# Adaptation Status and Related Factors at 2 Time Points After Surgery in Patients With Gastrointestinal Tract Cancer

# Abstract

**Background:** The diagnosis of cancer and subsequent surgery represent a life-threatening and stressful experience with several factors relating to the patient's process of adaptation.

**Objective:** The purpose of this longitudinal study was to examine adaptation status and related factors in patients who have been diagnosed with and undergone surgery for gastrointestinal tract cancer.

**Interventions/Methods:** The survey was administered twice (2 weeks after discharge from the hospital and 6 months after surgery). 25 patients responded to both questionnaires about quality of life (QOL), which was regarded as an index of adaptation status; illness-related demands, the 'Why me?' question, sense of coherence (SOC), perceived social support, and disease data.

**Results:** On the second survey, scores about illness-related demands, the 'Why me?' question, SOC, and QOL, other than the QOL social relationships domain, improved, but scores about perceived social support lowered. A correlation between the 'Why me?' question and the SOC and the difference in the overall QOL by cancer site were found only on the second survey. Low demands of illness and high SOC predicted high QOL on both surveys.

**Conclusions:** Except for social relationships, adaptation status six months after surgery improved compared to after discharge. The relationships between some variables took on a significant meaning at six months after surgery.

**Implications for Practice:** Comparisons between two time points suggested that most cancer patients had dispositional resilience. Meanwhile, the findings related to social relationships and the relationships between some variables suggested the necessity for professional interventions targeting these factors.

Gastrointestinal tract cancer has been a major threat for the Japanese population because it is the leading site of cancer-related mortality in Japan.[1] An abdominal operation is the most effective curative treatment for gastrointestinal tract cancer in most cases. The diagnosis of cancer and subsequent surgery represent a life-threatening event and a physically and psychosocially stressful experience. Immediately after surgery, patients are physically weak, and their mental state may be dominated by concern and increased vulnerability. Studies[2-4] comparing patients having a diagnosis of cancer and the general population show that the diagnosis of cancer significantly decreases quality of life (QOL) in cancer patients. However, several longitudinal studies[5-8] found that the physical and psychological impacts of having cancer and its treatments are relieved with the passage of time. Patients who have left the hospital and are physically getting better in comparison to immediately after surgery may place too much confidence in the curative effect of the treatment. While it may be true that the demands of life after leaving the hospital differ by patient, their adaptation status during this time may be affected by their perceived burden rather than by the severity of their disease, such as the cancer site or the kind of operation. Their perceived burden/stress may also be closely related with the factors of dispositional resilience and social relationships. It is said that the transition phase from the period of diagnosis and medical treatment of cancer to survivorship occurs several months after leaving the hospital.[9] The passage of time may defuse the impact of the cancer diagnosis, but expectations of the curative effect of the treatment may vary. Several factors in addition to the impact of cancer are related to the adaptation status of patients who have been diagnosed with and undergone surgery for cancer. Thus, this longitudinal study examined patients' adaptation status and the related factors.

Conceptual Framework

This study presumed the diagnosis of cancer and subsequent surgery as a stressful experience and adopted patients' perceived QOL as an index of their adaptation to that stressful experience. After leaving the hospital, patients with gastrointestinal tract cancer and surgery have to deal with not only symptoms of the digestive system, but also multiple problems and tasks, such as recuperation, resuming activities of daily living, and re-establishing their social lives. This means that multidimensional well-being is threatened by the illness. In order to confirm their adaptation status, an index representing a broad range of content that includes physical, functional, emotional, and social well-being is needed. Many experts agree that QOL, with both positive and negative facets of life, is a multidimensional concept with considerable subjectivity and dynamism.[10] Thus, we thought that using a QOL scale could identify the perceived adaptation status of cancer patients after surgery.

Immediately after surgery, the impact of cancer may be so severe as to hide personal and situational differences among individuals and social situations; however, this impact may be defused with the passage of time. Even after the impact is defused, however, it does not necessarily mean that the patients will be able to adapt to cancer. For example, dispositional resilience is a personal factor, meaning that it may have distinct differences among individuals, and social relationships have the potential to both contribute to and diminish adaptation, depending on the situation. The other related factors' effects should be considered, including their interrelationships and taking into account the period of time. According to Lazarus[11], psychological stress was defined as "a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her

well-being." In the case of postoperative cancer patients, factors such as the impact of cancer, dispositional resilience, and social relationships affect the appraisal process of the psychological stress. Thus, this study considered these factors as they relate to adaptation status.

