physical improvement after treatment, whereas item 4 measures potential patient embarrassment related to the disease process.

These preliminary results indicated that there were domains of QOL that were affected and not captured by existing QOL instruments. In particular, the psychologic and emotional domains (anxiety, worry), as evidenced by the change in the SF-36 Mental and FACT-G Emotional subscale scores, appeared to warrant further investigation. In addition, physical impairments and issues related to potential embarrassment or body image were brought forth by the findings using the DLQI. The results of the preliminary studies led us to the conclusion that existing QOL measures were relatively insensitive for patients with NMSC, and that a disease-specific QOL measure for NMSC was needed.

METHODS

Overall Study Design

On the basis of the issues identified in the background and preliminary studies, the overall goal of the proposed research was to develop an instrument that will assess QOL among NMSC patients. A cross-sectional design was used to conduct these two stages of the study. Stage I focused on developing a comprehensive list of items regarding QOL issues based on information obtained from members of the target audience, experts in the field, and the existing body of literature. Patient information was obtained from semistructured interviews. Stage II focused on obtaining feedback from another sample of NMSC patients who have previously undergone treatment for NMSC to establish item relevance, comprehensibility, and completion time. After statistical analysis, the number of items was reduced, and only those most relevant were retained. These two stages were to be a part of a larger study to complete the validation of the newly created QOL instrument. Subsequent stages establishing the basic psychometric properties (i.e., reliability and validity) and the sensitivity of the instrument over time are currently underway.

Study Population

Eligible participants consisted of patients who presented to a dermatologic surgery clinic of a large Midwestern teaching hospital with a high-risk nonmelanoma cervicofacial skin cancer between December 1, 2003 and May 2004. High-risk NMSC was defined by any of the following criteria: tumors with a diameter greater than 2 cm, tumors of longstanding duration, tumors with a diffuse histologic growth pattern, recurrent tumors, tumors arising within the H-zone or in patients with hereditary syndromes or significant immunosuppression, or tumors with evidence of perineural spread. Inclusion criteria consisted of sufficient physical and mental capacity, adult age, and the ability to speak and read English. Participants with major psychiatric illnesses, other disabling chronic medical illnesses (e.g., rheumatoid arthritis, stroke, renal failure), or cognitive impairment were excluded because these factors could confound assessment. All participants were evaluated at the initial visit before discussions of therapeutic interventions. A trained research assistant explained the research study to the participants and obtained an institutional review board approved informed consent form.

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Eligible health care provider participants had to meet the following eligibility criteria: a nurse or medical practitioner with experience of treating at least 100 patients with NMSC over the past 3 years. Medical practitioners were recruited from multiple specialties including dermatology, otolaryngology, plastic surgery, and oculoplastic surgery.

Stage I: Item Generation

Twenty face-to-face semistructured interviews were conducted during this stage of the study. Small sample sizes have been shown to be efficient and effective in previous instrument development projects during the content identification phase.[29] The final sample size was determined by the unique information that was still being obtained when the last few participants were interviewed. During the interviews, patients were asked about ways that NMSC may have impacted their physical functioning or other areas of well being (emotional, social, etc.). If the patient did not wish to participate, the research coordinator filled out a refusal form that included the patient's reason for not participating. Structured forms were created for the interview process to ensure that similar procedures were followed.

In addition, health care providers who have expertise and experience in treating NMSC patients were interviewed. This group included nurses, plastic surgeons, dermatologists, oculoplastic surgeons, and otolaryngologists. The results of the semistructured were analyzed for content by identifying themes in the responses. A list of common phrases was prepared, and redundant items were omitted. Two expert reviewers reviewed and rated the items as to its general theme (e.g., physical functioning, social, etc.) Interrater agreement was assessed; all nonduplicate items were included on an initial questionnaire to be rated by another sample of NMSC patients in stage II.

Stage II: Item Reduction and Scale Construction

All items were submitted to literacy testing with the aim of simplifying the material to the lowest possible reading level to allow maximum participation (approximately 8th grade level or below). Each item was then formatted and scored for importance (1 = not at all to 5 = very much) to indicate the issue relevancy of the item to QOL among NMSC patients. In addition to rating the items, these patients were asked to circle those items that were unclear. Patient refusal or acceptance to enroll in the study was documented as previously described. A final qualitative item invited respondents to describe content issues that were important to them but were not included among the questionnaire items.

On return of the survey, descriptive statistics (means, standard deviations, range) and frequency distributions for all items were calculated. A correlation matrix was constructed. Items were ranked depending on means ($M \geq 3$) and standard deviations ($SD \leq 2$) for the importance and agreement of the item for the realm of well being. Items showing correlation coefficients 0.30 or greater were ranked for inclusion. The items were then reviewed for redundancy, and similar items were eliminated. Cronbach's alpha was used to determine the internal consistency of the Facial Skin Cancer Index (FSCI). Items ranked as most relevant on our combined criteria were refined and placed on the final instrument for future validation studies.

RESULTS

For stage I, 20 patient semistructured interviews were performed. Descriptive statistics for this group is outlined in Table I. All patients had undergone treatment for a NMSC within the past year of the interview.

