

Factors Affecting the Quality of Life of Gastric Cancer Survivors

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Abstract

Background:

The number of gastric cancer survivors has been increasing, and such survivors experience various changes in their lives post-recovery. Adapting to these changes requires appropriate interventions that can improve their quality of life (QoL). This study was conducted to investigate the factors affecting the QoL of gastric cancer survivors to provide basic data for effective intervention.

Methods:

Data were collected between September 8 and September 29, 2017 from the Gastric Cancer Center at a tertiary hospital. Questionnaire surveys were conducted using the EORTC QLQ-C30/STO22, Self-Efficacy-Scale, Multidimensional Scale of Perceived Social Support, and Quality of Life-Cancer Survivors Questionnaire on gastric cancer survivors who were followed up for three years after gastrectomy. Data were analyzed using descriptive statistics, t-test, ANOVA, Pearson's correlation coefficient, and stepwise multiple regression analysis.

Results:

A total of 136 gastric cancer survivors completed the questionnaire survey. There were significant positive correlations of QoL with self-efficacy, functional status, and social support ($r=.35$, $p<.001$; $r=.53$, $p<.001$; $r=.26$, $p<.001$, respectively). There were significant negative correlations of QoL with general symptoms, gastric cancer-specific symptoms ($r=-.39$, $p<.001$; $r=-.51$, $p<.001$). The regression model explained 48.3% of the QoL, and the affecting factors were gastric cancer-specific symptoms ($\beta=-.397$, $p<.001$), religious belief ($\beta=.299$, $p<.001$), functional status ($\beta=.251$, $p=.003$), and self-efficacy ($\beta=.191$, $p=.004$).

Conclusion:

This study confirmed that gastric cancer-specific symptoms, spiritual well-being, self-efficacy and functional status affect the QoL of gastric cancer survivors. Hence, these factors should be considered in the interventions to improve the QoL of gastric cancer survivors.

1. Introduction

Gastric cancer is the fifth most common cancer globally [1]. Moreover, gastric cancer has the highest rate in South Korea in terms of cancer occurrence rate [2]. The five-year relative survival rate of gastric cancer has increased from 43.9% in 1993–1995 to 76.5% in 2013–2017 in South Korea [3]. Two out of every three patients diagnosed with gastric cancer are estimated to survive for five years or more. Given that the number of gastric cancer survivors is expected to rise, it is necessary to pay more attention to their life after treatment.

Cancer survivors experience different physiological, psychological, functional, and social changes post-recovery [4-6]. When they adapt well to these changes, they are able to live a healthy life and improve their quality of life (QoL) [7]. Therefore, they need interventions that aid their adaptation to multiple aspects of their lives post-recovery.

Most studies on cancer survivors have been conducted on survivors of breast cancer and childhood cancer [8-11]. Even in South Korea, there has not been much research on gastric cancer survivors despite the high occurrence rate of this cancer and high survival rate of individuals with this cancer. Moreover, relevant studies on gastric cancer survivors have focused on solitary aspects, such as the relationship between a type of gastrectomy and the QoL [12, 13], relationship between nutritional status and the QoL [14-16], and occupations and their influencing factors [17]. A focus on comprehensive aspects has been missing, warranting an analysis of how multiple aspects affect the adaptation and QoL of gastric cancer survivors in various ways.

The purpose of this study was to determine gastric cancer survivors' symptoms, self-efficacy, functional status, social support, and QoL, and analyze the factors affecting their QoL. Therefore, it attempted to provide fundamental data for the implementation of effective interventions to improve gastric cancer survivors' adaptation and QoL.

2. Methods

2.1. Study design

This study used a descriptive cross-sectional design to investigate the factors affecting the QoL of gastric cancer survivors. This study was approved by the institutional review board (IRB no.4-2017-0651) of Severance Hospital in Seoul, South Korea.

2.2. Participants and procedure

The data were collected between September 8 and September 29, 2017 from the Gastric Cancer Center at Severance Hospital in Seoul. Patients who were followed up for over three years after gastrectomy were informed of the purpose of the study. We conducted the survey after receiving the written consent of patients who agreed to participate in the study. The inclusion criteria of the study were as follows: (1) gastric cancer survivors who completed their cancer treatment such as gastrectomy and chemotherapy; (2) ≥ 19 years old; (3) no evidence of recurrence or metastasis on medical record; and (4) absence of any other major health problems requiring treatment. Of the 140 patients initially recruited, the data for four were not included since they did not complete the survey. Thus, data for 136 survivors were included in the analysis. Disease-related characteristics were collected from the hospital electronic medical record.

