Health-Related Quality of Life of Cancer Patients Receiving Chemotherapy

[1]Manal M. Anwar, [1]Heba R. Elareed and [2]Ahmed Hassan

[1]Public Health and Community Medicine, [2]Clinical Oncology Department Faculty of Medicine, Beni-Suef University, Egypt

Abstract

Background: Cancer is one of the chronic diseases highly influence people's health and Quality of life (QOL). QOL has become a significant outcome measure in the treatment of cancer patients. **Objective:** To assess cancer patients' QOL and its related consequences in relation to different chemotherapy treatment schedules. **Method**: This was a cross-sectional study among 200 cancer patients in Oncology Clinic, Beni-Suef University hospital. The European Organization for Research and Treatment of Cancer Quality of life Questionnaire was used to measure quality of life for the participating patients. **Results**: The study showed that 40.5% of patients with unfavorable physical functioning and 36.5% with emotional dysfunction, while the favorable category represented 50.5%, 43% and 41% for role, social and cognitive functioning respectively. Symptoms scales showed that 62.5%, 60%, 56%, 55.5% and 50.5% of studied cancer patients had fairly favorable fatigue, pain, appetite loss, financial difficulties and insomnia respectively, while 60%, 59% and 43.5% of them had favorable symptoms of constipation, diarrhea and nausea-vomiting respectively**.** There was a statistically significant association between quality of life and income. The fairly favorable and enough income was 54.5% vs. 48.7% for not enough income (P=0.0001). As for onset of cancer; the fairly favorable and the less than one-year onset was 58.5% vs 34.3% for more than one-year onset (P=0.005). As for stage of cancer; the favorable and cancer stage I showed 46.7% vs 13.7% for stage 4 (P=0.001). A strong association was found between QOL and number of CT cycles. Patients treated with ≤ 2 CT cycles and fairly favorable QOL represented 56.7% (P< 0.001), 66.1% for those received 3-5 cycles and fairly favorable QOL (P<0.001) and 42.9 % for those treated with ≥ 6 cycles and unfavorable QOL (P<0.001). **Conclusion**: A Chemotherapy cycle may improve QOL in patients with solid tumors. Half of cancer patients undergoing chemotherapy treatment had fairly favorable QOL.

Keywords: *Cancer; Chemotherapy (CT); Quality of life (QOL).*

Correspondence: Heba R. Elareed, Email: dr_heba_alareed@yahoo.com

Introduction

Performance of cancer patients might be impaired because of their sufferings related to the symptom burden and advancement of the disease stage. Alleviating their symptoms (e.g. fatigue, dyspnea, cough, loss of appetite and pain) and effective management would relief their suffering and help improving their quality of life (QOL). The prevalence of many symptoms reflects an advanced stage and has been associated with emotional ill-being, poor physical and societal involvement with a decrease in the global QOL.[1,2]

One of the recent concepts accepted as a criterion to evaluate treatment results in patients with chronic physical (cancer) and mental diseases, is quality of life

(QOL). Health-related quality of life (HRQOL) - an accepted concept to evaluate cancer treatment results- is a multi-dimensional concept that includes domains related to physical, mental, emotional, and social functioning.[3] Quality of life is defined by the World Health Organization (WHO) as an individual's perception of life, culture, values, goals, expectations, standards, and concerns.[4] Cancer poses a physical and mental stress for example: pain, depression, nutritional disturbances and disease progression consequences may be reflected on the whole family social well being as well as posing an economic burden.[5, 6]

Recently, progress in cancer treatment improved survival; thus, an important surrogate is to improve the treatment related quality of life of cancer patients; especially for those with long term survivorship.[7]

Cancer survivors might suffer from long-term social/emotional problems. Hence, their support (spiritual/ philosophical) and maintaining their body image is of a major concern.[8-10]

Specialized cancer specific health care team aims at maximizing the occupational abilities and improving physical, mental and social aspects performance of cancer patients.[7, 11]

The aim of this study is to assess cancer patients' QOL and its related consequences in relation to different chemotherapy treatment cycles.

Method

Study site: This study was carried out in a tertiary care hospital (Beni-Suef University hospital) – Beni Suef Governorate, Egypt. *Study design:* This is a descriptive cross-sectional study.

Sample size: A convenient sample of 200 patients who presented to the oncology clinic from February to August 2018. The sample size was estimated using Epi-Info version 7 Stat Calc, [Center for Disease Control (CDC), WHO], depending on the following criteria; confidence level of 95%, a margin of error of 5%.

