Published in final edited form as:

Dermatol Surg. 2009 July ; 35(7): 1041–1049. doi:10.1111/j.1524-4725.2009.01181.x.

Patient Satisfaction after Treatment of Nonmelanoma Skin Cancer

Maryam M. Asgari, MD MPH^{1,2}, Daniel Bertenthal, MPH³, Saunak Sen, PhD^{3,4}, Anju Sahay, PhD³, and Mary-Margaret Chren, MD^{2,3}

¹Division of Research, Kaiser Permanente Northern California, Oakland, California

²Department of Dermatology, University of California at San Francisco

³Health Services Research Enhancement Award Program (REAP), San Francisco Veterans Affairs Medical Center

⁴Department of Epidemiology and Biostatistics, University of California at San Francisco

Abstract

Background—Patient satisfaction is an important aspect of patient-centered care, but has not been systematically studied after treatment of nonmelanoma skin cancer (NMSC), the most prevalent cancer.

Objective—To compare patient satisfaction after treatment for NMSC and to determine factors associated with better satisfaction.

Methods—We prospectively measured patient, tumor and care characteristics in 834 consecutive patients at two centers before and after destruction, excision and Mohs surgery. We evaluated factors associated with short-term and long-term satisfaction.

Results—In all treatment groups, patients were more satisfied with the interpersonal manners of the staff, communication, and financial aspects of their care, than with the technical quality, time with the clinician, and accessibility of their care ($p < 0.05$). Short-term satisfaction did not differ across treatment groups. In multivariable regression models adjusting for patient, tumor, and care characteristics, higher long-term satisfaction was independently associated with younger age, better pre-treatment mental health and skin-related quality of life, and treatment with Mohs surgery ($p < 0.05$).

Conclusions—Long-term patient satisfaction after treatment of NMSC is related to pre-treatment patient characteristics (mental health, skin-related quality of life) as well as treatment type (Mohs) but not related to tumor characteristics. These results can guide informed decision-making for treatment of NMSC.

INTRODUCTION

Non-melanoma skin cancer (NMSC) can be successfully treated with different therapies including destruction (cryotherapy, electrodesiccation and curettage, laser ablation), radiation, surgery (excision, Mohs surgery) and topical chemotherapeutic agents (5-fluorouracil, imiquimod, 5-aminolevulinic acid with photodynamic therapy). There is substantial variation in treatment selection in different practice settings¹ and insufficient evidence exists to recommend a single treatment as superior to others for most tumors.²⁻⁴ Data largely from

Corresponding Author: Mary-Margaret Chren, MD, University of California at San Francisco, San Francisco VAMC, 4150 Clement Street, 151 R, San Francisco, CA 94121, Phone: (415)221-4810 ext 3982, Fax: (415)751-3927, E-mail: chrenm@derm.ucsf.edu.

We the authors certify that the manuscript represents original and valid work and neither the manuscript nor one with substantially similar content has been published or is being considered for publication elsewhere. The authors declare no conflict of interest.

retrospective studies suggest that recurrence rates are lowest after the most technologically intensive therapy, Mohs surgery, and highest after destruction.^{2,5-6} Skin-related quality of life improves similarly after Mohs surgery or excision, but does not improve after destruction with electrodesiccation and curettage.⁷

In an increasingly patient-oriented health care system, patient satisfaction is an important outcome to guide treatment selection, especially for typically nonfatal conditions such as NMSC. Patient satisfaction can be influenced by numerous variables such as the patient's perceptions of practitioner competence and communication, financial aspects associated with care, environmental surroundings, and clinical outcome. In addition, patient satisfaction has been associated with several other outcomes including health status, quality of life, adherence to medical advice, and initiation of complaints.⁸⁻¹¹

We sought to compare patient satisfaction after the three main treatments for NMSC and to determine pre-treatment patient, tumor, and care characteristics that are associated with better short-term and long-term satisfaction.