2.3. Measures

2.3.1. Symptoms

The symptom scales of the Korean version of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 36 (EORTC QLQ-C30) and EORTC QLQ the gastric cancer module (EORTC QLQ-STO22) were used to measure symptom level [18, 19]. The symptom scale of EORTC QLQ-C30 has 13 items and the symptom scale of EORTC ST0-22 has 22 items. The raw scores were transformed to scores ranging from 0 to 100 according to the scoring manual [20]. A higher score on a symptom scale indicated a higher level of symptom. In this study, Cronbach's α values of the symptom scales of EORTC QLQ-C30 and EORTC QLQ-STO22 were 0.74 and 0.83, respectively.

2.3.2. Self-efficacy

To measure self-efficacy, the Korean version of the Self-Efficacy Scale was used [21]. It consists of 13 items rated on a five-point Likert scale ranging from 1 (disagree strongly) to 5 (agree strongly), with the scoring of negative items reversed. A higher score indicated greater self-efficacy. Cronbach's α was 0.83 in a previous study [22] and 0.85 in this study.

2.3.3. Functional status

Functional status was measured by using the function scale of the Korean version of the EORTC QLQ-C30 [18]. This scale consists of 15 items, and its raw scores are transformed to scores ranging from 0 to 100 according to the scoring manual [20]. A higher score indicated a higher level of functional status. The Cronbach's α was 0.84 in this study.

2.3.4. Social support

The Multidimensional Scale of Perceived Social Support(MSPSS) was used to measure social support [23]. The MSPSS includes 12 items representing the support of three domains (family, friends, significant others), The domain of support from significant others refers to support provided by meaningful others, which, in this study, included the support provided by the medical staff such as doctors and nurses. The original scale is seven-point Likert scale; however, we employed a five-point Likert scale ranging from 1 (disagree strongly) to 5 (agree strongly), based on a previous study [24]. A higher score indicated a higher level of social support. Cronbach's α was 0.83 in a previous study [24] as well as in this study.

2.3.5. Quality of life

QoL was measured by using the Korean version of the Quality of Life-Cancer Survivors Questionnaire (QOL-CS) [25]. The QOL-CS includes 41 items representing the four domains of physical, social, psychological, and spiritual well-being. The items are rated on a four-point Likert scale ranging from 1 (not at all) to 4 (very much). The scoring of negative items was reversed, and a higher score represented a better QoL. Cronbach's α was 0.83 in this study.

2.4 Statistical analysis

Statistical analysis was performed using SPSS version 25.0. The demographic and disease-related characteristics of the participants were analyzed using frequencies, percentages, means, and standard deviations. Symptoms, self-efficacy, functional status, social support, and QoL were analyzed using means and standard deviations. Differences in symptoms, self-efficacy, functional status, social support, and QoL according to the demographic and disease-related characteristics of the participants were analyzed using t-tests, ANOVA, and post hoc analysis, which was performed by the Scheffe test according to the assumption of homoscedasticity. The correlations among symptoms, self-efficacy, functional status, social support, and QoL of the participants were analyzed using Pearson's correlation coefficient. To identify factors affecting the QoL of the participants, a stepwise multiple regression analysis was performed. A p-value of $<.05$ was considered to be statistically significant.

3. Results

Of the 140 patients initially recruited, the data for four were not included since they did not complete the survey. Hence, data for 136 survivors were included in the analysis. Disease-related characteristics were collected from the hospital electronic medical record. The sociodemographic and disease-related characteristics of the participants are shown in Table 1. Men accounted for 62.5% of the participants, and the mean age of the participants was 58.8 ± 10.8 years. Of the participants, 85.3% were married, 59.0% were employed, and 52.9% had religious beliefs. The spouse was the main caregiver for 71.3% of the participants. Most of the participants were diagnosed at the first stage of cancer (76.5%), and the mean duration after gastrectomy was 5.1 ± 2.3 years. Moreover, 77.2% of the participants had not received chemotherapy. The mean body mass index of participants at the time of the survey was 21.5 ± 2.6 kg/m².

