

Quality of Life and Predictors among Gastrointestinal Cancer Survivors in Iran

Abstract

Background: Quality of life (QoL) is an important indicator for evaluating treatment outcomes among cancer patients. Therefore, this study aimed to assess QoL and associated factors among Iranian gastric and colorectal cancer survivors. **Materials and Methods:** This epidemiologic study was conducted among 120 gastric and colorectal cancer survivors in Shahid Ghazi Hospital affiliated to Tabriz University of Medical Sciences, Iran, in 2019. Participants were selected through the convenience sampling method. The data collection instrument included a demographic and disease-related checklist and cancer-related QoL questionnaire (QLQ-C30). Data were collected using face-to-face interviews and analyzed by the logistic regression model. **Results:** The average overall QoL score was 48.98. Based on the threshold, more than half of the participants had a problem in physical performance, cognitive performance, emotional performance, fatigue, pain, and financial subscales. Anemia and marital status were the most predictors in all subscales. HTN and physical activity are the strongest predictors for global QoL subscale and symptom subscale, respectively. These factors predicted a significant proportion of variance for QoL (84% for global QoL, 83.50% for functional subscale, and 67.30% for symptom subscale). **Conclusions:** Our findings highlighted that the QoL level of gastrointestinal cancer patients was low. In our study, anemia, marital status, BUN/Cr, HTN, and physical activity were identified as the most important predictor factors of QoL. Therefore, it seems that the formulation and implementation of supportive care programs that aimed to resolve these health problems can play a crucial role in improving the QoL of patients.

Keywords: Cancer, cancer survivors, colorectal, quality of life, stomach neoplasms

Introduction

Gastrointestinal (GI) cancers account for approximately one-third of all cancer incidence and mortality worldwide. Based on data from GLOBOCAN 2020, GI cancers accounted for 18.7% of new cancer cases and 22.6% of cancer deaths in 2020.^[1] In Iran, gastric cancer has been reported as the most common cancer in males and the third one in females.^[2] The 5-year survival for colorectal cancer patients is reported to be around 64–67% worldwide.^[3] In a different way, the 5-year survival rate among Iranian colorectal cancer patients was estimated as 54%, which is lower than the percentage reported for developed countries, especially due to delay in diagnosis.^[4] Cancer can negatively affect patients' Quality of Life (QoL) due to its destructive effects on patients' life processes.^[5] QoL is considered an important factor in assessing the quality of

care provided to cancer survivors, through which consequences of all cancer cares can be assessed.^[6] In recent decades, the number of cancer survivors has increased due to the advancement in prevention and treatment of disease. As a result, today, the QoL has gained double importance in the care of cancer patients.^[7]

QoL is defined as "individuals' perception of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards, and concerns".^[8] Therefore, it seems that the concept of QoL is a basic concept to indicate the global individuals' state of health.^[9] As a result, estimating the impact of chronic diseases on patients' QoL is necessary for better allocation of healthcare resources. Many international studies reviewing the QoL of cancer survivors have reached contradictory results. Although some studies reported that QoL of cancer survivors is largely

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comparable to a healthy population,^[10,11] other studies reported that cancer diagnosis can still have a devastating effect on cancer survivors' QoL even 2 to 26 years after diagnosis.^[6] In particular, studies conducted in Iran,^[12] Asia,^[9] and some European countries (10) have shown that the various aspects of QoL in cancer survivors are lower than in the general population.

In this regard, studies in Iran have examined the QoL of colorectal cancer patients. These studies showed that QoL of Iranian colorectal cancer patients was low or moderate.^[12] To the best of our knowledge, a few studies have studied the QoL of Iranian colorectal cancer survivors, and the results of these studies were inconsistent, and some reported QoL in these survivors as moderate^[13] or low.^[12] As a result, due to existing knowledge gap, further studies are needed in this field. A better understanding of cancer survivors' QoL and its predictors are important in developing a care plan for these survivors. So, this study aimed to assess QoL and associated factors among Iranian gastric and colorectal cancer survivors.

