

Fujimori et al. <sup>12</sup>	2007 Psychooncology Japan	529	Digestive 35% Breast 24% Head and neck 21% Lung 20%	Questionnaire (70-item)	<p>1. Method of disclosure of bad news: low delivered bad news, 21 items, variance explained = 9.81, <math>\alpha</math> coefficient = 0.93</p> <p>2. Provision of emotional support: supportive aspects, including offering comfort and support to patients and families, 17 items, variance explained = 7.77, <math>\alpha</math> coefficient = 0.88</p> <p>3. Provision of additional information: discussing disease, treatment, and impact on daily activity, 15 items, variance explained = 5.17, <math>\alpha</math> coefficient = 0.82</p> <p>4. Setting: where and when the news was conveyed and provision of a comfortable environment and sufficient time, 17 items, variance explained = 10.23, <math>\alpha</math> coefficient = 0.77</p>	<p>Highest rating [Mean(SD), range; 1-5]</p> <p>Want physician to tell the treatment plan: 4.53(0.58), 97%</p> <p>Want physician to assume responsibility for patient care until the end: 4.51(0.59), 97%</p> <p>Want physician to answer patient's questions: 4.49(0.52), 99%</p> <p>Want physician to tell about the latest treatment: 4.49(0.63), 96%</p> <p>Want physician to break bad news in a way that is easy to understand: 4.43(0.54), 98%</p> <p>Want physician to tell all treatment options: 4.42(0.69), 93%</p> <p>Want physician to explain the status of illness: 4.40(0.56), 97%</p> <p>Want physician to break bad news honestly: 4.35(0.58), 97%</p> <p>Want physician to tell what patient can hope for: 4.33(0.58), 92%</p> <p>Want physician to explain until patient is satisfied: 4.34(0.63), 94%</p>	<p>Telling about your life expectancy</p> <p>Marital status (married &gt; unmarried) (lower &gt; higher)</p> <p>Education (higher &gt; lower)</p> <p>Breaking bad news in a matter-of-fact manner</p> <p>Age (older &gt; younger)</p> <p>Education (higher &gt; lower)</p> <p>Fatalism (higher &gt; lower)</p> <p>Anxious (lower &gt; higher)</p> <p>Recurrence or metastasis (presence &gt; absence)</p> <p>Breaking bad news step-by-step</p> <p>Fighting spirit (higher &gt; lower)</p> <p>Education (lower &gt; higher)</p> <p>Employment status (unemployed &gt; employed)</p> <p>Avoidance (higher &gt; lower)</p> <p>Number of bad news items received (more &gt; less)</p> <p>Breaking bad news before it is definite</p> <p>Avoidance (higher &gt; lower)</p> <p>Education (higher &gt; lower)</p> <p>Breast cancer (no &gt; yes)</p> <p>Talking in a decisive tone of voice</p> <p>Gender (male &gt; female)</p> <p>Fatalism (higher &gt; lower)</p> <p>Education (lower &gt; higher)</p>
Fujimori et al. <sup>32</sup>	2007 Psychooncology Japan	529	Digestive 35% Breast 24% Head and neck 21% Lung 20%	Questionnaire (The Measure of Patients' Preferences, by Parker et al. 2001)	<p>1. Emotional support: supportive aspects, including offering comfort and support to patients and families, 9 items, total variance = 14.5%, <math>\alpha</math> coefficient = 0.90</p> <p>2. Medical information: discussing disease and treatment, 10 items, total variance = 11.8%, <math>\alpha</math> coefficient = 0.91</p> <p>3. Clear explanation: how the news was conveyed, 8 items, total variance = 11.5%, <math>\alpha</math> coefficient = 0.89</p> <p>4. Encouraging question-asking: allowing patient to ask questions and taking sufficient consultation time to answer patient questions completely, 9 items, total variance = 9.9%, <math>\alpha</math> coefficient = 0.91</p> <p>5. Setting: where and when the news was conveyed, including privacy and having the physician's full attention, 5 items, total variance = 6.8%, <math>\alpha</math> coefficient = 0.83</p>	<p>Highest rating [Mean(SD), range; 1-5]</p> <p>Want to be told in person: 4.23(0.81)</p> <p>Want physician to tell best treatment option: 4.14(0.77)</p> <p>Want physician to tell he/she will do everything to cure patient's cancer: 4.14(0.81)</p> <p>Want to feel confident about physician's skill: 4.03(0.70)</p> <p>Want to be given news in a clear, simple language: 4.02(0.77)</p> <p>Want to be given detailed information about test results: 4.00(0.77)</p> <p>Want physician to be up to date on research: 3.99(0.82)</p> <p>Want physician to be honest about patient's condition: 3.90(0.75)</p> <p>Want physician really to listen to patient: 3.84(0.84)</p> <p>Want physician to make patient feel comfortable about asking questions: 3.79(0.84)</p>	<p>1. Emotional support</p> <p>Gender (female &gt; male)</p> <p>Fighting spirit (higher &gt; lower)</p> <p>Anxious (higher &gt; lower)</p> <p>Distress (higher &gt; lower)</p> <p>2. Medical information</p> <p>Age (younger &gt; older)</p> <p>Gender (female &gt; male)</p> <p>Education (higher &gt; lower)</p> <p>Fighting spirit (higher &gt; lower)</p> <p>Anxious (higher &gt; lower)</p> <p>3. Clear explanation</p> <p>Age (younger &gt; older)</p> <p>Gender (female &gt; male)</p> <p>Education (higher &gt; lower)</p> <p>Fighting spirit (higher &gt; lower)</p> <p>Anxious (higher &gt; lower)</p> <p>4. Encouraging question-asking</p> <p>Age (younger &gt; older)</p> <p>Gender (female &gt; male)</p> <p>Education (higher &gt; lower)</p> <p>Recurrence or metastasis (without &gt; with)</p> <p>Fighting spirit (higher &gt; lower)</p> <p>Anxious (higher &gt; lower)</p> <p>5. Setting</p> <p>Gender (female &gt; male)</p> <p>Education (higher &gt; lower)</p> <p>Fighting spirit (higher &gt; lower)</p> <p>Anxious (higher &gt; lower)</p>

Continued

Table 1. Continued

Author	Year	Journal	Country	Sample	Method	Results	Components of patient preferences	Items of patient preferences	Factors associated with patient preferences
Azu et al. <sup>33</sup>	2007	Am J Surg	USA	691	Questionnaire			<p>No preference for the gender of physician disclosing the diagnosis: 90%</p> <p>Want physician to give patient full attention: 73%</p> <p>Want physician to maintain eye contact: 66%</p> <p>Want to be asked how much information patient would like to know: 59%</p> <p>Want physician to allow enough time to ask questions: 84%</p> <p>Want primary physician to tell bad news: —</p> <p>Want to be told with family members: —</p> <p>Want to be told in person: —</p>	
Deschepper et al. <sup>34</sup>	2008	Patient Educ Couns	Belgium	17	In-depth interview		<p>Lung 24%</p> <p>Prostate 18%</p> <p>Other 58%</p>	<p>Want physician in a slow-paced manner</p> <p>Want physician to tell information gradually</p> <p>Want physician to tailor to patient's emotional responses</p> <p>Want physician to be honest</p> <p>Want to be given hope</p>	

**Table 2.** Patient preferences for communication of bad news

Component	Articles
Setting	11, 12, 21, 25, 26, 31, 32
Manner of communicating bad news	11, 12, 26, 32
What and how much information to provide	11, 12, 16, 21, 22, 25, 26, 31, 32
Emotional support	11, 12, 16, 21, 22, 25, 26, 31, 32
Encouraging question-asking	32
The amount of time available to the patient	26
Communications that deflect the impact of the diagnosis	16
Information is not limited or delayed	16

**MANNER OF COMMUNICATING BAD NEWS**

Four articles identified this component, which deals with how physicians should communicate bad news to their patients during consultations (11,12,26,32). Most patients preferred that their physicians communicate the bad news clearly (11,12,18,22,31,32) and honestly (11,14,32), in a manner that facilitates each patient’s full understanding; this includes choosing words carefully, avoiding medical jargon, showing actual X-ray films and laboratory data, and providing written explanations as needed (11,12,21,22,25,26,31,32).

**WHAT AND HOW MUCH INFORMATION TO BE PROVIDED**

Nine articles identified what and how much information is to be provided, which refers to the nature and the amount of the information provided by physicians during consultations in which bad news is communicated (11,12,16,21,22,25,26,31,32), as a component. Four relatively early studies reported that almost all patients (96–98%) wanted to be told whether their illness was cancer (13,17,19,23). Ten studies showed that many patients (57–95%) wished to receive all the information available, both good and bad (14,16–19,22,23,25,27,30). Four studies reported that most patients wanted to know about their chance of a cure (91–97%) and how effective the treatment of their cancer was (79–98%) (13,17,19,23). However, four studies suggested that a lower percentage of patients (27–61%) wished to discuss their life expectancy (12,18,22,24). Furthermore, 12 studies showed that patients wanted to receive information regarding their treatment, e.g. information regarding all available treatment options, the recommended treatment option, the latest treatment and research, the future treatment plan, and adverse effects and risks of treatment (11–13,16,19,21–23,25,26,31,32) as well as information regarding the impact of their disease and treatment on their daily activities, e.g. work, food, life-style, rehabilitation and social resources (11,12,18,21,22,25,31,32). Four studies showed whose decision patients preferred was adopted regarding their treatment: the patient, the patient’s family, the patient’s physician

or collaboration (11,12,28,30), but their results were inconsistent.