Six health care provider semistructured interviews were performed. Mean length of years in practice was 15 (range 6–26) years. There were four physicians (dermatologic surgeon, facial

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plastic surgeon, oculoplastic surgeon, plastic surgeon) and two nurses specialized in the care of skin cancer patients.

A total of 71 distinct items were generated in stage I. These items were then tested during stage II in a sample of 52 patients. Demographic and clinical data were similar to those obtained in stage I (Table I).

The item reduction techniques reduced the FSCI from 71 to 32 items, representing 6 domains. Although some of the eliminated items did not display sufficient variability (<1.0 SD) or showed strong ceiling or floor effects, a significant number (approximately 20) of these items focused on treatment related issues. These items were eliminated, but a single item addressing concerns related to treatment was added to the emotional subscale. Descriptive statistics are shown in Table II for the 32 items.

For the most part, items showed good variability and means were fairly close to the mid-point of the scale, indicating that on average, all of the retained items reflected important patient concerns. Some negative skewness was indicated, especially on the emotional well-being subscale. Negative skew was also shown in the lifestyle subscale, particularly for the fourth and fifth items (Table II). Positive skew did not appear to be as problematic but was evidenced in the Social/family subscales. There were few missing data for any item.

As shown, alpha coefficients for all the subscales indicated good reliability (>.80), with the exception of Lifestyle (marginal reliability) and Physical/functioning. Low reliability for the latter subscale was most likely caused by so few items (only 3 were tested during phase 2). To correct this problem, we added additional items for future testing and eliminated the item related to pain. Similarly, the item concerning responsibility on family was found to be ambiguously worded and therefore was modified and divided into two separate items for the next phase. The final version of the FSCI to be tested in subsequent validation phases consists of 36 items.

DISCUSSION

NMSC is a unique cancer in that the concerns are less about mortality and disease gravity but rather of disfigurement, discomfort, and illness perception. Given this situation, it is surprising that no disease-specific QOL instrument currently exists for this common disease. In addition, QOL measurement may arguably be the most important endpoint in terms of quantifying patient outcomes because traditional endpoints of mortality and survival are not particularly relevant in this patient population.

In using the existing, broader QOL instruments in our preliminary studies, we often heard from the participants that they felt that most of the items were irrelevant to their situation. The preliminary studies did demonstrate some QOL alterations, but the sensitivity of these instruments was quite low and therefore artificially diminished the recorded impact of the disease.

We report the development of a disease-specific QOL measure for patients with NMSC of the head and neck. It is a 36-item questionnaire that can be readily administered in the clinical setting without assistance. These items were systematically developed and represent a range of important aspects of QOL for this specific patient population, as represented by patient opinions and statistical substantiation. Although health care expert opinion and review of the literature was also used, this newly created questionnaire largely represents the expressed viewpoints of patients with NMSC.

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The creation of specific subscales was loosely based on past QOL instrument designs[25,29,30] but was largely driven by patient comments during the semistructured interviews, preliminary studies, and clinical experience. The Appearance subscale is unique to this instrument and was separated out from the Emotional subscale. The Appearance subscale was created to capture the key issues of disfigurement, scarring, and self image perceptions, whereas the Emotional subscale was designed to focus more on issues related to the clinical course of the cancer.

The creation of this valid measurement tool will potentially serve as an outcome measure in future intervention studies that aim to improve QOL of this ever growing population. Currently, surgical removal remains the mainstay for the vast majority of patients with NMSC. However, the recent advent of topical 5-fluorouracil and diclofenac and increasing interest in laser or photodynamic therapy for treatment of NMSC highlight the burgeoning field of nonsurgical options.[31,32] On the horizon, topical immune response modifiers may play a larger role in the treatment of nonsurgical options for NMSC.[33] In certain situations, nonsurgical treatments may offer some advantages in terms of reduction of scarring and better cosmetic results. However, the length of treatment and associated discomfort of some of these nonsurgical options may negatively impact patient QOL. A valid and disease-specific QOL instrument would be useful for future studies comparing different treatment modalities for specific patient populations.

Finally, perceptions of illness may be different between the sexes, among ethnic groups (Latinos/Hispanic vs. whites), between regions of the country, and among certain NMSC clinical subgroups (immunocompromised patients, varying anatomic locations, size/severity of disease). Information in regard to differing illness perceptions will help clinicians to target at-risk groups in terms of perioperative counseling.

Additional psychometric testing and validation studies of this newly created scale are currently underway. The subsequent validation studies are being conducted on a multi-institutional basis to broaden the geographic and patient diversity. With further rigorous testing, it is predicted that the final instrument will contain fewer items along with some modifications to this preliminary version.

CONCLUSION

We have created a new disease-specific QOL instrument for patients with NMSC of the head and neck. Validation studies are currently underway. This newly created scale will potentially serve as an important outcome measure in future interventional studies that aim to improve QOL of this ever growing population.

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TABLE I

Descriptive Statistics for Sociodemographic and Study Variables.

