



Published in final edited form as:

Head Neck. 2010 March ; 32(3): 301–309. doi:10.1002/hed.21181.

A Multidimensional Analysis of Body Image Concerns Among Newly Diagnosed Patients with Oral Cavity Cancer

Michelle Cororve Fingeret, Ph.D.¹, Damon J. Vidrine, Dr.P.H.¹, Gregory P. Reece, M.D.², Ann M. Gillenwater, M.D.³, and Ellen R. Gritz, Ph.D.¹

¹Department of Behavioral Science, The University of Texas M. D. Anderson Cancer Center, Houston, TX

²Department of Plastic Surgery, The University of Texas M. D. Anderson Cancer Center, Houston, TX

³Department of Head and Neck Surgery, The University of Texas M. D. Anderson Cancer Center, Houston, TX

Abstract

Background—Body image is a critical psychosocial issue for patients facing treatment for oral cancer yet there is limited research conducted in this area. This study utilizes a multidimensional approach to body image assessment and evaluates relationships between body image, demographic, health, and psychosocial variables.

Methods—Newly diagnosed patients with oral cancer completed self-report questionnaires and a structured clinical interview.

Results—Most participants identified current and/or future body image concerns primarily related to impending surgery. Adequate psychometric properties were demonstrated on a range of body image measures. Depression was the strongest and most consistent predictor of body image outcomes.

Conclusions—Preliminary evidence supports the importance of evaluating body image concerns in oral cancer patients prior to surgical intervention. Our findings have implications for developing validated body image tools and can be used to guide psychosocial interventions targeting body image disturbance.

Keywords

body image; facial disfigurement; oral cavity cancer; distress; quality of life

Introduction

Body image is recognized as a critical psychosocial issue for individuals with oral cancer, as the disease and its treatment can have devastating consequences involving disfigurement and functional impairment. There are enormous social implications for the body image changes experienced by these patients due to the visible nature of the facial region and its association with identity, communication abilities, and interpersonal functioning. Research with a broad

Correspondence and/or reprint requests should be sent to: Dr. Michelle Cororve Fingeret, University of Texas M. D. Anderson Cancer Center, Department of Behavioral Science, P.O. Box 301439, Unit 1330, Houston, TX 77230-1439, (713) 563-8032, mcfinger@mdanderson.org.

Portions of this paper were presented at the annual meetings of the Society for Research on Nicotine and Tobacco, February 2007 and the Society of Behavioral Medicine, March 2007

array of head and neck patients identifies a number of psychosocial difficulties associated with appearance changes including high levels of anxiety and depression, worsened relationships with partners and increased social isolation.(1,2) One important variable to consider when examining psychosocial distress involving body image appears to be preoperative expectations. The anticipation of disfigurative surgery as well as inaccurate perceptions of postoperative appearance in head and neck patients have been significantly related to overall distress and low levels of coping effectiveness.(3–5)

Previous work has typically been conducted with a broad array of head and neck patients and therefore has not considered the unique psychosocial concerns of oral cancer patients as they relate to bodily and appearance changes. The primary purpose of this study is to obtain a greater understanding of the nature and extent of body image concerns experienced by patients with oral cancer. Much of the research conducted on body image in cancer patients has been widely criticized for using loosely constructed or simplistic definitions of body image and employing inadequately validated measures.(6,7) In the broader field of body image research, great attention is paid to the multidimensional nature of body image, which involves cognitions, behaviors, and emotions about the entire body and its functioning.(8) Body image investment, or the importance placed on appearance and valuing specific body ideals, is recognized as another critical component which directly influences one's body image evaluation.(9) Numerous tools are available to evaluate these facets of body image, and can be applied in the oncology setting. It is critical to recognize that body image experiences are inherently subjective and not necessarily congruent with objective body changes readily observed by others. The influence of subjective factors in determining adjustment to bodily changes is underscored by a wealth of research on patients with disfiguring conditions which demonstrates no clear relationship between degree of disfigurement and the nature of psychological response to disfigurement.(10–12)

Although some research suggests that many patients with head and neck cancer appear to adapt well to disfigurement,(10,13) other studies have found high rates of psychosocial distress related to appearance changes. In a recent study, 41% (N = 114) of surgical patients with oral or oropharyngeal cancer reported distress about appearance on a quality of life scale included in their medical record.(14) This concern was only directly mentioned in seven patient charts leading the authors to conclude that body image issues are either not being recorded or properly addressed for many patients. Strauss(15) conducted a retrospective study of patients receiving surgery for oral and maxillofacial cancer and reported that all patients had experienced considerable presurgical anxiety with surgical mutilation as a prominent fear. Nearly 60% also reported feeling discounted or stigmatized because of their cancer-related appearance.

