



Assess and Evaluation the Quality Of Life (QoL) Among Cancer Patients Undergoing Treatment by Using EORTC QLQ-30 Scale

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ABSTRACT

Background: Cancer is a challenge for majority of population's health-related quality of life (HRQoL). This study aimed to analyze the impact of clinical characteristics and social determinants of health on the QoL of a cohort of persons diagnosed and/or treated for cancer.

Methods: We performed a cross-sectional study in a cohort of 155 with various stages of cancer at different stages of their disease. Data were obtained using questionnaires QLQ-C30 from the European Organization for Research and Treatment of Cancer (EORTC), which include a set of functional and symptomatic scales.

Results: Out of 155 subjects, large proportion were diagnosed with Oral cancer 67(43.2%) and Breast cancer 23(14.8%). The mean of global health status/QoL was 52.34 (SD= 23.34). Quality of life was significantly associated with some functional scales as role functioning ($P \leq 0.001$), social function, ($P=0.00$), and symptom scales as pain ($P=0.00$), loss of appetite ($P=0.004$) and financial impact ($P=0.02$) as well as associations were noted in relation to socio demographic characteristics. The highest functional status was cognitive functioning (54.58 ± 27.68).

Conclusions: The cancer diagnosis has become more prevalent and carries significant changes to the method of living with physical and emotional changes in term of quality of life (QoL) because of inconvenience, torment, disfigurement, reliance and loss of confidence.

Keywords: Cancer Patients, Quality of Life, EORTC QLQ-30 Scale, cognitive functions, HRQoL

INTRODUCTION

The cancer diagnosis carries significant changes to the method of living with physical and emotional changes because of inconvenience, torment, disfigurement, reliance and loss of confidence. It isn't unexpected to relate "cancer" to a perilous disease and consider it "morally infectious", in any event, maintaining a strategic distance from to articulate its name (Michelone APC).¹ Cancer is the subsequent driving reason for death internationally, and is responsible for an expected 9.6 million death in 2018. Comprehensively, around 1 out of 6 death is ex-

pected to cancer (Ferlay J).² Within the forecasted changes in population demographics in the next two decades, even if current global cancer rates remain unchanged, the estimated incidence of new cancer will rise to 21.4 million by 2030(American Cancer Society).³ Moreover previous studies suggest that depression and poor quality of life are often psychological consequences in patients living with cancer, and cancer patients face the double challenge of difficulties to manage the physical as well as psychological effects of cancer (Montazeri A).⁴

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WHO defines QoL as individual perception of life, values, objectives, standards and interests resides in the frame work of culture. Cancer is one of the most important health concerns of today and evaluating QoL in cancer patients is an increasingly important issue (Rizzo PB et al).⁵ Quality of life is the impact of patients' physical (development, physical exercises and capacity to prevail in work and in family duties), (social exercises, being valuable, self-perception, anxiety and despondency) and mental (life fulfillment, social help need and job work) wellbeing for prosperity. A person's QoL is subject to transitions over time, evincing, for example, the patient's competency to cope with the disease or the experiences with varied treatment modalities. Therefore, a requisite evaluation of QoL is imperative at more than two points in time to be able to evaluate both short- and long-term effects of diagnosis and treatments. All domains of an individual's QoL can be affected by malignancy. The deterioration in the QoL kicks off following diagnosis of the malignancy and lingers due to the vigorous nature of the treatment [I Ramasubbu SK et al, 2021].⁶

Symptoms of disease and therapy are torment, respiration trouble, sickness, feebleness and, obviously, reactions of the same cancer have disrupted their quality of life (Rodrigues AM et al).⁷ Through this cross-sectional examination, we will survey QoL of cancer patients by utilizing EORTC-QOL (The EORTC QLQ-C30 is one of the most broadly utilized quality of life polls in cancer research & includes: Physical Functioning (PF), Emotional Functioning (EF), Pain (PA) and Fatigue (FA). Measurement System gives a psychometrically strong instrument to the measurement of wellbeing related quality of life (HRQoL) in a scope of constant or potentially serious conditions (Giesinger JM et al).⁸ The European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 is a cross culturally accepted and widely used instrument for assessing the health related quality of life (HRQoL) of cancer patients (Aaronson NK et al).⁹

Despite the fact that numerous investigations have been done on this part of cancer, but there is continuous requirement of illuminated QoL part of cancer patients, corresponding to accessibility of adequate information. Therefore, this study was carried out that would allow us to further evaluate the QOL and affecting factors on it among the study population. Considering the increasing prevalence of cancer and its destructive effects on QoL and low local reports pertaining to QoL of cancer patients, this study aimed to evaluate QoL of adult cancer patients. Results of this investigation were believed to provide a foundation for interventions to improve QoL among patients with cancer with objectives to assess the QoL among the cancer patients using QLQ-C30 questionnaire and also to find the association between the QoL of cancer patients' with their demographic and disease-related variables.

