

Quality of Life in Cancer Patients Undergoing Chemotherapy in a Tertiary Care Center in Malwa Region of Punjab

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ABSTRACT

Objective: The objective of this prospective, non-interventional, 4-month observational study was to analyze and compare patient-reported quality of life (QOL) and their physical/psychosocial symptom burden during their respective chemotherapy sessions.

Materials and Methods: A prospective and descriptive study was carried out jointly by Pharmacology and Oncology Departments of a tertiary care center in Malwa region of Punjab. The data collection was performed by administering validated questionnaire/response after taking informed consent.

Results: A total of 131 cancer patients were recruited with the mean age of 49.05 ± 14.35 (SD (standard deviation)) years. As per the QOL scoring of Global Health Status (GHS) and four items of symptom scale, that is, insomnia, pain, appetite loss, and constipation, and financial difficulties attained a significance difference. GHS significantly improved in group three as compared to group one, indicating that the patient's overall health/QOL improved as the chemotherapy session progressed.

Conclusion: Although QOL scoring system did not show significant improvement in all areas (except insomnia, pain, appetite loss, constipation, and financial difficulties) with reference to their respective chemotherapy cycles, but a judicious diagnosis with an appropriate treatment including chemotherapy may lessen the negative perception of cancer as a deadly and fatal disease in our rural population.

Key words: Chemotherapy, European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Core 36, quality of life

INTRODUCTION

Cancer prevalence in India is estimated to be around 2.0-2.5 million, with over 7-8 lakh new cases identified every year and data enumerated specifically among males: 46-122 per 100,000 population and among females: 57-135 per 100,000 population. Cancer deaths reported

per year: 4-5 lakh. More than 70% of the cases report for diagnosis and treatment in the advanced stages of the disease, leading to a poor survival and high mortality rate.^[1]

Nowadays, Punjab is acknowledged as cancer bowl of India with rising burden of cancer that leads to additional load of noncommunicable diseases. A survey was conducted by the Department of Health and Family Welfare, Government of Punjab in 2009 in which 7,738 cases of cancer were identified and out of which 245 were in Faridkot District of Punjab.^[1]

As contrary to above accounts, a new disclosure by a nationally representative survey published in Lancet,

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revealed that the cumulative risk index (probability of death due to cancer) in Punjab is less than the national average and even lesser than most of the states in the country.^[2] The State of Punjab has been in focus because of a mixture of reports emerging in media which especially focused on the Malwa region of the state. It shows divergence on prevalence and incidence of data regarding cancer patients.

Cancer chemotherapy in the 20th century has been dominated by the development of genotoxic drugs, initiated by the discovery of the anticancer properties of nitrogen mustard and the folic acid analogue aminopterin in the 1940s.^[3] Chemotherapy has been recognized to decrease the incidence of both local and systemic recurrence and improve overall survival of patients.^[4] Combination chemotherapy is usually preferred to outweigh risk-benefit ratios, however, long-term cancer chemotherapy have its own impact on cancer survivors including QOL, psychosocial issues, and physical symptoms and particularly the adverse effects of systemic adjuvant therapy (chemotherapy).^[5,6]

QOL is subjective and patients own judgment in this respect is a major determinant, in a way it is described as a “quality of being”.^[7] Cancer and its treatment has a substantial impact on mental and social health and in conclusion, on QOL of patients.^[8,9] In this new era of cancer management, more emphasis is given on QOL rather than on quantity of life,; so in cancer patients where total cure is a remote attainment, measurement of QOL and follow-up may indicate acceptance, adaptation of disease, and chemotherapy.^[10-12]

Health-related QOL (HRQOL) measures (instruments and questionnaires) are well-defined questionnaires that gauge individuals’ observation of their own physical, mental, and social health grade, or aspects of their health status resulting from cancer and its treatment.^[13]

Many cancer-specific QOL measures have been developed, such as the Functional Adjustment to Cancer Therapy (FACT), European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-C30 (EORTC QLQ-C33), Functional Living Index-Cancer (FLIC), and Cancer Rehabilitation Evaluation System (CaRES/CaRES-SF).^[14,15]

The objective of this prospective, non-interventional, 4-month observational study was to analyze and compare patient-reported QOL and their physical/psychosocial symptom burden, measured by completion of validated questionnaires in heterogeneous cancer cohort patients during their respective chemotherapy sessions.