**EMOTIONAL SUPPORT**

Nine articles identified emotional support, which refers to the supportive aspects of communication and includes offering comfort and support to patients, as a component (11,12,16,21,22,25,28,31,32). When communicating bad news, patients desired that physicians considered the patients’ and family members’ feelings by imagining themselves in their patient’s situation (11,12), speaking gently and softly (11,12,14,15,26), talking in a way that inspires hope (11,12,15,22) and without touching or hugging (12,20). After communicating the bad news, patients desired that physicians used supportive expressions to relieve the patients’ emotional distress, allowed the patient to express their feelings and reassured them (12,21,22,25,31,32). Telling the patient not to abandon hope until the end was also considered valuable by patients (11,12,16).

In addition, the following components were proposed: encouraging patients to ask questions (32), making a sufficient amount of time available to the patient (26), communicating in a manner that deflected the impact of the diagnosis and that did not limit or delay information (16).

**FACTORS ASSOCIATED WITH PATIENT PREFERENCES FOR THE COMMUNICATION OF BAD NEWS**

There were eight studies that among them explored a total of 24 demographic (e.g. age, gender, education), medical (e.g. stage of disease, recurrence) and psychological (e.g. anxiety, fighting spirit, distress) factors, and identified 12 factors that were associated with patient preferences for the communication of bad news (12,13,19,21,23,30–32).

Seven of these eight studies reported that age, gender and education were associated factors (12,13,21,23,30–32). Younger patients, female patients and more highly educated patients consistently desired to receive as much detailed information as possible and to receive emotional support. Younger and more highly educated patients also wanted to participate in decisions regarding their treatment. And two studies suggested that psychological states were associated with patient preferences: higher distress, anxiety and a fighting spirit were associated with wanting to receive as much detailed information as possible and to receive emotional support (12,32). One study suggested that having an average income was associated with wanting more information than having a low income was (19).

Cross-cultural differences were indicated by some patients’ preferences. Only 30% or fewer of patients in Asian studies preferred to discuss life expectancy (12,24), whereas ~60% of patients in Western studies preferred to do so (18,22). While 78% of patients in Japan were found to prefer to be told with family members present (12), only 40% in Ireland (27), 53–57% in Australia (18,22) and 61% in Portugal

preferred to be told with family members present (28), and 81% of patients in the United States did not wish anyone else to be present when they received bad news (20). Other patient preferences were generally similar across cultures. In most studies, almost all of cancer patients placed a high value on their physicians' expertise and honesty in delivering detailed information about the diagnosis and treatment options and in answering their questions (11–23,25,26,31–34). Likewise, half of the studies reported that patients considered it important for physicians to give patients their full attention, provide them with emotional support and sustain their hope (11,12,14,15,21,22,25,26,31–34).

## DISCUSSION

The majority of the studies selected for inclusion in this review used descriptive evidence or qualitative methods to explore patient preferences with regard to the communication of bad news. Most were conducted in Western countries and used different measures to obtain information on patient preferences. However, the results provide some guidance with regard to physicians' attitudes and behaviours when communicating bad news.

Four commonly observed components of cancer patients' preferences were identified: setting, manner of communicating bad news, what and how much information was to be provided and emotional support (11,12,16,21,22,25,26,31,32). Cancer patients' preferences suggested that the elements of non-verbal communication, such as setting, manner and emotional support, are important to cancer patients when physicians communicate bad news to them. These four components of patients' preferences should be assessed before communicating bad news. Information regarding these components would be valuable to physicians, as it would enable them to provide cancer patients with information about their disease in a manner that best meets the patients' needs.

Marked cross-cultural differences were found with regard to some patients' preferences, for example, there was a wide variation with respect to having relatives present when receiving bad news (12,14,18,20,22,27,28) and desire to receive information regarding their life expectancy (12,18,22,24). In family-centred cultures, such as Japanese culture, patients preferred that relatives be present more than patients in Western cultures did, and comparatively fewer patients preferred to discuss life expectancy in Asian cultures. This preference regarding discussion of prognostic information may be related to a study on a good death conducted in Japan by Miyashita et al. (35) that 'unawareness of death' was one of the major contributors to a good death, which was very important in Japan.

The findings in this review also suggested a lack of evidence of factors associated with patients' preferences with regard to the communication of bad news. Nevertheless, the findings indicate that these preferences vary according to demographic and psychological variables but not according

to disease variables. Younger, female and more highly educated patients and patients with a higher level of distress, anxiety, fighting spirit or moderate-income consistently desired to receive as much detailed information as possible. A prompt sheet containing a list of questions designed to encourage patient inquiries during medical consultations might be a useful tool for such patients (36). Some studies showed that the use of such sheets was associated with an increase in the number of questions patients asked (37–39). Furthermore, younger, female and more educated patients and patients with a higher level of distress, anxiety or fighting spirit also valued receiving emotional support. Balancing hope and honesty is an important skill in physicians (40).

The findings in this review suggested that the results of these studies have the following implications for physician communication of bad news to patients:

- (i) Before consultations in which physicians plan to communicate bad news to a patient, they should spend sufficient time to discuss the disease with the patient and their relatives, and leave their beepers with another medical staff member, such as a nurse, to avoid interruptions.
- (ii) Physicians should communicate detailed information regarding bad news clearly and honestly, in a manner that facilitates patients' full understanding.
- (iii) When communicating bad news, physicians should consider the patients' and their relatives' feelings by imagining themselves in their patient's situation, speaking gently and softly, talking in a way that inspires hope, without touching or hugging the patient.
- (iv) After communicating bad news, physicians should use supportive expressions to relieve patients' emotional distress, should allow patients to express their feelings, should reassure patients and should sustain patients' hope.
- (v) Physicians should discuss information regarding treatment and the impact of the disease and treatment on daily activities with their patients.
- (vi) Younger, female and more educated patients as well as patients with higher level of distress or anxiety, and those with a fighting spirit were found to prefer to be given as much detailed information as possible and to receive emotional support. Patients with moderate-income desired more information than low-income patients. Physicians should ask patients about their own preferences because the existence of individual differences was reported in these studies.

Three limitations should be noted. First, almost all of the studies reviewed were descriptive, resulting in a low evidence level. Nevertheless, descriptive qualitative and quantitative research is integral to our understanding of these issues. The second limitation is a language bias, making it necessary to interpret reports from different linguistic areas cautiously. Lastly, since only research published in English was reviewed, studies in Asian countries may have been

missed. However, none of the literature references in the studies that were included in the review had been published in other languages.

Our recommendations for future research include studies to identify preferences with regard to the manner of communicating bad news, factors associated with patient preferences and cross-cultural differences by means of validated measures. Such studies would require a rigorous design to provide a strong basis for creating informative guidelines and intervention programmes for physicians and other health professionals concerned with the communication of bad news to patients. The results of this review provide a framework for devising intervention programmes to enhance physicians' communication skills, i.e. for teaching physicians how to communicate bad news in a manner that corresponds to an individual patient's preference. Such intervention programmes may benefit from being designed based on the framework identified in the present report.

## CONCLUSION

This systematic literature review revealed that patient preferences with regard to communication of bad news have mainly been investigated in Western countries and that the studies used a variety of different measures to obtain information regarding patient preferences, although most reports contained mostly descriptive evidence. Our findings showed that patient preferences regarding the communication of bad news to them by physicians consist of four components: setting, manner of communicating bad news, what and how much information is provided and emotional support. Patient preferences were found to be associated with demographic factors. Younger patients, female patients and more highly educated patients consistently desired to receive as much detailed information as possible and to receive emotional support. This review also revealed that Asian patients prefer that relatives be present when receiving bad news more than do Western patients and that they prefer to discuss life expectancy less than Western patients.

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## Conflict of interest statement

None declared.

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Clinical Paper  
Head and Neck Oncology

# Perioperative assessment of psychological state and quality of life of head and neck cancer patients undergoing surgery

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**Abstract.** This study assessed psychological state and quality of life (QOL) in head and neck cancer patients during the perioperative period. Patients who had undergone primary surgery at the Department of Oral and Maxillofacial Surgery, Tokyo Medical and Dental University Hospital, Tokyo, Japan were enrolled. After obtaining informed consent, three tests were administered: the Hospital Anxiety and Depression Scale (HADS) to assess psychological state, and the Functional Assessment of Cancer Therapy General (FACT-G) and Functional Assessment of Head and Neck (FACT-H&N) to assess QOL. Japanese language versions of all tests were administered. Tests were administered 1 day before surgery, 1 week after surgery, and 1 and 6 months after discharge. Test scores were analyzed, as were relationships between psychological state, QOL and clinical factors. Anxiety was greatest before surgery, while depression was greatest immediately after surgery. QOL in the somatic and specific domains also decreased immediately after surgery. QOL in most domains improved 1 month after discharge. This study offers important information regarding perioperative psychological state and QOL in head and neck cancer patients.