Inclusion criteria: Age ≥18 years, Confirmed diagnosis with cancer, Under chemotherapy treatment, No history of other chronic disease such as diabetes or heart disease.

Data collection tool

The European Organization for Research and Treatment of Cancer QOL Questionnaire (EORTC QLQ-C30) was used to measure QOL for the participating patients.[12] The questionnaire is in English language; it was translated into Arabic and then back translated into English, to ensure correct translation of the questions. The Arabic version was revised by 7 experts and tested in a pilot study on 20 patients. The reliability of the questionnaire was tested by Cronbach alpha and found to be 0.81.

The questionnaire included 44 questions in two parts: The first part: (14 Questions) including socio-demographic variables and patients' characteristics such as age, gender, educational level, marital status, employment, residence, and monthly income. In addition to tumor characteristics such as: stage, timing and number of chemotherapy cycles. **The second part** (30 Questions): European Organization for Research and Treatment of Cancer Quality of life questionnaire (EORTC–QOL-C30). Each question had an equal value and the QOL was quantified as the sum of the scores. The QOL-C30 is composed of both multi-item scales and single-item measures. All of the scales and single-item measures range from score 0 to 100. A high scale score represents a higher response level.

A high score for a functional scale represents a high / healthy level of functioning; a high score for the global

health status / QOL represents a high QOL, but a high score for a symptom scale / item represents a high level of symptoms / problems.

Table (1): The scoring system for the Quality of life questionnaire was according to the following

Scale	Degree of Quality of Life		
	Unfavorable	Fairly favorable	Favorable
Functional	0-33.3	33.3-66.6	≥ 66.6
Symptom	≥ 66.6	33.3-66.6	0-33.3

The subjects were asked to rate how true each statement is 7 days ago with a response scale ranging from 1 to 4 "Not at all", "A little", "Quite a bit" and "Very much.".

Regarding the overall QOL, the respondents were asked to circle the number that represents how they feel about their health and quality of life at the present time ranging from 1 to 7. The number (1) represents the worst possible life and the number (7) represents the best possible life. The scores were classified into three categories: unfavorable, fairly favorable, and favorable. The higher the scores the better QOL is.

The patients were given approximately twenty minutes to complete the questionnaire aided by medical students to fill up the questionnaire by reading loud the questions for them and their answers were recorded.

Statistical analysis

Data were collected, coded and entered to computer before being analyzed using the software, Statistical Package for Social Science, (SPSS) version 20 (IBM, USA). For analysis purpose, frequency distribution as percentage and descriptive statistics in the form of mean and standard deviation were calculated. Comparisons of qualitative data were performed using Chi-squared test. The level of statistical significance was set to be ≤ 0.05

Ethical consideration

After institutional approvals, The Faculty of Medicine, Beni-Suef University Research Ethics Committee has approved the study protocol. The study objectives and procedures were explained in details for each participant and it was clearly explained to participants that the results would not be declared. Participation in the study was intended to be voluntary and a written informed consent was obtained from each participant prior to inclusion in the study.

Results

Regarding functional scales, 40.5% of patients showed unfavorable physical functioning and 36.5% were emotional functioning, while the favorable category represented 50.5%, 43% and 41% for role, social and cognitive functioning respectively.

Symptoms scales showed that 62.5%, 60%, 56%, 55.5% and 50.5 % of studied cancer patients had fairly favorable fatigue, pain, appetite loss, financial difficulties and insomnia respectively, while 60%, 59% 43.5% of them had favorable symptoms of constipation, diarrhea and nausea-vomiting respectively **(Table 1**)

Table 2 showed that the study patients' mean age was 51.19±14.4 years (range 20-87 years). Female participants were 56.5% and 43.5% were males; 68.5%, of study participants were illiterate, 62.5% were jobless, 84% were married and 91% resided in rural areas. Among the study group; 65% were diagnosed with cancer for more than one year, 37% had stage III disease and 53.5% were diagnosed to

have distant metastasis. Breast cancer patients constituted 22%, followed by lung cancer 12.5%, gastrointestinal malignancies 11%, lymphomas 12.5%, genitourinary 15%, liver cancer 17%, and others 10%.

Table (1): Quality of life scoring among cancer patient.