Cancer diagnosis and treatment make a variety of demands ranging over multiple dimensions. In a study[12] involving people treated for colorectal cancer, their demands were considerably affected by time since treatment, perception of illness, and activity level. For cancer patients experiencing the heavy demands related to illness, cancer can continue to have an impact. Thus, this study examined illness-related demands as one of the variables of the impact of cancer. When a person receives a cancer diagnosis and begins treatment, most of them may ask, "Why did this happen to me?" According to Attribution Theory, this kind of questioning is an attributional activity, and ascribing causes is especially relevant when one's health is threatened, when symptoms or tension is heightened, or when a catastrophic event takes place.[13] Thus, this study used the question "Why me?" as a variable indicating the impact of cancer, on the premise that cancer arouses the question "Why me?" As other variables of the impact of cancer, this study used cancer sites and indications for supplemental treatment. According to an American study[14] involving a large sample of cancer patients (n=4496), diagnoses with a poorer prognosis and greater patient burden produced similar rates of distress. In a study[15] of quality of life in survivors of colorectal carcinoma, most respondents reported a relatively uniform and high quality of life in 3 years, except for those in TNM Stage IV. The prevalence of physical and psychological distress may differ by cancer site and stage. However, cancer site and stage do not reflect patients' perceptions.

Taylor[16] said in an article about cognitive adaptation to threatening events that people have

"self-curing abilities" and use their social networks and individual resources to help them deal with personal problems. Based on a review of previous studies, Aspinwall and MacNamara[17] argued that positive emotions and beliefs seem not only to be associated with good outcomes among people experiencing adversity, but also to play a role in realizing good outcomes. Given that patients who undergo surgical treatment for cancer have self-curing abilities with positive emotions and beliefs—namely, dispositional resilience—expectations of the curative effect of treatment would positively affect their adaptation status. The present study considered dispositional resilience as a factor that is positively related to patients' adaptation status and adopted the concept of sense of coherence (SOC) as an index of resilience. According to systematic reviews[18, 19] of SOC and its relationship with QOL and health, the SOC seems to have an impact on QOL and a main, moderating, or mediating role in the explanation of health. The concept of SOC, which was proposed by Antonovsky,[20] represents the salutogenic strength of the human being—that is, it focuses on human health and adaptation to a stressful environment rather than etiology/pathogenesis. Given a strong SOC, one has a dispositional orientation toward perceiving life as comprehensible, manageable, and meaningful. For example, in a study[21] of women with a recent diagnosis of gynecological cancer, a strong SOC was associated with lower levels of demoralization, which is a dysphoric mood state. In another study,[22] regression analyses found that the SOC of hematological cancer survivors predicted fear of recurrence and posttraumatic stress symptomatology.

SOC alone cannot explain patients' overall health. Social relationships, especially social support, are also important during adaptation to the cancer experience. According to a literature review[23] of multi-dimensional QOL among long-term adult survivors for each of several cancer

sites, social support improves psychological domain QOL for breast, cervical, and colorectal survivors. Another study[24] that examined cancer patients at 3 and 15 months after diagnosis suggested that lower levels of social support were strongly associated with higher levels of depression symptoms. Furthermore, in a study[25] of lung cancer patients over time in a palliative setting, there were times when high social support scores predicted high QOL. However, social relationships could have both positive and negative psychological effects, even leading to disappointments about the quality and quantity of the support people give in the face of a personal life crisis.[11] In a study[6] about stressors among female cancer survivors, the frequency of what survivors reported as stressors tended to be greater 1 month after treatment than 3 months after treatment, though the answers of survivors' partners showed the opposite trend. Relationships with partners may therefore have negative effects on some patients' stressors. Our study examined the social relationships of cancer patients on the premise that they can function both positively and negatively on the progress of adaptation.

