

Effects of a self-care education program on quality of life of patients with gastric cancer after gastrectomy

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Background Gastrectomy affects different aspects of functionality and impacts on the quality of life (QoL) of patients with gastric cancer. The importance of appropriate assessment of QoL in cancer patients is well established, yet strategies that help improve this important patient outcome are relatively scarce.

Objective To examine the effectiveness of a brief self-care education program to improve QoL of gastric cancer patients after gastrectomy.

Methods Using a randomized controlled trial, 59 patients with gastric cancer and candidate for gastrectomy were randomly assigned either to an intervention group ($n = 31$) to participate in a brief self-care education program or to a usual-care group ($n = 28$). Data were collected on patient demographics, and QoL was measured by the QLQ-C30 and the QLQ-STO22 at baseline and 1 month after gastrectomy.

Results There were no statistically significant between-group differences in any subscales of the QLQ-C30 and the QLQ-STO22. However, participants in the brief self-care education program showed significant improvements from baseline in the global health status-QoL scale ($t = 2.243$, $P < .05$), experience of pain ($t = 2.508$, $P < .05$), constipation ($t = 2.773$, $P < .05$), and the experience of dysphagia at the follow-up assessment.

Limitations This study is likely to be underpowered to show differences between the groups.

Conclusion A brief self-care education program was not sufficient to significantly improve the quality of life of patients with gastric cancer after gastrectomy.

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Gastric cancer remains the second leading cause of cancer deaths worldwide, although the incidence of the disease has declined considerably since the 1930s.^{1,2} This type of cancer is more prevalent in developing countries, with the highest incidence rate in Eastern Asia.² Likewise, gastric cancer is the most common fatal cancer in Iran, with a wide variation in incidence rates across different geographical areas. Residents of the north and northwest of the country are at a particularly higher risk of developing digestive system cancers – esophageal cancer is most prevalent in the provinces of Mazandaran and Golestan, and gastric cancer is most seen in Ardabil and East Azerbaijan.³

Overall, the prognosis of gastric cancer is very poor, with 5-year survival rate of 5%-15%.⁴ The type of treatment depends on the stage of the cancer

at the time of diagnosis, and may include surgery, chemotherapy, and/or radiation therapy. Yet, surgical resection remains the most effective method of treatment in early and advanced gastric cancer. The type of surgery varies depending on the extent of the invasion and location of the tumor, and often includes subtotal or total gastrectomy.⁴ Although surgery helps relieve symptoms, early and late complications after gastrectomy are common, and depending on the extent of the resection, patients may experience symptoms of reflux, dumping syndrome, abdominal cramping, pain, nausea, anemia, vitamin deficiency, weight loss, diarrhea, and weakness. Psychological complications are also common, and relate to the diagnosis of cancer itself, symptoms of the disease, and side effects of treatment.⁴ The associated physical and psychological traumas affect

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the wellbeing and quality of life (QoL) of the patients.⁵⁻⁷

Quality of life is a multidimensional construct that often includes physical, mental, social, and spiritual health. Although discrete, these dimensions are highly inter-related.⁸ For example, results of a study in Japan showed positive associations between physical complications after gastrectomy and psychological distress.⁹ The importance of QoL in cancer disease management is well documented.^{4,10} However, the concept has not been widely studied in patients with gastric cancer¹¹ and evidence is particularly scarce from Iran. A study by Davoodi et al (2002) found that all dimensions of QoL were affected in Iranian patients after esophagectomy. The patients commonly reported deterioration in physical, role, and social functioning, changes in emotional and psychological wellbeing, and feeling of failure. Similarly, the spirituality dimension was affected, likely because the decline in general functioning had raised the awareness of death issues.¹² Available evidence shows that gastrectomy affects patient QoL and that QoL varies depending on the type of the surgery. Patients with open gastrectomy are more likely to report poorer QoL than those who undergo laparoscopy-assisted gastrectomy.^{13,14} Likewise, patients with subtotal gastrectomy report better QoL than those who undergo total gastrectomy.¹¹ QoL scores also seem to affect cancer prognosis and survival. Park et al. reported that baseline social functioning was a predictor of survival in patients with advanced gastric cancer who were treated with first-line chemotherapy.¹⁵