MATERIALS AND METHODS

Study Design

Data were obtained prospectively from a cohort of consecutive patients with NMSC diagnosed in 1999 and 2000 at a university-affiliated dermatology practice or the nearby affiliated VA Medical Center. The study was approved by the Institutional Review Board at both institutions. Potential study participants were identified by daily review of all pathology records at both institutions. NMSCs were defined as those with a final histopathologic diagnosis of basal cell carcinoma or squamous cell carcinoma (including squamous cell carcinoma-in-situ). Potential participants were excluded if they were younger than 18 years, if their records were protected because they were employees, or if they had a previous skin cancer diagnosed during the study period. Participants were considered ineligible if they were physically or mentally unable to complete surveys, did not speak English, or had no current address available. Patients were enrolled if they responded to a pre-treatment questionnaire about their health and quality of life.

We restricted the study population to 834 individuals whose tumors were treated by electrodesiccation and curettage (destruction), excision, or Mohs surgery. If a patient had multiple tumors, he or she was asked to respond only about therapy of the most bothersome tumor, and data are reported only about this tumor and its care.

Data Collection and Measures

Data were obtained from medical records and patient surveys. Using structured data-forms, trained research staff collected data from clinical notes and pathology records. Clinicians were categorized according to level of training, as attending physicians, resident physicians, or nurse practitioners.

Socioeconomic characteristics, co-morbid illnesses, tumor-related quality of life, and health status were measured before therapy from patients' answers to a mailed survey. Comorbidity was measured by an adapted version of the Charlson index.¹²⁻¹³ Tumor-related quality of life was measured with the 16-item version of Skindex.¹⁴ We used a composite score calculated as the mean of the three Skindex subscale scores.⁷ We also inquired about pre-treatment concern about scar and worry about the treatment. Health status was measured with an adapted version of the Medical Outcomes Study SF-12 instrument¹⁵ which reported a Physical Component Score (PCS) and a Mental Component Score (MCS). In evaluating these scores, higher is healthier and 50 is the mean norm-based standardized score.

Short-term patient satisfaction was measured one week after therapy with the 18-item version of the Patient Satisfaction Questionnaire (PSQ-18),¹⁶ adapted for the treatment of skin cancer. The PSQ-18 assesses general satisfaction as well as satisfaction with six domains of care during a medical visit. Patients responded about how strongly they agreed or disagreed with statements about technical quality, interpersonal manner, communication, financial aspects of care, time spent with clinician, and accessibility of care. For each question, scores varied from 1 to 5; for overall satisfaction and the domains of care, higher scores indicate increased satisfaction with medical care.

To measure long-term satisfaction (after scar remodeling was complete), patients responded at 12 months after therapy to a single global question, "I am completely satisfied with the treatment of my skin problem." This item was derived from the general satisfaction items of the PSQ-18; scores varied from 1 (strongly disagree) to 5 (strongly agree). We used a global item because we reasoned that after a year, patients would likely remember overall impressions rather than the details of their experience.

Statistical Analysis

Based on previous work about patient satisfaction and our clinical experience, we hypothesized that long-term satisfaction would be best for older, married patients, those with better pre-treatment skin-related quality of life and mental health status, those treated at the VA, and those treated with Mohs surgery.^{9-10,17-19}

We compared baseline clinical features in the three treatment groups using either a Chi-square test or a Fisher's exact test, as indicated by number of subjects per cell. A one-way ANOVA was used for comparison of continuous variables. For ordinal variables, analysis was performed using the non-parametric Kruskal-Wallis test allowing for ties.

For multivariable analyses we chose variables that were either significant ($p < 0.20$) characteristics in bivariable analyses, or characteristics we judged to be clinically important. The worry variables were markedly colinear with Skindex and were therefore excluded from the multivariable model. The clinically important variables we included were pre-treatment patient characteristics (patient age, gender, race, health status), tumor location, and care characteristics (treatment type and care site).

We found that the three treatment groups (destruction, excision, and Mohs) differed substantially in important patient, tumor and care characteristics. For example, destruction was rarely performed in tumors on the head and neck. To compare treatments, we sought to compare outcomes in patients who had similar patient, tumor and care characteristics. We restricted multivariable analyses to subjects in which sufficient numbers of patients shared patient (sex), tumor (location) and care (provider, site of care) characteristics. The case mix allowed for two sets of comparisons: patients treated with Mohs or excision and those treated with excision or destruction. We then used multivariable ordinal logistic models to evaluate independent predictors of long-term patient satisfaction, using generalized estimating equations (GEE) to adjust for clustering within strata defined by sex, site of care, provider, and tumor location.