Purpose

The purpose of this study was to examine adaptation status 2 weeks after discharge from hospital and 6 months after surgery in patients who had been diagnosed with and undergone surgery for gastrointestinal tract cancer and identify the relationships of their adaptation at each point with the impact of cancer, dispositional resilience, and social relationships. QOL was adopted as an index of the adaptation, and the question "Why me?", illness-related demands, SOC, and social support were used as related variables. These variables were longitudinally measured to identify change with time in adaptation status involving changes of scores of each variable from 2 weeks after discharge to 6 months after surgery.

## Methods

### Sample and procedures

The sample included patients who had been newly diagnosed with gastrointestinal tract cancer and had undergone surgery in one of five general hospitals in Japan. The inclusion criteria were: age ≥20 years; awareness of cancer diagnosis; and absence of psychiatric disorders. The participants were recruited by hospital nurses from among all eligible subjects, regardless of the stage of cancer, surgical procedure, or demographic attributes, for 4 months starting in October 2006. The same survey was administered twice. The first questionnaire was completed and returned anonymously through the mail within 2 weeks after discharge. Participants who demonstrated a willingness to participate in the second survey indicated so in the reply card; they then received the second questionnaire by mail 2 weeks prior to 6 months after surgery, and they were requested to complete and return the second questionnaire within 6 months after surgery. The same identification number was entered on the first questionnaire, the reply card, and the second questionnaire of each respondent so as to enable paired analyses. Approval for the study was obtained from the research ethics committee of the institution with which the author is affiliated, as well as from each of the hospitals in which the survey was conducted.

A total of 123 surgeries for gastrointestinal tract cancer was performed during the survey period, but a questionnaire was not distributed to 31 patients who were not entirely aware of their cancer diagnosis, were judged as mentally disqualified, or did not wish to participate (distribution rate: 74.8%). The first time, 60 questionnaires were returned. The response rate for all questionnaires distributed was 65.2%, while that for all patients who had surgery was 48.8%. Although the second questionnaire was distributed to 31 patients who showed willingness to

respond to the second questionnaire, only 25 of these second questionnaires were returned; thus, this sample consisted of 25 respondents. The response rate for the second questionnaire for all patients who had surgery during this survey was 20.3%.

The Japanese health system allows postoperative patients to remain in hospital until they have recovered to a certain extent, so that their length of stay depends on the degree of surgical invasiveness. In a patient survey[26] involving a cohort in hospitals and clinics in Japan in 2005 conducted by the Ministry of Health, Labour and Welfare, the average length of stay for discharged patients was 18.2 days after abdominal operations.

Questionnaires

An overview of the variables and the study concepts included in the questionnaire is presented in Table 1. The questionnaire was composed of four measures (described below), the "Why me?" question, and a demographic and disease data form.

QOL was measured with WHOQOL-26, which was developed from the WHOQOL-100 for ease of use for Japanese subjects. The WHOQOL defines QOL as "an individual's perception of his or her position in life in the context of the culture and value systems in which he or she lives and in relation to goals, expectations, standards, and concerns."[27] The WHOQOL-26 is a Japanese instrument and assesses QOL in four domains (physical, psychological, social relationship, and environmental), with two additional questions assessing overall QOL.[28] A research study, in which the sample consisted of cancer patients, confirmed that this instrument had an internal consistency of 0.97.[28]

The demands of illness were measured with a Questionnaire on the Demands of Illness (Q-Demands), which was developed for use in this series of surveys. The Q-Demands consisted

of items representing the illness-related demands after undergoing surgery for cancer, and the coefficient alpha was 0.77 in a study[29] using a sample of 66 patients who had been newly diagnosed with gastrointestinal tract cancer and had undergone surgery. Attributional activities were measured by asking about the extent of thinking "Why did this happen to me?" The SOC and perceived social support were measured with the Coherence Scale and the Norbeck Social Support Questionnaire (NSSQ), 1995 version, respectively, which were translated into Japanese for use in this series of surveys. The Coherence Scale was developed by Lewis and Gallison[30] to measure an individual's attitudinal predisposition toward his or her personal world as more or less coherent, and content validity was predicated on the construct of coherence by Antonovsky[18]. Research on breast cancer patients and diabetic patients has established that the scale's internal consistency reliability is 0.92 or higher. [30] The NSSQ was designed by Norbeck[31] and assesses multiple dimensions of perceived social support, such as number of people in the network, emotional support, and tangible support. Since the NSSQ is not a summative-type instrument, the internal consistency with coefficient alpha was not tested.