Items		Unfavorable N (%)	Fairly favorable N (%)	Favorable N (%)
Global Health Status/ QOL		64 (32)	100 (50)	36 (18)
Functional scales	**Physical functioning**	81(40.5)	71 (35.5)	48 (24)
	Role functioning	48 (24)	51 (25.5)	101(50.5)
	Emotional functioning	73 (36.5)	68 (34)	59 (29.5)
	Cognitive functioning	44 (22)	74 (37)	82 (41)
	Social functioning	41 (20.5)	73 (36.5)	86 (43)
Symptoms scales	**Fatigue**	58 (29)	125 (62.5)	17 (8.5)
	Nausea and vomiting	28 (14)	85 (42.5)	87 (43.5)
	Pain	51(25.5)	120 (60)	29 (14.5)
	Dyspnea	42 (21)	79 (39.5)	79 (39.5)
	Insomnia	45 (22.5)	101 (50.5)	54 (27)
	Appetite loss	31 (15.5)	112 (56)	57 (28.5)
	Constipation	11 (5.5)	69 (34.5)	120 (60)
	Diarrhea	12 (6)	70 (35)	118 (59)
	Financial difficulties	30 (15)	111 (55.5)	59 (29.5)

As regard the global health status in relation to disease and socio-demographic factors; the study illustrated statistically significant difference between global health status / QOL and income (P=0.0001), onset of cancer (P=0.005) and cancer stage (P=0.001)**.**

Relation between global health status / QOL and number of chemotherapy cycles is shown in **Table 3**. Half of patients showed a fairly favorable QOL status. A strong association was found between QOL and number of CT cycles with a significant difference between the levels of QOL for patients treated with ≤ 2 CT cycles (P < 0.001), with 3-5 cycles (P < 0.001) and those treated with ≥ 6 cycles (P < 0.001).

Discussion

Cancer treatment related mental and health effects were found to affect patients' health related QOL; particularly in advanced stages. Several studies support these findings especially with adoption of chemotherapy.

Functional scales; the present study showed that favorable role, social, cognitive functioning were reported in 45-50%. Findings that was similar to the reported physical well being of patients undergoing chemotherapy [13,14] and contrary to a report showing significant affection of physical domain on QOL in breast cancer patients'.[15] Psychological domain had no correlation with mode of treatment of cancer in agreement with a similar study finding.[16]

Symptoms scale; study participants had *favorable* gastrointestinal side effects followed by nausea & vomiting. *Fairly favorable* scale was highest for pain, loss of appetite and financial difficulties **(Table1**), findings that were comparable to international reports showing that poor health-related quality of life (HRQOL) among cancer patients is associated with multiple factors, including sleep disturbances, fatigue, pain, anxiety, and depression.[13,17] Discrepancies between our findings and others might be attributed to the adoption of different study tools, different spectrum of cancer patients' population demographics, e.g.: history of disease onset, different

chemotherapy regimens and performance of the patients.

The present study showed no association between QOL and demographic data. Similar results were reported internationally [18] and only one study

Table (2): Global health status in relation to disease and socio-demographic factors

Characters of the patients	N (%) Total = 200	Global Health Status/ QOL			P-Value
		Un favorable N (%)	Fairly favorable N (%)	Favorable N (%)	
Age Mean ±SD; (range)	51.19±14.4; (20-87)				
Sex					
• **Male**	87 (43.5)	25 (28.7)	50 (57.5)	12 (13.8)	0.154
• **Female**	113 (56.5)	39 (34.5)	50 (44.2)	24 (21.3)	
Education					
• **Illiterate**	137 (68.5)	43 (31.4)	66 (48.2)	28 (20.4)	0.205
• **Primary**	27 (13.5)	12 (44.5)	11 (40.7)	4 (14.8)	
• **Secondary**	23 (11.5)	5 (21.7)	17 (73.9)	1 (4.4)	
• **University**	13 (6.5)	4 (30.8)	6 (46.1)	3 (23.1)	
Occupation					
• **Not working**	125 (62.5)	40 (32)	65 (52)	20 (16)	0.774
• **Farmer**	38 (19)	14 (36.8)	18 (47.4)	6 (15.8)	
• **Worker**	19 (9.5)	6 (31.6)	8 (42.1)	5 (26.3)	
• **Employee**	18 (9)	4 (22.2)	9 (50)	5 (27.8)	
Income					
• **Enough**	44 (22)	14 (31.8)	24 (54.5)	6 (13.7)	0.0001
• **Not enough**	156 (78)	50 (32)	76 (48.7)	30 (19.3)	
Marriage					
• **Single**	9 (4.5)	4 (44.5)	2 (22.2)	3 (33.3)	0.206
• **Married**	168 (84)	53 (31.5)	88 (52.4)	27 (16.1)	
• **Widow**	22 (11)	7 (31.8)	10 (45.5)	5 (22.7)	
• **Divorced**	1 (0.5)	0 (0)	0 (0)	1 (100)	
Residence					
• **Urban**	18 (9)	5 (27.8)	11 (61.1)	2 (11.1)	0.571
• **Rural**	182 (91)	59 (32.4)	89 (48.9)	34 (18.7)	
Onset of cancer					
• **One year ago**	130 (65)	34 (26.2)	76 (58.5)	20 (15.3)	0.005
• **More than one year**	70 (35)	30 (42.9)	24 (34.3)	16 (22.9)	
Cancer stage (TNM)					
• **1**	15 (7.5)	5 (33.3)	3 (20)	7 (46.7)	0.001
• **2**	60 (30)	28 (46.7)	25 (41.7)	7 (11.6)	
• **3**	74 (37)	19 (25.7)	40 (54)	15 (20.3)	
• **4**	51 (25.5)	12 (23.5)	32 (62.8)	7 (13.7)	
Metastasis					
• **Yes**	107 (53.5)	38 (35.5)	47 (43.9)	22 (20.6)	0.180
• **No**	93 (46.5)	26 (28)	53 (57)	14 (15)	
Type of cancer					
• **Breast cancer**	44 (22)	13 (29.5)	20 (45.5)	11 (25)	
• **Lung cancer**	25 (12.5)	8 (32)	10 (40)	7 (28)	0.682
• **GIT**	22 (11)	7 (31.8)	9 (40.9)	6 (27.3)	
• **Lymphoma**	25 (12.5)	9 (36)	10 (40)	6 (24)	
• **GU**	30 (15)	8 (26.7)	15 (50)	7 (23.3)	
• **Liver**	34 (17)	10 (29.4)	16 (47.1)	8 (23.5)	
• **Others***	20 (10)	6 (30)	7 (35)	7 (35)	