Materials and Methods

This quantitative study has an epidemiologic design and was conducted in outpatient cancer clinics in Tabriz University of Medical Sciences, Iran. Data were collected from January 2019 to October 2019 using the convenience sampling method. The eligibility criteria for the study were the following: (1) being at least 18 and no older than 80 years of age at the time of the study; (2) living in Tabriz, the cancer of East Azerbaijan Province in northwest of Iran; (3) completion of active cancer treatments at least 1 year before participation in the study for at least one of the following types of cancer: colorectal and gastric cancers, and having no signs or symptoms of active cancer; and 5) being able to communicate verbally. Patients who suffered from another type of cancer or were treated for any other type of cancer were ineligible to participate in the study. The sample size was calculated based on the pilot study on 20 cancer patients. The calculated sample size ($s^2 = 2.97$, $d = 0.5$, $z^2 \cdot a/2 = 1.96$) was equal to 120 cancer patients. In this regard, a convenience sample of 135 eligible patients were invited for participation in the study. Furthermore, 15 patients refused to participate (11.1%) (participation rate = 0.89).

The questionnaire used in this study consisted of two parts. The first one was designed to collect some demographic and disease-related characteristics of patients (including age, gender, job, education level, blood pressure, blood sugar, CBC, BUN, creatinine, etc.). Paraclinical data were extracted from the patient's medical record with the permission. In this study, the presence of anemia in patients was determined based on the results of hemoglobin test. The hemoglobin level in women and men was marked as a value <12 g/dL and <13 g/dL, respectively.^[14] In addition, physical activity was obtained as the number

of minutes of exercise per day by self-report. The second part of the questionnaire was a cancer-related QoL questionnaire (QLQ-C30) with 30 items which assessed cancer patients' QoL in 15 subscales. The questionnaire consisted of five functional subscales (physical functioning, role functioning, cognitive functioning, emotional functioning, and social functioning), nine symptom subscales (fatigue, pain, nausea and vomiting, dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties), and global health and QoL subscale. The scoring of 28 items was rated on 4-point Likert scales, ranging from "not at all" (1) to "very much" (7), and the scoring of two items was rated on 7-point Likert scales, ranging from "extremely bad" (1) to "extremely good" (7). The final questionnaire items were scored on a scale ranging from 0 to 100. A higher score for the functional subscales and global QoL scale indicated better functioning and QoL. For symptom subscales, a higher score indicated more frequent and/or more intense symptoms.^[15] The threshold for clinical importance was recently calculated to improve the interpretation of the QLQ-C30 scales.^[16] The Persian version of the questionnaire was validated in a previous study. In this study, the face and content validities of the questionnaire were assessed and verified by an expert panel including ten academic members of Tabriz University of Medical Sciences, Iran. The final version of the questionnaire was tested for reliability in a pilot study including 30 cancer survivors who were selected randomly. The Cronbach's alpha coefficient for items of the QLQ-30 questionnaire was 0.85. To perform data collection, first, this research project was approved by the Regional Ethics. Then, the necessary permissions were obtained from the research environment (outpatient clinic of Shahid Ghazi Hospital in Tabriz). The first author attended the clinic during the sampling period and identified eligible patients who were referred to the clinic for the follow-up visits. After providing the necessary information regarding aims of the study, the patients were invited to participate in the study. Moreover, after providing verbal consent, a written informed consent was obtained from all participants. Data were collected through an interview in a private room. Due to the cultural restrictions in female patients, one of the patient's companions was asked to be with the patient during the interview. With this method, the data of most patients were collected.

Data were analyzed using SPSS software version 19. The Kolmogorov-Smirnov test was used to examine the normal distribution of data. Mean (SD), frequency, and percentages were used to describe the results of the study. In-dependent samples *t*-test and Chi-square were used to assess the association between fatigue and marital status, employment status, anemia, blood pressure, diabetes, smoking, physical activity, and BUN/Cr ratio. Furthermore, a linear regression model was used to identify predictor variables. A significance level was considered less than 0.05.

Ethical considerations

This study was approved by Regional Ethics Committee at Tabriz University of Medical Sciences, Iran (IR.TBZMED.REC.1396.345). Written informed consent was obtained from all patients before participation in the study.

Results

Some demographic and disease-related characteristics of participants are reported in Table 1. A total of 120 GI cancer survivors were included in this study. The age mean (SD) of participants was 56.01 (11.07) years. Fifty-five percent of participants were male, and 87% were married. The mean (SD) of BUN and creatinine was estimated at 24.10 (1.39) and 1.11 (0.41), respectively.