Clearly additional research is warranted to obtain a greater understanding of the nature and extent of body image concerns experienced by patients with oral cancer. For this study, our primary goal is to provide novel data about multiple dimensions of body image through the use of existing measures. Because many of the measures employed were not designed for or previously used with oral cancer patients, particular attention is given to examining psychometric properties and reporting on their initial use. Our secondary goal is to evaluate relationships between body image and key demographic, health behavior, medical, and psychosocial variables. We hypothesize that body image concerns are a unique source of psychological distress in patients with oral cancer and may be affected by variables such as sex, age, ethnicity, marital status, disease stage, and smoking behaviors.

Materials and Methods

Participants

The study sample included 75 patients with newly diagnosed oral cavity cancer scheduled to undergo surgical treatment at The University of Texas M. D. Anderson Cancer Center (MDACC). The study protocol was approved by the Institutional Review Board. Individuals were excluded if they were non-English speaking, had received previous treatment for a malignancy in the head and neck region, or had significant preexisting facial disfigurement from a previous trauma or congenital defect. Only 7% of participants approached declined to participate citing disinterest in the study or feeling too overwhelmed by their diagnosis.

Design and Procedures

Participants were evaluated at a single time point, prior to surgical intervention. After obtaining informed consent, participants were escorted to a clinic research room and administered a breath carbon monoxide test (Bedfont Micro Smokerlyzer®) to biochemically verify smoking status. Participants then completed the battery of self-report questionnaires and were administered a brief structured clinical interview to evaluate body image concerns. All participants were provided with a \$20 gift card at the completion of the evaluation.

Self-Report Questionnaires

A packet of survey instruments was administered to obtain data on demographic variables, health behaviors, medical history, body image, and psychosocial distress. Body image was evaluated using the following brief report measures in order to capture a range of dimensions involving body-related cognitions, emotions, and behaviors: 10-item Body Image Scale (BIS),(16) 20-item Appearance Schemas Inventory-Revised (ASI-R),(17) 16-item Body Satisfaction Scale (BSS),(18) 6-item Fear of Negative Appearance Scale (FNAES),(19) and 4-item Head and Neck Survey- Appearance Subscale (HNS).(20) On all measures, higher scores were reflective of greater body image concerns. The BIS incorporates items across all of the body image dimensions listed above, and is designed to evaluate satisfaction/ dissatisfaction with appearance changes resulting from cancer and its treatment. It is considered applicable for patients with any cancer site and form of therapy, but has only been previously validated with breast cancer patients(16). The ASI-R was designed to capture the critical element of body image investment and evaluates the importance, meaning, and influence of appearance in one's life. The BSS focuses on cognitive appraisal of body image by evaluating satisfaction/ dissatisfaction with 16 body parts, half involving the head and the other half involving the body. The FNAES focuses on cognitive and emotional aspects of body image with the goal of assessing fear of negative evaluation by others. The HNS-appearance subscale was used to capture behavioral aspects of body image. This was the only measure used specifically designed for head and neck patients, and assesses the degree to which physical appearance has affected a patient's social interactions and participation in work and recreational activities. When used with head and neck patients, this subscale has demonstrated convergent validity with other related measures, good internal consistency (0.83), and very high test-retest reliability (0.96).(20)

The Brief Symptom Inventory 18 (BSI-18) was included to evaluate psychological distress. The BSI has been psychometrically validated for use with cancer patients, and both adult community norms and oncology patient norms are available.(21) Higher scores on this measure are reflective of worse functioning (i.e., greater distress).