Overall, strategies to improve QoL of cancer patients are limited and include education, physical activity, self-care programs, and psychosocial support. The effectiveness of these strategies has been successfully evaluated in different stages of cancer treatment, for example, during the course of treatment or after completion of treatment.^{16,17} However, little has been written about strategies that can help recover QoL in patients with gastric cancer, most of whom need gastrectomy. Complications after gastrectomy are common, indicating the need for a clear discharge plan to help the patient and family cope more effectively with the changes. The discharge plan should be developed based on an evaluation of the patient's and family's capacity for self-care,¹⁸ that is, the patient and the family should be willing and able to become involved in patient care activities to help manage a chronic health condition.¹⁹ A discharge plan for patients after they have undergone a gastrectomy could include patient education on symptoms of dumping syndrome, strategies to manage the symptoms, the importance of maintaining a well-balanced diet and taking nutritional supplements as prescribed, and pain management. Patients also need to be supported to engage in physical and social activities.^{20,21} A practical discharge plan based on self-care abilities ensures that the patient and the family have necessary knowledge, skills, and support system to effectively

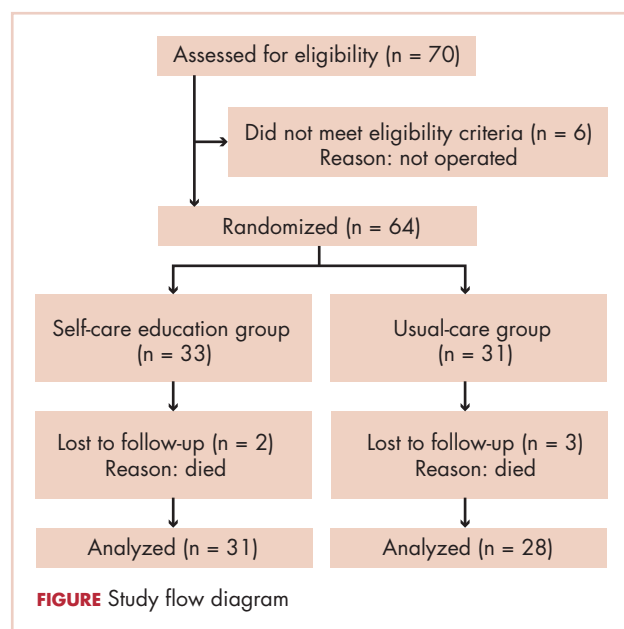
manage their health and lifestyle balance. This study aimed to examine the effectiveness of a brief self-care education program to improve QoL of patients with gastric cancer after gastrectomy.

Materials and methods

Consecutive patients admitted to a tertiary cancer hospital in the north-west of Iran from April 1, 2008 to April 1, 2010, were invited to participate in the study and underwent screening for inclusion criteria. The inclusion criteria included: diagnosis of gastric cancer, age between 35 and 75 years, and a candidate for gastrectomy. Exclusion criteria included patients with comorbidities of cardiovascular disease, respiratory disease, or kidney disease. A total 6 participants' eligibility criteria changed and they did not undergo gastrectomy. These patients were excluded from the study (Figure 1). The study protocol conformed to the generally accepted principles of human ethics research and received approval from the Human Research Ethics Committee of the participating hospital. Participants received information about the study and signed the consent form.

Using a random number table, participants were randomly allocated to either self-care education group (33 participants) or usual-care group (31 participants). Allocation concealment was obtained using sequentially numbered sealed envelopes to reduce the risk of allocation bias. Baseline data were obtained within a few days of admission to hospital and before gastrectomy.

The self-care education program was designed to help the patients develop a better understanding of their disease and learn strategies to manage their condition after discharge. The content of the program was closely aligned to the needs of the



patients after gastrectomy and included education on dumping syndrome, nutrition, physical activity, and psychosocial support. The program consisted of a half-hour, face-to-face education session with the patient, preferably with involvement of the family. In addition, the patient was given a pamphlet containing the same information. To reduce the possibility of interactions between participants in self-care group and usual care, the self-care education program was delivered on the day of discharge. Patients in the self-care education group also received a follow-up call from a researcher 2 weeks after discharge to ensure that they were following the instructions and to provide them with an opportunity to raise their concerns. The self-care education program was administered by the first researcher.

Patients in the usual-care group received routine care without a planned educational session. The routine care for patients with gastric cancer included bowel preparation before surgery, administration of intravenous antibiotics, and monitoring the patients for postoperative complications, such as pneumonia, infection, hemorrhage, and anastomotic leak. Both the patients and clinicians were blind to treatment allocation.