Variable	Phase I Distribution % (n)	Phase II Distribution % (n)
Age	Mdn = 69.5 M = 65.7, SD = 12.7 Range = 42–86 years	Mdn = 69.5 M = 66.7, SD = 13.2 Range = 40–91 years
Sex		
Women	55.0 (11)	61.5 (32)
Men	45.0 (9)	38.5 (20)
Income		
≤10K	5.0 (1)	7.7 (4)
10,001–20K	15.0 (3)	13.5 (7)
20,001–30K	15.0 (3)	5.8 (3)
30,001–50K	15.0 (3)	28.8 (15)
50,001–70K	5.0 (1)	13.5 (7)
>70K	45.0 (9)	19.2 (10)
Missing		11.5 (6)
Education		
High school (or less)	35.0 (7)	42.3 (22)
College attendance	40.0 (8)	28.8 (15)
College graduate	20.0 (4)	17.3 (9)
Graduate degree	5.0 (1)	9.6 (5)
Missing		1.9 (1)
Marital status		
Never	5.0 (1)	13.5 (7)
Married	70.0 (14)	55.8 (29)
Divorced	5.0 (1)	15.4 (8)
Widowed	20.0 (4)	15.4 (8)
Living arrangement		
Alone	30.0 (6)	28.8 (15)
Spouse	55.0 (11)	48.1 (25)
Spouse/children	15.0 (3)	19.2 (10)
Other relatives		3.8 (2)
Employment status		
Full-time	20.0 (4)	26.9 (14)
Part-time	5.0 (1)	5.8 (3)
Retired	50.0 (10)	51.9 (27)
Homemaker		5.8 (3)
Self-employed	15.0 (3)	1.9 (1)
Retired/part-time	10.0 (2)	7.7 (4)
History		
Basal	75.0 (15)	86.5 (45)
Squamous	25.0 (5)	11.5 (6)
Tumor location		
Nose	40.0 (8)	40.4 (21)
Lip	25.0 (5)	0.0 (0)
Eye	15.0 (3)	13.5 (7)
Ear	0.05 (1)	5.8 (3)
Cheek	0.00 (0)	15.4 (8)
Forehead	0.00 (0)	13.5 (7)
Neck	0.00 (0)	3.8 (2)
Other (Chin, eyebrow)	15.0 (3)	7.7 (4)

Phase I: n = 20; phase II: n = 52.

Mdn = median; M = mean.

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TABLE II

Item Frequency Distribution, Phase II.

Item	Mean (SD)	Item Frequency Distribution 1	2	3	4	5	Missing Frequency (%)
Emotional alpha = .81							
Metastasis	4.31 (1.20)	3	3	4	7	35	0
Cancer progression	4.23 (1.20)	3	3	5	9	32	0
Family skin cancers	3.52 (1.51)	11	0	11	11	19	0
Causal factors	4.17 (1.28)	5	1	5	10	31	0
Frustrated	3.17 (1.44)	10	7	11	12	12	0
Anxiety	3.47 (1.33)	8	1	14	15	13	1 (1.9)
Future concerns	4.67 (0.71)	1	1	11	0	39	0
Appearance alpha = .84							
Clothing limitations	2.08 (1.33)	27	8	5	10	2	0
Scar size, depth	3.69 (1.26)	3	8	8	15	17	0
Personal attractiveness	2.98 (1.36)	10	9	14	10	9	0
Embarrassment	2.50 (1.36)	18	8	13	8	5	0
Other’s questions	2.25 (1.17)	19	10	16	5	2	0
Scar visibility	3.46 (1.41)	7	7	9	13	16	0
Work/Financial alpha = .81							
Time off work	1.77 (1.34)	34	3	2	6	3	4 (7.7)
Limits advancement	3.33 (1.46)	37	4	3	2	4	0
Financial problems	3.04 (1.56)	14	6	9	10	13	0
Effect on work functions	1.91 (1.27)	28	5	5	8	1	5 (9.6)
Health insurance coverage	4.02 (1.43)	7	2	4	9	30	0
Lifestyle/recreation alpha = .78							
Limits on outdoor activities	3.52 (1.38)	7	5	10	14	16	0
Types outdoor activities	3.56 (1.41)	8	3	10	14	17	0
Interference with hobbies	2.79 (1.40)	12	12	12	7	9	0
Constant sunscreen use	4.08 (1.35)	6	1	6	9	30	0
Sun-protective clothing	3.96 (1.33)	6	1	7	13	25	0
Social/family alpha = .87							
What friends think	2.23 (1.38)	23	11	5	9	4	0
Limiting socialization	2.71 (1.59)	21	2	7	13	8	1 (1.9)
What family thinks	3.29 (1.43)	9	7	7	16	12	1 (1.9)
Spousal attitude/thoughts	2.73 (1.48)	17	2	13	9	7	4 (7.7)
Responsibility on family	3.08 (1.51)	14	3	11	13	11	0
Isolation period	2.70 (1.66)	20	6	4	9	11	0
Physical/functioning alpha = .63							
Skin sensitivity to touch	2.69 (1.50)	15	13	7	7	10	0
Skin sore	3.48 (1.32)	6	6	11	15	14	0
Body functions	3.75 (1.49)	9	1	7	11	23	0

n = 52.