**Keywords:** head and neck cancer; anxiety; depression; quality of life; perioperative assessment.

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Patients diagnosed with cancer experience shock and distress over the realization that they have a life-threatening disease<sup>2</sup>. This is particularly true with head and neck cancer, which generally requires surgery that can seriously impact daily life<sup>24</sup>. Surgery in this area can impair the senses of taste and smell, as well as disturbing motor

functions such as chewing, swallowing and speaking. Functions of the head and neck area also play a specific role in social and emotional expression and communication in the individual's interactions with society.

In head and neck cancer patients, the lesion and the clinical changes before and

after surgery are visible. Even minor tissue loss and structural alteration caused by treatments may lead to significant dysfunction and disfigurement with an enormous impact on somatic and psychosocial functioning.

Compared with less visible cancers, head and neck cancer tends to damage

self-image, self-esteem, confidence and identity to a greater extent, in addition to causing more somatic and psychosocial distress than other cancers<sup>24</sup>.

Untreated distress can have long-term, harmful consequences on patients' desire for survival and improvement of quality of life (QOL). Both cancer patients and their relatives share this distress<sup>11</sup> but only in the past 15 years have clinicians given this problem serious attention<sup>21</sup>. The literature contains few case studies on psychological state and QOL in head and neck cancer patients during the perioperative period and in the first 6 months after surgery.

The purpose of the current study was to investigate trends in psychological state and QOL in head and neck cancer patients during the perioperative period and in the first 6 months after discharge. Patients were monitored just prior to surgery, during the perioperative stage, and 1 and 6 months following discharge. The study also included analysis of clinical factors that may impact patients' psychological state and QOL.

## Materials and methods

The present study enrolled head and neck cancer patients treated at the Department of Oral and Maxillofacial Surgery, Tokyo Medical and Dental University Hospital. Approval for this study was obtained from the research ethics committee of the university. Patient accrual to the study began in November 2005 and concluded in May 2006.

Patients were invited to participate if: they had been diagnosed with head and neck cancer; they were 18 years of age or older; their initial treatment was surgical; their condition did not preclude completion of the questionnaire and a brief interview with the authors; and they had no severe mental illness or dementia. Thirty-eight patients who met these inclusion criteria were asked to present at the time of their pretreatment visit. At this visit, after providing patients with a detailed explanation of the purpose of the study, informed consent in writing was received from 36 patients; two patients declined to participate. Participants included 32 men and 4 women with a mean age of 58.2 years. They were asked to complete a questionnaire 1 day before surgery, 1 week after surgery, and 1 month and 6 months after discharge. Sociodemographic data and disease-related information were obtained from the hospital charts.

Three questionnaires were administered: the Hospital Anxiety and Depression Scale (HADS) to assess psychological state, and

the Functional Assessment of Cancer Therapy General (FACT-G) and the Functional Assessment of Cancer Therapy Head and Neck (FACT-H&N) to assess QOL. Japanese language versions were used for all tests.

## Assessment tools

### *Hospital anxiety and depression scale (HADS)*

The Hospital Anxiety and Depression Scale screens for psychiatric morbidity, such as anxiety and depression in patients with somatic illness<sup>25</sup>. There are two domains with 7 questions in each. Responses are scored on a scale from 0 to 3, and each subscale is scored from 0 to 21. According to ZIGMOND et al.<sup>25</sup>, scores of 0–7 represent a noncase of psychiatric morbidity, scores of 8–10 indicate a doubtful or borderline case, and scores of 11–21 indicate a definite case. Scores above 19 indicate severe distress and probable major depression<sup>15</sup>. The use of HADS is extensively documented in cancer patients globally, and its validity is confirmed in a variety of diagnostic groups, including head and neck cancer. ZIGMOND et al.<sup>25</sup> confirmed the reliability and validity of the Japanese language version of the HADS. Hosaka and Aoki<sup>9</sup> compared the HADS to multiple psychological screening tools, including the SDS (Zung's Self Rating Depression Scale), and concluded that only the HADS questionnaire distinguished depression from other psychological state and was an effective screening tool.

### *Functional assessment of cancer therapy-general (FACT-G), Functional assessment of cancer therapy-head and neck (FACT-H&N)*

The FACT-G, Version 4, consists of 27 questions that yield scores in four domains (physical well-being, social/family well-being, psychological well-being, and functional well-being). The FACT-H&N contains 11 questions that are specific to head and neck cancer patients. Each question consists of a declarative statement rated on a 0–4 Likert-type scale. Higher scores are indicative of higher QOL<sup>3</sup>.

To determine QOL in the specific domain, the authors summed selected questions as the eating, swallowing, speaking and esthetics domains. The eating domain included consuming a normal diet, savoring the taste of food, and having a good appetite. From the FACT-H&N, question 1, *I am able to eat the foods I like*, question 5, *I am able to eat as much food as I want*, and question 11, *I can eat solid*

*foods*, were selected to represent the eating domain. These three scores were summed to determine the score of the eating domain. The speaking domain comprised pronunciation and understandability of speech. Question 4, *My voice has its usual quality and strength*, and question 10, *I am able to communicate with others*, were selected to represent the speaking domain. Summing these two scores determined the score of the speaking domain. Question 6, *I am unhappy with how my face and neck look*, was selected for the esthetics domain and question 7, *I can swallow naturally and easily*, for the swallowing domain. The specific domain was defined as the sum of the eating, swallowing, speaking and esthetics specific domain subgroups.

## Statistical analysis

Changes in the subscale scores over time for HADS, FACT-G, and FACT-H&N were analyzed by repeated measures analysis of variance (ANOVA) with post hoc comparisons (Scheffe *F* test; 95% significance). In order to determine whether patient dropout affected the results, one-way ANOVA was used to compare mean scores for participating patients at all time points with those for patients who failed to complete the study.

To obtain additional insight into the relationships between psychological state and clinical factors, and those between QOL and clinical factors, repeated two-factor ANOVA with one intergroup factor and post hoc comparisons (Scheffe *F* test; 95% significance) was performed to determine intergroup differences. The following clinical factors were analyzed: tumor site; TNM stage; type of neck dissection; and presence or absence of postoperative radiotherapy. Some subgroups, such as type of bone resection and type of reconstruction, were excluded from the analysis because of insufficient numbers. All analytical procedures were carried out using the SPSS Version 14.0 (SPSS Japan Inc.) statistical software package. The level of statistical significance was set at  $p = 0.05$  for all analyses.

## Results

Of the 36 patients who consented to participate in this study, the authors were able to analyze data from 35; one patient did not return the questionnaire as required 1 day before surgery. Nine patients did not complete the study: 6 died during the 6-month follow-up period, one was transferred to another hospital halfway through the study, and two declined to continue



from 1 month after discharge. 26 participants completed the entire study protocol. Clinical and demographic factors and the percentage of patients who completed the study are shown in Table 1. No surgical complications were noted in any patient. Postoperative radiotherapy was performed for 6 patients with squamous cell carcinoma (SCC; tongue base,  $n = 2$ ; oral tongue,  $n = 1$ ; floor of mouth,  $n = 2$ ; mandible,  $n = 1$ ; all received a radiation dose of 50 Gy), one patient with adenocarcinoma of the parotid gland (50 Gy), and one patient with malignant lymphoma (60 Gy).

Table 1. The number and characteristics of patients who completed the study and patients who failed to complete the study at all time points.

Characteristic	Patients who completed the study	Patients who failed to complete the study	Response rate (%)
Gender			
Male	23	8	74.2
Female	3	1	75.0
Age			
<55	8	5	61.5
55-64	7	1	87.5
65+	11	3	78.6
Alcohol status			
Current	13	4	76.5
Ex	12	4	75.0
Never	1	1	50.0
Smoking status			
Current	7	2	77.8
Ex	6	5	76.2
Never	3	2	60.0
Tumor site			
Tongue/Anterior tonsillar pillar	14	3	82.4
Lower gingiva/Floor of mouth	4	4	50.0
Upper gingiva/Hard palate/Parotid gland/Buccal mucosa	8	2	80.0
TNM stage			
I/II	13	2	86.7
III/IV	13	7	65.0
Pathology			
Squamous cell carcinoma	22	8	73.3
Adenocarcinoma	2	0	100
Adenosquamous cell carcinoma	1	0	100
Malignant lymphoma	1	0	100
Mucoepidermoid carcinoma	0	1	0
Type of neck dissection			
Ipsilateral selective neck dissection	7	1	87.5
Ipsilateral modified radical neck dissection	7	6	53.8
Bilateral neck dissection	4	2	66.7
No neck dissection	8	0	100
Type of soft tissue/salivary gland resection			
Partial glossectomy	7	0	100
Hemiglossectomy	3	1	75.0
Parotidectomy	2	2	50.0
Floor of mouth resection	2	1	66.7
Buccal mucosa resection	1	1	50.0
Subtotal glossectomy	1	0	100
Anterior tonsillar pillar resection	1	0	100
No soft tissue/salivary gland resection	9	4	69.2
Type of bone resection			
Segmental mandibulectomy	3	1	75.0