We also performed a secondary analysis comparing Mohs and excision using matched pairs. The matched pairs were created using propensity scores resulting in 44 comparable pairs. We calculated propensity scores for each patient who had been treated with Mohs or excision using a logistic regression model. In this model, the dependent variable was whether the individual received Mohs or excision. The independent variables included sex, site of care, provider, tumor location, and variables shown to be associated with treatment choice including age, baseline Skindex composite score and baseline SF-12 Physical and Mental Component Scores. We then matched patients treated with Mohs to patients treated with excision by selecting the

patient pair with the most similar propensity scores, removing the pair, and selecting a pair with the next most similar propensity scores. The process was repeated until the difference in propensity scores exceeded 0.2. We then calculated the average difference in satisfaction in the matched pairs. Significance was evaluated using a permutation test. For each pair, we randomly switched the treatment labels, and calculated the average difference in satisfaction. This process was repeated until it yielded the distribution of the average difference in satisfaction between the two treatments. The p-value was the proportion of times the observed absolute average difference in satisfaction exceeded the absolute average difference in satisfaction in the permuted data.

Statistical analyses were performed using Stata Statistical Software, Release 9.2, and the R programming language (<http://www.r-project.org>).

RESULTS

Baseline Characteristics

Treatment modalities included destruction by electrodesiccation and curettage (19%), excision (40%) and Mohs surgery (41%). Patients in the three treatment categories were similar in age, physical and mental health status, and co-morbidity index, but differed in education, income, baseline quality of life, and tumor characteristics. Also, excision was more likely to be performed at the VA, and Mohs was almost exclusively performed by attending physicians (Table 1).

Domains of Short-Term Satisfaction

At one week after therapy, general satisfaction was high (4.19 ± 0.86). Overall, patients were more satisfied with the interpersonal manners of the staff, communication, and financial aspects of their care than with other domains of satisfaction. Patients in the three treatment groups had similar satisfaction with most domains, except that compared with patients treated with destruction, patients treated with Mohs and excision were somewhat more satisfied with the technical quality of their care, and with communication (Figure 1).

Predictors of Long-Term Patient Satisfaction

At one year after therapy, 571 patients (68%) responded about their long-term satisfaction with care. Overall, mean long-term satisfaction was high (4.08 ± 1.08), and, in bivariate analyses, was related to being married, having better baseline health status and skin-related quality of life, and having tumors on the head and neck (Table 2).

In the subset of patients treated with excision or Mohs ($n=315$), odds of higher long-term satisfaction was independently associated with younger age, better pre-treatment mental health status and skin-related quality of life, and treatment with Mohs surgery (Figure 2a). In the subset of patients treated with excision or destruction ($n=211$), odds of higher long-term satisfaction was independently associated ($p<0.05$) only with better pre-treatment mental health status (Figure 2b). Similar results were found in the propensity analyses.

DISCUSSION

One week after treatment for NMSC, patients were generally satisfied with their care, but were more satisfied with the interpersonal manners of the staff, with communication, and with financial aspects of their care, compared to the technical quality, time with the clinician, and accessibility of their care. Compared with those treated with destruction, patients treated with excision or Mohs were somewhat more likely to perceive better technical quality and

communication, but the 4 other domains of short-term satisfaction were similar across treatment groups.

A year after treatment for NMSC, overall long-term satisfaction with therapy was high regardless of treatment type. Among patients treated with excision or Mohs, independent predictors of higher satisfaction were younger age, better pre-treatment skin-related quality of life, better pre-treatment mental health status, and treatment with Mohs surgery. Among patients treated with excision or destruction, the only independent predictor of higher satisfaction was better pre-treatment mental health status.

In all comparisons, better pre-treatment mental health predicted higher long-term satisfaction after treatment of NMSC. These results are consistent with a previous prospective study of dermatologic outpatients, which also showed that patient satisfaction measured at 3 days and 4 weeks after a dermatologic outpatient encounter was significantly associated with pre-visit quality of life and psychiatric disorders.⁹ Further evidence of the association of lower patient satisfaction with self-reported psychiatric morbidity is supported by a recently published review of the dermatologic literature.⁸

In the comparison of patients treated with excision or Mohs, the odds of higher satisfaction were less for older patients. This finding is in contrast to previous studies that have shown that older patients are more satisfied with their care,^{9,20} independent of health status. On the other hand, the relationship of age and satisfaction is likely complex.²¹ One possible explanation for our findings is that older patients may have been less tolerant of the length of the Mohs surgery procedure, although this issue deserves further study.