Analyses

First, for each of the survey time points (2 weeks after discharge from hospital and 6 months after surgery), descriptive statistics for each study variable, including the subdivisions of the QOL variable, were determined, and the differences in each study variable by demographic or clinical characteristics were assessed. After the correlations between the study variables were assessed, the effects that other variables had on the QOL variables were identified. Next, the mean values of study variables paired in survey time points were compared, and the differences and the correlations between each pair were assessed.

Because of the small sample size in this study, nonparametric methods (Wilcoxon's rank sum test or the Kruskal-Wallis rank test) were used to test the differences among variables. The correlations between variables were assessed using Spearman's rank correlation coefficient. To evaluate the effect of the other study variables on QOL, a categorical regression analysis using QOL as the dependent variable was performed. The statistical analyses were performed using SPSS, version 15.

## Results

### Sample characteristics

Overall, 65.0% of the respondents were male; 32% had gastric cancer, 44% colorectal cancer, and 24% other types, such as cancer of the esophagus, pancreas, liver, and gallbladder. The average age of the first-time respondents was 62.6 years (SD = 11.4), and the average duration after surgery was 44.8 days (SD = 23.1); the average age of the second-time respondents was 63.0 years (SD = 11.5), and an average of 174.2 days (SD=23.3) passed after surgery. The demographic and clinical characteristics of this study sample at the time of the first survey and the change in score from the first to the second survey are summarized in Table 2. When the associations among the demographic and clinical data were assessed, there was a significant difference in time elapsed after surgery by cancer type only at the time of the first survey ($\chi^2$ = 7.08, df = 2; p < 0.05). Colorectal cancer had the shortest time elapsed after surgery, while cancer at other sites had the longest of the three types.

When scores in this study sample on the first survey were compared with those of patients who responded just once to the questionnaires, there were significant differences between those who answered both surveys and those who completed only the first survey. Those who answered

both surveys were significantly younger ($p < 0.05$) and had significantly higher scores on the social support questionnaires ($p < 0.05$, in all) and significantly lower Q-Demands scores ($p < 0.05$) than those who completed only the first survey. Although the SOC and QOL scores were higher for those who answered both surveys than for those who answered only the first survey, the differences were not significant.

Characteristics of study variables for each survey time point

On the first survey, the Q-Demands and the SOC exhibited a significant correlation with the WHOQOL-26 ($r = -0.73$, $p < 0.001$; $r = 0.49$, $p < 0.05$, respectively). Correlations between the Q-Demands and each subdivision of the WHOQOL-26 were strong, and those between the SOC and each subdivision of the WHOQOL-26, with the exception of the overall QOL domain, were moderate. No other relationships and associations with the WHOQOL-26 were identified. On the categorical regression analyses using the WHOQOL-26 as the dependent variable, the WHOQOL-26 was affected by the Q-Demands and the SOC ($\beta = -0.62$, SE = 0.15, $p < 0.001$; $\beta = 0.30$, SE = 0.15, $p < 0.05$, respectively). The predictive model explained 50% of the variance for the equation ($F = 5.86$, df = 5, 19; $p < 0.01$).

On the second survey, the two variables Q-Demands and SOC still exhibited a significant correlation with the WHOQOL-26 ($r = -0.77$, $p < 0.001$; $r = 0.76$, $p < 0.001$, respectively). Both variables were also strongly correlated with each subdivision of the WHOQOL-26, with the exception of the social relationships domain. The psychological domain and the overall QOL domain were significantly correlated with the "Why me?" question ($r = -0.51$, $p < 0.01$; $r = -0.53$, $p < 0.01$, respectively). The "Why me?" question was also significantly correlated with the Q-Demands and the SOC ($r = -0.54$, $p < 0.001$; $r = 0.43$, $p < 0.05$, respectively). The overall

QOL domain score was significantly different by cancer site ($\chi^2$ = 7.38, df = 2, p<0.05). The score for patients who belonged to the other types of cancer (esophagus, pancreas, liver, and gallbladder) was remarkably low. On the categorical regression analyses, variables that affected the WHOQOL-26 were still the Q-Demands and the SOC ($\beta$ = -0.54, SE = 0.13, p < 0.001; $\beta$ = 0.46, SE = 0.13, p < 0.001, respectively). The effect of the SOC was increased, and the predictive model explained 81% of the variance for the equation (F = 21.34, df = 5, 15; p < 0.001).