Table 1 (Continued)

Characteristic	Patients who completed the study	Patients who failed to complete the study	Response rate (%)
Marginal mandibulectomy	2	2	50.0
Hemimandibulectomy	1	0	100.0
Subtotal maxillectomy	1	0	100.0
Coronoidectomy of the mandible	1	0	100.0
Subtotal mandibulectomy	0	1	0.0
No bone resection	18	5	78.3
Type of microsurgically revascularized reconstruction			
Radial forearm fasciocutaneous flap	6	2	75.0
Rectus abdominis musculocutaneous flap with metal plates to secure the position	3	3	50.0
Scapula osteomyocutaneous flap	2	0	100.0
Rectus abdominis musculocutaneous flap	1	0	100.0
No microsurgically revascularized reconstruction	14	4	77.8
Postoperative radiotherapy			
Radiotherapy	7	3	70.0
No radiotherapy	19	6	76.0
Length of admission days			
<50	17	1	94.4
51-100	4	5	44.4
101+	5	3	62.5

### Scores for psychological state and QOL

Scores for the HADS, FACT-G, and FACT-H&N are shown in Table 2. HADS scores over time indicated that none of the patients exhibited psychiatric caseness. When mean scores for all tests at each time point between patients who completed the study and those who dropped out were compared no statistically significant differences were found.

### Changes in psychological state and QOL over time

#### Changes in psychological state

Statistically significant changes over time were found for anxiety (ANOVA,  $F = 9.75$ ;  $df = 3$ ;  $p < 0.001$ ) and depression (ANOVA,  $F = 6.25$ ;  $df = 3$ ;  $p = 0.001$ ). Anxiety increased the day before surgery and depression increased 1 week after surgery. Both measures improved at 1 month after discharge.

Post hoc analysis for anxiety showed significant differences between the following time points: 1 day before surgery and 1 month after discharge (Scheffe  $F$  test:  $p < 0.001$ ); 1 day before surgery and 6 months after discharge (Scheffe  $F$  test:  $p = 0.008$ ); and 1 week after surgery and 1 month after discharge (Scheffe  $F$  test:  $p = 0.031$ ). Post hoc analysis for depression showed a significant difference

between 1 week after surgery and 1 month after discharge (Scheffe  $F$  test:  $p = 0.009$ ).

#### Changes in QOL

Statistically significant changes over time were found in the physical domain (ANOVA,  $F = 11.83$ ;  $df = 3$ ;  $p < 0.001$ ), functional domain (ANOVA,  $F = 4.61$ ;  $df = 3$ ;  $p = 0.005$ ), and specific domain (ANOVA,  $F = 11.57$ ;  $df = 3$ ;  $p < 0.001$ ) (Table 2). The physical, functional, and specific domains of QOL decreased 1 week after surgery. By 1 month after discharge these 3 domains had improved over the values at 1 week after surgery, and this improvement was maintained or increased at 6 months after discharge.

In the physical domain, post hoc analysis showed significant differences between the following time points: 1 day before surgery and 6 months after discharge (Scheffe  $F$  test:  $p = 0.021$ ); 1 week after surgery and 1 month after discharge (Scheffe  $F$  test:  $p = 0.002$ ); and 1 week after surgery and 6 months after discharge (Scheffe  $F$  test:  $p < 0.001$ ). In the functional domain, post hoc analysis showed a significant difference between 1 week after surgery and 6 months after discharge (Scheffe  $F$  test:  $p = 0.001$ ). In the specific domain, post hoc analysis showed significant differences between the following time points: 1 week after surgery and 1 day before surgery (Scheffe  $F$  test:  $p = 0.004$ ); 1 week after

surgery and 1 month after discharge (Scheffe  $F$  test:  $p = 0.001$ ); and 1 week after surgery and 6 months after discharge (Scheffe  $F$  test:  $p < 0.001$ ).

#### Changes in specific domain subgroups

Statistically significant changes over time were found in the eating domain (ANOVA,  $F = 8.46$ ;  $df = 3$ ;  $p < 0.001$ ), in the swallowing domain (ANOVA,  $F = 5.83$ ;  $df = 3$ ;  $p = 0.001$ ), and in the speaking domain (ANOVA,  $F = 7.89$ ;  $df = 3$ ;  $p < 0.001$ ). Scores for the four specific domain subgroups are summarized in Table 3. Scores for the three domains of eating, swallowing and speaking decreased 1 week after surgery, all improved 1 month after discharge, and additional improvement was noted at 6 months after discharge. Esthetics domain scores declined at 1 week after surgery, further declined at 1 month after discharge, and at 6 months only regained the 1 week after surgery value.

In the eating domain, post hoc analysis showed significant differences between the following time points: 1 week after surgery and 1 day before surgery (Scheffe  $F$  test:  $p = 0.003$ ); 1 week after surgery and 1 month after discharge (Scheffe  $F$  test:  $p = 0.037$ ); and 1 week after surgery and 6 months after discharge (Scheffe  $F$  test:  $p = 0.003$ ). In the swallowing domain, post hoc analysis showed significant differences between the following time points: 1 week

Table 2. Mean scores for psychological state and quality of life in patients who completed the study and those who failed to complete the study.

Score for each domain	One day before surgery		One week after surgery		One month after discharge		Six months after discharge Completers* N = 26	F	df	p value
	Completers* N = 26	Non-completers** N = 9	Completers* N = 26	Non-completers** N = 9	Completers* N = 26	Non-completers** N = 7				
Mean (±SD)										
Psychological state (HADS)										
Anxiety	5.92 (±3.00)	6.33 (±3.77)	4.73 (±3.22)	5.44 (±3.09)	3.12 (±2.47)	2.71 (±3.09)	4.12 (±2.73)	9.75	3	<0.001*
Depression	4.04 (±3.85)	4.55 (±4.77)	6.19 (±5.22)	6.44 (±3.91)	3.58 (±2.98)	2.00 (±2.87)	4.12 (±3.95)	6.25	3	0.001*
QOL domain (FACT-G)										
Physical	21.27 (±4.00)	21.33 (±4.82)	18.65 (±6.07)	19.78 (±4.63)	21.92 (±5.82)	24.71 (±4.19)	24.12 (±3.30)	11.83	3	<0.001*
Social/family	18.75 (±5.42)	16.42 (±8.17)	18.18 (±5.78)	19.16 (±7.29)	17.23 (±6.24)	17.73 (±8.55)	17.65 (±5.96)	0.33	3	0.804
Psychological	16.95 (±5.28)	18.11 (±4.31)	16.12 (±5.77)	17.22 (±4.24)	18.46 (±4.29)	20.29 (±3.82)	17.54 (±4.32)	1.03	3	0.381
Functional	18.23 (±5.15)	17.00 (±4.87)	16.35 (±5.99)	13.67 (±3.94)	18.69 (±6.26)	19.43 (±4.89)	21.12 (±4.77)	4.61	3	0.005*
QOL domain (FACT-H&N)										
Specific domain	24.12(±7.53)	26.11(±5.64)	17.42(±7.22)	18.22(±7.49)	23.58(±5.93)	25.14(±4.53)	25.19(±5.35)	11.57	3	<0.001*

\*Completers: Patients who completed the study; \*\*Non-completer: Patients who dropped out between 1 and 6 months after discharge; SD: standard deviation; F: F value corresponding to F statistics for one-way repeated measures analysis of variance (ANOVA); df: Degrees of freedom; p values: corresponding to F statistics for one-way repeated measures ANOVA; HADS: the Hospital Anxiety and Depression Scale; QOL: Quality of Life; FACT-G: the Functional Assessment of Cancer Therapy General; FACT-H&N: the Functional Assessment of Cancer Therapy Head and Neck.  
\* p < 0.05.

after surgery and 1 month after discharge (Scheffe F test:  $p = 0.031$ ); and 1 week after surgery and 6 months after discharge (Scheffe F test:  $p = 0.011$ ). In the speaking domain, post hoc analysis showed significant differences between the following time points: 1 week after surgery and 1 day before surgery (Scheffe F test:  $p = 0.042$ ); 1 week after surgery and 1 month after discharge (Scheffe F test:  $p < 0.001$ ); and 1 week after surgery and 6 months after discharge (Scheffe F test:  $p = 0.004$ ).

**The relationship between psychological state, QOL and clinical factors**

Analysis of data from patients who had completed all questionnaires provided additional insight into the relationships between psychological state and clinical factors, and between QOL and clinical factors. The numbers in two clinical factor subgroups (type of mandibular resection and type of microscopically revascularized reconstruction) were too small for analysis so these subgroups were excluded.