METHODOLOGY

The study setting and samples: The study was conducted at Oncology department of JA Group of hospital from Jan to May 2021. All cancer patients above the age of 18 years who were admitted to oncology ward during the study period and had at least 6 months duration of cancer diagnosis, and had no other serious debilitating co-morbidity were our source populations. *Inclusion and Exclusion Criteria:* Patients who were receiving therapy and are above 18 years old were included. Those who did not consent for the study and are unable to respond for the questions were excluded.

Data collection instrument (Questionnaires): Data on QoL was collected through face-to-face interview using EORTC QLQ-C30 (Scott, N. W et al)¹⁰. The EORTC QLQ-C30 is a 30-item questionnaire composed of 5 multi-item functional subscales: physical, role, emotional, social and cognitive functioning; three multi-item symptom scales measuring fatigue, pain, and emesis; a global health status subscale; and six single items to assess financial impact and symptoms such as dyspnea, sleep disturbance, appetite, diarrhea, and constipation. Variables related to socio-demography and clinical information as cancer type, time since diagnosis, type of therapy were extracted from charts in the oncology unit (Scott, N. W et al).¹⁰ The scales are rated in terms of percentage. A high score in functional scale and global health status denotes high health status, respectively. But, for a symptom scale high score represents severe symptomatology (Michelson H et al).¹¹ The questions were translated into Hindi and local dialects so as to maintain unbiased response. The filled questionnaire was checked daily for completeness. The reliability (psychometric property) of the tool was evaluated and demonstrated a Cronbach alpha value of 0.832. The subjects in our research also received a questionnaire on their socio-demographic data, including gender, age, marital status, education, employment, social class, family type and area of residence. The categories of socio-demographic variables were adapted from the Agarwal A social classification (Agarwal A).¹² To facilitate the analysis some of the categories were merged. A high scale score represents a higher response level. Along these lines, a high score for a useful scale speaks of a high/healthy degree of functioning, a high score for the worldwide health status/QoL speaks of a high QoL, but a high score for an indication scale/thing speaks of an elevated level of symptomatology/problems and poor QOL.

The standard for scoring these scales is the equivalent in all cases: The normal of the things was estimated that add to the scale; this is the crude score. For functioning scales (PF, RF, EF, RF, SF) mean score <50 will be considered affected and >50 will be considered not affected

All mean scores were changed straight away into a scale from 0 to 100 focuses, as portrayed above,

where 0 speaks to the most exceedingly terrible health status and 100 the best condition of health with the exception of the indication scale, in which the higher score speaks of more symptoms and the most noticeably worst QOL. Scale scores were calculated by averaging items within scales and transforming average scores linearly.

Data management and statistical analysis: Data were cleaned, coded, and entered into Microsoft Office Excel 2007, Epi-info version 3.5.1 software and then exported to SPSS Version 24.0 for analysis. Domain scores in EORTC QLQ-C30 which measures a functional scale and global health status was recorded. The use of these transformed scores has several advantages. Transformed scores may be difficult to interpret; however, there are a number of ways to ease the interpretation of QLQ-C30 results. Descriptive statistics was presented using means with standard deviation (\pm SD) and percentages (%). Values were kept <0.05 with 95% confidence interval. Bivariate analysis and F (Anova) test was applied to investigate the correlation of independent variables. Binary logistic regression was employed to determine associated factors. One-way analysis of variance has been employed to assess difference in quality of life. The dimensions were considered as numerical variables and presented by mean and standard deviations. Socio-demographic characteristics were analysed as categorical variables. The differences between genders in all scales were tested by Student's t test.

Ethical considerations: Ethical endorsement was taken from Institutional Ethical Committee of Gajra Raja Medical College, Gwalior (M.P.) before starting the investigation by the approval certificate no 14/IEC-GRMC/2019. Examination didn't need any intrusive or non-obtrusive diagnostic strategy or with holding of any medication recommended by treating specialist or beginning any new medication. Study participants were informed about the objective of the study before data collection and asked for consent. Questionnaire was pre-tested to check acceptability and consistency two weeks before the actual data collection.

RESULTS

Characteristics of the participants: The present study was based on the findings from 155 subjects. All of the patients who attended the cancer treatment center responded to the questionnaire. There mean age (SD) of the respondents was 48.0(13.6%). More than half of the patients were males 80(51.6), 66 (42.6) were in the age group of between 40-60 years.40.0(33.5%) have formal education 69 (43.9%) and 32(20.6%) were illiterate. majority of patients 99(63. %) belong to middle class and had the average monthly income was 13550 \pm 2500 INR per capita/per month.