MATERIAL AND METHODS

A total of 131 cancer patients were recruited in the present non-interventional, prospective clinical investigation analysis. The time duration was 4 months. The study was conducted by Oncology and Pharmacology Department of a tertiary care center in Malwa region of Punjab after taking permission from the Institutional Ethics Committee. Before the subjects were asked to participate and fill QOL questionnaire, a formal consent was obtained from all of them. The following inclusion criteria were outlined in advance before recruiting patients for study:

- Diagnosed with cancer and visiting the institution to receive chemotherapy
- No history of other chronic disease such as diabetes or heart disease
- No known mental problem or being treated with psychotropic drugs.

After translating the EORTC QLQ-C30 in local language (Punjabi), standardized and modified questionnaires were used to measure QOL in the patients.

EORTC QLQ-C30 version 3

The EORTC QLQ-C30 version 3 questionnaire consists of five functional scales (physical, role, emotional, cognitive, and social), a scale for Global QOL, and nine symptom scales (fatigue, pain, nausea/vomiting, dyspnea, appetite loss, sleep disturbance, constipation, diarrhea, and financial difficulties). All measures are scaled from 0 to 100 with higher scores in symptom scales indicate a more severe problem (i.e. more severe symptoms).^[15,16]

We used a linear transformation to standardize the raw score, so that scores range from 0 to 100; a higher score represents a higher (“better”) level of functioning GHS or a higher (“worse”) level of symptoms.^[15] The patients were categorized as those with varied number of chemotherapy cycles as shown in Table 1.

Data collection

Baseline information included demographic data, for example, age, gender, education level, occupation, and marital status. Clinical information included type of

Table 1: Study group characteristics

Name of group	Abbreviation of groups	No. of subjects	Chemotherapy cycles
Group one	G-1	48	1-2
Group two	G-2	59	3-4
Group three	G-3	24	5 and above

cancer, family history, relapse, and duration and number of chemotherapy cycles.

Statistic

Baseline distinctiveness (demographic, clinical, and HRQOL) were summarized by descriptive statistics. Mean, percentages, and standard deviation (SD) were calculated wherever appropriate. HRQOL and clinical characteristics were compared among three distinct categories of participants [Table 1]. The comparison among three distinctive groups (varied number of chemotherapy cycles) was done by analysis of variance (ANOVA) with Tukey's honestly significant difference test (T-HSD) except in symptom score with skewed data; we applied nonparametric Kruskal-Wallis test. All $P \leq 0.05$ were considered as significant.

RESULT

All 131 eligible patients participated in the study with response rate of 100%. The mean age of the participants was 49.05 years \pm 14.35 (mean \pm SD) with most common age group being 41-50 years with female preponderance (66%). Sixty-five patients (49.61%) were illiterate and majority were (65.64%) unemployed as shown in Table 2. Out of our 131 subjects, 30.53% were suffering from genitourinary carcinoma in which majority of cases were of cervix and endometrial cancers (11.45%), followed by ovary and testis (10.68%). Family history was seen only in 13.74%, in which no significant hereditary correlation was observed. Only 2.29% of patients had breast cancer relative (mother/grandmother) suffering in family. The cancer-specific variable tabulated in Table 3.

Mean and standard deviation of individual item in all three scales were calculated in all three groups and statistical inference was drawn using analysis of variances (ANOVAs) for any key significance with post ANOVA Tukey's HSD to establish intragroup characterizations as shown in Table 4.