A statistically significant main effect of TNM stage was found in the swallowing domain (two-way ANOVA,  $F = 8.27$ ;  $df = 3,1$ ;  $p = 0.008$ ). A statistically significant main effect of postoperative radiation was found in the speaking domain (two-way ANOVA,  $F = 322$ ;  $df = 3,1$ ;  $p < 0.001$ ). Other main effects of clinical factors were not statistically significant (Table 4). No statistically significant interactions between any time point and clinical factor were found. Patients with tumors in the lower gingiva/floor of the mouth, TNM III/IV, and most extensive neck dissections reported the most severe depression and the lowest QOL in the somatic and specific domains immediately after surgery. Fig. 1 shows trends over time for FACT-H&N scores across various clinical demographics.

**Discussion**

The mean scores demonstrated that anxiety increased before surgery, then decreased and remained below preoperative levels throughout the follow-up period. Like patients with other types of cancer, those with head and neck cancer experience considerable distress on a day-to-day basis. Their anxiety before surgery is likely to be particularly high, since they often picture themselves with significant alterations in function and physical appearance resulting from the surgery.

Depression, as indicated by mean HADS scores, peaked 1 week after sur-

Table 3. Comparison of mean scores for QOL in the Specific domain subgroups in the 26 patients who completed the study.

Specific domain subgroup	One day before surgery	One week after surgery	One month after discharge	Six months after discharge	F value	df	p value
Eating	6.77 (±3.24)	4.27 (±3.63)	6.58 (±3.10)	7.65 (±3.43)	8.46	3	<0.001*
Swallowing	2.65 (±1.47)	1.58 (±1.24)	2.42 (±1.07)	2.73 (±1.15)	5.83	3	0.001*
Speaking	5.42 (±2.34)	3.62 (±1.77)	4.58 (±1.94)	5.69 (±1.41)	7.89	3	<0.001*
Esthetics	2.88 (±1.31)	2.58 (±1.21)	2.27 (±1.51)	2.58 (±1.53)	1.17	3	0.326

SD: standard deviation; F: F value corresponding to F statistics for one-way repeated measures analysis of variance (ANOVA); df: Degrees of freedom; p values: corresponding to F statistics for one-way repeated measures ANOVA.

gery, then improved 1 month after discharge with a slight increase at 6 months after discharge. The data suggest that depression peaks in the immediate postoperative period but improves as patients adjust to their functional state.

Few studies have focused on the psychological state of head and neck cancer patients during the perioperative period. HASSANEIN *et al.*<sup>7</sup> suggested that a prospective longitudinal study of psychological distress in head and neck cancer patients during the perioperative period was needed. The current study revealed a changing trend in psychological state during the perioperative period.

QOL decreased 1 week after surgery in the somatic domains (including physical and functional well-being) and in the specific domain. QOL in the physical, psychological and functional domains exceeded preoperative levels 1 month after discharge

and 6 months after discharge. A previous study reported that specific domain QOL impairment due to surgery generally returned to the baseline value at 3 months post treatment and surpassed pretreatment levels at 12–24 months<sup>14</sup>. The authors' results indicate that acute somatic side effects of surgery impair QOL in the somatic and specific domains during the perioperative period but that QOL improves by 1 month after discharge.

MERCKAERT *et al.*<sup>12</sup> suggested that it was important to detect somatic and psychosocial state in head and neck cancer patients as early as possible and to support the patients appropriately. KATZ *et al.*<sup>11</sup> reported that patients randomly assigned to intervention groups showed lower anxiety, lower distress, greater knowledge about their cancer treatments and greater satisfaction with their supportive care and treatments.

PETRUSON *et al.*<sup>16</sup> suggested that psychosocial support programs could improve psychological state and QOL only when interventions were performed based on appropriate and detailed assessments. These authors also insisted that assessments should be made regularly throughout treatment and follow-up in head and neck cancer patients, enabling rapid and adequate symptom treatment and/or psychological intervention.

The authors suggest that clinicians should provide patients with supportive care that includes the perioperative period. DAVID and BARRITT<sup>4</sup> suggested that preoperative information was important to reduce anxiety and to prepare the patient for potential postoperative difficulties. STRAUSS<sup>22</sup> suggested that it was important to provide preoperative psychological reassurance to increase postoperative adaptation in dealing with psychosocial

Table 4. Relationships between psychological states and clinical factors, and between QOL and clinical factors in the 26 patients who completed the study.

Psychological state and QOL/Clinical factor p value (F)	Tumor site	TNM stage	Type of neck dissection	Postoperative radiation
df	3, 2	3, 1	3, 3	3, 1
Psychological state (HADS)				
Anxiety	0.974 (0.027)	0.081 (3.31)	0.121 (2.16)	0.720 (0.131)
Depression	0.902 (0.100)	0.431 (0.640)	0.302 (1.29)	0.221 (1.56)
QOL domain (FACT-G)				
Physical	0.901 (0.110)	0.859 (0.032)	0.498 (0.820)	0.246 (1.40)
Social/family	0.173 (1.90)	0.326 (1.01)	0.064 (2.80)	0.864 (0.030)
Psychological	0.581 (0.560)	0.647 (0.220)	0.615 (0.610)	0.316 (1.04)
Functional	0.994 (0.006)	0.502 (0.460)	0.573 (0.680)	0.776 (0.083)
QOL domain (FACT-H&N)				
Specific domain	0.776 (0.260)	0.311 (1.07)	0.832 (0.290)	0.348 (0.917)
Eating domain	0.846 (0.170)	0.247 (1.41)	0.773 (0.370)	0.837 (0.043)
Swallowing domain	0.145 (2.10)	0.008* (8.27)	0.544 (0.730)	0.359 (0.908)
Speaking domain	0.618 (0.490)	0.256 (1.35)	0.986 (0.047)	<0.001* (322)
Esthetics domain	0.986 (0.014)	0.920 (0.010)	0.424 (0.970)	0.558 (0.354)

F: F values corresponding to F statistics are reported for between-sample variation; p values: corresponding to between-sample F statistics; df: Degrees of freedom are reported for within-sample variation and between-sample variation, respectively; HADS: the Hospital Anxiety and Depression Scale; QOL: Quality of Life; FACT-G: the Functional Assessment of Cancer Therapy General; FACT-H&N: the Functional Assessment of Cancer Therapy Head and Neck.

The Eating, Swallowing, Speaking, and Esthetics domains are subgroups of the Specific domain.

\* p < 0.05.

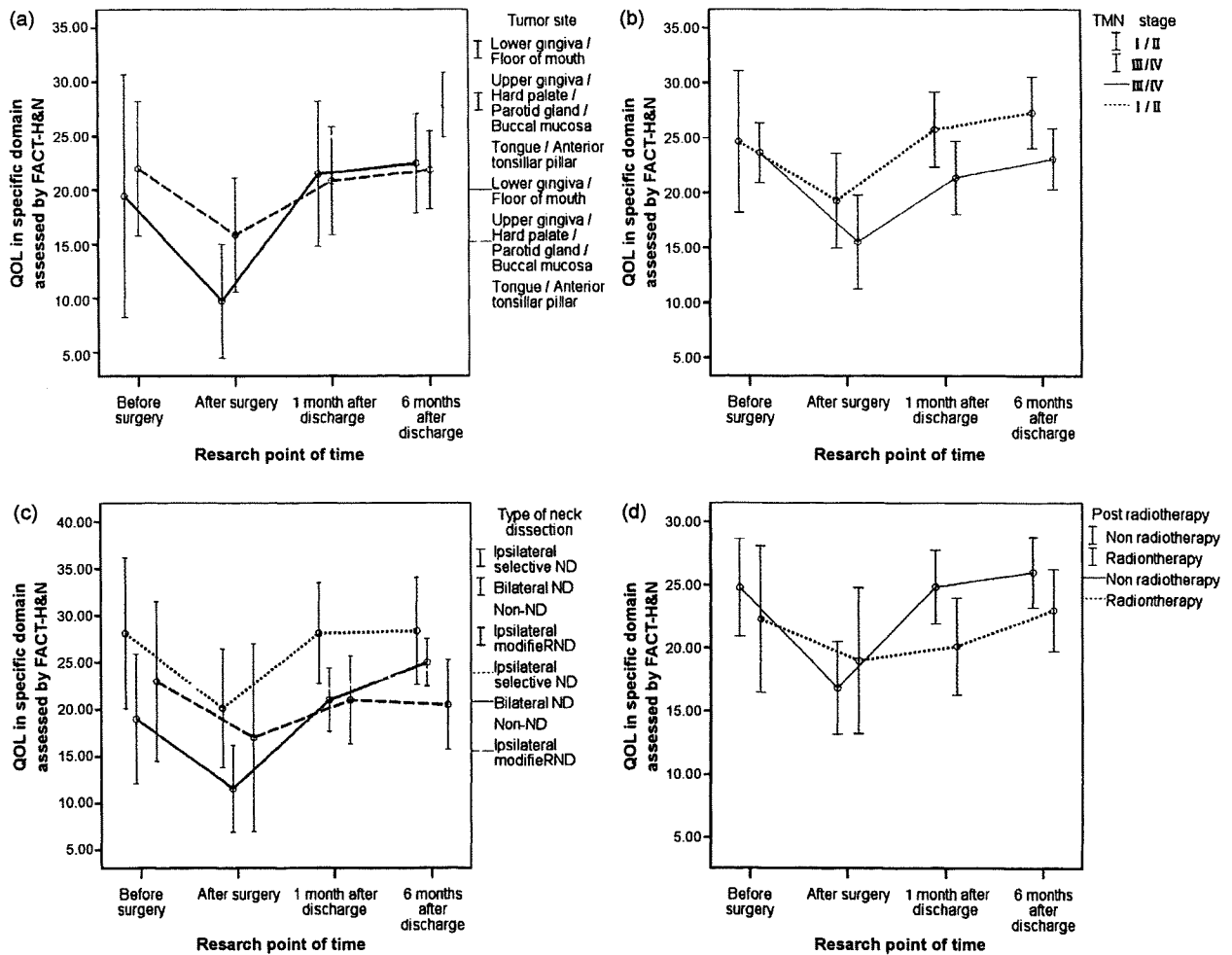


Fig. 1. Graphs of FACT-H&N. (A) Changing trends over time comparing tumor sites. (B) Changing trends over time comparing TNM stages. (C) Changing trends over time comparing type of neck dissection (ND: neck dissection. RND: radical neck dissection). (D) Changing trends over time comparing radiotherapy with no radiotherapy. The figures give mean scores and 95% confidence intervals.

difficulties, such as feelings of hopelessness, and psychological distress resulting from physical handicaps and subsequent significant life changes.