Comparisons of study variables paired in two time points

The scores of study variables on the first and second surveys were correlated, with correlation coefficients of 0.45 (p < 0.05) to 0.65 (p < 0.001), with the exception of the social relationship domain of the WHOQOL-26. In subdivisions of the WHOQOL-26 on the second survey, only the social relationship domain had a low score compared to the first survey (Fig. 1). The physical domain and the psychological domain scores were significantly higher (Z = -2.28, p < 0.05; Z = -2.71, p < 0.001, respectively) than those on the first survey.

Scores of the Q-Demands and the "Why me?" question were significantly lower on the second survey than on the first survey (Z = -2.14, p < 0.05; Z = -2.37, p < 0.05, respectively). The score of the SOC on the second survey improved compared to that on the first survey, but the medians of this pair were equivalent. On the other hand, the number of people in the network, emotional support, and tangible support measured in the NSSQ were lower on the second survey than on the first survey, though the difference was not significant. The data about the number of people in the network included information about the kind of relationship for each person. Focusing on the kinds of relationship, only the average number of family members or relatives increased from 6.1 on the first survey to 7.3 on the second survey, but the number of other kinds

of relationships decreased.

## Discussion

The WHOQOL-26 scores on the second survey were somewhat high, even as compared with those of a general population sample in Japan in a study[28] using the same WHOQOL-26 scale. Some studies[32, 33] have found that postoperative cancer patients reframed their internal standards of health in the process of becoming and remaining ill; that is, the internal standards of QOL in the patients in this study might have evolved to become different from those in a general population. Thus, it cannot be positively stated that QOL in this study sample improved on a level with that in a general population. However, considering that the scores of the "Why me?" question and the Q-Demands were significantly lower on the second survey than on the first survey, the impact of cancer might be less 6 months after surgery. Similarly, the findings that the physical domain and the psychological domain scores of the WHOQOL-26 were significantly higher on the second survey suggests that QOL on these domains was improving considerably 6 months after surgery.

The NSSQ scores in this study were high on both surveys in comparison with those in other studies using the NSSQ, in which the samples included patients with cancer of the reproductive organs in Sweden,[34] healthy adults in the United States,[31] and cancer patients in Hong Kong.[35] This finding may be related to the general Japanese tendency to attach importance to social relationships. On a qualitative study[36] of the experiences of Japanese patients with colorectal cancer during the first 6 months after surgery, most patients who mentioned that they had accepted the cancer diagnosis had learned to be grateful for their experience and saw other's concern for them in a favorable light. In the current study, however, the NSSQ scores, as well as

the score of the social relationship domain of WHOQOL-26, were lower on the second survey than on the first survey. The patients in this study sample may need some nursing intervention that takes their social relationships into consideration, all the more because of their tendency for high scores on perceived social support.

The strong SOC and the low Q-Demands predicted a high QOL at both time points. However, it was found that, only on the second survey, the SOC was negatively correlated with the "Why me?" question, which was also correlated with the psychological domain and the overall QOL domain of the WHOQOL-26. Moreover, a difference in the overall QOL domain by cancer site was found on the second survey. Although the analysis in this study could not identify causal relationships between variables, these study findings suggest that the relationships among the overall QOL, the weak SOC, a poor prognosis, and strong thoughts of "Why me?" take on a significant meaning 6 months after surgery.

If the thought of "Why me?" in patients who had low SOC and low overall QOL continue over 6 months after surgery, these depressive moods may lead them to persistent depression. As Antonovsky said that a person's SOC is likely to be stable throughout adulthood,[20] the SOC score in this study showed no significant difference between the two time points. Although changing patients' SOC may be difficult, providing interventions targeting the thought of "Why me?" in the early stage of the adaptation process may be useful for improving patients' QOL. Generating attributions such as "Why me?" is an inferential activity, so that if adequate cues for the contents and the process are given to patients, the outcomes may be directed to desirable rather than injurious ones. A nursing intervention using cognitive-behavioral interventions that some studies[37-41] have already verified to have positive results in cancer patients may be useful in

taking up and dealing with the thought of "Why me?"