Structured Clinical Interview

To obtain additional information about the multidimensional nature of body image, a brief structured clinical interview was developed for this study. Content was based on a wide range of thoughts, behaviors, and emotions associated with individuals reporting appearance concerns in clinical populations with body image disturbance, which do not appear to be adequately tapped by other selected instruments. This includes evaluation of: a) preoccupation with appearance (i.e., time spent worrying), b) degree of distress associated with appearance, c) alterations in grooming as a result of appearance concerns, d) avoidance behaviors, e) checking behaviors/reassurance seeking, and f) degree of interference with daily activities. All clinical interviews were conducted by a licensed psychologist and responses were coded in terms of frequency/severity. For example, when asked how much time is occupied by thoughts about current/future defects or flaws in physical appearance – responses were categorized as follows: rarely/never (< 1 hour per week), a little (several times per week, < 1 hour per day), minimal (at least one hour per day), moderate (1–3 hours per day), severe (>3 hours, up to 8 hours per day), extreme (> 8 hours per day).

Data Analysis

After conducting descriptive analyses on participant characteristics, distributional indices and internal consistency for each scale were examined. Bivariate correlations were computed between measures to evaluate strength of association. We then evaluated unadjusted associations between each body image measure and the following variables: age, sex, race/ethnicity, education level, marital status, employment status, smoking status, disease stage, and psychosocial distress. Next, multiple regression models were constructed for each body image outcome. Due to the small sample size and exploratory nature of our study, we added variables with p-values of $\leq .1$ to construct initial regression models. Variables with p-value ($> .05$) were then sequentially removed and the model was re-estimated (highest p value first). Once only variables with $p < .05$ remained, each previously removed variable was re-introduced and p-values were re-inspected. All multiple regression models included smoking status and sex due to the consistent associations of these variables with body image in the general population(22–24). All statistical analyses were performed with Stata, version 8.2

Results

Descriptive statistics are presented in Table 1. There was considerable variation in terms of demographic variables such as education level and employment status as well as disease stage. Mean age for this sample was 57.71, SD = 14.68. Regarding smoking status, 41% of participants were current smokers or recent quitters (e.g., within the past 30 days), 28% were former smokers, and 31% had never smoked. The majority of participants were diagnosed with a squamous cell carcinoma. The most frequent tumor sites were tongue, floor of mouth, mandible, buccal mucosa, retromolar trigone, and alveolar ridge.

Results from the clinical interview indicated that 77% (N=58) of participants identified current and/or future appearance-related concerns. These concerns were primarily related to impending surgery and involved future scarring/disfigurement at the surgical site, loss of teeth, loss of hair, and speech concerns. Among those identifying specific aspects of body image they were concerned or dissatisfied with, 25% (14 out of 56) indicated spending more than 1–3 hours a day thinking about their appearance with four participants spending greater than 8 hours a day in this activity. Approximately 36% (20 out of 56) reported at least moderate levels of distress associated with thoughts about appearance. While most felt they had effective coping skills to manage distress, two participants found it difficult to control or cope with the worry, such that they had difficulty functioning (e.g., getting out of bed,

unable to work). Very few endorsed problematic levels of avoidance, camouflaging, excessive grooming, or reassurance seeking.

Our initial evaluation of body image outcomes (BIS, ASI-R, FNAES, BSS, HNS) focused on distributional properties and internal reliability estimates, summarized in Table 2. Internal consistency for all scales was high, and measures were significantly associated with one another in the expected direction (see Table 3). Bivariate correlations between measures ranged from 0.09 and 0.58. With the exception of the ASI-R, all other measures were positively skewed. This suggests that as a whole, scores reflected relatively low levels of body image concerns. Table 3 presents a correlation matrix of body image outcomes.

Table 4 presents unadjusted associations between body image outcomes and a range of sociodemographic and health variables. Of particular interest, there were no sex differences found on any of the body image measures. Depending on the measure, significant associations were found with race/ethnicity, employment status, and/or disease stage. Current smokers had elevated body image concerns on the BIS and BSS compared to nonsmokers, and unemployed participants had significantly elevated body image concerns on the BIS and HNS compared to employed or retired participants. Age was inversely correlated with body image concerns on the HNS. Unique findings for disease stage were demonstrated with the BSS where patients with T2 tumors reported the lowest body image concerns compared to all other patients.

For all body image outcomes, significant associations were found with the BSI, a measure of psychosocial distress (see Table 5). The depression subscale was significantly correlated with all body image outcomes and the anxiety subscale was significantly correlated with all outcomes except for the ASI-R and FNAES. This suggests significant overlap between body image concerns and psychological distress, an expected finding.