DE BOER *et al.*<sup>5</sup> reported that expression of psychological pretreatment complaints was predictive for less recurrence and better survival in head and neck cancer patients. In view of the present results, clinicians should observe patients for anxiety and consider its impact, especially before surgery.

Depression is considered a significant prognostic indicator for global QOL<sup>16</sup>. HASSANEIN *et al.*<sup>7</sup> insisted that psychological distress, especially depression, showed a very strong positive association with poor QOL in the somatic and specific domains. The authors suggest that clinicians should pay attention to symptoms of depression in the head and neck cancer patient, especially soon after surgery.

The present study found no statistically significant interactions between any time

point and clinical factors. Patients with tumors in the lower gingiva/floor of the mouth, TNM III/IV, and most extensive neck dissections reported the most severe depression and the lowest QOL in the somatic and specific domains immediately after surgery. AARSTAD *et al.*<sup>1</sup> and VAN CANN *et al.*<sup>23</sup> reported similar trends for head and neck cancer patients with advanced TNM stage, and SCHLIEPHAKE *et al.*<sup>20</sup> reported similar findings for tumors located in the lower gingiva or floor of the mouth. Previous reports indicate that more extensive neck dissection leads to a decrease in QOL<sup>10</sup>. Consequently, a more limited neck dissection could result in an improved QOL, and modifications to radical neck dissection may contribute to improvement in postoperative QOL<sup>10</sup>. The timeframe of the present study excluded any delayed effects of radiation; hence the authors could not clarify the effect of postoperative radiation therapy on psychological state and

QOL. VAN CANN *et al.* reported that postoperative radiation therapy influenced QOL in head and neck patients in general and in oral cancer patients specifically, finding that severity of xerostomia increased with greater doses of postoperative radiation. They also stressed the importance of performing radical surgery from an oncological point of view<sup>23</sup>. Surgery is generally a stressful event that can profoundly disturb patients' somatic and psychological homeostasis<sup>18</sup>. It is difficult to separate the effects of treatment and to draw conclusions as to which treatment reduces QOL<sup>1</sup>. Further research with larger patient numbers should be conducted to assess the relationship between psychological state, QOL and clinical factors during the perioperative period.

This study found that QOL in the swallowing, eating, and speaking domains decreased 1 week after surgery, then recovered to or exceeded preoperative levels 1 month after discharge, and

improved further by 6 months after discharge. These patterns were associated with all of the clinical factors examined.

RADFORD *et al.*<sup>17</sup> suggested that surgery significantly impacts verbal communication and swallowing, especially 6 months postoperatively. In a study of head and neck cancer patients, GOLDSTEIN *et al.*<sup>6</sup> reported that although the recovery of QOL differed according to survival time, QOL in the eating domain showed the greatest decrease 3 months after treatment. It has been suggested that head and neck cancer patients have disease-specific difficulties and reduced QOL because the affected area plays a vital role in various aspects of life<sup>24</sup>. Difficulties with eating, swallowing and speaking caused by surgery directly impact patients' daily life. The mandible and teeth are vital for chewing, and these structures are affected by treatments for head and neck cancer that involve jaw resection or teeth extractions, resulting in the patient becoming edentulous and/or finding it difficult to chew<sup>19</sup>. The present study confirmed that surgery for head and neck cancer can reduce QOL in the somatic and specific domains.

The authors suggest that although patients experience disability and dysfunction postoperatively<sup>7,8,14</sup>, many are able to compensate effectively for the remaining chronic somatic side effects. This study shows that postoperative adaptation can occur by the end of the first month after discharge.

In the current study, no statistically significant changes were found in the esthetics domain. Further research should be conducted to determine whether esthetic problems affect patients' psychosocial state and QOL. Surgeons tend to focus on difficulties in swallowing or avoiding recurrence, rather than esthetic problems<sup>13,24</sup>. The authors recommend that surgeons remain aware of head and neck cancer patients' concerns about their changing appearance.

These findings could provide staff who support these patients with the opportunity to formulate a common understanding regarding preoperative, postoperative and discharge planning based on changes in psychological state and QOL. There is also the opportunity to provide head and neck patients and their families with educational support programs that explain what postoperative psychological and physical difficulties to expect. In conclusion, these findings could provide a basis for further study aimed at ensuring higher quality support and psychological intervention appropriate to each individual.

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# Psychological Distress and Quality of Life in Cervical Cancer Survivors After Radiotherapy

## *Do Treatment Modalities, Disease Stage, and Self-esteem Influence Outcomes?*

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**Abstract:** The present study evaluated whether differences in the type of radiotherapy, disease stage, and self-esteem influence psychological distress and quality of life (QOL) among cervical cancer survivors. Sixty survivors, after radiotherapy, chemoradiotherapy, or postoperative radiotherapy for cervical cancer, participated in the study. The participants were asked to complete questionnaires during follow-up visits. The questionnaires included the Japanese version of the Hospital Anxiety and Depression Scale, the Functional Assessment of Cancer Therapy-General, and the Rosenberg Self-esteem Scale. The results indicated that psychological distress and QOL in cervical cancer survivors were not significantly different among treatment modalities and disease stage. Psychological distress and QOL differed significantly in accordance with the survivor's self-esteem. Survivors in the high self-esteem group had lower levels of anxiety and depression and higher QOL scores (emotional and social/family aspects of QOL and total QOL) than those in the low self-esteem group. Psychosocial support with consideration of a patient's self-esteem is necessary throughout and beyond radiotherapy for cervical cancer.

**Key Words:** Cervical cancer, Survivors, Quality of life, Psychological distress, Self-esteem

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The cervix, ovary, endometrium, vulva, and vagina are common sites of gynecologic malignancies, accounting for 11.5% of all cancers in women.<sup>1</sup> In particular, cervical cancer is the second most common cancer among women worldwide.<sup>2,3</sup> With the increasing survival rates of cervical cancer patients owing to earlier detection and more effective treatment programs,<sup>3</sup> the quality of life (QOL) of

cervical cancer survivors has been gaining increasing attention. Cervical cancer patients tend to have issues involving their femininity, self-image, changes in sexual function, and fertility preservation, in addition to the general distress that follows cancer treatment.<sup>4</sup> As such, the QOL in women with cervical cancer is often disturbed.

Radiotherapy plays an important role in cervical cancer patients. Previous studies have indicated that different treatment modalities affect the lives of surviving women to varying degrees in physical, sexual, and psychosocial functioning.<sup>3</sup> Maintaining the QOL of gynecologic cancer survivors after radiotherapy requires careful consideration of all domains that affect the patient. One of the concerns is related to combination treatment regimens, such as surgery or chemotherapy, as they may increase complications and thereby negatively affect the QOL. According to a Cochrane review of acute and late toxicity after concomitant chemoradiotherapy,<sup>5</sup> late effects of treatment have not been well reported, and therefore, the impact of concomitant chemoradiotherapy on these effects could not be determined.

The choice of treatment modality is based on disease extent, followed by the patient's age and general condition. Patients

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diagnosed with early-stage cervical cancer are usually treated with surgery, radiotherapy, or their combination. Some patients also receive concurrent chemotherapy as a part of curative treatment. On the other hand, standard treatment for patients with locally advanced cervical cancer is concomitant chemoradiotherapy,<sup>6</sup> although radiotherapy alone is indicated for elderly patients or patients with renal failure.

Regarding physical and psychosocial concerns among cervical cancer survivors, it has been difficult to draw definite conclusions, and many previous studies lacked information about the patients' disease stages and treatment modalities.<sup>3</sup>

In addition to treatment modalities and disease stages, self-esteem can promote or detract from a patient's well-being.<sup>7</sup> In the mid-1960s, Maurice Rosenberg<sup>8</sup> defined self-esteem as a favorable or unfavorable attitude toward the self, and this became the most frequently used definition for research. A patient's self-esteem may influence his or her QOL and psychological distress. However, few studies have examined self-esteem in cancer survivors.

