

The Effect of Chemotherapy on Quality Of Life of Colorectal Cancer Patients before and 21 Days after the First Chemotherapeutic Sessions

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Abstract: Colorectal cancer and its treatment may cause adverse effects to the social function, including work and productive life, relationship with the family, partners and friends, and other interests and social activities, the disease and treatment impact to patients' well-being and functional results is a topic of growing interest for the colorectal cancer researches. Although improvements in treatment regimens have beneficially impacted the prognosis of colorectal cancer, several quality of life issues result from potential side effects of such aggressive treatment. This study aimed to assess the effect of chemotherapy on quality of life for colorectal cancer patients before the beginning and 21 days after the first session of chemotherapy. The study was carried out in outpatient of the Cancer Institute. The sample consists of 80 patients diagnosed as colorectal cancer, postoperatively and undergoing chemotherapy. The European Organization for Research and Treatment of Cancer-Quality of life Core-30 (EORTC QLQ-C30) questionnaire was used to assess patient's quality of life. Data were collected over a period of seven months started from September 2009 to March 2010. The results revealed that all symptoms dimensions except fatigue, and functional dimensions related to physical, role, and cognitive functioning as well as overall functioning was significantly decreased post the chemotherapeutic session. Conclusion and recommendation explained that; for the improvement of quality of life, patients with colorectal cancer undergoing chemotherapy should be included in program to help them find out adopt, and deal with function and symptoms complication of chemotherapy.

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1. Introduction

Cancer is a disease that affects people in the whole world and may bring some impacts to patients and families' lives in different ways, since the diagnosis acknowledgement until the treatment choice, its process, and the rehabilitation. Colorectal cancer, the third leading cause of cancer death worldwide, represents 10% of cancer diagnoses and deaths ⁽¹⁾. More than 800,000 new cases are diagnosed annually, including 300,000 in the U.S. and Europe alone ⁽²⁾. Estimated new cases of colorectal cancer in United States in 2012 are 103,170 while deaths are 51,690 ⁽³⁾. In Egypt, colorectal cancer is the 7th most common cancer with reported incidence of 1/100,000 cases ⁽⁴⁾. An increasingly important issue in oncology is to evaluate quality of life in cancer patients ⁽⁵⁾. The cancer-specific quality of life is related to all stages of the disease ^(6,7). In fact, for all types of cancer patients general quality of life instruments can be used to assess the overall impact of patients' health status on their quality of life ⁽⁸⁾.

Health-related quality of life (HRQOL) is an important outcome of cancer therapy, currently; quality of life has been introduced as an endpoint for treatment comparisons on many cancer types, particularly in advanced stages ⁽⁹⁾. Quality of life also, as an early indicator of disease progression could help the physician on daily practice to closely monitor the patients ⁽¹⁰⁾. In addition, quality of life may be considered to be the

effect of an illness and its treatment as perceived by patients and is modified by factors such as impairments, functional stress, perceptions and social opportunities ^(11, 12). According to the World Health Organization (WHO), quality of life is defined as individual perception of life, values, objectives, standards, and interests in the framework of culture. Quality of life is increasingly being used as a primary outcome measure in studies to evaluate the effectiveness of treatment ⁽¹³⁻¹⁶⁾. Colorectal cancer and its treatment may cause adverse effects to the social function, including work and productive life, relationship with the family, partners and friends, and other interests and social activities ⁽¹⁷⁾.

Physical and emotional integrity alterations, such as discomfort, pain, disfigurement, dependence and self-esteem loss are reported by patients who realize deep changes to their quality of life in a short-term ⁽¹⁸⁾. The disease and treatment impact to patients' well-being and functional results is a topic of growing interest for the colorectal cancer researches. The main problems facing long-term cancer survivors are related to social/emotional support, health habits, spiritual/philosophical view of life, and body image concerns ⁽¹⁷⁾. Recently, several studies have been developed in order to assess such alterations in individuals' lives through the Quality of Life (QOL) and Health Related Quality of Life (HRQL) Assessments ⁽¹⁷⁻¹⁹⁾. Accurate assessment of

health-related quality of life in patients with advanced colorectal cancer is essential to improve our understanding of how cancer and chemotherapy influence patients' life and to adapt treatment strategies⁽²⁰⁾. A range of factors influence health-related quality of life assessments, and they may vary according to each study, however, health-related quality of life may be considered having a great mental, physical and social function level, as well as real life position (social role), which includes relationships, health perception, abilities, satisfaction with life and well-being. They may also include assessments of the patients' satisfaction level regarding the treatment, results, health state, and future perspectives⁽²¹⁾.

Currently, there are several therapeutic modalities for cancer treatment, such as: surgery (curative, palliative) chemotherapy, and radiation therapy, which may be used isolated or associated, and an increasing number of researches assesses the quality of life of colorectal cancer patients going through different treatment types^(18,22,23). When assessing the value of a particular treatment, it is important to consider the impact it may have on the quality of life of those being treated. This is particularly so for cancer patients, whose life expectancy may be short⁽²⁴⁾. The relationship between colorectal cancer risk and physical activity and dietary habits has been well-established, but less is known about the relationship between these behaviours and quality of life post-diagnosis. Moreover, it is unknown whether this relationship is consistent across cancer stage or treatment setting⁽²⁵⁾. Although improvements in treatment regimens have beneficially impacted the prognosis of colorectal cancer, several quality of life issues result from potential side effects of such aggressive treatment. Consequently, shifting part of our focus in research and program development to address issues of quality of life and survivorship has become essential^(26, 27). Moreover, quality of life measurements are considered essential to assess the impact caused by the treatment to patients' lives.