The finding that Mohs surgery was an independent predictor of higher satisfaction is potentially important. Studies of predictors of short-term and long-term satisfaction have found that short-term satisfaction is more likely associated with patient-doctor communication whereas long-term satisfaction is reflective of symptom outcome (symptom resolution, need for repeat visits, functional status).²⁰ One possible explanation for better odds of higher long-term satisfaction following Mohs may be better functioning of local structures due to the tissue-sparing aspects of the technique. We have found no difference between patients treated with Mohs or excision, however, in long-term quality-of-life outcomes, including bother from appearance and effects on social or physical functioning.⁷ These findings may be due to the fact that quality of life and satisfaction reflect different aspects of patients' experience after therapy.

The PSQ-18 may have lacked sensitivity by failing to inquire about key factors that are known to influence overall satisfaction, such as environmental factors, interactions between non-provider office staff and patient,²² nursing care,²³ and time spent in the waiting room.^{24-25, 26} Another limitation is that our study participants were patients willing to complete a questionnaire, which may limit generalizability. The 571 patients who responded about satisfaction at one year were similar to those who did not respond in many characteristics including age, gender, marital status, pretreatment physical and mental health, pretreatment Skindex scores, and tumor type and location of treatment, but had smaller tumors.

Although we have established statistically significant differences in the odds of higher satisfaction with certain patient and treatment characteristics, the clinical significance of these differences may be questioned. A previous study suggested that dermatology patients clearly differentiate between being satisfied or very satisfied with their healthcare.²⁷ For some patients, being satisfied meant that aspects of their care could have been improved, whereas being very satisfied meant that optimal care had been provided. This finding suggests that subtle statistically significant differences in global satisfaction can have clinical relevance.

In summary, long-term patient satisfaction of treatment of NMSC is related to pre-treatment patient characteristics as well as treatment choice. These results need to be combined with data about other outcome measures to inform decision making for treatment of NMSC.

Acknowledgments

FUNDING:

NIAMS (K23 AR 051037-01, Dr. Asgari; K24 AR052667, Dr. Chren); Health Services Research & Development Service, Department of Veterans Affairs [IIR 04-043-3 (Dr. Chren), and Health Services Research Enhancement Award Program (REAP), San Francisco Veterans Affairs Medical Center].

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Figure 1.
Domains of short-term patient satisfaction*

a

Figure 2a.
Predictors of long-term satisfaction (Mohs compared with excision)*

b

Figure 2b.
Predictors of long-term satisfaction (excision compared with destruction)*

Table 1

Baseline Characteristics (n=834)

Characteristics	Overall	Destruction n= 162	Excision n = 332	Mohs n = 340	P
Patient Characteristics					
Age, years (mean)	65.8	64.0	66.9	65.6	0.101
Gender (% male)	75.3	78.4	80.1	69.1	0.003
Marital Status (% married)	47.8	46.5	47.6	48.6	0.901
Race (% Caucasian)	94.4	96.1	93.2	94.6	0.425
Education, % completed High School or less College Graduate/Professional School	39.1 30.8 30.1	26.9 34.6 38.5	42.5 29.1 28.4	41.6 30.1 27.7	0.011
Income, annual (< \$30,000)	52.5	47.6	59.5	47.9	0.006
History of previous NMSC (%)	55.1	60.5	54.2	53.5	0.309
% > median Charlson Index	38.3	41.4	39.8	35.3	0.326
Health Status (mean component score of SF-12) ¹ Physical Mental	45.7 48.4	45.3 49.0	45.2 48.0	46.4 48.4	0.390 0.682
Worry (mean score) ² about scar about treatment	28.6 38.6	19.8 30.8	24.7 35.3	36.7 45.6	<0.001 <0.001
Skinex Composite (mean score) ³	25.0	20.7	24.9	27.3	<0.001
Tumor Characteristics					
Histologic type (% basal cell carcinoma)	76.6	79.6	68.4	83.2	<0.001
Diameter (mm, mean)	10.7	9.6	12.4	9.5	0.003
Location (% head & neck)	68.3	29.2	59.0	95.9	<0.001
Care Characteristics					
Practice site (% VA)	46.8	40.7	62.7	34.1	<0.001
Training level of clinician % attending % resident % nurse practitioner	70.1 27.3 2.6	57.1 33.8 9.1	46.8 51.1 2.1	98.8 1.2 0	<0.001

¹ As measured by SF-12 instrument which computes a Physical Component Summary Score (PCS12) and a Mental Component Summary Score (MCS12); a higher score reflects a better health status.