The symptoms, self-efficacy, functional status, social support, and QoL of the participants are shown in Table 2. The mean general symptom score was 17.40 ± 10.55 (range, 0–100), and the most common general symptoms were fatigue (31.54 ± 18.46), diarrhea (26.23 ± 25.14), and insomnia (20.59 ± 28.99). The mean gastric cancer-specific symptom score was 18.07 ± 10.64 (range, 0–100), and the most common gastric cancer-specific symptoms were anxiety (29.49 ± 22.07), body image (25.00 ± 30.29), and dry mouth (22.30 ± 25.68). The mean self-efficacy score was 3.74 ± 0.66 (range, 1–5). The mean functional status score was 85.56 ± 11.31 (range, 0–100), and role functioning (89.95 ± 15.49) was found to be more robust than the other function. The mean social support score was 3.53 ± 0.61 (range 1–5), and family support (4.34 ± 0.77) was found to be greater than support from the other two domains. Finally, the mean QoL score was 3.01 ± 0.28 (range 1–4).

The differences in the symptoms, self-efficacy, functional status, social support, and QoL according to participants characteristics are shown in Table 3. The gastric cancer-specific symptom score differed significantly according to age. In the post hoc analysis, participants less than 65 years of age had a higher amount of gastric cancer-specific symptoms than those over 65 years of age. The self-efficacy score was significantly lower among those aged over 65 years, unemployed, not having any religious beliefs, and having a non-spouse as the main caregiver. The functional status score was significantly higher among those who were employed, and the social support score was significantly higher among

those who spouse was their main caregiver. The QoL score was significantly higher among those having religious beliefs, diagnosed at the first stage of cancer, and not having received chemotherapy.

The correlations among the symptoms, self-efficacy, functional status, social support, and QoL are shown in Table 4. The QoL was significantly positively correlated with self-efficacy ($r = 0.35, p < .001$), functional status ($r = 0.53, p < .001$), and social support ($r = 0.26, p < .001$). In contrast, the QoL was significantly negatively correlated with general symptoms ($r = -0.39, p < .001$) and gastric cancer-specific symptoms ($r = -0.51, p < .001$).

The factors affecting QoL, as determined by the stepwise multiple regression analysis, are shown in Table 5. The sociodemographic and disease-related factors (religious belief, cancer stage, exposure to chemotherapy), general symptoms, gastric cancer-specific symptoms, self-efficacy, functional status, and social support were included as the independent variables. The cancer stage, exposure to chemotherapy, general symptoms, and social support were excluded in the regression model; hence, the final regression model was constructed using four factors; religious presence, gastric cancer-specific symptoms, self-efficacy, and functional status. The regression model explained 48.3% of the QoL of the participants. The affecting factors of QoL were gastric cancer-specific symptoms ($\beta = -0.397, p < .001$), religious presence ($\beta = 0.299, p < .001$), functional status ($\beta = 0.251, p = .003$), and self-efficacy ($\beta = 0.191, p = .004$).

4. Discussion

Of the general symptoms of gastric cancer, the most common symptoms among survivors who participated in this study were fatigue, diarrhea, and sleep disorder. Of the specific symptoms of gastric cancer, the most common symptoms were anxiety, physical changes, and dryness of mouth. This result is consistent with the results of previous studies conducted with long-term gastric cancer survivors, who had completed five years or more since gastrectomy [13, 26]. This result was also similar to that of a study conducted on short-term gastric cancer survivors before and after 3 and 12 months of gastrectomy [27]. Therefore, gastric cancer survivors continuously experienced main symptoms, although the degree of symptoms experiences by survivors differed based on the time elapsed since gastrectomy. In particular, many previous studies have revealed that one of the most common symptoms experienced by cancer survivors, regardless of the type of cancer, is fatigue [8, 28-30]. Fatigue makes impedes cancer survivors from taking on roles and activities to an extent that greatly affects their activities of daily living and lowers their QoL. This makes it crucial to provide appropriate intervention for addressing the problem of cancer survivors' fatigue [29]. In addition, cancer survivors continuously experience psychological symptoms such as anxiety, along with physical problems, due to the changes in their lives [31]. After treatment, it is important to control gastric cancer survivors' symptoms in order to enable their adaptation to their new life and improve their QoL. In this regard, intervention programs such as complex exercise therapy and health education therapy, which have been determined to produce successful result with other type of cancer survivors, may be effective [9, 32]. In terms of education methods, the conventional method based on brochures and multimedia can be used to provide basic knowledge in only a limited way [8]. Therefore, it is necessary to develop a mobile application based symptom control intervention

program that can help gastric cancer survivors review and revisit information provided through basic education, and engage in self-monitoring. Such a program can also make it possible for the medical staff to provide feedback in a way that enhances the survivors' continuous and efficient management of their symptoms.