As per the QOL scoring, GHS and four items of symptom scale, that is, insomnia, pain, appetite loss, and financial difficulties attained a significant difference [Figures 1 and 2]. GHS significantly improved in group three as compared to the group one, indicating that the patient rated their overall health/QOL improved and better as the chemotherapy session progressed as shown in Figure 3. Statistical significant observed in pain parameter in G-1 and G-2, but surprisingly the improvement from G-2 to G-3 was not as expected. Five functional scales did not improve, rather remained invariable throughout the study [Figure 4]. A linear down regression was noticed in GHS with increasing age [Figure 5].

Table 2: Patient's demographic details

Variable	Group	Frequency	Percentage
Age	Up to 20 years	5	3.81
	21-30 years	6	4.58
	31-40 years	25	19.08
	41-50 years	39	29.77
	51-60 years	32	24.42
	61-70 years	19	14.50
Gender	>70 years	5	3.81
	Male	44	33.58
Marital status	Female	87	66.41
	Married	125	95.41
Education	Unmarried	6	4.58
	Illiterate	65	49.61
	Up to 5 th standard	13	9.92
	5 th -10 th standard	22	16.79
	10 th -12 th standard	24	18.32
Occupation	>12 th standard	7	5.34
	Unemployed	3	2.29
	Laborer	14	10.68
	Household	83	63.35
	Students	5	3.81
	Professional	2	1.52
	Others	24	18.32

Table 3: Cancer-specific statistics

Variables	Groups	Frequency	Percentage
Type of cancer	Head, neck, and face	35	26.71
	Thorax	27	20.61
	Abdominal	15	11.45
	Genitourinary	40	30.53
	Hematological/lymphatic	09	6.87
	Connective tissue	03	2.29
	Unknown primary	02	1.52
Family history of cancer	Present	18	13.74
	Absent	113	86.25
Relapse of cancer	Present	37	28.24
	Absent	94	71.75
Number of chemotherapy cycles patient had	1-2	48	36.64
	3-4	59	45.03
	5 and above	24	18.32
Duration of chemotherapy	<6 months	65	49.61
	7-12 months	30	22.90
	13-18 months	14	10.68
	18-24 months	07	5.34
	>24 months	15	11.45

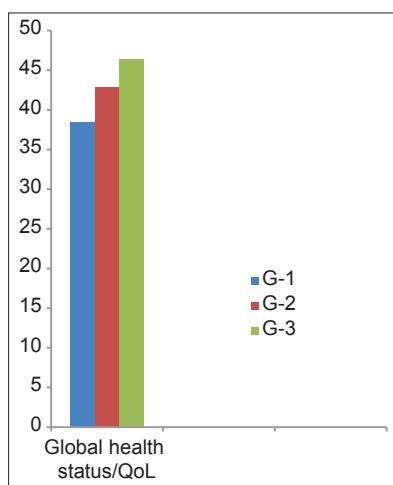
DISCUSSION

In current medicine practice, the evaluation of a patient's health is based not only on clinical or laboratory indicator but also on holistic advances that includes the evaluation of the consequences of diagnosis or therapy/treatment, which perhaps indicate the progress of QOL in either way.