Table 2 reports the mean (SD) scores of participants in functional and symptoms subscales and global QoL. Also, the percentage of patients who had problems in each subscale, as mentioned above based on the determined threshold, is reported in this table.

A regression model was used to determine the factors affecting the QoL and its predictors. All the variables that were significant according to Pearson's tests and independent *t*-test or were significant based on the review of the literature,^[13,17-22] including marital status, employment, anemia, blood pressure, diabetes, smoking, sports activity, and BUN, were included in the regression model. The results of the linear regression analysis of the possible predicting factors of QoL are reported in Table 3.

Table 1: Demographic and disease-related characteristics of cancer patients

Variables	Categories	N (%)
Job	Housekeeper	38 (31.70)
	Self-employed	34 (28.30)
	Retired	27 (22.50)
	Unemployment	12 (10)
	Employee	9 (7.50)
Education	Primary	52 (43.30)
	Diploma	46 (38.30)
	University degree	22 (18.30)
Type of cancer	Colorectal	87 (72.50)
	Gastric	33 (27.50)
Anemia	Yes	77 (64.10)
	No	43 (35.90)
Diabetes	Yes	33 (27.50)
	No	87 (72.50)
Hypertension	Yes	49 (40.80)
	No	71 (59.20)
Smoking	Yes	42 (35)
	No	78 (65)
Physical activity (min/day)	Nothing	83 (69.20)
	<60	15 (12.50)
	60-120	18 (15)
	>120	4 (3.30)

HTN, marital status, anemia, and BUN/Cr ratio were the strongest predictors of QoL, respectively. Globally, these variables predicted 84% of the variance of the QoL variable. The results also showed that marital status, anemia, BUN/Cr ratio, and activity were the strongest predictors of functional scale, respectively. These variables predicted 83.5% of the variance of the global functional scale [Table 4]. According to the linear regression model results, marital status and anemia were the most important predictors of symptoms, respectively. These variables predicted 67.3% of the variance of the symptom scale [Table 5].

Discussion

This study was carried out to assess QoL and associated factors among Iranian gastric and colorectal cancer survivors. The results of the present study showed that the general QoL of participants was not at an acceptable level. Also, this level of QoL was lower than that reported in previous studies.^[17-19] On the other hand, consistent with results of the present study, Lee *et al.*^[17] reported that cancer survivors 5 years after initial treatment still needed symptom management, food control, maintaining self-esteem, maintaining social competitiveness, and financial support. By comparing QoL levels of our participants with those of colorectal cancer survivors in previous studies,^[18] we found that the GI cancer survivors had lower QoL. In addition, based on the threshold, the QoL of most participants was poor. It should be noted that this study was conducted among GI cancer survivors, and previous studies showed that GI cancer survivors have a lower, in comparison with colorectal cancer survivors, after initial treatments.^[18]

The results of this study showed that the participants had many symptoms that could negatively affect their QoL. Worsening of symptoms including pain, insomnia, loss of appetite, nausea and vomiting, and eating problems; increasing financial problems; and reducing joint support all can have a negative cumulative effect on the QoL of patients.^[19] In the symptom subscale, the lowest score was related to the fatigue dimension. In a previous study, fatigue was identified as one of the most frequent symptoms in colorectal cancer patients.^[23] This level of fatigue can cause many physical, emotional, and cognitive problems for patients. Emotional problems include problems related to decreased energy and decreased desire and interest in activities. The results of the present study showed that participant scores on the performance domain were average. This result was similar to the results of the previous study.^[20] Cancer and its treatment can have harmful effects on social functioning, including work and life; relationships with family, friends, relatives, and colleagues; and other social activities. Studies in Asian countries have demonstrated a low level of QoL among cancer survivors.^[9,18] Also, previous studies in Iran reported

Table 2: Mean(SD) scores of participants' QoL in function, symptoms, and global QoL