Multivariate analyses indicated that while controlling for effects of other variables, depression was the strongest and most consistent predictor of body image outcomes across the measures. The BSI depression scale significantly contributed to multivariate models for each body image measure (see Table 6). As with the univariate analyses, sociodemographic or medical variables contributed limited information that varied depending on the body image measure. Our models explained between 9% and 32% of variance in body image outcomes depending on the measure. The most variance explained was for the BSS, where disease stage, sex, and depression all significantly contributed to the model ($F = 4.71$, $p < 0.05$, $R^2=0.32$).

Discussion

This study was conducted to explore the initial use of existing body image measures with oral cancer patients and to evaluate the relationship between body image and key demographic, health and psychosocial variables. By evaluating patients prior to initiation of cancer treatment, we obtain important preliminary information about the nature of body image concerns in this patient group that can provide directions for future research. Previous studies in this area have focused primarily on outcomes following cancer treatment, and have been limited by the use of poorly constructed measures. In this study, we provide an analysis of multiple dimensions of body image using a broad array of measures drawn from the larger field of body image research.

The body image measures used here demonstrated convergent validity and high levels of internal consistency, thereby suggesting they are potentially useful with this population. The strength of association between the measures also lends support that each is tapping a unique aspect of body image functioning. The Body Image Scale (BIS) is recognized as

incorporating multiple body image dimensions involving cognitions, behaviors, and emotions and is the only measure focusing on changes as a result of disease and treatment. The Body Satisfaction Scale (BSS) involves cognitive appraisal of different body sites, and the Fear of Negative Appearance Evaluation Scale (FNAES) evaluates preoccupation with and distress associated with appearance evaluation. The appearance subscale of the Head and Neck Survey (HNS) taps behavioral avoidance and may have potential use as a stand along body image measure for head and neck cancer patients. The Appearance Schemas Inventory (ASI-R) focuses on general investment in body image or the degree to which an individual places importance on physical appearance.

Our findings suggest that prior to surgery there was a relatively low level of endorsement of current body image concerns. This was not surprising as patients with oral cancer tend to experience disfigurement, scarring, swelling and other outward appearance changes primarily as a result of treatment. In contrast to the 15% of our sample that reported being dissatisfied with their general appearance prior to surgical treatment, over 75% identified current and/or future appearance related concerns, primarily related to changes anticipated as a result of impending surgical treatment. Many focused on specific body parts related to disease site, others described more general concerns about experiencing disfigurement, swelling, or scarring. Among participants identifying appearance-related concerns, there was considerable variability in the amount of time spent thinking about and the degree of distress associated with these concerns. A subset of participants indicated moderate to severe levels of preoccupation with and/or distress about appearance concerns. Psychosocial intervention may thus be warranted to identify and treat body image disturbance in a select group of patients prior to surgical treatment. These findings point to the importance of evaluating anticipatory anxiety or preoperative expectations, which have previously been identified by Dropkin(5) as relating to decreased postoperative coping effectiveness for the head and neck patient.

We were not surprised to find that psychosocial distress, specifically depression scores, was the strongest and most consistent predictor of body image outcomes in both univariate and multivariate models. Individuals with head and neck cancer are known to have high levels of psychological distress, with worry, anxiety and depression frequently cited.(25,26) A unique source of psychological distress in patients with oral cancer is believed to arise from appearance-related changes involving facial disfigurement following surgical intervention. In this study, the association between body image concerns and depressive symptoms was found prior to surgical intervention, thereby providing useful information when counseling patients preoperatively. It is important to note here that the current findings are cross-sectional, and thus do not indicate whether appearance-related concerns drive distress or vice versa.

In contrast to our findings with psychological distress, no sociodemographic, health behavior, or medical variables demonstrated consistent associations with body image outcomes. The lack of sex differences in body image scores was surprising, as women are widely recognized as having higher levels of body image dissatisfaction compared to men. (27) Additional research is needed to replicate these findings and to determine whether unique characteristics of patients with oral cancer attenuate the relationship of body image and sex. In a separate study with individuals living with HIV/AIDS, we also found a lack of sex differences on body image measures,(28) which may indicate something unique about the experience of body image concerns for medical populations especially those facing life-threatening illnesses.