Table 4: Patients' EORTC QLQ-C30 (version 3) dimension scores in three groups

Component items of EORTC QLQ-C30	Group (mean (SD))			ANOVA P value	T-HSD o.05	Between groups significance
	One (N=48)	Two (N=59)	Three (N=24)			
Global Health Status/QOL scale						
Global Health Status/QOL	38.46 (13.1)	42.78 (12.9)	46.37 (15.9)	0.05*	7.4	G-1 and G-3
Functional scales						
Physical functioning	55.003 (22)	61.59 (21.3)	55.28 (26.3)	0.26		NS
Role functioning	36.81 (28.1)	39.27 (25.9)	37.5 (30.4)	0.89		NS
Emotional functioning	42.53 (23.5)	46.05 (20.8)	44.1 (29.5)	0.74		NS
Cognitive functioning	75.35 (18.2)	74.58 (18.1)	73.61 (25)	0.94		NS
Social functioning	41.67 (17.2)	40.4 (17.3)	40.28 (23)	0.93		NS
Symptom scales						
Fatigue	63.66 (16.3)	59.89 (19)	60.65 (20.2)	0.56		NS
Nausea and vomiting	32.64 (31.3)	24.02 (21.5)	28.48 (29.7)	0.26		NS
Pain	52.78 (22.4)	39.55 (23)	43.75 (20.8)	0.01*	12	G-1 and G-2
Dyspnea	17.36 (26.6)	20.91 (26.9)	20.84 (21.6)	0.59 [#]		NS
Insomnia	35.42 (25.4)	27.6 (23.7)	20.45 (17.9)	0.03*	12.79	G-1 and G-3
Appetite loss	45.4 (17.3)	42.38 (19.4)	34.67 (15.8)	0.061*	9.8	NS
Constipation	37.5 (32)	32.21 (32.7)	19.45 (34.3)	0.051* [#]	17.98	G-1 and G-3
Diarrhea	18.75 (29.9)	13 (23.2)	12.5 (29.2)	0.57 [#]		NS
Financial difficulties	65.14 (18.5)	70.62 (22.4)	77.8 (20.8)	0.05*	11.34	G-1 and G-3

*Statistically significant, [#]Kruskal-Wallis Test. T-HSD, Tukey's honestly significant difference test; QOL, Quality of life; EORTC QLQ-C30, European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30; ANOVA, Analysis of variance; SD, Standard deviation; NS, Not significant

**Figure 1: Global health status/quality of life (QOL) scale scoring**

So in cancer care, “global well-being” including physical, emotional, mental, social, and behavioral components is the main surrogate objective apart from concluding cure.

Nowadays, QOL has been introduced as an endpoint for treatment particularly in advanced cancer stages and it also is an early indicator of disease progression. A number of valid QOL tools have become accessible to determine HRQOL.^[17-19]

The most widely applicable instrument to measure the QOL in cancer patients is the EORTC QLQ-C30. Using this method, the current study assessed the QOL in cancer patients undergoing chemotherapy. Several studies support

our findings on the influence of chemotherapy on QOL among the cancer patients.^[20-22]

The present study shows that improvement of QOL in cancer patient can be conceded by means of chemotherapy. However, this is not always the case. For example, Nemati *et al.*, reported that the level of QOL in the patients with leukemia undergoing chemotherapy was 87.5% lower than that in the control group.^[23] The differences might be due to different patients' population (sample size or patient age), cancer types, or may be due to wide-ranging toxicity of chemotherapy agents.

Statistical significant improvement was observed in pain parameter between group one and two, but surprisingly the improvement from group two to three was not as per expectation. This may be attributed to the subsequent adverse reactions that follow the advance stage of chemotherapy (like neuropathies or subjective variations). However, many other study quote amelioration of pain severity.^[24-26]

None of the functional scale items turned significant in our study including physical functioning, role functioning, emotional functioning, and cognitive and social functioning. Perhaps they remain stable during the progression of chemotherapy sessions with minor alteration which is in accordance with the study conducted by Zabernigg *et al.*^[27]

Insomnia, appetite loss, and constipation significantly improved in majority of patients; in contrast, there was