Nurses, in their decision and actions, can influence their patient's quality of life. In addition, quality of life certainly has relevance of nursing; often patients consult nurse regarding how to obtain the best possible quality of life for themselves or for their family members. Moreover, quality of life is an important indicator of the success of nursing, medical, or health care intervention. Therefore, improving the health related quality of life for colorectal patients should be an interdisciplinary goal of physician, nurses; patients care technician, social worker and dietitians⁽²⁸⁾. Focusing nursing intervention on decreasing chemotherapy treatment symptoms, or to improve the patient ability to deal with them, improving functional abilities, decreasing limitation and identifying issues that affect general health perception could increase a patient's overall health related quality of life⁽²⁹⁾. Because nurses and other health professionals are

interested in the influence that health and illness have on quality of life, the evaluation of the positiveness or negativeness of attributes that characterize one's quality of life appears to be of pertinent value⁽³⁰⁾.

Aim of the study:

The study aim to assess quality of life, to identify the domains affected in colorectal cancer patients undergoing chemotherapeutic treatment and to examine the relationship between socio-demographic characteristics and quality of life and correlate them with the quality of life domains.

Research hypothesis:

1. Colorectal patients undergoing chemotherapy; will have higher scores of quality of life and global health status before chemotherapy than 21 days after.
2. Colorectal patients undergoing chemotherapy will have higher level of symptom or problems 21 days after first chemotherapeutic session than before.

2. Materials and Method:

Design:

The study was quasi experimental design.

Setting:

The study was carried out on outpatient of Cancer Institute affiliated to Ministry of Health. Tanta City.

Subjects:

A convenience sample of 80 patients diagnosed with colorectal cancer, post operatively, who attended the outpatient clinic for follow up and prior to the beginning of the first chemotherapeutic session.

Inclusion criteria:

Subjects were selected according to the following criteria: Adult, 18 years or older, both sex with colorectal cancer diagnosis, post operatively, for chemotherapy treatment, free from other chronic diseases, willing and able to communicate verbally and nonverbally, and have stable vital signs.

Exclusion criteria:

Subjects were excluded from the study if they had chronic disease such as renal failure, heart failure, diabetes mellitus, or hepatic failure, and if they had other types of cancer.

Tool of the study:

Quality of life interview questionnaire: It consists two parts:

Part one:

Related to patient's socio-demographic data which includes; age, sex, marital status, level of education, occupation and place of residence.

Part two:

This part was adapted to asses quality of life of colorectal patients using the quality of life questionnaire-C30 QLQ-C30 (Version 3.0) with functional/ symptom scale indicated⁽³¹⁾. QLQ-C30 has been found to be a valid, reliable and useful research tool for Egyptian culture, it is a health related quality of life questionnaire validated specifically for cancer

patients by the European Organization for research and treatment of cancer (EORTC). Its quality of life model is multi-dimensional and European Organization for research and treatment of cancer group defines it according to the central elements of the functional status, cancer and treatment specific symptoms, psychological distress, social interaction, financial impact, perceived health status and overall quality of life. It is comprised of both multi item scale and single item measures. These include 30 questions which cover five functional scales: physical, emotional, cognitive, social, and role functioning, a global health or overall quality of life, three symptom scales in order to measure fatigue, pain, nausea and vomiting, and five single items to assess symptoms such as: dyspnea, insomnia, appetite loss, constipation, diarrhea; and one single item which assesses financial difficulties. Each of the multi-item scales includes a different set of items, no item occurs in more than one scale.

Scoring system:

QLQ-C30 generates scores in the functional and symptoms scales. The principles of the scoring these scales is done as follow:

1. Estimating the average of the items that contribute to the scale; this is the raw score.
2. Using of the linear transformation to standardize the row score, each score is transformed in a scale from 0 to 100. According to EORTC guidelines, a high scale score represents a higher response level, thus a high score for a functional scale represents a high or healthy level of functioning, and high score for the global health status represents a high QOL, but a high score for a symptom scale items represents a high level of symptom or problems.

Method:

1. An official Permission to carry out the study was obtained from the responsible authorities.
2. Patient's written consent to participate in the study was obtained.
3. Patient's confidentiality was ascertained.
4. The original English language copy of EORTC scale was adoptive and modified by the researchers; it was tested for validity and applicability, necessary modifications were done.
5. The reliability of the interview questionnaire has been acceptable and was tested by using Cronbach's Alpha test and it was greater than .70.
6. Patient who fulfilled the inclusion criteria was selected, and the purpose of the study was explained to each patient.
7. The interview questionnaire was conducted individually by the researchers for data collection twice:
 - Post operative and prior to the beginning of the first chemotherapeutic session.
 - 21 days after the first chemotherapeutic session.