Instruments

The EORTC QLQ-C30. The validated Persian versions of the EORTC QLQ-C30²² and QLQ-STO22²³ were used to assess the QoL of patients with gastric cancer before gastrectomy and 1 month after the procedure. The QLQ-C30 (Quality of Life Questionnaire-Core 30, version 3.0) is the most recent version developed by the European Organization for Research and Treatment of Cancer (EORTC) to assess QoL of patients with cancer disease.²⁴ The questionnaire is composed of a 2-item global health status-QoL subscale and 5 subscales of physical (5 items), role (2 items), cognitive (2 items), social (2 items), and emotional functioning (4 items). The QLQ-C30 also includes 7 symptom subscales of fatigue (3 items), nausea and vomiting (2 items), pain (2 items), dyspnea (1 item), insomnia (1 item), appetite loss (1 item), constipation (1 item), diarrhea (1 item), and financial difficulties (1 item) dyspnea.²⁵ Except for the global health status-QoL subscale, for which responses are rated on a 7-point scale (1, very poor; 7, excellent), responses to the other subscales are rated on a 4-point scale (1, not at all; 4, very much). Higher scores on the global health status-QoL subscale and the functional subscales represent better quality of life, whereas higher scores on the symptom scales represent severe symptom experience and thus poorer quality of life.

The QLQ-STO22. The 22-item QLQ-STO22 (Quality of Life Questionnaire - Gastric Module) is a disease-specific questionnaire that was developed specifically to assess the symptoms of dysphagia (4 items), pain/discomfort (3 items), dietary restrictions (5 items), upper gas-

tro-intestinal symptoms (3 items), emotional problems (3 items), dry mouth (1 item), body image (1 item), and hair loss (2 items) in patients with gastric cancer.²⁴ Responses to the items are rated on a 4-point scale (1, not at all; 4, very much),²⁶ with higher scores representing severe symptom experience and thus poorer quality of life. The psychometric and clinical validity of the QLQ-C30²⁷ and the QLQ-STO22 have been well documented.^{8,23,28} The EORTC recommends that the QLQ-STO22 to be used in conjunction with the QLQ-C30 for assessment of QoL in patients with gastric cancer.²⁸

The self-care education program was designed to address common challenges of patients after gastrectomy, such as nausea, vomiting, loss of appetite, dysphagia, pain, and emotional distress — the symptoms and conditions that are captured and measured by the QLQ-C30 and the QLQ-STO22. In the current study, most of the patients completed the study tools themselves, but they were administered by the researcher if the patient was illiterate, in which case, the researcher would read the questions to the patient and record the responses.

Data analyses

All of the scores on the QLQ-C30 and QLQ-STO22 questionnaires were linearly transformed to scores from 0 to 100 according to the EORTC scoring manuals and analyzed using the SPSS version 19.0. Descriptive and inferential statistics were used. The analysis of covariance was used to compare mean scores between groups, and within-group differences were examined using the paired *t* tests. The chi-square test was used to analyze categorical data. A value of $P < .05$ was considered as statistically significant.

Results

The demographic and disease characteristics of the study participants are shown in Table 1. The results of analysis of covariance are summarized in Table 2. There were no statistically significant between-groups differences in any of the subscales of the QLQ-C30 and the QLQ-STO22, though there were statistically significant within-group differences in some of the subscales. The results of the paired *t* tests comparing the baseline and follow-up scores are shown in Table 3. At the follow-up assessment, the self-care education group showed significant improvements compared with baseline data in the global health status-QoL scale ($t = 2.243, P < .05$), experience of pain ($t = 2.508, P < .05$), and constipation ($t = 2.773, P < .05$). Patients in this group also reported significant improvements in the experience of dysphagia ($t = -2.497, P < .05$) at the follow-up, as measured by the QLQ-STO22. Although role functioning and appetite also improved in self-care group, follow-up scores were not statistically different from baseline scores. In addition, participants in this group reported a significant

decrease in physical functioning ($t = 2.218, P < .05$) after gastrectomy.

As with the participants in the self-care education group, patients in usual-care group also reported deterioration in physical functioning ($t = 3.537, P < .05$) at the follow-up assessment. Compared with baseline scores, patients in usual-care group showed significant improvements in role functioning ($t = -2.313, P < .01$) and appetite ($t = 3.802, P < .01$) at the follow-up assessment.