The self-efficacy of gastric cancer survivors who participated in this study was higher than the efficacy levels in reported in previous studies conducted on gastric cancer patients who underwent chemotherapy and breast cancer patients who underwent radiotherapy [33, 34]. The gastric cancer survivors in this study experienced extended survivorship or permanent survivorship after passing through phases of acute survivorship during their cancer treatment; thus, they had a high possibility of not being afflicted with cancer even after the completion of the treatment. The high level of self-efficacy of these survivors may also have been a result of the trust and self-confidence they developed through the experience of the disease and its treatment [35]. When cancer survivors enter extended survivorship after passing acute survivorship, they want to return to the personal and social roles they were performing before by controlling the symptoms caused by the side effects of the treatment [36]. If their self-efficacy is high in during this phase, they are able to adapt to changes in diverse aspects of their lives, and gain control over their lives [35, 36]. Therefore, in order to improve gastric cancer survivors' adaptation to changes and their QoL, it is necessary to intervene to maintain and promote their self-efficacy. In this sense, intervention programs such as voluntary service activity, cognitive behavior treatment, and meditation may be effective [37, 38].

The functional status of gastric cancer survivors who participated in this study was as high as the levels reported in previous studies on long-term gastric cancer survivors [28, 39]. Among the subcategories of functional status, cognitive function had the lowest and role function had the highest score; this result was consistent with the results of previous studies [28, 39]. Relevant studies have been undertaken in the past on cancer survivors' cognitive function, and one of these studies reported that the chemotherapy provided to gastric cancer patients affected their cognitive function [40]. However, in the current study, 77.2% of the survivors did not have chemotherapy. As such, cognitive function could have been the lowest among all function due to other causes such as the normal ageing process rather than the cancer treatment process [41]. As mentioned above, in this study, role function was found to be at the highest level among all the subcategories of functional status. Nevertheless, 41.0% of survivors took a leave of absence or quit their jobs. Cancer survivors' return to their jobs and household labor after the end of treatment is important to them and their families[6]. Difficulty in returning to the role function they had before their cancer diagnosis negatively affects their QoL [42]. Therefore, it is important to provide intervention that focus on their return to the society; in this regard, providing interventions before their functional status is lowered makes it easier for them to return to the society. In terms of intervention plans, education about cancer symptoms and symptom control methods needs to be provided to reduce the adverse after-effects of cancer treatment and increase the survivors' possibility of engaging in social activities. To ensure that gastric cancer survivors receive timely information on job return and the occupational rehabilitation program, they must be offered consultations on occupational rehabilitation or be connected with a team of occupational rehabilitation professionals [43].

The level of social support available to gastric cancer survivors who participated in this study, and as well as the extent of support offered from various domains—with family ranking first, followed by friend and medical staff—was similar to results on social support in a previous study on breast cancer survivors [44]. The family was found to provide the most amount of support in this study because of spouses accounting for 71.3% of the caregivers. Gastric cancer survivors were found to receive the lowest amount of social support from the medical staff in this study. Cancer survivors experience physical and psychological symptoms continuously after the end of cancer treatment [11]; hence, receiving support from one's surroundings is necessary, as is receiving the appropriate resources and information. Therefore, developing intervention programs to provide constant support and information by the medical staff after the end of the cancer treatment should be considered.

The QoL of gastric cancer survivors who participated in this study was higher than the QoL reported in previous studies on thyroid cancer survivors, colon cancer survivors, and lymphoma survivors [25, 45]. Gastric cancer survivors can be assumed to have a relatively higher QoL than survivors of other cancer type because of the regular medical checkups implemented in South Korea. These checkups have allowed for the detection of cancer in its initial stages, and its consequent treatment, in over 50% of gastric cancer[46]. However, in order to maintain this higher QoL of gastric cancer survivors in comparison to other survivors, effective intervention may be needed.