8. The interview questionnaire lasts for 20-30 minutes with little clarification to some patient if needed.

Statistical analysis:

For categorical data the number and percentage were calculated. For calculating the difference in frequency of functions and symptoms before and after chemotherapy median, Interquartile range, mean rank and Wilcoxon signed rank test were used. The differences between median values were calculated for each dimension and the effect of different variables on this mean difference was tested using median, Interquartile range, mean rank, Mann-Whitney and Kruskal-Wallis Test. The level of significance was adopted at $p \leq 0.05$.

3. Results:

The subjects comprised of 80 patients attending outpatient clinic, Tanta Cancer Institute, with age ranged from 41-76 years. As for sex, more than half of the subjects were female (57.5%), and majority of them (92.5%) were married, while (40%) of them were housewives and illiterate, and only (12.5%) and (10%) of them were retired and have university level of education respectively. Regarding to place of residence, about three quarters of the subjects (72.5%) were from rural area.

Table (1): Total score of QOL items for colorectal cancer patient pre and 21 days post chemotherapy. In this table, it can be seen that the highest score of functioning dimensions before chemotherapy was related to role and cognitive functioning with a medium of 100.00 each and Interquartile range of 50.00, 20.00 respectively. The table also showed that functional dimension of QOL related to physical, role, and cognitive functioning as well as overall functioning was significantly decreased post chemotherapy with p value = 0.00 each, a negative rank of 40.64, 27.50, 42.15, 40.96 and positive rank of 13.50, 0.00, 21.5, 12.5 respectively. This table also shows that global health status was decreased post chemotherapy with a median of 66.67 and 50 and Interquartile range of 50.0, 33.33 before and after the chemotherapy respectively, although the decrease was not significantly with $p = 0.135$.

Concerning symptom dimension of QOL of colorectal cancer patients, the same table revealed that there was a significant increase in symptom dimension 21 days after the chemotherapy as related to pain, nausea and vomiting, diarrhea and constipation, dyspnea, insomnia, and anorexia and overall symptom with a median of 40.00, 0.00, 16.67, 57.97, and 57.02 respectively pre chemotherapy and 60.00, 66.67, 50.00, 72.46, 96.49 respectively post chemotherapy ,negative rank of 16.50, 0.00, 19.00, 26.89, and 6.00 respectively and a positive rank of 37.28, 38.50, 40.79, 40.59, and 42.32 respectively with p value = 0.00 each.

Table (2): Correlation between function, symptom, and global dimensions of QOL of

colorectal cancer patients. It is obvious that no significant correlation was found between function, symptom, or global dimensions of QOL of colorectal cancer patient since p value = 0.474, 0.836 and 0.638 respectively.

Table (3): Correlation between QOL items of colorectal cancer patients and their age pre and 21 days post chemotherapy. This table illustrate that, the only significant correlation of QOL items was found between role functioning and nausea and vomiting with patient age pre the first chemotherapeutic session with $P = 0.031$ and 0.047 , respectively.

Table (4): Correlation between QOL items of colorectal cancer patients and their place of residence pre and 21 days post chemotherapy. From this table, it can be concluded that the only significant correlation was found between role functioning of QOL and patients from rural area pre chemotherapy with a median of 100.00, interquartile range of 25.00, a mean rank of 21.91 with $p = 0.00$.

Table (5): Correlation between QOL items of colorectal cancer patients and their gender pre and 21 days post chemotherapy. The table illustrated that, there was a significant correlation was found between female patients and physical function of QOL items pre chemotherapy with a mean rank of 44.67 with $p = 0.052$, and global health status with a mean rank 46.11, 22.89

pre and post chemotherapy respectively with $p = 0.010$. For male patient the significant correlation was found between cognitive functioning and diarrhea and constipation pre and post chemotherapy with mean rank of 45.79, 48.15 in the pre and 21.12, 21.21 in the post chemotherapy respectively with $p = 0.053$ and 0.007 , respectively.

Table (6): Correlation between QOL items of colorectal cancer patients and their occupation pre and 21 days post chemotherapy. This table demonstrated that the there was a significant correlations were found between patient occupation and; role, emotional and cognitive functioning of QOL with $p = 0.007$, 0.022 and 0.002 respectively. In addition the same table shows that there was significant correlation was found between patient occupation and nausea and vomiting and diarrhea and constipation with $p = 0.028$ and 0.001 , respectively.

Table (7): Correlation between QOL items of colorectal cancer patients and their level of education pre and 21 days post chemotherapy. In this table, the only significant correlation was found between physical functioning and patients education pre chemotherapy with a median of 60, 80, 60, 30 and Interquartile range of; 20,60, 20, 35 for illiterate, read and write, diploma and university level of education respectively with $p = 0.001$.