Domains of QOL**	Mean(SD)*	Thresholds for Clinical Importance		
		NO	Yes ***	
		n (%)	n (%)	
Function	Physical function	62.22 (2.23)	28 (23.30)	92 (76.70)
	Role function	67.50 (2.70)	79 (65.80)	41 (34.20)
	Cognitive function	64.58 (2.62)	44 (36.70)	76 (63.30)
	Emotional function	55.34 (2.75)	42 (35)	78 (65)
	Social function	65.69 (2.33)	66 (55)	54 (45)
	Function total	63.06 (2.52)		
Symptoms	Fatigue	49.62 (2.59)	43 (35.80)	77 (64.20)
	Nausea/vomiting	13.61 (1.99)	68 (56.70)	52 (43.30)
	Pain	46.66 (3.11)	42 (35)	78 (65)
	Dyspnea	23.88 (2.77)	63 (52.50)	57 (47.50)
	Insomnia	38.88 (2.71)	69 (57.50)	51 (42.50)
	Appetite. Loss	32.77 (3.20)	90 (75)	30 (25)
	Constipation	27.50 (3.37)	94 (78.30)	26 (21.70)
	Diarrhea	23.05 (2.95)	65 (54.20)	55 (45.80)
	Financial problems	35.55 (2.25)	26 (21.70)	94 (78.30)
	Symptoms total	32.39 (2.53)		
Global QoL	48.12 (2.61)			

*Standard Deviation, **Quality of life, ***Clinically significance problem

that patients with colorectal cancer had a moderate^[12] or low QoL.^[13] The results of the present study showed that men had a better global QoL, which was similar with the result of another study in Iran.^[13] Women bear more pressure because of their important role in household management. This can cause a greater decline in their QoL compared to men.

The results of the study also showed a significant correlation between QoL and age. This result is consistent with other studies. Larsson *et al.*^[21] showed that younger people have a lower QoL. On the other hand, the results of Sio *et al.*'s^[22] study showed that elderly patients have a lower overall QoL score than middle-aged and young women. It seems that this finding may be due to more rigorous treatment regimens for young people compared to older people. The side effects of these treatments can cause a further decline in the QoL. Results of the study showed that there is a significant correlation between the employment status and income of patients and their QoL and performance. In Nikbakht *et al.*'s^[13] study, there was a significant correlation between employment and the QoL and performance of participants. Employment and income strengthen motivation and engagement in health-related activities. On the other hand, having no suitable job or sufficient income creates an additional burden for the patient.

The results of the study showed that there is a significant correlation between education level and QoL. This result is

Table 3: Linear regression analysis of the possible predicting factors of global of GI cancer survivors

Variable	Coefficient (B)	Std. Error (SE)	
Constant	53.32	0.46	
Marital status (single=0)	10.38	0.18	0.15*
Anemia (anemia=0)	16.65	0.19	0.24**
Hypertension (yes=0)	35.28	0.20	0.46***
Diabetes (yes=0)	0.63	0.30	0.00
Smoking (yes=0)	0.26	0.16	0.00
Activity	1.61	0.10	0.04
BUN/Cr****	0.96	0.01	0.58***

Adjusted R²=0.84, f=48.95, *p=0.045, **p=0.002, ***p<0.001
**** Blood Urea Nitrogen to Creatinine Ratio

Table 4: Linear regression analysis of the possible predicting factors of function of GI cancer survivors

Variable	Coefficient (B)	Std. Error (SE)	Standardized Coefficient (β)
Constant	53.32	0.46	
Marital status (single=0)	10.38	0.18	0.15*
Anemia (anemia=0)	16.65	0.19	0.24**
Hypertension (yes=0)	35.28	0.21	0.46***
Diabetes (yes=0)	0.63	0.30	0.00
Smoking (yes=0)	0.26	0.16	0.01
Activity	1.61	0.10	0.04
BUN/Cr****	0.96	0.01	0.58***

Adjusted R²=0.83, f=44.99, *p<0.001, **p=0.005, ***p=0.015
**** Blood Urea Nitrogen to Creatinine Ratio

Table 5: Linear regression analysis of the possible predicting factors of symptoms of GI cancer survivors

Variable	Coefficient (B)	Std. Error (SE)	Standardized Coefficient (β)
Constant	54.99	11.70	
Marital status (single=0)	-18.60	4.73	-0.45*
Anemia (anemia=0)	-26.52	4.87	-0.46*
Hypertension (yes=0)	-0.84	5.23	-0.02
Diabetes (yes=0)	-2.43	7.49	-0.03
Smoking (yes=0)	0.80	4.07	0.02
Activity	4.52	2.47	0.20
BUN/Cr**	-0.05	0.11	-0.47

Adjusted R²=0.67, f=15.88, *p<0.001

** Blood Urea Nitrogen to Creatinine Ratio

consistent with other studies. The results of Ban *et al.*'s^[24] study showed that the level of education of people has a significant relationship with their QoL.