Research limitations and Nursing Implications

In applying the results in this study to nursing practice, the research limitations should be considered carefully. First of all, the small sample size, which was restricted to patients with gastrointestinal tract cancer, limits the ability to generalize the results of this study. Meanwhile, using nonparametric methods in the analyses because of the small sample size also created some limitations. Increasing sample size and restricting the properties of the study subjects are necessary to better clarify the relationships among the variables. Secondly, there is a research limitation brought by the convenience method of sampling used in this study. It was up to patients to determine whether to respond to the questionnaire, including the number of times, so that a bias in attribution of respondents could have developed. Actually, comparing scores of variables 2 weeks after discharge between the respondents who answered both surveys and those who completed only the first survey, the groups that answered both surveys were significantly younger, had higher scores on the NSSQ, and had lower scores on Q-Demands than the group that answered only the first survey. Furthermore, 1 of the 6 respondents who showed willingness to respond to the second questionnaire by the reply card but did not respond was later reported by the family to have died. Thus, respondents in this study were limited to patients who were willing to respond to the questionnaire and could do so 6 months after surgery. Furthermore, the fact that the results were produced by data corresponding to 20% of all patients who had undergone surgery for gastrointestinal tract cancer in the hospitals should be carefully considered.

Although the data from the patients who did not participate in this study were not collected,

there was a high possibility that patients who participated in both surveys had relatively beneficial factors related to adjustment. This may explain why they could improve their adaptation status 6 months after surgery. If so, some nursing intervention to support beneficial factors (lower illness-related demands and the higher perceived social support) would be useful, especially for the rest of the patients, because these factors were weaker points for them than for those in this study sample. Providing such intervention early after discharge may be important, because nursing interventions after surgery to support their coping strategy to illness-related demands may be able to effectively change patients' health behavior.

Conclusions

Except for social relationships, the adaptation status, especially in the physical and psychological domains of QOL, of the patients willing and able to complete both surveys 6 months after surgery improved 6 months after surgery compared to after discharge, though there was some possibility that this study sample consisted of patients who had more beneficial factors related to adaptation status than the patients who decided not to participate in both surveys. A decline of the scores of the "Why me?" question and the Q-Demands on the second survey indicated that the impact of cancer was defused 6 months after surgery, while no significant difference in the SOC, as an index of dispositional resilience, was found between the two surveys. Significant differences in the overall QOL domain by cancer site were found only on the second survey, and that in patients with cancer having a poor prognosis was remarkably low. Furthermore, a correlation between the "Why me?" question and the SOC was found only on the second survey. Although high illness-related demands and low SOC predicted low QOL on both surveys, a focus and a period for nursing interventions to be provided should be carefully

considered. Because the study findings suggest that, although the SOC was hard to change, the demands of illness decreased with the passing of time, nursing interventions early after discharge focusing on the demands of illness may promote health-related behavior in cancer patients.

