Perceived Social Support as a Predictor of Disease-Specific Quality of Life in Head-and-Neck Cancer Patients

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ABSTRACT

Background: Treatment for head-and-neck cancer (HNC) can lead to severe decrements in disease-specific quality of life (DSQOL) due to disfigurement and disability in speech, eating, and/or breathing. Psychosocial factors such as social support may explain individual variance in DSQOL outcomes.

Objective: The researchers sought to evaluate changes in perceived availability of social support from pretreatment to posttreatment and to determine whether decreases in perceived social support predicted poorer posttreatment DSQOL among HNC patients, controlling for disease- and treatment-related factors.

Methods: Participants (n = 32) were newly diagnosed with HNC and were awaiting surgery and/or radiation treatment. Measures included the ENRICHD Social Support instrument (ESSI) to assess perceived social support and the Functional Assessment of Cancer Therapy–Head & Neck (FACT-H&N) to assess DSQOL. Paired-samples *t*-tests and hierarchical regression analyses were conducted to determine relationships between pretreatment and posttreatment perceived social support and DSQOL.

Results: Perceived social support decreased significantly from pre- to posttreatment ($F[31] = -2.71$, $P < .01$). After adjusting for relevant covariates and pretreatment DSQOL, change in perceived social support remained a significant predictor of posttreatment DSQOL ($\beta = .47$, $P < .01$).

Limitations: This study included a relatively small sample of HNC patients, which limited power to evaluate mechanisms of observed relationships.

Conclusions: Increased social isolation may be a risk factor for poorer physical recovery from, or adjustment to, treatment-related side effects. Social support may be an important target for psychosocial interventions for patients who face challenging treatment side effects.

Head-and-neck cancer (HNC) is one of the most emotionally traumatic diagnoses of cancer.[1] Treatment can result in chronic and debilitating side effects, such as facial disfigurement and functional limitations (eg, problems with speech, breathing, and/or eating).[2] These side effects require complex multidisciplinary patient care[3] and have been associated with a loss of independence and significant psychological distress.[1,2]

DISEASE-SPECIFIC QUALITY OF LIFE

The rate at which survivors return to baseline levels of quality of life (QOL) following treatment remains unclear. Advanced cancer stage and greater treatment complexity (ie, combined surgery/radiation vs either treatment alone) have been associated with greater QOL decrements in disease-specific domains (eg, disfigurement, chewing ability, and eating in public).[4] Furthermore, findings suggest that the majority of patients who undergo a combination of surgery and radiation may experience significant weight loss during treatment.[5] As malnutrition and progressive weight loss may impact morbidity and mortality in cancer patients,[6] decrements in disease-specific QOL (DSQOL) can pose serious long-term consequences.

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RELATIONSHIP BETWEEN PERCEIVED SOCIAL SUPPORT AND DSQOL

Few studies have examined the extent to which psychosocial factors such as social support may help to explain variations in posttreatment DSQOL among HNC patients. Preliminary evidence suggests that, among HNC survivors, greater perceived social support is associated with

better posttreatment outcomes for disease-specific concerns (eg, speech and aesthetics).[7] Despite this, other studies have reported nonsignificant relationships between perceived social support and domains of functional status (eg, pain, disfigurement, chewing and swallowing)[8] and general QOL,[9] although these studies were cross-sectional in design. Due to a lack of prospective studies, the direction of this relationship remains equivocal. For example, disfigurement and speech difficulties can disrupt interpersonal relationships and/or lead to social isolation.[10,11] For these reasons, HNC patients may be at increased risk for experiencing decrements in social support given disease-specific side effects (eg, disfigurement or, speech difficulties). However, in other cancer populations, social support has been shown to facilitate posttreatment adjustment and/or to influence physiologic mechanisms of recovery.[12] Among postoperative patients, social support was shown to attenuate the impact of disfigurement for women.[13] Results suggested that female HNC patients experiencing both low social support and facial disfigurement were at greatest risk for poorer psychological well-being.

While it has been suggested that perceived social support is a stable individual characteristic,[14] limited evidence suggests that HNC patients commonly perceive their social support as insufficient during treatment.[15] At 1 year post treatment, patients reported lower social support than they did before treatment.[16] It remains unknown whether a reduction in perceived social support may itself predict poorer posttreatment DSQOL.