The present study aimed to evaluate psychological distress and QOL in cervical cancer survivors. We examined whether differences in treatment modalities, disease stages, and self-esteem influence psychological distress and QOL.

## METHODS

The Research Center Hospital for Charged Particle Therapy, National Institute of Radiological Sciences, research review board approved the study and granted formal access to the patients. Before participation, all participants were informed of the nature, risks, and benefits of study participation and provided written informed consent.

### Subjects

Cervical cancer survivors were eligible for study participation if (1) they were older than 20 years; (2) they were aware of their cancer diagnosis; (3) they had a diagnosis of cervical cancer and had completed their cancer treatment at least 6 months before study participation; (4) their condition was not so severe that they could not complete the questionnaire and participate in the study; (5) they had no severe mental disorder or dementia; and (6) they were able to provide informed consent.

### Treatments

In patients with early-stage disease, radical hysterectomy was the primary procedure. Medically inoperable or elderly patients older than 70 years were treated with radiotherapy. Postoperative radiotherapy was principally indicated in cases with metastatic lymph nodes, invasion of the cardinal ligament, vascular invasion, and incomplete removal of the vaginal wall after radical hysterectomy.

In definitive radiotherapy, patients were treated with a combination of external beam and high-dose-rate intracavitary irradiation. External whole-pelvis irradiation was performed using anteroposterior and posteroanterior parallel opposing ports with a dose of 1.8 Gy per fraction 5 times per week. A midline block was inserted at a total dose of 19.8 Gy for lesions of less than 4-cm diameter at stages Ib1 and IIb disease or 30.6 Gy for those at stages IIb with less than 4-cm-diameter lesion, IIIb, and IV disease. Pelvic irradiation with central shielding was performed with doses of 2 Gy per fraction to a total dose of 49.8 or 50.6 Gy. Along with central shielding irradiation, 4 fractions of intracavitary irradiation with a remote afterloading system using high-dose rate iridium 192 sources were given once a week, with a fraction dose of 5 to 7 Gy at point A, at a total dose ranging from 22 to 28 Gy.

Patients with locally advanced cervical cancer were treated with concomitant chemoradiotherapy if meeting with the following

eligibility criteria: histopathologically confirmed carcinomas of stages Ib2, IIb less than 4 cm in diameter, IIIb, or IV; age between 20 and 70 years; a performance status of 0 to 2; and adequate baseline bone marrow, hepatic, and renal functions.

For postoperative radiotherapy, 30 Gy of whole-pelvis external beam irradiation was delivered, followed by 10 to 20 Gy of central shielding external beam irradiation, up to a total dose of 40 to 50 Gy. Additional boost irradiation of 12 Gy of high-dose-rate intracavitary irradiation was performed for the vaginal stump at a 5-mm depth from the vaginal surface.

All the study subjects were requested to complete the questionnaires on an outpatient basis when they visited the hospital for their follow-up visits. Medical information and demographic data were taken from medical records and patient reports.

### Functional Assessment of Cancer Therapy-General

To assess the QOL, all subjects completed a questionnaire on Functional Assessment of Cancer Therapy-General (FACT-G). The FACT-G questionnaire consists of 27 questions in 4 domains: 7 physical, 7 social/family, 6 emotional, and 7 functional questions.<sup>9</sup> The Japanese version of FACT-G<sup>10</sup> has been validated. Items are rated from 0 (not at all) to 4 (very much). Higher scores on each subscale and a higher overall score indicate better QOL.

### Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale (HADS) is a self-rating questionnaire with 14 items measuring psychological distresses: HADS-anxiety (HADS-A) and HADS-depression (HADS-D).<sup>11</sup> The Japanese version of HADS was back-translated by Kitamura,<sup>12</sup> and the reliability and validity of the Japanese version was confirmed by Kugaya et al.<sup>13</sup> Each item is answered on a 4-point response category (0–3), so the possible scores for anxiety or depression ranged from 0 to 21.<sup>14</sup> The higher the score, the higher the level of symptoms. The cutoff points for HADS are assumed to be 8 or 11 points, where a total score on HADS-D and HADS-A of 8 constitutes suspected depression and a total score of 11 or higher indicates depression.<sup>15,16</sup>

### Rosenberg Self-esteem Scale

Self-esteem was measured with the Japanese version of the Rosenberg Self-esteem (RSE) Scale, a widely used, reliable, and valid measure.<sup>17</sup> The RSE Scale measures the overall sense of being capable and feeling worthwhile and competent. The questionnaire consists of 10 items measured on a 5-point scale (1–5). The

TABLE 1. Patient characteristics (N = 60)

	No. (%)	Mean (SD)
Age, yr		61.4 (11.8)
Marital status		
Married	38 (63.3)	
Single	12 (20)	
Widowed	10 (16.7)	
Education, yr		11.7 (2)
Occupation		
Employed full-time	15 (25)	
Employed part-time	8 (13.3)	
Unemployed	36 (60)	
Other	1 (1.7)	

TABLE 2. Patient characteristics: stage and treatment modalities

Stage	Radiation	Chemoradiation	Surgery and Radiation	Total
0	1	0	0	1
I	8	3	3	14
II	9	1	4	14
III	14	9	0	23
IV	1	5	1	7
Recurrence	0	0	1	1
Total	33	18	9	60

maximum score of 50 reflects the best possible self-esteem, whereas the minimum score of 10, the least possible self-esteem.

### Statistical Analyses

Data were analyzed using the Statistical Package for Social Sciences (SPSS Inc, Chicago, Ill). We compiled descriptive statistics on psychological distress, QOL, self-esteem, and clinical and demographic measures.

In addition, differences in QOL and psychological distress among treatment modalities were analyzed, using 1-way analysis of variance with post hoc comparisons (Scheffé or F test). Differences in QOL and psychological distress depending on disease stages and self-esteem were analyzed using the Mann-Whitney *U* test. All *P* values were 2-sided, and the significance level was set at *P* < 0.05.

To examine the differences of psychological distress and QOL depending on disease stages, stages I and II were categorized into an early-stage group, and stages III, IV, and recurrence were classified as an advanced-stage group.

Regarding self-esteem, to examine the relationships of self-esteem scores and the score of psychological distress and QOL, participants were divided into a high self-esteem group (*n* = 33; scores of RSE Scale were higher than the median) and low self-

esteem group (*n* = 31; scores of RSE Scale were lower than the median). The median score of self-esteem was 35. We selected this median cutoff value because there was no cutoff for the original Japanese version of RSE Scale for the cancer population, and the scores were distributed binomially at the border of the median.

## RESULTS

During the recruitment phase (March 2005–September 2005), 72 patients met the inclusion criteria. Of these, 12 were then excluded because of incomplete data, and 60 were eligible.

### Demographic and Medical Variables

Demographic and medical variables are summarized in Tables 1 and 2. Mean age was 61.4 years (range, 32–79 years; SD, 11.8 years). Mean education period was 11.7 years, and 38 (63.3%) of the 60 participants were married. One patient (1.7%) had stage 0, 14 (23.3%) had stage I, 14 (23.3%) had stage II, 23 (38.3%) had stage III, 7 (11.7%) had stage IV disease, and 1 had recurrence. Thirty-three patients (55%) received radiotherapy, 18 (30%) received chemoradiotherapy, and 9 (15%) received postoperative radiotherapy. Mean follow-up duration was 33 months (range, 6.3–129.2 months) after initiation of treatment.

### Differences of Psychological Distress Among Treatment Modalities, Disease Stages, and Self-esteem

Table 3 shows the psychological distress for the respective treatment modalities. There were no significant differences in the scores of anxiety and depression among the 3 treatment modalities (HADS-A:  $F_2 = 0.258$ ,  $P = 0.774$ ; and HADS-D:  $F_2 = 0.034$ ,  $P = 0.967$ ). Similarly, there were no significant differences in the scores of anxiety and depression (Table 3) between the early-stage and advanced-stage groups (HADS-A:  $U = 314.5$ ,  $P = 0.144$ ; and HADS-D:  $U = 394.5$ ,  $P = 0.866$ ). Figure 1 shows that the scores of anxiety and depression in the high self-esteem group were significantly lower than those of the low self-esteem group (HADS-A:  $U = 242$ ,  $P = 0.008$ ; and HADS-D:  $U = 245$ ,  $P = 0.010$ ).