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**Fig.1 differences in mean for subscales of WHOQOL-26**
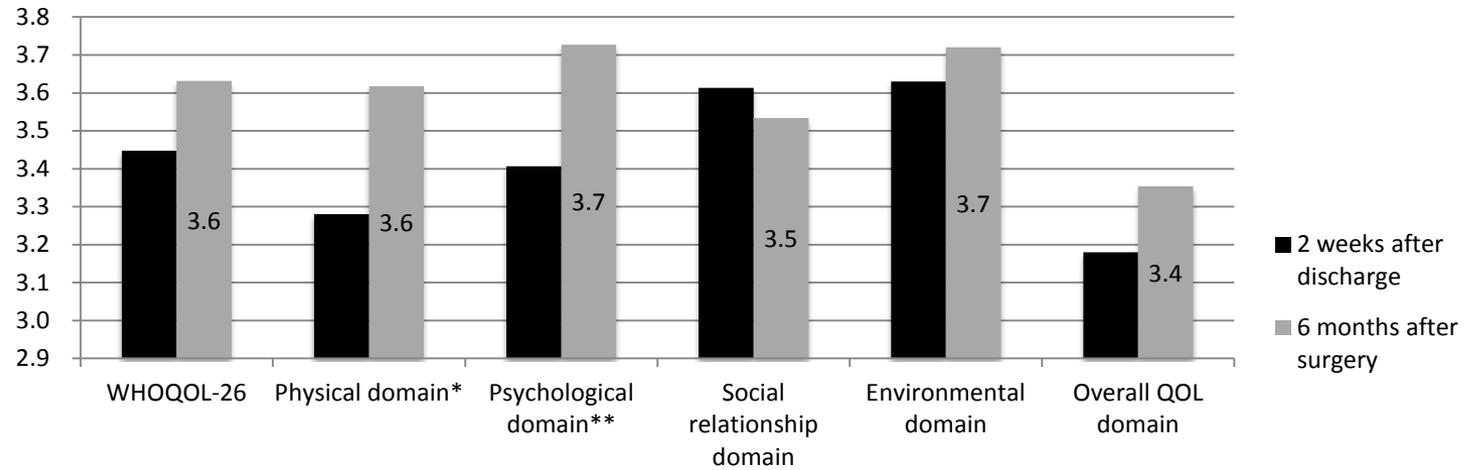
Paired Wilcoxon's rank sum test was employed  * p < 0.05, ** p < 0.001

**Table 1. The study concepts and variables**

| *Study Concept /* <br> **Variable** | **Original Measure** | **Indicator** |
|---|---|---|
| *Adaptation status /* <br> Quality of Life (QOL) | WHOQOL-26 | [26 items with 5-point rating scales] <br><br> *Higher scores indicate higher levels of perceived QOL* |
| *Impact of cancer /* <br> Attributional activity | The "Why me?" <br> question | [A question with 5-point Likert response options] <br><br> *Higher score indicates stronger levels of thought of 'Why me?'* |
| Demands of illness | Questionnaire on the <br> Demands of Illness <br> (Q-Demands) | [12 items that were formatted with 5-point Likert response options] <br><br> *Higher scores indicate greater perceived demands.* |
| Cancer sites | Demographic and <br> disease data form | [Nominal scale] |
| Supplemental treatment | | [Nominal scale] |
| Comorbidity | | [Nominal scale] |
| *Dispositional resilience /* <br> Sense of Coherence <br> (SOC) | Coherence Scale | [29 items that were formatted with 7-point Likert response options] <br> *Higher scores indicate higher levels of coherence* |
| *Social relationships /* <br> Perceived Social <br> Support | Norbeck Social Support <br> Questionnaire (NSSQ), <br> 1995 version | [A list of significant people in their lives, indicating the kind of relationship <br> for each person & 8 items with a 5-point rating scale for each relationship] <br> *Higher scores indicate greater amount of support available from each* <br> *person* |
| Employment status | Demographic and <br> disease data form | [Nominal scale ] |
| Marital status | | [Nominal scale ] |

**Table 2.  Demographic and clinical characteristics of the first study sample and the difference between the first and second samples**

n=25

| Variable | | | The first time | | The second time |
|---|---|---|---|---|---|
| | | | n | % | Change |
| Age | | Mean: | 62.6 y（SD, 11.4） | | 63.0 y (SD, 11.5) |
| Sex | male | | 39 | 65.0 | - |
| | female | | 21 | 35.0 | - |
| Cancer Site | colorectal | | 8 | 32.0 | - |
| | gastric | | 11 | 44.0 | - |
| | other site* | | 6 | 24.0 | - |
| Supplemental treatment | check-up only | | 12 | 48.0 | - |
| | chemotherapy | | 10 | 40.0 | - |
| | other treatment | | 3 | 12.0 | - |
| Comorbidity | present | | 10 | 40.0 | - |
| | absent | | 15 | 60.0 | - |
| Employment status | employed | | 14 | 56.0 | -4 |
| | not employed | | 11 | 44.0 | +4 |
| Marital status | married | | 22 | 88.0 | -1 |
| | single | | 3 | 12.0 | +1 |
| Duration after surgery | | Mean: | 44.8 d (SD, 23.1) | | 174.2 (SD=23.3) |

*other sites: esophagus, pancreas, liver, and gallbladder