Several of our univariate findings warrant further evaluation in future studies. We provide important preliminary data to further explore the influence of smoking status, disease stage,

ethnicity, age, and marital status on body image with larger samples followed prospectively through cancer treatment and into the period of survivorship. There is reason to believe that the relationship between smoking status and body image will strengthen following surgical intervention as those who continue smoking are at higher risk for wound infections and problems with postoperative healing. These difficulties can contribute to greater disfigurement and thus higher levels of body image concerns. Moreover, with the onset of surgical treatment and other concomitant cancer therapies, body image outcomes are likely to become increasingly important and may affect patients differently based on age, marital status, and ethnicity/race. For example, younger individuals and/or those who are not married may have more difficulty adjusting to appearance changes. Ethnicity is widely recognized to influence body image outcomes in the general population due to cultural influences on ideal standards of attractiveness.⁽²⁷⁾ Tumor stage may be another relevant variable that relates to degree of disfigurement following surgical intervention. Larger tumors, depending on the site, are often associated with greater functional and appearance changes following treatment. However, the relationship between body image outcomes and tumor stage is likely to be complex especially when one considers the subjective nature of body image.

We acknowledge a number of limitations to the present study. Because our participants were being treated at a comprehensive cancer center, it is likely that more aggressive and unusual cases present for treatment. This may limit the ability to generalize our findings. In addition, we conducted a number of analyses without controlling for multiple comparisons. This was due to the exploratory nature of our study, and was considered necessary to elucidate the relationships and provide directions for future studies. We acknowledge that our findings especially with regard to sociodemographic, health behavior, and medical factors must be examined with a larger sample to improve power to detect effects. Moreover, prospective evaluation of these outcomes is needed. One important health behavior not specifically examined here but should be included in the future is alcohol consumption. Alcohol is an important risk factor for head and neck cancer, and the influence of alcohol use on body image and other psychosocial outcomes is not well understood.

In summary, we provide important preliminary data to evaluate body image concerns in patients with oral cavity cancer using an array of self-report measures. We also present novel information about patients who are at risk for disfigurement and appear to be experiencing anticipatory anxiety related to impending cancer treatment. Additional work is needed to clarify the utility of the measures employed in this study for specific diagnostic and clinical purposes. For example, cut-off points need to be established to determine clinical levels of body image disturbance requiring psychosocial intervention. It is also necessary to establish whether scores on these measures are sensitive to change following psychosocial intervention. Development of a brief comprehensive tool that evaluates relevant and unique body image domains for oral cancer patients would likely provide the greatest clinical utility.

Acknowledgments

This research was supported, in part, by a cancer prevention fellowship supported by the National Cancer Institute training grant R25 CA57730, Robert M. Chamberlain, Ph.D., Principal Investigator, University of Texas M.D. Anderson Cancer Center

References

1. Gamba A, Romano M, Grosso IM, et al. Psychosocial adjustment of patients surgically treated for head and neck cancer. *Head Neck*. 1992; 14(3):218–23. [PubMed: 1587739]