Table1. Distribution of cancer patients by socio-demographic & medical Characteristics (N=155)

Characteristics	Cases (%)
Socio-Demographic Characteristics	
Gender	
Male	80(51.6)
Female	75(48.4)
Age*	
<25 Yr	3(1.9)
25-40 Yr	49(31.7)
40-60 Yr	66 (42.6)
>60 yr	37(23.9)
Education	
Illiterate	32(20.6)
Elementary	58(37.4)
Higher Secondary	56(36.1)
\geq Graduate	9(5.8)
Occupation	
Professional	8(5.2)
Skilled	27(17.4)
Non skilled	55(35.5)
Housewife	65(41.9)
Social Economic status (Per capita Income/Month)	
I (Upper)	13(8.4)
II (Upper Middle)	33(21.3)
III (Lower Middle)	66(42.6)
IV (Lower)	43(27.7)
Marital Status	
Married	115(74.2)
Single/Unmarried	28(18.0)
Widow /Divorced	12(7.7)
Type of Family	
Joint	29(18.7)
Single/Nuclear	126(81.3)
Area of residence	
Urban	59(38.1)
Urban slums	87(56.1)
Rural	9(5.8)
Family History of Cancer	
No	135(87.1)
Yes	20.0(12.9)
No of Dependents	
0	3(1.9)
\leq 2	64(41.3)
>2	88(56.8)
Medical Characteristics	
Type of Cancer	
Female Reproductive#	18(11.6)
Breast	23(14.8)
Oral**	67(43.2)
Blood	14(9.0)
Lung	15(9.7)
Other@	18(11.6)
Treatment History	
Surgery + Chemotherapy	45(29.0)
Surgery	13(8.4)
Chemotherapy	82(52.9)
Surgery + Radiotherapy + Chemotherapy	15(9.7)
TNM staging	
II	104(67.1)
III	27(17.4)
IV	14(9.0)
BMI(Kg/M²)	
\leq 18.5	85(54.84)
18.5 <25	65(41.94)
\geq 25	5(3.23)

* Mean age (SD)= 48.0(13.6); **[including Head & neck]

#Female reproductive include cervix, ovary,

@include Colorectal, Esophagus, Gallbladder, Gastric, Hepatocellular, Pancreas & Prostate

Most of the patients 126 (81.3%) had single family with majority of cases 115 (74.2%) were married and more cases 87 (56.1%) were belonged to urban slum areas followed with urban areas 59 (38.1%). The highest number of cases were housewives 65 (41.9%) followed with unskilled worker 55 (35.5%). In relation to family burdens (Dependency ratio), 88 (56.8%) of patients reported that they were responsible for the care of more than two another person, and only 3 (1.9%) were free from dependent responsibility. Only 20.0 (12.9%) patients were described the family history of any type of cancer previously. The most common cancer include oral cancer patients 67 (43.2%) followed with breast cancer 23 (14.8%) and female reproductive in female 18 (11.6%). The frequently prescribed treatment was chemotherapy 82 (52.9%) followed with Surgery + Chemotherapy 45 (29.0%). More than 60% cases were found in stage II (TNM stage) 104 (67.1%) followed with stage III 27 (17.4%). The weight of cancer patients was described in term of BMI where more than 50% patients had the poor weight (BMI \leq 18.5). (Table 1)

Socio-demographic variables and functional

scores: Table 2 shows mean values of EORTC QLQ-C30 scores for all scales and items. Average physical, and emotional functioning was more among males than females while role & social functioning was better in females than male while cognitive functioning was more or less same in both genders but it was not found significant ($P > 0.05$). QoL score was better in old age in comparison to younger age group but not found significant ($P < 0.05$). Education and its impact on Domains of quality of life revealed that average functioning score was found maximum in secondary and above educated persons. Occupation revealed that all QoL domains were significantly highest ($P < 0.05$) among professional group in comparison to other occupation categories. Similarly social economic status impact the QoL in cancer patients and in our study were found that cancer patients belong to upper and upper middle class had the higher score in all domains (Emotional & social functioning had statistically significant $P < 0.05$) means had better QoL in comparison to other class. Higher score of all domains of QoL were found in the patients of joint family system but there was no significant correlation ($P > 0.05$).

Table 2: Comparison of patients' socio-demographic variables and EORTC QLQ-C30 (n = 155)