Table (1): Total score of QOL items for colorectal cancer patient pre and 21 days post first chemotherapeutic sessions

QOL Items	Pre		Post		Mean Rank (Post-Pre)		Wilcoxon Signed Ranks Test	
	Median	Interquartile Range	Median	Interquartile Range	Negative Ranks	Positive Ranks	Z	P-value
Function dimensions								
1.Physical	60.00	35.00	20.00	20.00	40.643	13.500	-7.248	0.000
2.Role	100.00	50.00	50.00	50.00	27.500	0.000	-6.804	0.000
3.Emotional	12.50	25.00	12.50	25.00	21.700	19.300	-0.340	0.734
4.Social	0.00	29.17	0.00	33.34	28.083	28.813	-1.023	0.306
5.Cognitive	100.00	20.00	60.00	35.00	42.147	21.500	-6.755	0.000
Overall functions	-23.46	21.22	-50.46	23.15	40.959	12.500	-7.437	0.000
Symptom dimensions								
1.Fatigue	85.84	39.34	92.99	39.34	35.429	33.850	-1.113	0.266
2.Pain	40.00	40.00	60.00	20.00	16.500	37.278	-5.897	0.000
3.Nausea& vomiting	0.00	29.17	66.67	33.33	0.000	38.500	-7.602	0.000
4.Diarrhea& constipation	16.67	33.33	50.00	0.00	19.000	40.794	-6.875	0.000
5.Dyspnea, insomnia& anorexia	57.97	28.98	72.46	28.98	26.885	40.591	-3.200	0.001
Overall symptoms	57.02	15.36	96.49	20.84	6.000	42.316	-7.667	0.000
Global health status	66.67	50.00	50.00	33.33	39.935	38.875	-1.496	0.135

Table (2): Correlation between quality of life dimensions of colorectal cancer patients pre and 21 days post first chemotherapeutic sessions

Correlations		Function dimensions	Symptom dimensions
Symptom dimensions	r	0.117	
	p-value	0.474	
Global Health	r	-0.034	-0.077
	p-value	0.836	0.638

Table (3) Correlation between quality of life dimensions of colorectal cancer patients and their age pre and 21 days post first chemotherapeutic sessions

QOL dimension	Age			
	Pre		Post	
	r	P-value	r	P-value
Function dimension				
1.Physical	0.091	0.420	-0.04	0.78
2.Role	-0.241	0.031	-0.18	0.28
3.Emotional	-0.118	0.296	-0.11	0.50
4.Social	-0.110	0.331	0.01	0.94
5.Cognitive	0.034	0.762	-0.04	0.81
Overall functions	-0.134	0.237	-0.16	0.33
Symptom dimension				
1.Pain	-0.012	0.916	0.05	0.76
2.Fatigue	-0.127	0.260	-0.09	0.57
3.Nausea and vomiting	0.222	0.047	-0.08	0.60
4.Constipation and diarrhea	0.026	0.817	0.05	0.77
5.Dyspnea, insomnia& anorexia	-0.003	0.981	-0.12	0.47
Overall symptoms	0.026	0.819	-0.07	0.65
Global health status	-0.193	0.087	0.29	0.06

Table (4): Correlation between quality of life dimensions of colorectal cancer patients and their place of residence pre and 21 days post first chemotherapeutic sessions

QOL Items	Residence	Pre		Mean rank	Post		Mean rank	Mann-Whitney Test (P-value)	
		Median	Interquartile Range		Median	Interquartile Range		pre	post
Function dimensions	Rural	60.00	30.00	20.48	20.00	20.00	40.397	0.947	0.99
1.Physical	Urban	60.00	40.00	20.55	20.00	20.00	40.773		
2.Role	Rural	100.00	25.00	21.91	50.00	100.00	45.810	0.000	0.18
	Urban	50.00	50.00	16.77	0.00	50.00	26.500		
3.Emotional	Rural	12.50	31.25	19.19	12.50	25.00	38.845	0.291	0.24
	Urban	12.50	25.00	23.95	25.00	37.50	44.864		
4.Social	Rural	0.00	33.33	19.36	0.00	33.33	40.155	0.823	0.31
	Urban	0.00	16.67	23.50	16.67	33.33	41.409		
5.Cognitive	Rural	100.00	20.00	20.93	60.00	30.00	40.052	0.757	0.69
	Urban	100.00	40.00	19.36	60.00	60.00	41.682		
Overall functions	Rural	-23.46	30.86	19.84	-54.32	23.15	41.224	0.646	0.56
	Urban	-23.46	15.43	22.23	-38.89	23.15	38.591		
Symptom dimensions	Rural	85.84	42.92	20.36	85.84	35.77	38.603	0.228	0.90
1.Fatigue	Urban	100.14	28.61	20.86	100.14	42.92	45.500		
2.Pain	Rural	40.00	40.00	19.07	60.00	20.00	38.776	0.260	0.19
	Urban	40.00	60.00	24.27	80.00	40.00	45.045		
3.Nausea& vomiting	Rural	0.00	16.67	20.91	66.67	33.33	39.259	0.321	0.71
	Urban	0.00	33.33	19.41	66.67	33.33	43.773		
4.Diarrhea& constipation	Rural	16.67	33.33	20.97	50.00	0.00	39.879	0.681	0.59
	Urban	16.67	33.33	19.27	50.00	0.00	42.136		
5.Dyspnea, insomnia& anorexia	Rural	57.97	28.99	21.17	72.46	14.49	39.603	0.560	0.54
	Urban	57.97	14.49	18.73	57.97	43.48	42.864		
Overall symptoms	Rural	57.02	15.35	20.59	96.49	19.74	38.741	0.264	0.94
	Urban	57.02	13.16	20.27	96.49	26.32	45.136		
Global health status	Rural	66.67	50.00	19.43	50.00	16.67	40.500	1.000	0.33
	Urban	50.00	50.00	23.32	50.00	66.67	40.500		

Table (5): Correlation between quality of life dimensions of colorectal cancer patients and their gender pre and 21 days post first chemotherapeutic session.