² A higher score indicates more worry.

³ A higher score indicates worse quality of life.

Table 2
Long-Term Patient Satisfaction after Treatment for NMSC

Characteristic	Patient Satisfaction at 1 year mean ($\pm$ SD)	P
Patient Characteristics		
Age ≤median >median	4.10 ($\pm$ 1.1) 4.06 ($\pm$ 1.1)	0.358
Gender Male Female	4.11 ($\pm$ 1.0) 3.97 ($\pm$ 1.2)	0.399
Race White Other	4.11 ($\pm$ 1.1) 3.83 ($\pm$ 1.1)	0.057
Marital Status Married Single/divorce/widowed	4.20 ($\pm$ 1.0) 3.95 ($\pm$ 1.2)	0.007
Education completed High School or less College or more	4.11 ($\pm$ 1.1) 4.06 ($\pm$ 1.1)	0.517
Income < \$30,000 ≥ \$30,000	4.12 ($\pm$ 1.0) 4.05 ($\pm$ 1.1)	0.457
History of previous NMSC Yes No	4.04 ($\pm$ 1.1) 4.13 ($\pm$ 1.0)	0.480
Skin Related Quality of Life (Skindex composite) ¹ < median score (better) □ median score (worse)	4.22 ($\pm$ 0.99) 3.98 ($\pm$ 1.1)	0.011
Pre-Treatment Comorbidity ² ≤ median Charlson (better) > median Charlson (worse)	4.09 ($\pm$ 1.1) 4.07 ($\pm$ 1.1)	0.792
Pre-Treatment Physical Health Status ³ ≤median score (worse) > median score (better)	4.00 ($\pm$ 1.1) 4.17 ($\pm$ 1.1)	0.021
Pre-Treatment Mental Health Status ³ ≤median score (worse) > median score (better)	3.91 ($\pm$ 1.1) 4.27 ($\pm$ 0.96)	<0.001
Pre-Treatment worry about scar ≤median score (less worry) >median score (more worry)	4.20 ($\pm$ 1.0) 3.96 ($\pm$ 1.1)	0.006
Pre-treatment worry about treatment ≤median score (less worry) >median score (more worry)	4.16 ($\pm$) 4.01 ($\pm$)	0.123
Tumor Characteristics		
Histologic type Basal cell carcinoma Squamous cell carcinoma	4.10 ($\pm$ 1.1) 4.00 ($\pm$ 1.1)	0.299
Location of lesion Head and neck Other	4.15 ($\pm$ 1.0) 3.91 ($\pm$ 1.2)	0.017
Tumor diameter □ 10 mm > 10 mm	4.08 ($\pm$ 1.1) 4.12 ($\pm$ 1.0)	0.947
Care Characteristics		
Practice Site VA hospital Private hospital	4.06 ($\pm$ 1.1) 4.10 ($\pm$ 1.1)	0.481
Training Level of Clinician	4.08 ($\pm$ 1.1)	0.127

Characteristic	Patient Satisfaction at 1 year mean ($\pm$ SD)	P
Attending	4.08 ($\pm$ 1.1)	
Resident	3.76 ($\pm$ 0.97)	
Nurse practitioner		
Treatment	3.95 ($\pm$ 1.2)	0.123
Destruction	4.02 ($\pm$ 1.1)	
Excision	4.19 ($\pm$ 0.99)	
Mohs		

¹ As defined by the composite Skindex16 score, defined as the mean of the three Skindex subscales: Symptoms, Emotional effects, and Effects on social functioning. A higher score indicates worse quality of life.

² Using an adaptation of the Charlson Comorbidity Index. A higher score indicates more comorbid illness.

³ As measured by SF-12 instrument which computes a Physical Component Summary Score (PCS12) and a Mental Component Summary Score (MCS12); a higher score reflects a better health status

⁴ A higher score indicates more worry.