Characteristics	Physical Functioning (Mean \pm SD)	Role Functioning (Mean \pm SD)	Emotional Functioning (Mean \pm SD)	Cognitive Functioning (Mean \pm SD)	Social Functioning (Mean \pm SD)
Gender					
Male	42.92 \pm 29.34	40.21 \pm 31.68	29.17 \pm 23.84	54.58 \pm 27.68	28.33 \pm 22.17
Female	40.18 \pm 27.05	46.22 \pm 30.46	22.89 \pm 20.78	54.0 \pm 28.9	30.89 \pm 24.08
P value (t test)	0.794	0.960	0.428	0.984	1.48
Age					
<25 Yr	28.89 \pm 3.85	33.33 \pm 0.0	5.56 \pm 9.62	61.1 \pm 9.62	00 \pm 00
25-50 Yr	43.27 \pm 26.46	42.15 \pm 30.01	27.32 \pm 19.43	57.53 \pm 29.09	30.77 \pm 21.88
>50 Yr	38.75 \pm 32.33	45.83 \pm 34.44	24.83 \pm 21.27	46.88 \pm 24.47	28.82 \pm 20.85
P value (ANOVA)	0.484	0.68	0.38	0.082	0.257
Education					
Illiterate	43.22 \pm 27.36	46.55 \pm 31.05	25.22 \pm 20.29	52.44 \pm 28.76	29.17 \pm 17.84
Elementary	40.48 \pm 30.41	32.74 \pm 29.91	25.89 \pm 19.34	60.71 \pm 23.66	28.57 \pm 19.09
Higher Secondary	43.33 \pm 33.00	50.00 \pm 23.57	20.83 \pm 8.89	41.67 \pm 21.93	16.67 \pm 15.57
\geq Graduate	42.67 \pm 27.33	53.33 \pm 18.26	28.33 \pm 13.94	50.00 \pm 20.41	46.67 \pm 18.26
P value (ANOVA)	0.101	0.023*	0.009*	0.407	0.291
Occupation					
Professional	52.67 \pm 29.42	53.33 \pm 24.32	54.17 \pm 32.92	75.00 \pm 9.62	43.33 \pm 28.49
Skilled	41.43 \pm 22.06	45.24 \pm 13.76	37.43 \pm 23.70	53.47 \pm 2.65	34.42 \pm 22.10
Non skilled	42.00 \pm 28.27	43.75 \pm 24.61	31.08 \pm 22.76	45.24 \pm 28.66	29.05 \pm 15.21
Housewife#	50.83 \pm 28.17	47.92 \pm 26.45	17.71 \pm 13.15	64.58 \pm 22.67	33.33 \pm 16.51
P value (ANOVA)	0.24	0.69	0.012*	0.001*	0.056*
Social Economic status (Per capita Income/ Month)					
I (Upper)	38.46 \pm 35.17	48.72 \pm 39.94	44.23 \pm 41.16	56.41 \pm 30.08	37.18 \pm 34.80
II (Upper Middle)	48.12 \pm 29.54	47.83 \pm 33.07	21.38 \pm 24.08	54.35 \pm 29.40	42.03 \pm 31.73
III (Lower Middle)	38.52 \pm 28.12	37.65 \pm 33.20	25.00 \pm 28.21	53.70 \pm 30.43	21.60 \pm 31.96
IV (Lower)	51.03 \pm 24.73	50.64 \pm 27.28	36.22 \pm 32.23	64.10 \pm 28.55	38.46 \pm 36.14
P value (ANOVA)	0.197	0.394	0.015*	0.321	0.034*
Type of Family					
Joint	43.28 \pm 27.53	45.20 \pm 30.90	29.03 \pm 27.81	54.38 \pm 28.36	30.37 \pm 31.25
Single/Nuclear	36.84 \pm 32.91	32.46 \pm 30.67	15.35 \pm 21.56	54.39 \pm 30.35	24.56 \pm 32.57
P value (t test)	0.412	0.241	0.065	0.995	0.767

Housewife include females that don't paid work; § Marital Status "Single" include unmarried, divorced, widow; * Significant Statistically There was significant ($p < 0.05$) higher score of emotional and social functioning among Upper and upper middle in comparison to lower middle and lower class.

Table 3: Comparison of patients' medical characteristics and EORTC QLQ-C30 (n = 155)