PRESENT STUDY

Few studies have prospectively examined the relationship between perceived social support and DSQOL among HNC patients. Furthermore, virtually no studies have examined changes in perceived social support immediately following treatment, when treatment-related demands may be the most extensive. This study examined changes in perceived availability of social support following HNC treatment. We hypothesized that decrements in perceived social support would predict poorer posttreatment DSQOL beyond disease and treatment factors.

METHODS

Participants

Participants were recruited for a prospective study of QOL among adults who were recently diagnosed with HNC (stages I–IV) and who were awaiting surgery and/or radiation treatment. To create a homogenous sample with regard to biobehavioral factors, individuals were excluded if chemotherapy was part of their treatment plan. To ensure patients' comprehension of assessment materials and validity of self-reports, additional requirements were a ninth-grade reading level and the absence of cognitive impairment, respectively. The Structured Clinical Interview for DSM-IV/Non-Patient edition (SCID-IV/NP)[17] was used to identify and exclude patients who had suspected active psychiatric symptoms (ie, panic attacks, posttraumatic stress disorder, or psychosis within the past 3 months).

Procedure

Recruitment was conducted at the University of Miami Hospital and Clinics, Sylvester Comprehensive Cancer Center, and Jackson Memorial Hospital (Miami, Florida). Patients were introduced to the study and screened for eligibility during their otolaryngology clinic appointments. Those who met eligibility requirements were provided with an explanation of the study and invited to participate. Each participant signed a University of Miami institutional review board–approved informed consent form.

Before treatment and approximately 6 weeks post treatment, participants completed a psychosocial assessment that addressed perceived social support, QOL, and sociodemographic and disease-specific information. Participants received monetary compensation ($50) for each visit.

Of the 46 patients who provided complete psychosocial data before treatment, 5 cases were excluded due to changes in diagnosis and/or treatment plan. Of the 41 remaining eligible participants, 32 (78.0%) provided follow-up data after treatment. Attrition was attributed to participant inability to schedule follow-up assessment within 6 weeks of treatment completion (5 participants), participant refusal (2 participants), withdrawal from study (1 participant), and death (1 participant). There were no significant differences between completers and noncompleters on any variables assessed in the study.

Measures

Perceived social support. The 7-item ENRICHD Social Support instrument (ESSI) was used to assess perceived availability of social (ie, emotional, instrumental, informational, and appraisal) support.[18] Each item uses a 5-point scale ranging from "None of the time" to "All of the time." Higher scores indicate greater perceived support. The ESSI has shown adequate reliability and validity in QOL studies of chronic illness populations (eg, cardiac patients[19]) and has demonstrated good internal reliability in the current study (Cronbach's alpha = 0.88).

DSQOL. The Functional Assessment of Cancer Therapy–Head & Neck (FACT-H&N) is a validated self-report measure designed to assess general and HNC-specific QOL.[20] The FACT-H&N was previously rated by HNC patients to be relevant to their problems and easy to understand.[21] This study utilized total scores on the 11-item head and neck subscale, a measure of disease-specific concerns (eg, facial disfigurement and disability in speech, eating, breathing, and swallowing). Participants indicated the degree to which each item was true for them during the past week using a 5-point response scale ("Not at all" to "Very much"). Higher scores represent better DSQOL. This subscale has been shown to provide unique and meaningful QOL data to inform HNC patient care.[22] The subscale demonstrated good internal reliability in the current study (Cronbach's alpha = 0.80).

Demographic and disease variables. Age, education level, income, marital status, employment status, and ethnicity were assessed using a standard demographics questionnaire. HNC-specific variables included cancer site and stage, date of diagnosis, and type of treatment (ie, surgery and/or radiation treatment). The Charlson Comorbidity Index was used to assess presence of comorbid health conditions.[23]

Statistical Analysis

Statistical analyses were performed using SPSS 14.0 (SPSS, Inc., Chicago, Illinois). Pearson correlations (for continuous variables) and one-way analysis of variance (for categorical variables) were conducted to identify relationships between control variables and DSQOL. Control variables that were significantly related to DSQOL at $P \leq .10$ were incorporated into subsequent analyses. Differences between pre- and posttreatment perceived social support and DSQOL were tested for significance using paired-samples t tests. A hierarchical regression model was tested in which change in perceived social support predicted posttreatment DSQOL after adjustment for pretreatment DSQOL and relevant control variables. Statistical significance was determined at $P < .05$.