QOL Items	Sex	Pre		Mean rank	Post		Mean rank	Mann-Whitney Test (P-value)	
		Median	Interquartile Range		Median	Interquartile Rang		z	p
Function dimensions	Male	60.000	40.000	34.853	40.00	20.00	23.21	-1.939	0.052
1.Physical	Female	80.000	20.000	44.674	20.00	20.00	18.5		
2.Role	Male	100.000	50.000	40.324	50.00	100.00	23.09	-0.069	0.945
	Female	100.000	50.000	40.630	50.00	0.00	18.59		
3.Emotional	Male	12.500	43.750	44.500	12.50	31.25	20.65	-1.351	0.177
	Female	12.500	25.000	37.543	25.00	12.5	20.39		
4.Social	Male	0.000	33.333	44.500	0.00	33.33	22.35	-1.375	0.169
	Female	0.000	16.667	37.543	50.00	0.00	19.13		
5.Cognitive	Male	100.000	20.000	45.794	60.00	30.00	21.12	-1.936	0.053
	Female	80.000	40.000	36.587	40.00	60.00	20.04		
Overall functions	Male	-23.457	19.290	45.088	-38.89	19.29	24.65	-1.539	0.124
	Female	-23.457	30.864	37.109	15.43	-54.32	17.43		
Symptom dimensions	Male	85.837	35.765	43.441	100.14	42.92	22.24	-0.990	0.322
1.Fatigue	Female	85.837	42.918	38.326	28.61	85.84	19.22		
2.Pain	Male	40.000	40.000	41.912	60.00	30.00	21.03	-0.488	0.625
	Female	40.000	40.000	39.457	20.00	60.00	20.11		
3.Nausea& vomiting	Male	0.000	0.000	36.441	66.67	41.67	21.56	-1.718	0.086
	Female	0.000	33.333	43.500	33.033	66.67	19.72		
4.Diarrhea& constipation	Male	16.667	25.000	48.147	50.00	0.00	21.21	-2.685	0.007
	Female	0.000	16.667	34.848	0.00	50.00	19.98		
5.Dyspnea, insomnia& anorexia	Male	57.971	28.986	43.500	57.97	28.99	15.68	-1.034	0.301
	Female	57.971	28.986	38.283	28.99	72.46	24.07		
Overall symptoms	Male	57.018	17.544	44.265	96.49	26.32	20.79	-1.267	0.205
	Female	57.018	13.158	37.717	17.54	96.49	20.28		
Global health status	Male	33.333	50.000	32.912	50.00	16.67	17.26	-2.571	0.010
	Female	66.667	33.333	46.109	33.33	50.00	22.89		

Table (6): Correlation between quality of life dimensions of colorectal cancer patients and their occupation pre and 21 days post chemotherapeutic session.

QOL Items			Occupation					Kruskal-Wallis Test	
			Housewife	Farmer	Employee	Free work	Retired	X ²	P-value
Function dimension	Pre	Median	80	60	60	60		2.12	0.206
1.Physical		IQR	60	40	20	55			
		Median	20	20	20	40	40		
		IQR	20	20	20	30	30		
2.Role	Pre	Median	75	50		100	100	10.47	0.007
		IQR	50	50		37.5	75		
		Median	0	0	50	75	0		
		IQR	50	50	50	50	50		
3.Emotional	Pre	Median	12.5	12.5	12.5	37.5	0	2.30	0.022
		IQR	39.563	39.929	36.375	65	31.3		
		Median	12.5	0	18.75	25	0		
		IQR	25	25	43.75	28.13	31.25		
4.Social	Pre	Median	-8.333	0	8.333	-8.333	0	1.20	0.463
		IQR	16.667	16.667	29.167	29.167	25		
		Median	0	0	0	-8.33	33.33		
		IQR	33.33	33.33	33.33	29.17	75		
5.Cognitive	Pre	Median	80		90	100	100	1.85	0.002
		IQR	40		35	45	30		
		Median	60	60	60	40	60		
		IQR	35	20	30	45	40		
Overall functions	Pre	Median	-23.457	-23.457	-23.457	-15.741	-31.173	1.75	0.151
		IQR	28.935	23.148	21.219	28.935	27.006		
		Median	-54.32	-46.60	-46.60	-42.75	-62.04		
		IQR	15.43	46.30	28.94	25.08	50.15		
Symptom dimensions	Pre	Median	78.684	85.837	85.837	78.684	71.531	6.65	0.569
1.Fatigue		IQR	50.072	42.918	21.459	42.918	50.072		
		Median	85.84	85.84	107.30	85.84	100.14		
		IQR	28.61	71.53	39.43	71.53	50.07		
2.pain	Pre	Median	40	20	40	50	40	0.67	0.503
		IQR	60	40	30	50	20		