TABLE 3. Scores of psychological distress and QOL

	Psychological Distress (HADS)		QOL (FACT-G)				Total
	HADS-A	HADS-D	Physical	Social/Family	Emotional	Functional	
Treatment							
Radiation	5	4.5	23.8	19.7	18.1	20.2	81.8
Chemoradiation	4.6	4.7	22.8	18.9	16.1	17.8	75.4
Radiation and surgery	3.8	4	22.5	20.2	16	21.1	79.8
Stage							
Early	4	4.2	23.4	19.8	17.9	20.1	81.8
Advanced	5.2	4.6	23.4	19.6	16.7	19.7	78.9
Self-esteem	*	*		*	*		*
High	3.8	3.5	24.5	21.2	21.2	19	84.5
Low	5.5	5.5	22.3	18.2	18.2	15.4	75.6

HADS-A: score range 0–21, the higher the score, the higher the level of symptoms; HADS-D: score range 0–21, the higher the score, the higher the level of symptoms; FACT-G Physical: score range 0–28, the higher the score, the higher the level of QOL; FACT-G Social/Family: score range 0–28, the higher the score, the higher the level of QOL; FACT-G Emotional: score range 0–24, the higher the score, the higher the level of QOL; FACT-G Functional: score range 0–28, the higher the score, the higher the level of QOL; FACT-G Total: score range 0–108, the higher the score, the higher the level of QOL.

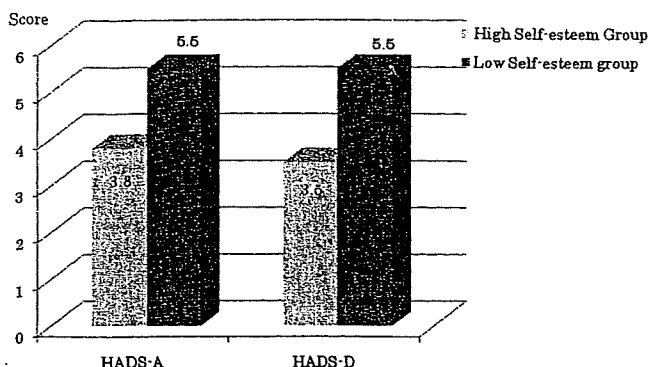


FIGURE 1. Mean HADS scores in the high and low self-esteem groups.

### Differences of QOL Among Treatment Modalities, Disease Stages, and Self-esteem

Based on FACT-G, no significant differences were found among treatment modalities in any aspect of QOL (physical:  $F_2 = 0.218$ ,  $P = 0.805$ ; social/family:  $F_2 = 0.096$ ,  $P = 0.909$ ; emotional:  $F_2 = 1.978$ ,  $P = 0.148$ ; functional:  $F_2 = 1.045$ ,  $P = 0.358$ ; and total QOL:  $F_2 = 1.169$ ,  $P = 0.318$ ). There were also no significant differences in any aspect of QOL between the early-stage and advanced-stage groups (physical:  $U = 412.5$ ,  $P = 0.742$ ; social/family:  $U = 362.5$ ,  $P = 0.496$ ; emotional:  $U = 362$ ,  $P = 0.375$ ; functional:  $U = 410.5$ ,  $P = 0.563$ ; and total QOL:  $U = 371$ ,  $P = 0.144$ ; Table 3).

The differences in the QOL based on the self-esteem score are shown in Figure 2. Social/family and emotional aspects of QOL and total scores of QOL were significantly higher in the high self-esteem group than in the low self-esteem group (social/family:  $U = 264$ ,  $P = 0.023$ ; emotional:  $U = 212$ ,  $P = 0.001$ ; and total QOL:  $U = 246$ ,  $P = 0.007$ ).

### DISCUSSION

The results of the present study indicate that differences in the levels of psychological distress and QOL in cervical cancer survivors were not significant among treatment modalities and disease stages. However, anxiety, depression, emotional and social/family aspects of QOL, and total QOL were significantly different, depending on the survivor's self-esteem.

Overall, anxiety and depression, as reflected by HADS-A and HADS-D, were not significantly different among treatment modalities and disease stages. Cull et al<sup>18</sup> showed that 33% of cervical cancer survivors with stage Ib disease treated by surgery or radiation were depressed at a mean of 97 weeks after treatment. This is the only study that specifically focused on anxiety and depression in cervical cancer survivors, but because treatment modalities and disease stages that may influence cervical cancer survivors' psychological distress were not examined, the levels of anxiety and depression of overall cervical cancer survivors are not well known. A few studies examined depression in gynecologic cancer survivors, indicating that levels of clinical depression up to 5 years after diagnosis were elevated compared with healthy controls.<sup>19</sup> Bradley et al<sup>19</sup> studied QOL and mental health in cervical and endometrial cancer survivors and concluded that treatment modality and stage of disease were not related to mood. These findings support the results of the present study, which showed that anxiety

and depression of cervical cancer survivors were not significantly different among treatment modalities and disease stages.

Few studies have examined the long-term impact of chemoradiation therapy on QOL in cervical cancer survivors. Nagy et al<sup>20</sup> examined 2 concomitant chemoradiotherapy regimens in QOL and acute toxicity, concluding that the chemotherapy arm with cisplatin at 20 mg/m<sup>2</sup> for 5 days every 21 days had better impact on patients' QOL and lower toxicity compared with its weekly application. The trend seemed to be that patients who had radiation therapy had more psychosocial and sexual problems compared with patients undergoing only surgical treatment. In addition, patients treated by multiple treatment modalities reported significantly lower QOL than those receiving single therapy.<sup>21,22</sup> However, a review of published articles has suggested that there was not enough information to draw clear conclusions regarding QOL of cervical cancer survivors because of methodological shortcomings in those studies.<sup>3</sup> The present study examined the QOL of cervical cancer survivors who had undergone chemoradiotherapy. Although more data may be needed to definitively determine the influences of chemoradiotherapy, our results showed no significant differences in QOL among radiotherapy, chemoradiotherapy, and postoperative radiotherapy, somewhat in contrast to the results of some previous studies.

Regarding disease stages and QOL, Klee et al<sup>23</sup> reported that QOL in survivors of advanced stages of cervical cancer had not reached the QOL of healthy women by 18 months after diagnosis. In contrast, Bradley et al<sup>19</sup> concluded that QOL was not related to disease characteristics, including treatment modality or stage of disease. Our present results also failed to show any significant differences in QOL according to disease stage.

The number of studies focusing on self-esteem in adult cancer survivors is limited. Bertero<sup>24</sup> examined self-esteem and QOL in breast cancer patients and found lowered self-esteem in 73.3%. In addition, lowered self-esteem was associated with psychosocial perspectives including negative affections, anger, hostility, absurdity, and low satisfaction with life. Katz et al<sup>25</sup> examined self-esteem in cancer patients, concluding that it was lowered in 20% to 50% of the patients. Tuinman et al<sup>7</sup> studied the predictive effects of self-esteem and social support on mental health and concluded that men who are single when they are diagnosed with testicular cancer and remain single are a vulnerable group in relation to self-esteem and mental health. For self-esteem in gynecologic cancer survivors, Yap and Davies<sup>26</sup> found that gonadal failure and infertility are among the most common long-term side effects, resulting in distress and lowered self-esteem and QOL.

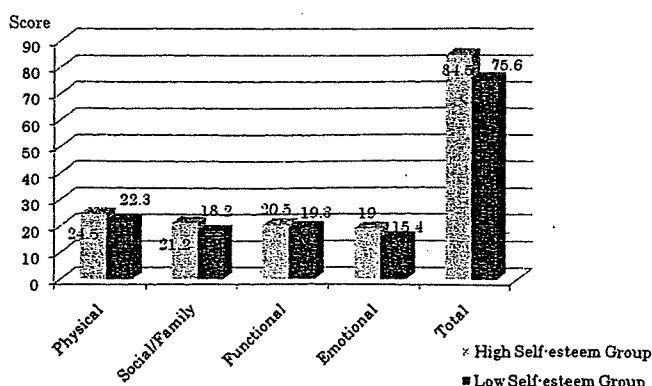


FIGURE 2. Mean scores of QOL in the high and low self-esteem groups.

The present study is the first to examine the differences in psychological distress and QOL in relation to cancer survivors' self-esteem. Anxiety and depression levels in the high self-esteem group were significantly lower than those in the low self-esteem group. For QOL, social/family and emotional aspects of QOL and total scores of QOL in the high self-esteem group were higher than those in the low self-esteem group. Despite facing the same difficult situations, survivors with high self-esteem tend to think positively, as opposed to those with low self-esteem, who tend to have a negative outlook. Especially for patients with low self-esteem, psychotherapeutic measures should be available and applied during and after treatment. Psychological supports including psychotherapy; cognitive behavioral therapy; family, group, and interpersonal therapies; medical crisis counseling; and crisis intervention can be used to help the patient express fears, anxieties, rage, helplessness, and hopelessness related to stressors.<sup>27</sup>

The current study had some limitations. We used a convenience sample, which limited the generalizability of the findings to other cervical cancer patients. In addition, this was a cross-sectional study, and a longitudinal study with a larger sample size could be expected to demonstrate the related variables during the course of the treatment. Nevertheless, our results strongly highlighted the importance of self-esteem as an influencing factor of psychological adjustment among cervical cancer survivors.

## CONCLUSION

Our findings indicate that psychosocial assessment and support are necessary beyond cervical cancer treatment, regardless of the type of radiotherapy and stage of disease. Addressing these factors may contribute to raising the survivors' self-esteem, which may be a key factor in preserving and improving patients' psychological state and QOL. Psychosocial intervention with consideration of self-esteem should start as early as possible to alleviate psychological distress in cervical cancer survivors.

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