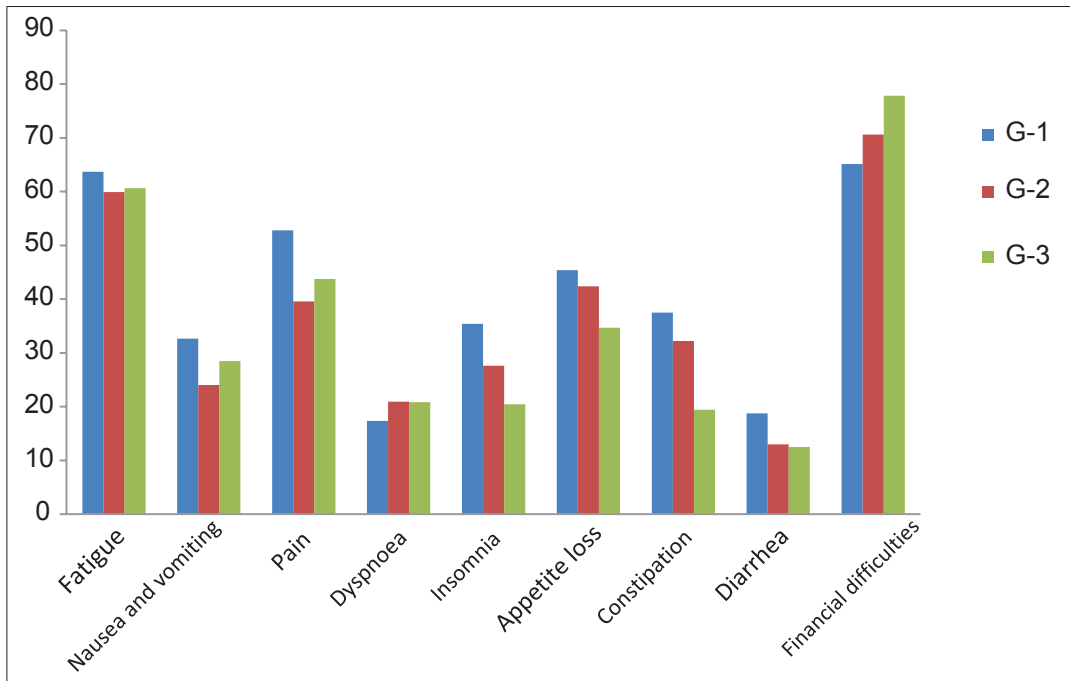


Figure 2: Symptom scale scoring status

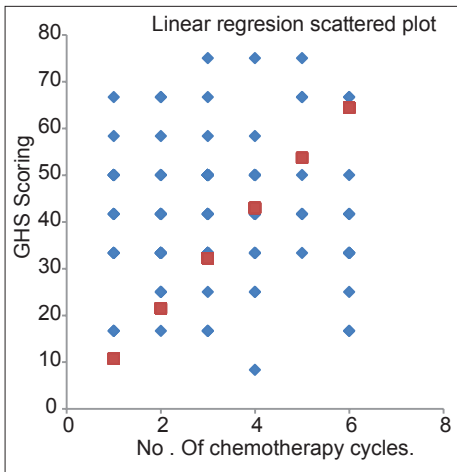


Figure 3: Linear regression graphs of Global Health Status and number of chemotherapy cycle given

significant increase of financial burden due to high cost of drugs and loss of earning days during successive chemotherapy sessions.

According to the findings of the present study, statistically there was no significant correlation observed between demographic variables such as time passed from diagnosis, income level, marital status, and employment status with QOL; except younger age group who showed significant increase in GHS score and this has been shared by other studies.^[28,29] It should be noted that a considerable number of patients in

the present study were illiterate or less educated; therefore, data collection in all the patients was assisted by medical students. So, it is likely that some questions are not precisely answered and it was one of the limitations of the study. Being heterogeneous groups (including all type of cancers, stages, etc.), without considering the stages and grading we encountered majority of patients at their variable stages of disease progression, so intragroup (within cancer) variations may be present.

Despite the limitations, the present study represents an attempt to understand the complicated interaction between cancer patients undergoing chemotherapy and their response to QOL domains. Our study is the first of its type which in depth assessed the chemotherapy response in terms of improvement in QOL in an area where the cancer incidence is alarmingly high, leading to panic alarm in rural population of Punjab.