Medical Characteristics	Total (N=155) (%)	Physical Functioning (Mean ±SD)	Role Functioning (Mean ±SD)	Emotional Functioning (Mean ±SD)	Cognitive Functioning (Mean ±SD)	Social Functioning (Mean ±SD)
Type of Cancer						
Female Reproductive#	18(11.6)	45±31.03	40.58±24.01	20.29±20.01	65.22±24.05	36.23±23.95
Breast	23(14.8)	45.56±29.07	44.75±32.67	25±29.09	57.10±25.62	26.54±21.31
Oral	67(43.2)	50.83±21.79	44.75±24.67	41.24±21.88	56.25±27.40	43.06±31.08
Prostate	14(9.1)	26.67±26.19	26.25±16.27	38.75±17.39	33.33±29.80	33.33±20.20
Lung	15(9.7)	29.58±13.98	32.67±19.86	39.35±16.09	43.75±13.44	20.83±16.50
Other@	18(11.6)	31.95±29.46	40.80±22.40	38.2±20.54	49.43±30.69	21.26±17.42
P value (ANOVA)		0.021	0.037*	0.184	0.033*	0.107
Treatment History						
Surgery + Chemotherapy	45(29.0)	44.59±27.48	42.22±33.63	29.26±29.6	54.44±30.23	38.15±21.03
Surgery	13(8.4)	52.82±26.03	52.41±31.50	41.23±15.99	60.38±17.23	42.59±14.01
Chemotherapy	82(52.9)	41.63±28.39	44.11±30.24	34.19±19.8	55.47±27.45	36.22±21.9
Surgery+ Radio + Chemo	15(9.7)	43.33±1.04	42.22±20.52	26.26±18.7	38±26.91	32.78±11.62
P value (ANOVA)		0.001**	0.061	0.007*	0.198	0.001**
TNM staging						
I	10(6.4)	73.33±32.66	80.00±32.20	80.83±31.93	91.67±11.79	88.67±21.94
II	104(67.1)	41.47±25.27	48.54±29.36	30.83±21.06	50.64±27.76	26.28±30.16
III	27(17.4)	35.56±29.76	42.42±31.70	30.86±30.47	61.73±23.94	28.40±25.24
IV	14(9.0)	31.43±29.75	30.81±26.53	17.26±22.75	40.48±18.16	25.48±20.08
P value (ANOVA)		0.001**	0.001*	0.001**	0.001**	0.001**
BMI(Kg/M²)						
≤18.5	85(54.84)	54.12±18.6	47.3±20.8	44.72±18.7	45.6±19.9	32.6±22.3
18.5 <25	65(41.94)	61.34±25.8	54.42±26.7	54.46±22.7	55.95±22.3	49.4±34.6
≥25	5(3.23)	74.42±35.7	68.62±33.8	63.5±32.9	68.5±30.9	60.6±32.3
P value (ANOVA)		0.035*	0.05*	0.007	0.003**	0.001**

#Female reproductive include cervix, ovary @Others include Blood, Gastro-Intestinal, Multiple myeloma, Head-Neck etc.

*Significant Statistically **Highly Significant Statistically

Table 4. Associations between symptom scales and affected QoL of cancer patients

Variables	Quality of Life		aOR (95%CI)	P Value
	Not affected	Affected		
Fatigue				
Yes	24(18.3)	107(81.7)	2.7(1.0:6.8)	0.065
No	9(37.5)	15(62.5)		
Nausea & vomiting				
Yes	42(39.6)	64(60.4)	3.4(2.0:5.7)	0.001*
No	34(69.4)	15(28.6)		
Pain				
Yes	103(25.2)	18(74.8)	1.8(1.2:2.8)	0.002*
No	21(61.8)	13(38.2)		
Dyspnea				
Yes	47(39.3)	71(60.7)	1.9(1.3:2.8)	0.036*
No	22(57.9)	16(42.1)		
Insomnia				
Yes	26(25.4)	76(74.5)	2.0(1.5:2.8)	0.020*
No	34(64.1)	19(35.9)		
Appetite loss				
Yes	8(5.5)	138(94.5)	2.3(1.6:3.3)	0.001*
No	5(55.5)	4(44.5)		
Constipation				
Yes	26(29.2)	63(70.8)	2.7(2.0:3.8)	0.003*
No	45(68.2)	21(31.8)		
Diarrhea				
Yes	32(76.8)	11(23.2)	2.6(1.9:3.5)	0.202
No	95(84.8)	17(15.2)		
Financial Impact				
Yes	2(1.3)	147(98.7)	2.5(1.8:3.3)	0.001*
No	3(50.0)	3(50.0)		
Global Health Function				
Poor	15 (13.8)	94(86.2)	3.9(1.8:9.1)	0.009*
Not Poor	18(39.1)	28(60.9)		

aOR – Adjusted Odds Ratio; *Significant Statistically (p<0.05)

Patients' medical characteristics and EORTC QLQ-C30 (functional) score:

In Table 3, association between the mean score of QoL and the medical characteristics – type of cancer, treatment history, stage of cancer (TNM) and BMI age computed. Significantly different varied QoL score was found in cancer type e.g., emotional score was poor in the female with breast and reproductive tract cancer. We found that patients with operation (surgery) had significantly (P=0.05) higher functional score means better QoL than those with other treatment. Highest functional scores in all domains of QoL were found among the patients of initial stage of cancer (TNM stage I) in comparison to advanced stage i.e., II, III & IV. Overweight cancer survivors reported significantly (P < 0.05) better QoL in almost all domains compared with underweight and normal weight.

Quality of Life (QoL) and symptoms scale: Table 4 revealed association between symptom scales and quality of life of cancer patients. Symptoms altering QoL of patients are financial impact. Symptoms scales like pain, nausea & vomiting, dyspnoea, appetite loss, constipation as well as financial and global health impact showed significant association with QoL affected except diarrhea that was no association and the fatigue has also associated in some manner with QoL affected.