**Others: Head and neck, Soft tissue sarcoma*

Table 3: Global Health Status/QOL in cancer patients according to number of chemotherapy cycles

Chemotherapy cycles	Global Health Status/QOL				
	Unfavorable N (%)	Fairly favorable N (%)	Favorable N (%)	Total N (%)	P- Value
Less than 2	17 (28.3)	34 (56.7)	9 (15)	60 (30)	0.001
3-5	11 (19.6)	37 (66.1)	8 (14.3)	56 (28)	0.001
More than 6	36 (42.9)	29 (34.5)	19 (22.6)	84 (42)	0.001
Total	64 (32)	100 (50)	36 (18)	200 (100)	0.001

reported that increased age is associated with reduced QOL of cancer patients.[19]

A strong association between disease onset and QOL is shown in table 2. Similar findings were reported confirming an impaired QOL with the longer elapsed time since initial diagnosis [20] and opposite to one study report showing no association between disease onset and QOL.[21] The difference might be due to the fact that more than half of the study population was diagnosed with metastatic disease.

In this study, 66.1% and 14.3% of patients who completed 3-5 cycles of chemotherapy had a fairly favorable and favorable level of QOL **(Table 3)**, similar to other international studies reporting that the majority of cancer patients had moderate QOL after 2-4 chemotherapy cycles [18] and a good / appropriate QOL post chemotherapy, [(22)] whilst contrary to others who reported below average / poor QOL among cancer patients undergoing chemotherapy. [8, 13, 23, 24] Difference between our findings and others might be explained by the diversity of the inclusion criteria and the prevalence of advanced stage diseases of other studies.

Recently; QOL has been accepted as an endpoint for treatment comparisons and an early indicator of disease progression for many cancer types, particularly in advanced stages. Improving QOL is as important as the survival benefit offered by recent medications. Reducing mortality and ensuring optimal health related QOL are considered the main objectives of medical care nowadays. [25]

Conclusion

Cancer chemotherapy treatment related issues affect health related QOL. In the present fairly favorable quality of life was experienced by half of the study patients with a statistically significant difference between global QOL and number of Chemotherapy cycles. Patients' income, cancer stage, onset of cancer and socio-demographic characteristics had no impact on QOL. Un-favorable physical and emotional functional scales in addition to fairly favorable pain, fatigue, loss of appetite and financial difficulties are unwanted effects of cancer related treatment affecting HRQOL that need to be dealt with in order to improve cancer patients' well being. Socioeconomic support is hence a necessity to improve health related quality of life for such patients.

Conflict of interest

The authors have no conflict of interest to declare.

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Authors' contributions

MA, HE and AH conceived and designed study, finalized the methodology and tools used. AH helping in data collection, MA and HE analyzed and drafted the manuscript. All the authors made significant contributions in manuscript

writing and finalizing the manuscript. The final manuscript has been read and approved by all the authors.

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