	Post	Median	70	60	60	70	60		
		IQR	20	40	50	35	60		
3.Nausea& vomiting	Pre	Median	0	0		0	33.333	4.05	0.028
		IQR	33.333	16.667		25	33.333		
	Post	Median	66.67	66.67	83.33	75	83.33		
		IQR	33.33	33.33	45.83	29.17	41.67		
4.Diarrhea& constipation	Pre	Median	0	33.333	25	16.667	0	4.84	0.001
		IQR	16.667	16.667	45.833	25	50		
	Post	Median	50	50	50	41.67	50		
		IQR	0	0	0	29.17	25		
5.Dyspnea, insomnia& anorexia	Pre	Median	57.971	57.971	57.971	65.217	57.971	7.57	0.306
		IQR	21.739	43.478	28.986	25.362	36.232		
	Post	Median	72.46	57.97	72.46	43.48	57.97		
		IQR	10.87	28.99	28.99	32.61	57.97		
Overall symptoms	Pre	Median	57.018	57.018	63.596	65.789	57.018	7.20	0.531
		IQR	20.833	17.544	13.158	27.412	4.386		
	Post	Median	94.30	83.33	100.88	85.53	96.49		
		IQR	19.74	21.93	18.64	35.09	37.28		
Global health status	Pre	Median	66.667	33.333	66.667	50	50	2.08	0.068
		IQR	33.333	16.667	33.333	66.667	66.667		
	Post	Median	50	50	50	41.67	50		
		IQR	33.33	16.67	16.67	41.67	41.67		

Table (7): Correlation between quality of life dimensions of colorectal cancer patients and their education pre and 21 days post first chemotherapeutic session.

QOL Items			Education				Kruskal-Wallis Test	
			Ill.	R&W	Dip.	Univ.	X ²	P-value
Function dimensions 1.Physical	Pre	Median	60	80	60	30	16.979	0.001
		IQR	20	60	20	35		
	Post	Median	30.00	20.00	20.00	30.00	0.12	0.99
		IQR	20.00	20.00	20.00	50.00		
2.Role	Pre	Median	100	50	100	100	2.887	0.409
		IQR	50	50	50	37.5		
	Post	Median	50.00	0.00	50.00	50.00	1.86	0.60
		IQR	100.00	50.00	50.00	100.00		
3.Emotional	Pre	Median	6.25	12.5	12.5	18.75	5.32	0.15
		IQR	46.875	37.5	25	21.875		
	Post	Median	12.50	25.00	0.00	18.75	3.99	0.26
		IQR	25.00	37.50	25.00	12.50		
4. Social	Pre	Median	0	0	-16.667	0	3.459	0.326
		IQR	33.333	16.667	33.333	25		
	Post	Median	0.00	0.00	0.00	-8.33	1.03	0.80
		IQR	33.33	50.00	50.00	29.17		
5. Cognitive	Pre	Median	90	80	100	100	2.794	0.425
		IQR	35	40	20	30		
	Post	Median	60.00	40.00	60.00	60.00	3.22	0.36
		IQR	20.00	40.00	10.00	40.00		
Overall function	Pre	Median	-23.457	-15.741	-31.173	-31.173	4.471	0.215
		IQR	19.29	15.432	38.58	21.219		
	Post	Median	-50.46	-46.60	-54.32	-46.60	0.22	0.97
		IQR	23.15	23.15	30.86	44.37		
Symptom dimensions 1.Fatigu	Pre	Median	71.531	100.143	85.837	78.684	5.129	0.163
		IQR	25.036	57.225	21.459	53.648		
	Post	Median	100.14	85.84	71.53	85.84	7.38	0.06
		IQR	39.34	28.61	50.07	71.53		
2.Pain	Pre	Median	40	40	20	50	3.726	0.293
		IQR	35	60	50	35		
	Post	Median	70.00	60.00	60.00	70.00	0.55	0.91
		IQR	40.00	20.00	30.00	35.00		
3.Nausea& vomiting	Pre	Median	0	0	0	16.667	6.02	0.111
		IQR	33.333	0	25	33.333		
	Post	Median	66.67	66.67	83.33	66.67	1.24	0.74
		IQR	29.17	33.33	41.67	37.50		
4.Diarrhea& constipation	Pre	Median	16.667	16.667	0	8.333	1.526	0.676
		IQR	50	16.667	33.333	29.167		
	Post	Median	50.00	50.00	50.00	50.00	5.90	0.12
		IQR	0.00	0.00	33.33	25.00		