2. Katz MR, Irish JC, Devins GM, Rodin GM, Gullane PJ. Psychosocial adjustment in head and neck cancer: the impact of disfigurement, gender and social support. *Head Neck*. 2003; 25(2):103–12. [PubMed: 12509792]
3. Cassileth BR, Lusk EJ, Tenaglia AN. Patients' perceptions of the cosmetic impact of melanoma resection. *Plast Reconstr Surg*. 1983; 71(1):73–5. [PubMed: 6849025]
4. Dropkin MJ. Body image and quality of life after head and neck cancer surgery. *Cancer Pract*. 1999; 7(6):309–13. [PubMed: 10732529]
5. Dropkin MJ. Coping with disfigurement/dysfunction and length of hospital stay after head and neck cancer surgery. *ORL Head Neck Nurs*. 1997; 15(1):22–6. [PubMed: 9180583]
6. White CA. Body image dimensions and cancer: a heuristic cognitive behavioural model. *Psychooncology*. 2000; 9(3):183–92. [PubMed: 10871714]
7. Frierson, GM.; Andersen, BL. Breast reconstruction. In: Sarwer, DB.; Pruzinsky, T.; Cash, TF.; Goldwyn, RM.; Persing, JA.; Whitaker, LA., editors. *Psychological Aspects of Reconstructive and Cosmetic Plastic Surgery: Clinical, Empirical, and Ethical Perspectives*. Lippincott, Williams & Wilkins; Philadelphia: 2006. p. 173-188.
8. Cash, TF. Cognitive-behavioral perspectives on body image. In: Cash, TF.; Pruzinsky, T., editors. *Body Image: A Handbook of Theory, Research, and Clinical Practice*. The Guilford Press; New York: 2002. p. 38-46.
9. Pruzinsky T. Enhancing quality of life in medical populations: A vision for body image assessment and rehabilitation as standards of care. *Body Image: An International Journal of Research*. 2004; 1(1):71–81.
10. Pruzinsky, T. Social and psychological effects of facial disfigurement: Quality of life, body image and surgical reconstruction. In: Weber, RW.; Goepfert, H.; Miller, MJ., editors. *Basal and Squamous Cell Carcinomas Skin Cancers of the Head and Neck*. Williams & Wilkins; 1996. p. 357-362.
11. Rumsey N, Clarke A, White P, Wyn-Williams M, Garlick W. Altered body image: appearance-related concerns of people with visible disfigurement. *J Adv Nurs*. 2004; 48(5):443–53. [PubMed: 15533082]
12. Newell, R. *Body Image and Disfigurement Care*. Taylor & Francis Group; New York: 2000.
13. Vickery LE, Latchford G, Hewison J, Bellew M, Feber T. The impact of head and neck cancer and facial disfigurement on the quality of life of patients and their partners. *Head Neck*. 2003; 25(4): 289–96. [PubMed: 12658733]
14. Millsopp L, Bandom L, Humphris G, Lowe D, Stat C, Rogers S. Facial appearance after operations for oral and oropharyngeal cancer: a comparison of casenotes and patient-completed questionnaire. *Br J Oral Maxillofac Surg*. 2006; 44(5):358–63. [PubMed: 16236404]
15. Strauss RP. Psychosocial responses to oral and maxillofacial surgery for head and neck cancer. *Journal of Oral and Maxillofacial Surgery*. 1989; 47:343–348. [PubMed: 2926543]
16. Hopwood P, Fletcher I, Lee A, Al Ghazal S. A body image scale for use with cancer patients. *Eur J Cancer*. 2001; 37(2):189–97. [PubMed: 11166145]
17. Cash TF, Melnyk SE, Hrabosky JI. The assessment of body image investment: An extensive revision of the Appearance Schemas Inventory. *International Journal of Eating Disorders*. 2004; 35(3):305–316. [PubMed: 15048946]
18. Slade PD, Dewey ME, Newton T, Brodie D, Kiemle G. Development and preliminary validation of The Body Satisfaction Scale (BSS). *Psychology and Health*. 1990; 4:213–220.
19. Lundgren JD, Anderson DA, Thompson JK. Fear of negative appearance evaluation: Development and evaluation of a new construct for risk factor work in the field of eating disorders. *Eating Behaviors*. 2004; 5(1):75–84. [PubMed: 15000956]
20. Gliklich RE, Goldsmith TA, Funk GF. Are head and neck specific quality of life measures necessary? *Head Neck*. 1997; 19(6):474–80. [PubMed: 9278754]
21. Zabora J, BrintzenhofeSzoc K, Jacobsen P, et al. A new psychosocial screening instrument for use with cancer patients. *Psychosomatics*. 2001; 42(3):241–6. [PubMed: 11351113]
22. Streigel-Moore, RH.; Franko, DL. Body image issues among girls and women. In: Cash, TF.; Pruzinsky, T., editors. *Body Image: A Handbook of Theory, Research, and Clinical Practice*. The Guilford Press; New York: 2002. p. 183-191.

23. Gritz ER, Klesges RC, Meyers AW. The smoking and body weight relationship: Implications for intervention and postcessation weight control. *Annals of Behavioral Medicine*. 1989; 11(4):144–153.
24. Klesges RC, Meyers AW, Klesges LM, La Vasque ME. Smoking, body weight, and their effects on smoking behavior: a comprehensive review of the literature. *Psychol Bull*. 1989; 106(2):204–30. [PubMed: 2678202]
25. De Boer MF, McCormick LK, Pruyn JF, Ryckman RM, van den Borne BW. Physical and psychosocial correlates of head and neck cancer: a review of the literature. *Otolaryngol Head Neck Surg*. 1999; 120(3):427–36. [PubMed: 10064650]
26. Kugaya A, Akechi T, Okuyama T, et al. Prevalence, predictive factors, and screening for psychologic distress in patients with newly diagnosed head and neck cancer. *Cancer*. 2000; 88(12):2817–23. [PubMed: 10870066]
27. Cash, TF.; Pruzinsky, T. *Body image: A handbook of theory, research, & clinical practice*. The Guilford Press; New York: 2002.
28. Fingeret MC, Vidrine DJ, Arduino RC, Gritz E. The association between body image and smoking cessation among individuals living with HIV/AIDS. *Body Image: An International Journal of Research*. 2007; 4:201–206.