RESULTS

Sample

Participants in the current study were 32 men and women who were diagnosed with HNC and were awaiting surgery and/or radiation treatment. The sample reflected a diverse group of patients with a range of tumor sites and stages. See Table 1 for sample characteristics.

Tests of Covariates

Among sociodemographic factors, younger age ($r = -0.44$; $P = .01$) and full- or part-time employment ($F[1,30] = 4.7$; $P < .04$) were associated with greater posttreatment DSQOL. Among disease factors, patients with more advanced disease (ie, stages III–IV; $F[1,27] = 5.0$; $P < .04$) and those who underwent radiation treatment, alone or in combination with surgery, ($F[1,29] = 5.0$; $P < .04$) reported poorer posttreatment DSQOL. Four covariates were therefore retained in subsequent models of DSQOL: age and 3 dummy-coded variables representing employment status (employed = 0; not employed = 1), disease stage (early = 0; advanced = 1), and treatment (radiation = 0; no radiation = 1).

Differences in Pretreatment to Posttreatment Perceived Social Support and DSQOL

To determine whether perceived social support and DSQOL changed significantly from pre- to posttreatment, paired-samples t tests were conducted. Results indicated significant decreases in both perceived social support (mean pretreatment = 27.4, SD = 3.7; mean posttreatment = 24.9, SD = 6.0; $t[31] = -2.71$; $P < .01$) and DSQOL (mean pretreatment = 23.5, SD = 8.5; mean posttreatment = 20.3, SD = 7.7; $t[31] = -2.04$; $P = .05$).

Table 1

Sample Characteristics (n = 32)

	MEAN	SD
Age (years)	57.6	12.8
Education (years)	14.5	2.8
Household income ($K)	39.5	31.4
Number of medical comorbidities	2.3	2.7
Days since diagnosis at Time 1 assessment (pretreatment)	49.0	31.3

	PERCENTAGE
Sex	
Male	78.1%
Female	21.9%
Marital status	
Married or partnered	65.6%
Not married or partnered	34.3%
Employment status	
Employed full or part time	50.0%
Retired	25.0%
Unemployed because of disability	9.4%
Otherwise not employed	15.6%
Ethnic identification	
Non-Hispanic white	77.4%
Hispanic	19.4%
African American	3.2%
Tumor site	
Oral	57.7%
Pharyngeal	23.1%
Laryngeal	19.2%
Tumor stage	
I	34.5%
II	31.0%
III	20.7%
IV	13.8%
Treatment type	
Surgery only	54.8%
Surgery and radiation	32.3%
Radiation only	12.9%

Model of Posttreatment DSQOL

Pre- to posttreatment change in perceived social support was significantly related to posttreatment DSQOL ($r = 0.51$; $P < .01$). To determine whether this relationship persisted after adjustment for relevant covariates, a hierarchical regression model of posttreatment DSQOL was tested in which pretreatment DSQOL was entered in step 1, age and employment status were entered in step 2, cancer stage and treatment type were entered in step 3, and a variable representing pre- to posttreatment change in perceived social support was entered in step 4. (See Table 2.) Results indicated that change in perceived social support remained a significant predictor of posttreatment DSQOL ($\beta = .47$; $P < .01$). The final model accounted for a significant amount of variance in posttreat-

Table 2

Hierarchical Regression of DSQOL

VARIABLES	ß	$R^2\Delta$	F FOR $R^2\Delta$	P
Step 1				
Pretreatment DSQOL	0.33***	0.11	3.18	.09
Step 2				
Pretreatment DSQOL	0.40***			
Age	0.05			
Employment status	−0.46*	0.19	3.33	.05
Step 3				
Pretreatment DSQOL	0.20			
Age	−0.11			
Employment status	−0.45*			
HNC stage	−0.49**			
HNC treatment type	0.27***	0.27	7.08	<.01
Step 4				
Pretreatment DSQOL	0.13			
Age	−0.20			
Employment status	−0.32*			
Cancer stage	−0.45**			
Treatment type	0.31**			
Change in social support	0.47**	0.21	19.74	<.01

* $P < .05$, ** $P < .01$, *** $P < .10$. The final model accounted for a significant amount of variance in posttreatment DSQOL: $R^2 = 0.78$, $F[6,21] = 12.50$, $P < .01$.

ment DSQOL ($R^2 = 0.78$; $F[6,21] = 12.50$; $P < .01$). See Table 2 for results of hierarchical regression analyses.