5.Dyspnea, insomnia& anorexia	Pre	Median	57.971	57.971	57.971	65.217	3.795	0.284
		IQR	28.986	0	36.232	47.101		
	Post	Median	72.46	72.46	72.46	65.22	0.56	0.91
		IQR	39.86	28.99	21.74	36.23		
Overall symptom	Pre	Median	57.018	57.018	57.018	67.982	2.236	0.525
		IQR	8.772	30.702	8.772	26.316		
	Post	Median	96.49	92.11	96.49	85.53	3.78	0.29
		IQR	21.93	21.93	21.93	43.86		
Global health status	Pre	Median	58.333	50	66.667	75	0.804	0.849
		IQR	50	66.667	41.667	54.167		
	Post	Median	50.00	50.00	50.00	33.33	3.40	0.33
		IQR	29.17	33.33	25.00	25.00		

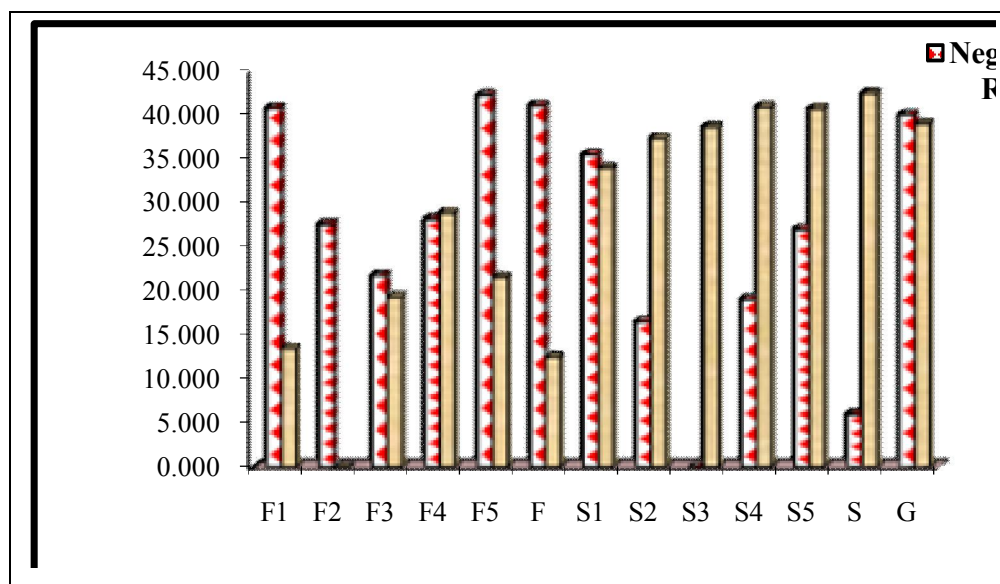


Figure (1) Quality of life dimensions of patients with colorectal cancer before and 21 days after the first chemotherapeutic sessions

4. Discussion:

Quality of life is an important issue for patients with colorectal cancer; accurate assessment of health related quality of life in patients with colorectal cancer is essential to improve our understanding of how cancer and chemotherapy influence patients, life and to adopt treatment strategies. The results of the present study proved that; for functional dimensions of QOL, physical, role, and cognitive functioning as well as overall functioning was significantly decreased post the chemotherapeutic session and the decreased wasn't significantly as related to emotional and social functioning, regarding symptoms dimension of QOL; the result of the present study also proved that; all symptoms dimensions was significantly decreased post the chemotherapeutic session except fatigue and the global health status wasn't significantly decreased after chemotherapy, this result in accordance with **Turgay et al (2008)**⁽³²⁾ who mentioned that all of the post chemotherapy mean scores from the quality of life instrument were statistically significant lower at day of 21 except for the cognitive functioning subscale and added that

overall, initial chemotherapy was found to have a significantly negative effect on the quality of life of cancer patients, the result also in agreement with **Hurny et al (1996)**⁽³³⁾ who proved that chemotherapy had an measurable adverse effect on QOL in women with node positive operable breast cancer, also **Pagano et al (2008)**⁽³⁴⁾ added that chemotherapy is a treatment known to have a significant impact on QOL, moreover, **Arndt et al (2005)**⁽¹⁸⁾ stated that there was statistically differences with cognitive function, pain, and appetite loss and the global health status was considered satisfactory. In contrast of the present study, **Conroy (2003)**⁽²⁰⁾ stated that more than half of the patients treated with palliative chemotherapy have an improvement or at least preservation of their health related quality of life, also **Bouvier (2008)**⁽³⁵⁾ mentioned that patient receiving adjuvant chemotherapy for colon cancer actually had better physical functioning than patient not receiving adjuvant chemotherapy, in addition, **Tsunoda et al (2009)**⁽³⁶⁾ added that overall health related QOL didn't deteriorate during adjuvant chemotherapy with colorectal cancer despite the

effect from surgical damage. Also the result of the present study was disagreed with **Dehkordi et al (2009)**⁽³⁷⁾ who stated that chemotherapy can lead to better sleep pattern in cancer patients and **Chen et al (2008)**⁽³⁸⁾ who found that QOL in lung cancer patients during the chemotherapy has been improved slightly over the baseline values, and **Heras (2009)**⁽³⁹⁾ who mentioned that fatigue intensity increased gradually during chemotherapy, also **Barras et al (2001)**⁽⁴⁰⁾ contradict this result and added that there was no differences between groups in quality of life at the initial assessment or once the treatment was completed and insomnia was the symptom with the highest impact on the quality of life.