Table 1

Demographic, smoking status, and disease characteristics of the sample (n = 75)

Variable	Subgroup	Number of patients (percent)
Age (years)	21–50	22 (29.3)
	51–60	22 (29.3)
	61–70	17 (22.7)
	71–95	14 (18.7)
Sex	Female	33 (44.0)
	Male	42 (56.0)
Racial/ethnic affiliation	White	60 (80.0)
	African American	5 (6.7)
	Hispanic	9 (12.0)
	Asian	1 (1.3)
Education level	High school or less	23 (30.7)
	Some college or technical school	27 (36.0)
	4 year college degree or higher	25 (33.3)
Married/living with significant other	Yes	51 (68.0)
	No	24 (32.0)
Employment status	Not employed (other than retirement)	12 (16.4)
	Retired	26 (35.6)
	Employed	35 (48.0)
Smoking status	Current smoker	23 (30.7)
	Recent (within 30 days) quitter	8 (10.7)
	Former smoker	21 (28.0)
	Never smoker	23 (30.7)
Disease stage	1	20 (29.4)
	2	25 (36.8)
	3	8 (11.8)
	4	15 (22.1)
Squamous cell carcinoma	Yes	67 (89.3)
	No	8 (10.7)

Table 2

Summary of distributional indices and reliability estimates for body image outcomes

Measure	Min	Max	Mean	SD	Cronbach's alpha
BIS	0	18	2.51	3.14	0.81
ASIR	1.8	4.25	2.93	0.56	0.84
FNAES	6	24	10.59	3.86	0.82
BSS	16	108	37.16	17.16	0.93
HNS	0	87.50	17.15	21.97	0.87

Note. BIS = Body Image Scale, ASIR = Appearance Schemas Inventory- Revised, FNAES = Fear of Negative Appearance Evaluation Scale, BSS = Body Satisfaction Scale, HNS = Head and Neck Survey – Appearance Subscale. Higher scores are reflective of greater body image concerns.

Table 3

Correlation Matrix of Body Image Outcomes

	BIS	ASI-R	FNAES	BSS
BIS				
ASI-R	.14			
FNAES	.27 *	.53 **		
BSS	.43 **	.09	.32 **	
HNS	.39 **	.39 **	.58 **	.35 **

Note.

BIS = Body Image Scale, ASI-R = Appearance Schemas Inventory- Revised, FNAES = Fear of Negative Appearance Evaluation Scale, BSS = Body Satisfaction Scale, HNS = Head and Neck Survey – Appearance Subscale

* Correlation is significant at $p < .05$

** Correlation is significant at $p < .01$

Table 4

Unadjusted associations between body image measures and socio-demographic, smoking status, and disease stage variables, mean score (standard deviation)