Discussion

This study used disease-specific QoL measures to evaluate the effects of a short self-care education program on different dimensions of the health-related quality of life in patients with gastric cancer. The participants were mainly men, with a mean age of 55 years, who had undergone total gastrectomy. These characteristics are similar to those reported in the literature. We found no between-group differences in any of the subscales of the QLQ-C30 and the QLQ-STO22. Overall, it is difficult to discuss the results of this study in light of the literature because there is dearth of similar research. Previous research has focused mainly on examining the impact of gastric cancer and associated treatments on QoL of patients.^{13,14} Consistent with our findings were those in a study that examined the effectiveness of an educational program plus tai chi on the QoL of Korean patients with gastric cancer did not demonstrate statistically significant results.²⁹ However, that research did not use a disease-specific measure to assess QoL and the participants had undergone gastrectomy at least 2 years before the study. In addition, the study had a low response rate and high dropout rate, which posed a serious threat to the validity of the findings.

We found significant within-group differences in some of the subscales of the QLQ-C30 and the QLQ-STO22, which are worth discussion. Patients in the self-care education program reported significant improvements from baseline in the global health status-QoL scale at the follow-up assessment, whereas it remained almost unchanged in the usual-care group. The perceived improvement in the global health status-QoL may be attributed to the overall improvements in disease symptoms, such as pain and dysphagia in the self-care education group. Similar to our findings, Lee et al found that patients in the education-plus-tai chi group had overall better feeling about themselves after the intervention.²⁹ Davoodi reported that a self-care education program also positively affected overall health perception and psychological wellbeing of patients after esophagectomy, although that study was not specifically in patients with gastric cancer.¹²

In the current study, patients in the self-care education program reported less pain, dysphagia, and constipation at the follow-up assessment. The improvements in the experience

TABLE 1 Characteristics of the participants by study group

Characteristic	Group, n (%)	
	Self-care education	Usual-care
Male	24 (82.8)	18 (72)
Age ≥ 65 y	6 (20)	11 (44)
Married	29 (100)	22 (88)
Illiterate	14 (50)	15 (60)
Cancer stage III	16 (55)	18 (72)
Types of gastric carcinoma		
Diffuse	22 (76)	22 (88)
Intestinal	7 (24)	3 (12)
Total gastrectomy	17 (59)	16 (64)
Conservative treatment		
Before surgery	1 (3)	0 (0)
After surgery	6 (21)	8 (32)

of pain, dysphagia, and constipation may be attributed to the tips and strategies that patients in this group received about effective management of these complications. Physical functioning was the only component of QoL that deteriorated significantly from baseline in the self-care education group. Similarly, participants in the usual-care group reported a significant decline in physical functioning after gastrectomy compared to baseline. This finding is consistent with the literature that gastrectomy leads to reduced physical functioning.⁸

Participants in the usual-care group reported significant improvements from baseline in role functioning and appetite at the follow-up. Although role functioning and appetite were similarly improved in the self-care program group, the differences between baseline and postgastrectomy were not significant. An explanation to this finding could be that patients in the usual-care group had significantly lower role functioning and less appetite at baseline than did patients in the self-care program. Therefore, the positive results of gastrectomy on these subscales were more pronounced in the usual-care group than in the self-care education group. Compared with patients in the usual-care group, those in the self-care education program had superior role functioning and appetite at the follow-up, although the differences between the groups were not statistically significant.

Overall, there is limited evidence that interventional strategies, such as a brief education or support groups can considerably improve QoL of gastric cancer patients after gastrectomy.³⁰ Certainly, there is a need for researchers, oncology nurses, oncology specialists, psychologists, educators, and other members of multidisciplinary team to

TABLE 2 Comparison of means scores on the subscales of the QLQ-C30 and the QLQ-STO22 between self-care education and usual-care groups postgastrectomy

Subscale	Group, mean score		Test results, F (P*)
	Self-care education	Usual-care	
QLQ-C30			
Global health status-QoL	68.965	63.667	2.027 (.161)
Physical functioning	45.287	40.266	1.092 (.301)
Role functioning	53.442	42.000	0.899 (.347)
Emotional functioning	63.667	60.632	0.442 (.509)
Cognitive functioning	98.667	97.126	0.751 (.390)
Social functioning	46.555	58.000	0.875 (.354)
Fatigue	62.667	54.789	1.193 (.280)
Nausea & vomiting	19.333	18.965	0.003 (.957)
Pain	20.000	25.287	0.287 (.595)
Dyspnea	9.333	8.056	0.032 (.858)
Insomnia	31.034	16.666	4.497 (.051)
Appetite loss	37.333	29.885	0.251 (.619)
Constipation	29.333	18.390	1.951 (.169)
Diarrhea	6.666	6.896	0.025 (.874)
Financial difficulties	12.000	35.632	3.010 (.089)
QLQ-STO22			
Dysphagia	25.862	30.333	0.532 (.469)
Discomfort	130.666	140.229	0.071 (.791)
Dietary restrictions	32.266	38.981	0.643 (.467)
Upper GI symptoms	33.716	19.555	0.080 (.779)
Emotional problems	47.555	45.210	3.533 (.443)
Having a dry mouth	24.000	26.436	1.253 (.268)
Body image	28.000	11.494	3.389 (.071)
Hair loss	32.180	33.330	0.895 (.349)