According to the world health organization, QOL is defined as individual perception of life, values, objectives, standard, and interests in the framework of culture⁽²³⁾, the result of the present study shows that QOL domains which affected significantly by patient' age were related to; role functioning and nausea and vomiting, and also there was correlation between role functioning of QOL and patients from rural area which may be attributed by the fact that patient from rural area encountered travel related difficulties and transportation financial burden particularly during treatment as outpatients which may affect their role functioning, this result is in constant with **Kafa (2010)**⁽⁴¹⁾ who found that there is a statistical significant correlation between age and psychological dimension of quality of life, in addition, **Kamal (2008)**⁽⁴²⁾ stated that the residency doesn't correlate with the indices of quality of life and **Nicolussi et al (2009)**⁽⁴³⁾ found no correlation between QOL and age, gender, social status, marriage and job, moreover, **Dehkordi et al (2009)**⁽³⁷⁾ who mentioned that there was no correlation between QOL and variables such as age, sex, marital status duration of disease, economic condition and occupational function, also the result of the present study is in disagreement with **Mokabel (1997)**⁽⁴⁴⁾, **Bouvier et al (2008)**⁽³⁵⁾ who indicated that there was a weak correlation between age and quality of life domain.

The result of the present study illustrated that there was a significant correlation between female patient and physical and global health status where these domains are most affected and for male patient the significant correlation was found between cognitive functioning and diarrhea and constipation, this may be attributed to the fact that women are physically weaker than men and they are more affected by the dramatic effect of surgery as well as the side effect of the chemotherapy, these result is in agreement with **Schmidt (2005)**⁽⁴⁵⁾ who reported that global health status and physical functioning were significantly worse for women than for men also **Kafa (2010)**⁽⁴¹⁾ found a statistical significant

differences between sex and total score of physical functioning and psychological status. In addition **Nicolussi et al (2009)**⁽⁴³⁾ supported this result and added that lower QOL scores were observed among women specifically related to pain, insomnia, fatigue, constipation and appetite loss while men have reported better score in the emotional and cognitive function scale than women, on the other hand the result of the present study was in disagreement with **Dehkordi et al (2009)**⁽³⁷⁾, **Nicolussi et al (2009)**⁽⁴³⁾ who proved no correlation between QOL and gender.

In relation to occupation, the result of the this study showed that; occupation affects greatly and significantly role, emotional, and cognitive functioning post chemotherapy which may be explained by the fact that due to their disease and its treatment, patients are at leave from the work, away from home and family responsibilities which may affect their role, cognitive and emotional status, the result of the present study also showed that, for symptom dimensions of QOL, nausea and vomiting, diarrhea and constipation are most affected symptoms by occupation post the chemotherapy which may be explained that these symptoms are the most common adverse effect of chemotherapy. The result of the present study is in disagreement with **Uwer et al (2011)**⁽⁴⁶⁾ who found that there was no correlation between QOL and the type of job, and with **Kamal (2008)**⁽⁴²⁾ who stated that occupation as a patients' variable, hadn't correlate with the patients QOL.

In relation to level of education, the present study revealed that; only correlation was found between physical functioning and patients level of education, this result is in accordance with **Kamal (2008)**⁽⁴²⁾ who stated that level of education is not correlate with indices of QOL, and **Uwer et al (2011)**⁽⁴⁶⁾ and **Dehkordi et al (2009)**⁽³⁷⁾ who mentioned that no correlation was found between QOL and patients' educational level, in contrast to the finding of the present study, **Nicolussi et al (2009)**⁽⁴³⁾ mentioned that concerning educational level, patients who had completed superior education reported having more social difficulties of QOL.

Conclusion and recommendations

Conclusion: Based on the findings of the study, it can be concluded that:

- Most function dimensions of QOL for colorectal cancer patient significantly decreased post the first chemotherapeutic session.
- All symptom dimensions except fatigue and overall symptoms have been increased post the first chemotherapeutic session.
- No significant correlation was found between function, symptom, or global dimensions of QOL of colorectal cancer patient

- Role function affected by patients from rural area, female patients affected more than males as related to physical function and global health status.
- **Recommendations:** based on the findings of this study, it can be recommended that:
 - Nursing staff should be encouraged to attend up to date scientific conferences and workshops related to improving QOL of cancer patients undergoing chemotherapy.
 - Patients with colorectal cancer for chemotherapy should be included in program to help them find out and adopt with function and symptoms complication of chemotherapy.
 - Using of different strategies to improve the patient ability to deal with function and symptoms complication of chemotherapy.
 - Integrate the quality of life of patient with chronic illness and cancer in nursing curriculum for under and postgraduate students.
 - Nursing curriculum should be directed towards the importance of nurse's role in different stages of cancer including diagnosis, treatment and rehabilitation.

(2) Recommendations for future studies:

- Further research is needed in this area for nursing staff to provide more comprehensive evaluation of quality of life for patients with cancer, patients who are receiving other complementary therapy for cancer treatment, and patient with non-operable cancer types.
- Development of strategy to help patients' improvement of their quality of life.

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