In our study, anemia was identified as one of the most important predictor factors of QoL in participants. Anemia is a relatively frequent comorbidity in cancer patients that jeopardizes patients' QoL, life expectancy, and survival.^[25] On the other hand, Wouters reports that anemia did not have an impact on survival in individuals younger than 60 years.^[26] Anemia is highly prevalent, especially among colorectal cancer patients, and nowadays, iron supplements are most often used to treat anemia.^[17] In Wouters' study, the detrimental effect of anemia on cancer patients' QoL was reported.^[26] A recent study showed that an increase in hemoglobin was significantly associated with improvement in cancer survivors' QoL.^[18] In this study, marital status was identified as one of the predictor factors of QoL. Married patients were more likely to have better QoL than unmarried ones. The presence of a support person can play an important role in responding to treatment and increase the patients' QoL. Spouses can increase the patient's willingness to continue the treatment process by encouraging the patient. A study showed that unmarried patients are less likely to receive social support.^[19]

Moreover, the results of the present study did identify physical activity as a predictor factor for QoL, especially for global QoL and functional subscale, which is in line with previous studies.^[20] Another study reported that having a special exercise program like yoga can improve QoL and the daily functioning of cancer patients.^[13] However, these results are inconsistent with a previous study reporting no association between exercise and QoL among cancer patients.^[21]

Hypertension is another predictor factor for QoL. Studies have demonstrated that patients with hypertension were more likely to have lower QoL.^[22,27,28]

Furthermore, the BUN/Cr ratio was another predictor factor of QoL among cancer survivors. BUN/Cr is an important biochemical parameter related to physical function. High

BUN levels indicate increased protein breakdown, which strongly affects the strength of muscle contraction and leads to fatigue and decreased physical function. When the body is deficient in energy, protein is consumed, and BUN levels elevate in response to activity.^[29] Previous studies have demonstrated a positive correlation between BUN level and activity tolerance^[30] and fatigue level.^[31]

This study has limitations that limit the application of its findings. The most important limitation of this study is that some patients went to physicians' private offices for their treatment, and we did not include them in our study. So, this limits our ability to generalize our results to all GI cancer survivors.

Conclusion

The study showed that the QoL level of GI cancer patients was low. In addition, anemia, marital status, BUN/Cr, creatinine, HTN, and physical activity were identified as the most important predictor factors of QoL and predicted a high percentage of the variance of QoL. Therefore, it seems that the formulation and implementation of supportive care programs with considering these factors can play a crucial role in improving the QoL of patients.

Application of findings: QoL is an important concept for the care of cancer survivors during and after active treatment. Guidelines suggest that patients should be screened for QoL and related issues during initial visits. Therefore, it is necessary to identify the factors affecting the QoL of patients in different stages of the disease. The results of the present study can be used as a guide for clinical trials, experimental and semiexperimental studies, and future systematic review studies in identifying factors related to the QoL of cancer survivors. Anemia was one of the most important variables that played a greater role in predicting the QoL. It is recommended to identify the cause of anemia (deficiency of vitamin B12, iron deficiency, or bone marrow depression) in these patients as soon as possible and take measures to resolve it. The nutritional status of patients and adequate fluid intake should be monitored. The use of supplements that can provide the nutritional needs of survivors can also help in this field, which should be the attention of researchers and treatment staff. Modifying the lifestyle of patients and having regular meal plans to get enough food, sports activities, and adjusting activities should be done in such a way that balance between activity and rest of the patients is recommended in both hospitalized patients and surviving patients. Correction of health problems such as blood pressure and diabetes control of patients as variables that can affect QoL should be considered by the treatment team.

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Conflicts of interest

Nothing to declare.

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