Quality of Life (QoL) and Functional score: Correlation in between different functional mean score and cancer patients life affected were correlated in Table 5.

Table 5: Associations between functional scale scores and affected QoL of cancer patients

Variables	Quality of Life				Pearson Correlation Coefficient ((r) P-Value
	Not affected		Affected		
	Cases (%)	(MS±SD)	Cases (%)	(MS±SD)	
Physical Functioning	22 (14.2)	42.7±28.5	133 (85.8)	33.4±21.5	0.502 [Negative Correlation] 0.0562*
Role Functioning	22 (14.2)	45.1±32.6	133 (85.8)	34.8±23.9	
Emotional Functioning	11 (7.1)	29.1±24.3	144 (92.9)	37.7±18.3	0.0562*
Cognitive functioning	62 (40.0)	55.5±28.4	93 (60.0)	43.8±21.6	
Social functioning	15 (9.7)	39.1±34.1	140 (90.3)	33.2±24.7	0.0562*
Global Health Function	61 (39.4)	46.1±25.3	94 (60.6)	42.7±23.4	
P value (ANOVA)	0.041*		0.001**		

*Statistically Significant, **Highly Significant

Results indicated significant ($P = 0.056$) negative correlation (0.502) in between different mean functional scores and no of patients QoL affected. Majority of patients QoL affected when emotional functioning score were poor followed with social, physical & role functioning score and after measuring with analysis of variance (F test) there was found significant difference in different domains with cases affected and not affected.

DISCUSSION

Contemporarily, innovative clinical treatments have greatly improved the survivals of cancer patients, making QoL the next important requirement of survivors. QoL has received extensive attention as an outcome measurement in public health and clinical medicine. In the present study, QoL of cancer survivors was measured by EORTC QLQ-C30. Although certain clinical factors and socioeconomic status such as age, education, income, marital status and stage *et al.* are considered to be the most important factors influencing survivals of cancer patients, these are factors which can't be modified. In contrast, body weight was one of the few potentially modifiable lifestyle factors [Schemper, M et al].¹³ A total of 155 patients participated in the study. Male cases were just little bit more than the female and more than 40% of cases belong to advanced age group (40-60 yrs). Majority of cases were married and educated up to secondary education and belonged to lower middle class. The most frequently reported cancer (ca) in males it was ca oral and in females' most common cancer were ca breast followed by ca reproductive tract. Majority of cases were classified in second stage (TNM II) of cancer, with treatment of chemotherapy. More than 50% of patients had found the BMI below normal (<18). our cancer registry data was more or less same to other cancer registry study done by Puri SSA et al (2014).¹⁴

The complete table of all expected mean HRQoL scores for all significant socio-demographic population groups is too complex but, in order to keep the focus on the primary aim of the study, added to the paper. Still, as a part of our entire research project, all the expected mean HRQoL scores for any significant socio-demographic population group were prepared. The results of our study considering age and

gender distribution were similar to the results conducted in the other European countries and elsewhere in the world.^{15 - 17} Some important but mostly statistically insignificant gender differences were identified in our study population: men reported better quality of life on the majority of the specific scales and, at the same time, reported fewer symptoms. On the other hand, women reported less appetite loss and diarrhoea. We didn't observe any gender-specific difference on cognitive functioning. In the Norwegian study, which was the first study conducted on a sample of the general population; men reported better quality of life on all scales and fewer symptoms (Hjermstad MJ et al).¹⁸ Similar results were observed in the German study – men reported better quality of life on all scales and fewer symptoms in comparison to women (Schwarz R et al).¹⁹ In the study from Denmark, which was published in 2014, the better quality of life assessed by men was not so obvious, men reported better physical functioning, less insomnia and constipation, whereas women reported better social functioning and less dyspnoea.¹⁵

In our study we observed that all scales deteriorated with age. Older subjects also reported more symptoms. The only exception is emotional functioning where there was no age-dependent fall. Similarly, emotional functioning was not age dependent also in three Scandinavian studies^{15,18,20}, but in the German population there was a slight decrease of emotional functioning in the older age groups (Vaneja Velenik et al).²¹ Similar difference was noticed with the fatigue scale. In the our study population we noticed a similar fall in the mean score of the global health status/quality of life scale and a similar increase of the mean score of the fatigue scale as in the German study. As our scores of most scales are more similar to the German results, we can assume contrary to expectations, our results suggest that women who are solely responsible for domestic tasks generally have better QoL. This could be responding to an inverse relationship between variables, concluding that as woman's health improves, she may begin to incorporate certain activities, such domestic tasks, especially if she is unable to work away from home because of the disease. So that being solely responsible for domestic tasks doesn't implicate higher QoL, but higher QoL could lead to a reincorporation to domestic tasks. Age is also an important factor for the various QoL functions. For the QLQ-C30 scales,

younger women had poorer emotional, cognitive and social scores, possibly because of unmet expectations regarding QoL, making it more difficult to cope with the disease. In contrast, older women have lower scores on the physical and role scales. Previous studies also suggest that younger women have greater psychological morbidity and poorer QoL after breast cancer diagnosis than older women [Dialla PO et al²² Kwan ML et al²³. On the subscale emotional well-being, younger women reported slightly higher scores than older women, although they were not statistically significant. Contrary to our study results, Kwan ML et al²³ reported cancer in older age was related to higher scores in all QoL domains except for social/family well-being.