CONCLUSION

A comprehensive assault by cancer surely disrupts the normal well-being of patients or we can say that cancer is an important health issue influencing QOL. The frequently considered efficacy criteria of cancer therapy are usually insufficient; if blended with individual's perspective (measured as HRQOL), than only it signifies

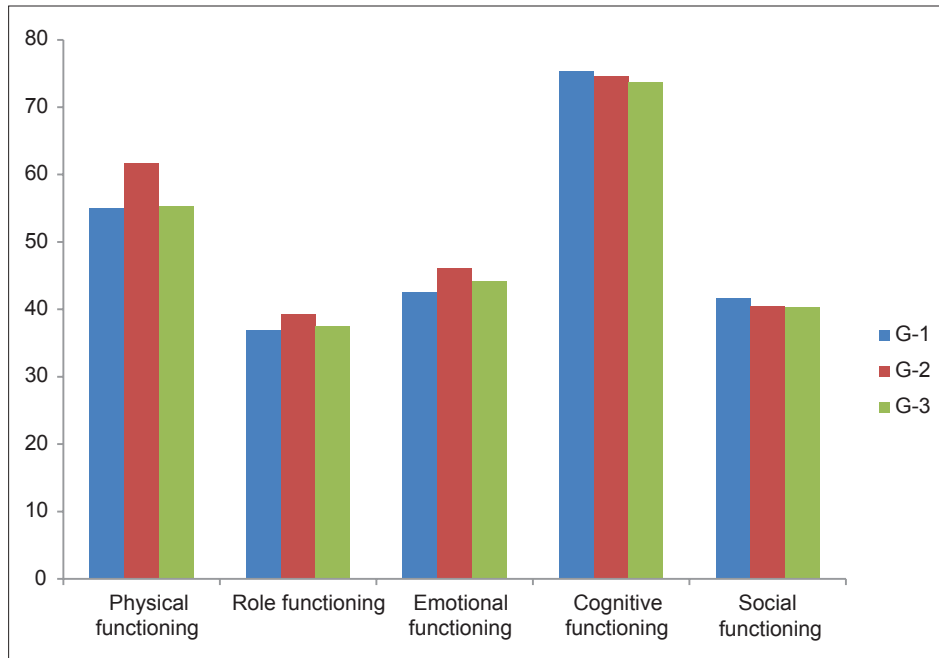


Figure 4: Functional scale scoring status

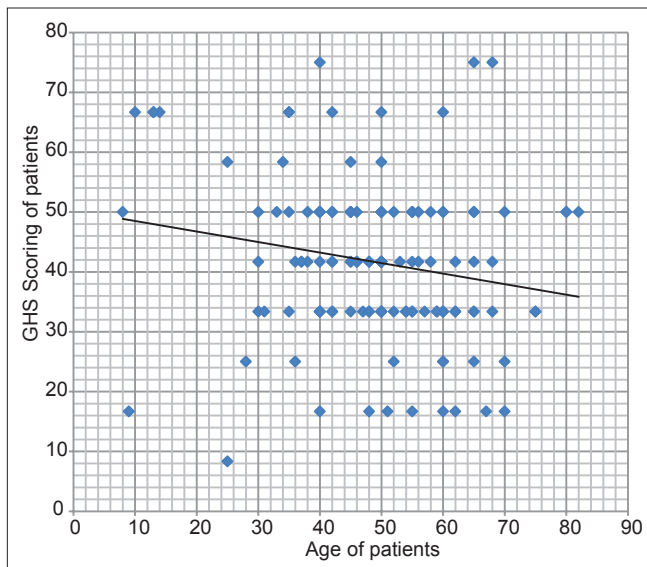


Figure 5: A linear regression graph of Global Health Status and age of patients.

a holistic approach toward the disease process. So well thought-out endpoint in cancer management with an assortment of conventional therapy and QOL measure will pronounce a better long-term goal. Education, awareness, and rehabilitation support are few minor but important things which need to be well-synchronized among government and social support organizations. A more comprehensive study is needed to establish the correlation of QOL with stage, grade, recurrence, metastasis of specific cancers, etc.

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