Additional Analyses

To test an alternative explanation for the relationship between perceived social support and DSQOL, a hierarchical regression model was tested in which change in DSQOL was hypothesized to predict posttreatment perceived social support. Results indicated that after adjustment for pretreatment perceived social support, change in DSQOL did not account for a significant amount of variance in posttreatment perceived social support.

DISCUSSION

HNC treatment has been associated with severe side effects (eg, disfigurement and disability in speech, swallowing, and eating) that can impact long-term DSQOL. While disease and treatment factors have been used to explain variances in the rate and extent to which survivors return to baseline levels of functioning,[4] limited evidence suggests that psychosocial factors such as social support may also predict posttreatment DSQOL.[7] However, the relationship between social support and DSQOL has not been established prospectively, particularly during and immediately after treatment, when treatment-related challenges may be the most severe. This study examined changes in perceived availability of social support among HNC patients from the pretreatment evaluation to 6 weeks post treatment. We hypothesized that reductions in perceived support would predict poorer posttreatment DSQOL beyond disease and treatment factors.

Based on limited work suggesting that social support may not remain stable during the year following diagnosis,[16] we predicted that perceived social support would decrease from the pretreatment evaluation to 6 weeks post treatment. Indeed, results indicated significant reductions in perceived support during this period. A number of factors may have placed participants at risk for decrements in perceived support. As the follow-up assessment was conducted soon after treatment completion, the decrease may have reflected reactions to disruptions in continuity of care from health-care personnel, which may not be available from informal sources. Research also suggests that partners of HNC patients may simultaneously struggle with comparable levels of psychological distress and feelings of helplessness,[24] which may limit their ability to provide effective support. In fact, HNC patients have previously reported insufficient levels of support from their social network.[15,25]

Reductions in perceived social support may also have been reinforced by social avoidance. It has been suggested that both fear of one's changed appearance and the reactions of others are important factors that influence social avoidance.[26] However, patients' need for support may change over time, and fear may subside with continued social exposure. Therefore, future work should focus on the trajectory of perceived social support over the course of HNC treatment and recovery, as well as factors that place certain patients at risk for decrements in perceived social support over time.

Based on prior evidence for the relationship between social support and DSQOL among HNC patients,[7] we predicted that reductions in perceived availability of social support would be associated with poorer posttreatment DSQOL. Results supported this relationship, even after adjustment for pretreatment DSQOL and sociodemographic (age and employment status) and disease-specific (tumor stage and treatment type) factors. An alternative model in which change in DSQOL was hypothesized to predict perceived posttreatment support was not statistically supported. Thus, our findings in this small sample suggest a unidirectional relationship between perceived support and DSQOL, in which reductions in perceived support may compromise adjustment to treatment-related concerns and/or rates of functional recovery.

Several pathways may account for the influence of perceived decrements in social support on posttreatment DSQOL. For instance, reductions in support may influence health behaviors; consistent supportive care has been related to helping HNC patients feel more prepared to manage treatment side effects[3] and to adhere to medication regimens.[27] Based on relationships between inadequate social support, stress, and morbidity found in other cancers,[28] reductions in social support may also influence DSQOL through physiologic mechanisms.

This study targeted a relatively small and heterogeneous sample of HNC patients, which limited our power to investigate mechanisms of observed relationships or to test findings

within different HNC subgroups. For example, the relationship between perceived support and DSQOL may be explained by variables that were not accounted for in our analyses, such as depression or neuroticism. Furthermore, we used a general measure of perceived social support in our analyses, and conclusions regarding the effects of different facets of support (eg, instrumental vs emotional) cannot be made. The short-term follow-up period also precluded exploring the long-term influence of peritreatment social support. Future studies should examine the effects of different facets of social support at different phases of illness and recovery, pathways underlying the relationships between social support and DSQOL, and the consequences of decrements in different types of support on long-term clinical outcomes. Longitudinal research may also help to identify personality factors (eg, interpersonal sensitivity) that may influence the trajectory of perceived social support over time.

Our findings underscore the importance of continued attention to the psychosocial care of HNC patients as they are diagnosed and enter treatment. The current results further suggest that maintenance of perceived social support during HNC treatment may have an important role in posttreatment recovery. Patients at risk for decrements in perceived social support may benefit from peritreatment psychosocial interventions that provide emotional and practical support and a focus on preserving social support networks via emphasis on communication and support-seeking skills.

Conflict of Interest Disclosures: All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

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