Evaluation of studies showed that education can improve the quality of life cancer patients undergoing radiotherapy. Effects of education with different domain on the quality of life of patients have been evaluated. We observed significant ($p=0.05$) for role and emotional functioning respectively in relation to education levels of a patient. While in the studies by various authors such as Heydarnejad *et al.*²⁴ done in patients undergoing chemotherapy no significance was found. Education develops self - efficacy and can improve the quality of life of cancer patients undergoing radiotherapy and chemotherapy. This was found in Lu et al. study (2017).²⁵ We found in this cross sectional study of participants with cancer that working around the time of cancer diagnosis and through the active treatment phase was positively associated with multiple areas of quality of life. House wife suffered much more and were found worst emotional, social and cognitive function scores. Functional and overall well-being may be higher in cancer patients working at the time of diagnosis because their ability to work may signify a sense of normalcy despite the cancer diagnosis. Our results support previous findings that continuing work after a cancer diagnosis is beneficial in multiple quality of life domains e.g., Bloom, et al. found greater increases in physical well-being among women working at least part time during the five years after diagnosis [Bloom JR].²⁶ People with a better economic situation will experience less financial distress and because they are less worried about high costs of treatment, job loss and salaries, which result in better QoL (Sanda MG et al²⁷). Cancer not only affects the overall QoL of patients, but also affects the QoL of single members of their families. For this reason, the families of these patients need a lot of social support to better adapt to the threats and problems associated with the disease. The adequate support to the families of patients improves the QoL of family members and provides the best support for patients finally improving their QoL (Ahmedzai S et al²⁸).

In this study, the larger the size of the social network, the more people understood social support so social and emotional functional score significantly high in Upper and upper middle class with joint family member. Similarly, a large supportive network,

through large amount of financial assistance and greater security in the socioeconomic context, can have a positive effect on the QoL of cancer patients (Ganz PA et al)²⁹. Regardless of the indicator used to measure social class, several studies have concluded that this is a clearly influential factor for QoL. Thus, belonging to a low social class has a negative impact on health and almost all functions of QoL [K.T. Ashing-Giwa et al.³⁰ The least favored classes generally have lower purchasing power, which limits their access to non-public therapeutic alternatives that could mitigate the effects of the disease [L.V. Holm et al]³¹, contributes to poor job stability and/or satisfaction, and disturbs psychological well-being [K. Meneses et al].³²

The rate of role functioning was found to be different with respect to marital status. Single and married individuals had good role functioning as compared to divorced individuals (<0.05). Married persons tend to present early before metastasis and receive advanced care unlike other individuals. Other study also estimated that cancer survival rate was also affected by marital status. A comparative study indicated that widowed patients were found to be at greater risk of death relative to other groups [Tadesse Mela ku Abega et al³³, A. Aizer et al³⁴]. Patient in nuclear family has better functioning QoL as compared to patient in joint family. The study found that living in a single family lowers the odds of having cancer. Similar experienced by Katarzyna Woźniak et al³⁵, that level of distress experienced by patient with family members is comparable or even higher, than the one experienced by the nuclear and single patient.

Better HRQoL is associated with higher BMI possibly owing to additional energetic reserve counteracting cachexia. Overweight breast cancer survivors reported significantly ($P < 0.05$) better QoL in almost all domains compared with underweight, normal weight and obese ones (Table 2). Overweight breast cancer survivors reported significantly higher QoL in domains of emotional function and fatigue, and had similar scores in all other domains when compared with normal weight ones; Underweight breast cancer survivors had significantly worse QoL in domains of constipation and diarrhea compared with normal weight ones (Xia, J et al³⁶).