GI, gastrointestinal; QoL, quality of life

* The significant level was $P < .05$.

work collaboratively to expand their knowledge of factors that impact on QoL of gastric cancer patients, and develop and evaluate alternative strategies that can help improve this important patient outcome. A multidisciplinary approach may have greater potential to recover the quality of life of gastric cancer patients. Previous research suggests that psychological interventions can reduce emotional distress and improve patients' coping skills, which

can positively affect the quality of life of patients with gastric cancer.³⁰ Hence, addition of psychological services to self-care education programs and the use of innovative patient education methods may show greater effects on QoL of gastric cancer patients after gastrectomy.³¹

This study used a randomized, controlled trial design and well-validated and disease-specific tools to examine the effectiveness of a self-care educational program

TABLE 3 Comparison of pre- and postgastrectomy mean scores on the subscales of QLQ-C30 and QLQ-STO22 in the self-care education and usual-care groups

Subscale	Self-care group		Paired t-test, t (P*)	Usual-care group		Paired t-test, t (P*)
	Pre-gastrectomy	Post-gastrectomy		Pre-gastrectomy	Post-gastrectomy	
QLQ-C30						
Physical functioning	60.229	45.287	1.507 (.143)	65.600	40.266	3.537 (.002*)
Role functioning	39.655	53.442	-1.819 (.800)	20.000	42.000	-2.313 (.030)
Cognitive functioning	94.827	98.667	-1.289 (.107)	92.666	97.126	-1.672 (.212)
Social functioning	60.344	46.555	1.451 (.061)	80.000	58.000	-2.313 (.030*)
Emotional functioning	45.114	63.667	-2.880 (.008)	69.333	60.632	.829 (.415)
Global health status-QoL	61.206	68.965	-2.243 (.033*)	64.333	63.667	.172 (.865)
Fatigue	51.724	54.789	1.510 (.172)	59.555	62.666	1.437 (.162)
Nausea	8.620	19.333	0.714 (.481)	20.333	18.965	-0.097 (.924)
Pain	39.655	20.000	2.508 (.18*)	28.000	25.287	1.553 (.134)
Dyspnea	8.046	9.333	1.061 (.209)	12.000	8.056	.267 (.792)
Insomnia	32.182	31.034	1.553 (.134)	29.333	16.666	.988 (.332)
Loss of appetite	36.779	29.885	1.808 (.081)	60.008	37.333	3.802 (.001*)
Constipation	41.390	29.333	2.773 (.010*)	27.996	18.390	.150 (.745)
Diarrhea	23.218	6.666	1.549 (.134)	35.200	6.896	.328 (.745)
Financial	45.982	12.000	0.143 (.888)	13.333	35.632	1.994 (.058)
QLQ-STO22						
Dysphagia	40.804	25.862	2.497 (.019*)	38.000	30.333	-1.063 (.299)
Discomfort	79.310	130.666	-4.308 (.000*)	64.0000	140.229	-3.733 (.001*)
Upper GI symptoms	34.009	33.716	-0.059 (.954)	27.998	19.555	1.642 (.114)
Dietary restrictions	35.200	32.266	.833 (.412)	23.218	38.981	1.357 (.217)
Emotional problems	57.854	47.555	1.913 (.066)	33.777	45.210	-1.802 (.084)
Dry mouth	33.333	24.000	-0.569 (.574)	48.000	26.436	-1.030 (.212)
Body image	6.896	28.000	-1.162 (.255)	19.996	11.494	-.823 (.411)
Hair loss	27.583	32.180	-1.361 (.184)	31.996	33.330	-1.000 (.327)

GI, gastrointestinal; QoL, quality of life

* The significant level is $P < .05$.

to improve the quality of life of gastric cancer patients after gastrectomy. However, the generalizability of the findings is limited because it was conducted at a single center, the intervention program was short, and the follow-up period limit was relatively short. In addition, it is likely that the study was too underpowered to detect significant differences. In conclusion, the assessment and improvement of quality of life is important in gastric

cancer patients who often undergo invasive procedures, such as gastrectomy. Our study failed to demonstrate statistically significant effects from a brief self-care education program.

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