With regard to the sociodemographic characteristics of the participants, gastric cancer survivors who reported following a religion had a significantly higher QoL than those who did not. A previous study reported that cancer survivors' participation in spiritual activities and their spiritual wellbeing positively affected their adaptation to life and QoL after cancer diagnosis [47]. Nevertheless, it was hard to analyze whether a religion was related to one's participation in spiritual activities and thereby improved spiritual wellbeing. Another study on the QoL of gastric cancer survivors utilized a measurement tool that focused on the survivors' symptoms and functional status, without accounting for their spiritual wellbeing [48]; this prevented an in-depth analysis of the relationship between spiritual activities, wellbeing, and QoL. Therefore, it will be necessary to undertake further research to explore these relationships.

With regard to the disease characteristics of gastric cancer survivors, those whose cancer was in the first stage, and those who did not undergo chemotherapy had a significantly higher QoL. According to a previous study, gastric cancer survivors who did not undergo chemotherapy had a higher QoL [13]. On the contrary, some studies have reported that exposure to chemotherapy did not affect gastric cancer survivors' QoL [49]. The current study's overall results on QoL may have been affected by the fact that 76.5% of the participants in this study were diagnosed at the first stage of cancer. Therefore, for accurate comparison, it will be necessary to conduct repeated research that includes cancer survivors diagnosed at later stage of cancer and those who received chemotherapy.

In this study, following a religion was found to affect the QoL of gastric cancer survivors positively. Moreover, specific symptoms of gastric cancer, self-efficacy, and functional status affected their QoL. However, social support did not affect gastric cancer survivors' QoL. The reason for the result could be

the 76.5% of participants were diagnosed at the first stage of cancer and 77.2% did not receive chemotherapy. This meant that participants were able to care for themselves, and therefore, were less dependent on their surroundings for help or support. Moreover, given that 71.3% of participants had spouses as caregivers, and that the level of family support was highest among all the subcategories of social support, it would be helpful to analyze aspects of social support available to gastric cancer survivors using tool measuring matrimonial interdependence.

This study has some limitations. It employed convenience sampling, wherein a small number of long-term gastric cancer survivors were recruited from just one tertiary hospital Seoul, South Korea. Thus, it may not be possible to generalize the study results for all gastric cancer survivors. In addition, since the study was cross-sectional, it could not appropriately analyze the causal relationships between variables; these relationships must be analyzed carefully in future study. Nevertheless, this study was meaningful in its inclusion of participants who were gastric cancer survivors demonstrating a high occurrence rate and high survival rate among most cancer survivors, including breast cancer and childhood cancer survivors. This study contributes to the existing literature by analyzing the factors that affect gastric cancer survivors' QoL in diverse ways.

5. Conclusion

Our results indicate that gastric cancer-specific symptoms, religious belief, functional status, and self-efficacy are significant factors affecting the QoL of gastric cancer survivors. Based on this result, healthcare providers could be trained to provide interventions and education to gastric cancer survivors to improve their QoL.

Declarations

Funding Information: The authors did not receive support from any organization for the submitted work.

Conflicts of interest/Competing interests: The authors have no relevant financial or non-financial interests to disclose.

Availability of data and material: Authors confirmed that some access restrictions apply to the data underlying the findings. This study used self-administered questionnaire and disease-related characteristics were collected from the hospital electronic medical record. Therefore, the data from this study could not be shared publicly due to confidentiality issues. If any inquiry, please contact the corresponding author (sangheekim@yuhs.ac).

Code availability: Not applicable

Ethics approval: This study was approved by the institutional review board (IRB no.4-2017-0651) of Severance Hospital in Seoul, South Korea.

Consent to participate: Informed consent was obtained from all individual participants included in the study.

Consent for publication: Patients signed informed consent regarding publishing their anonymous data for scientific purpose.

Authors' contribution: Jahyun Choi (JC), Sanghee Kim (SK), Mona Choi (MC), and Woo Jin Hyung (WJH) contributed to this study as following.

JC and SK designed this research, wrote the proposal and the draft of IRB approval form. JC collected date and coded it. JC, SK, MC, WJH did analyzed the data. JC wrote the first draft of manuscript. All authors reviewed and corrected it. Final version of this draft was reviewed and approved by all authors.

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Tables

Due to technical limitations, table 1-5 is only available as a download in the Supplemental Files section.

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