There was a relationship between medical diagnosis of patients and HRQoL. Oral cancer patients had the worst HRQoL. The other cancers with worse HRQoL were breast and reproductive tract cancers. Physical functioning, emotional & cognitive domain of QoL was high among Female with reproduction organ cancer and breast cancer. Role functioning QoL variable was lowest among lung cancer. Similarly Prasongvej, Pichita et al³⁷ stated that Cervical cancer survivors had higher score in emotional and social function, global health and pain. The mean score of the different functional domain among different type of carcinoma had impact the QoL with association of stage and symptoms, in advanced stage and signifi-

cant symptom scale affect QoL (Lv Y, Zhang J et al 2014).³⁸ The cancer patients experience a variety of symptoms. Inadequate management of symptoms might hamper the performance of the daily activities of an individual. The treatment of symptoms will help relieve the suffering and improve the quality of life (QoL)[Heidrich SM, et al]³⁹.The symptoms have a major impact on QoL among the patients with cancers. Greater symptom load has been associated with the higher levels of emotional suffering and poor physical, societal functioning and global QoL. These symptoms had affected the normal functioning of the patients miserably. Emotional functioning was affected in 50%, and physical functioning was affected in almost 23% of the remaining 50% of the participants. The study conducted by Gandhi AK et al.⁴⁰ also found that 80% of the population had average the overall mean QoL score of the study population; similar findings also were observed in the current study. The findings from other research studies also show that there was a significant reduction in the QoL due to common symptoms resulting from cancer.

The advanced breast cancer patients had lower QoL due to their changed body image [Melo Filho MR et al]⁴¹. Many authors reported that side effects of treatment affect the patient's QoL depending on the individual circumstances, the type of cancer, and its treatment [Wyatt G et al].⁴² Ca and its treatment strategies substantially affect HRQoL of patients. HRQoL is viewed as one of treatment end points in these individuals. Estimation of HRQoL of patients living with Ca helps to evaluate the effectiveness of our interventions. In developing countries including India, HRQoL measurement is not performed routinely. Another finding on this study indicated that surgery showed a positive impact on the global health status of patients since it could bring a radical cure of the diseases if it is followed by adequate adjuvant therapy [Tadesse Mela ku Abega et al³³, M. Akca et al]^{33,43}. The most common compliance on symptom scale was nausea and vomiting followed by fatigue. Nauseas and vomiting are common in Ca patients due to the disease and therapy. Furthermore, fatigue was found to be the second most disabling symptom among Ca patients. It is resulted from the therapy including radiotherapy and chemotherapy as well as the disease state. Consequently, the QoL of patients is reduced as fatigue becomes severe [Tadesse et al, P. J. E. Miller et al]^{33,44}. Researches revealed that malignancy by itself could induce malaise and weakness [P. Stone et al]⁴⁵. Patients with no history of vomiting were more likely to have good QoL as compared to patients with vomiting history. Vomiting was found to affect routine activities of patients including household activities, feeding style, time allocation for social activities, and daily function and recreation. In addition, patients with preserved social functioning are nearly four times more likely to have good QoL. Furthermore, patients with unaffected EF had 4.5 times good HRQoL as compared to affected HRQoL [C. M. Lindley et al].⁴⁶ The findings

from other research studies also show that there was a significant reduction in the QoL due to common symptoms resulting from cancer [Melo Filho MR et al].⁴¹ The advanced breast cancer patients had lower QoL due to their changed body image. Many authors reported that side effects of treatment affect the patient's QoL depending on the individual circumstances, the type of cancer, and its treatment.[Wyatt G et al] ⁴². It is noteworthy to report that the number of emotional symptoms that influenced the quality of life was considerably higher than physical symptoms. We eventually recommend that the emotional characteristics of patients with cancer should be evaluated and appropriate care initiatives should be implemented to improve their quality of life cancer and its treatment affected somehow the patients causing deficits in the functions and presence of more symptoms, jeopardizing their QoL among cancer patients. Inadequate management of symptoms might hamper the performance of the daily activities of an individual and their life affected.

Our study showed the correlation in between different functional domain scores and assessed on predicted cancer patients life affected or not. it had been found negative correlation in between domain score and QoL affected. All domains of an individual's QoL can be affected by malignancy. The deterioration in the QoL kicks off following diagnosis of the malignancy and lingers due to the vigorous nature of the treatment [Saravana Kumar et al].⁴⁷

CONCLUSION

Health related quality of life (HRQoL) of cancer patients was found to be low in this study of Gwalior. Patients initial stage (e.g., TNM I) had found better HRQoL. Further, the unmet needs of Ca patients and the level of satisfaction with the overall care were found to influence the extent of HRQoL. Therefore, early detection of neoplasm to arrest metastasis and extent of disease (e.g., TNM II, III & IV) is warranted in order to achieve better QoL. In addition, addressing the unmet needs of these patients and ensuring higher satisfaction rate are recommended to maintain adequate HRQoL. This study revealed that cancer patients experience many symptoms which affect their QoL. The management of cancer pain is a critical issue in the care of patients with cancer. The main issues are management of symptoms and need to use strategies that will empower the patients to have a better sense of control over their illness and treatment to improve the QoL. The findings of this study would pave ways for future research focusing on the need for interventional studies which would work to decrease the adverse impact of different factors on the QoL in patients with cancers.

LIMITATION

Our study has limitations with This study was a restricted one because it was cross-sectional in nature

and was applied with non-homogeneous, low sample size by convenience approach of one center; therefore, the results could only be applied in the population studied in this center.

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