	BIS	ASI-R	FNAES	BSS	HNS
Age in years					
21-50	2.2 (3.0)	3.1 (0.5)	10.9 (4.6)	35.2 (14.9)	24.1 (21.9)
51-60	2.5 (2.3)	2.8 (0.5)	10.4 (3.2)	38.3 (15.6)	17.9 (23.5)
61-70	3.6 (4.6)	2.9 (0.6)	11.1 (3.7)	39.7 (23.2)	13.2 (21.9)
71-95	1.7 (2.2)	2.9 (0.6)	9.8 (4.0)	35.2 (15.4)	9.1 (17.6)*
Sex					
Female	2.6 (2.6)	3.0 (0.7)	10.8 (4.4)	34.5 (13.9)	21.1 (24.3)
Male	2.4 (3.5)	2.9 (0.5)	10.4 (3.4)	39.3 (19.2)	14.1 (19.8)
Racial/Ethnic Affiliation					
White	2.5 (3.3)	2.9 (0.5)	10.8 (3.7)	39.5 (17.5)	18.3 (2.8)
Non-white	2.4 (2.5)	3.1 (0.6)	9.7 (4.2)	27.9 (12.3)**	12.5 (5.8)
Education Level					
≤ high school	3.0 (4.1)	3.0 (0.5)	10.5 (4.4)	35.3 (14.6)	16.8 (24.2)
Some college	2.4 (2.8)	2.9 (0.5)	10.3 (4.0)	36.4 (16.7)	19.7 (24.1)
≥ 4 year college degree	2.1 (2.5)	2.9 (0.7)	11.0 (3.3)	39.6 (19.9)	14.8 (17.7)
Married/Living with Significant Other					
Yes	2.0 (0.4)	2.9 (0.5)	10.3 (3.9)	35.5 (13.7)	15.0 (2.9)
No	3.5 (4.0)*	2.9 (0.6)	11.2 (3.8)	40.9 (23.0)	21.6 (5.0)
Employment Status					
Employed	2.3 (2.5)	2.9 (0.5)	10.4 (3.4)	34.7 (15.3)	15.9 (19.6)
Not employed	5.3 (5.0)**	3.0 (0.8)	11.1 (4.2)	40.2 (18.7)	29.7 (29.9)**
Retired	1.7 (2.2)	2.9 (0.6)	10.2 (3.5)	40.2 (19.1)	11.5 (16.7)
Current Smoker					
Yes	3.3 (3.7)	2.8 (0.6)	10.8 (4.1)	42.4 (20.4)	19.4 (4.3)
No	1.9 (2.5)*	3.0 (0.6)	10.5 (3.7)	33.6 (13.7)*	15.5 (3.1)
Disease Stage					

	BIS	ASI-R	FNAES	BSS	HNS
1	2.9 (2.4)	2.9 (0.5)	11.5 (3.8)	44.2 (15.9)	23.1 (21.5)
2	2.1 (2.9)	2.9 (0.6)	9.6 (3.3)	32.8 (11.3)**	15.0 (21.7)
3	1.4 (2.9)	3.0 (0.4)	10.9 (6.4)	36.7 (15.2)	16.4 (25.9)
4	3.6 (4.9)	2.9 (0.6)	9.9 (2.9)	40.2 (26.2)	17.4 (25.1)

***p < 0.01

BIS = Body Image Scale, ASI-R = Appearance Schemas Inventory- Revised, FNAES = Fear of Negative Appearance Evaluation Scale, BSS = Body Satisfaction Scale, HNS = Head and Neck Survey – Appearance Subscale. Higher scores are reflective of greater body image concerns.

* p < 0.1

** p < 0.05

Table 5

Unadjusted Associations Between Body Image Measures and Brief Symptom Inventory (BSI) scales – Regression coefficients

	BSI Depression Subscale	BSI – Anxiety subscale
ASI-R	0.015**	0.007
BIS	0.177***	0.114***
FNAES	0.12**	0.08*
BSS	0.822***	0.611***
HNS	1.033***	1.023***

Note. These are regression coefficients and therefore scale dependent.

BIS = BIS = Body Image Scale, ASI-R = Appearance Schemas Inventory – Revised, FNAES = Fear of Negative Appearance Evaluation, BSS = Body Satisfaction Scale, HNS = Head and Neck Survey – Appearance Subscale. Higher scores are reflective of worse functioning (i.e., greater body image concerns, higher levels of depression, anxiety)

*
p<0.1

**
p<0.05

p<0.01.

Table 6

Multivariate analyses: Association of sociodemographic, smoking status and disease stage with body image scale cores (regression coefficients) among participants with oral cavity malignancies

Variable	ASIR	BIS	FNAES	BSS	HNS
Disease stage ^a					
1				1	
2				-10.09**	
3				-8.43	
4				-8.55	
Current smoker	-0.25*	0.43	-0.37	0.97	-1.69
Sex (male)	-0.04	0.24	-0.06	9.62**	-4.06
BSS depression	-0.02***	0.17***	0.12***	0.79***	1.03***
Intercept	2.15	-6.41	4.77	-0.84	-31.35
F	3.01	11.27	2.35	4.71	7.06
p value	0.04	<0.0001	0.08	<0.001	<0.001
R ²	0.12	.32	0.09	0.32	.23

ASIR = Appearance Schemas Inventory Revised, BIS = Body Image Scale, FNAES = Fear of Negative Appearance Evaluation, BSS = Body Satisfaction Scale, HNS = Head and Neck Survey – Appearance Scale

^aThe first group listed served as the referent group.

* p<0.1

** p<0.05

*** p<0.01