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Original Article

Quality of Life and Its Determinants in Adult Cancer Patients Undergoing Chemotherapy Treatment in Pakistan

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A B S T R A C T

Objective: Cancer is a leading cause of death worldwide. Likewise, in Pakistan, it is a major health problem, with an approximate increase each year. Cancer treatment, particularly chemotherapy, produces a detrimental effect on individuals' well-being. Since the past few years, quality of life (QOL) is considered as the primary goal of cancer treatment in patients' survival. This study aimed to assess the QOL and its determinants in adult cancer patients undergoing chemotherapy treatment. **Methods:** An analytical cross-sectional design was employed to achieve the study objectives, utilizing consecutive sampling technique. A total of 150 adult (>19 years) cancer patients were recruited from a Tertiary Care Hospital in Karachi, Pakistan. The data were collected using the Functional Assessment of Cancer Therapy-General, a QOL questionnaire. Multiple linear regression was run to determine the effect of predictor variables, with a mean QOL score. **Results:** The overall mean score of QOL as 57.37. The domains of physical and emotional well-being were mainly affected by the chemotherapy treatment. Variables such as no previous hospitalization and no significant changes in life events were positively associated with the QOL. On the other hand, being female, unemployed, chemotherapy side effects (>1 week), impaired socialization, and discrimination by family/relatives were negatively associated with the QOL. **Conclusions:** The study findings suggested an overall low QOL among adult cancer patients undergoing chemotherapy treatment. It is recognized as a stressful treatment, which adversely affects the QOL of cancer patients. Interventions should focus on both the physical and psychological issues and need to be addressed to improve the QOL of adult cancer patients.

Key words: Cancer, chemotherapy, emotional well-being, physical well-being, quality of life, social well-being

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Introduction

Cancer is the second most common cause of deaths worldwide.[1] About 8.2 million people died due to different cancers in 2012.[2] In Asia, the incident rate of cancer is expected to increase from 6.1 to 10.7 million in 2030, with an estimated increase in mortality rate from 4.1 to 7.5 million in 2030.[3] Likewise, the rate of cancer is escalating in Pakistan; in 2012, of its 173 million people, 1.4 million were reported as cases of cancer, with an expected rise in the incident rate of 150,000 cases each year.[4]

Cancer affects a person's quality of life (QOL) in all domains. The impairment in the QOL starts from the diagnosis of cancer and continues with the aggressive nature of treatment. Chemotherapy is one of the most common treatment modalities that patients receive to combat cancer. Among 65% of the cancer population, 25% patients receive chemotherapy as the first line of treatment.[5] Chemotherapy is used to treat cancers by killing the rapidly growing abnormal cells and is believed to lower the recurrence of cancer and increase the survival rate of patients.[6] However, besides these therapeutic effects, it also has serious adverse effects which can have detrimental effects on the QOL of an individual. Moreover, chemotherapy treatment is administered for a long time duration to get the desired effect and requires frequent hospitalization for disease management, which poses an additional burden on cancer patients.[7]

Unlike other therapies, chemotherapy exhibits several systemic side effects that are difficult to tolerate. The most commonly reported side effects experienced by patients during and after chemotherapy cycles include nausea/vomiting, thrombocytopenia, mouth ulcers, and fatigue.[8-11] These adverse effects affect a person's ability to work and decrease their functional capacity. The symptoms are not limited to physical dysfunction only, but they also interfere with patients' psychological and emotional stability. An investigation conducted on female cancer patients showed that all the women who were working at the beginning of the chemotherapy treatment left their employments gradually with increase in the cycles due to the discouraging attitude of the employers.[12] Consequently, the individuals felt isolated, financially dependent on their families, and eventually, they lost interest in their life. Altered body image, that is, alopecia, an extremely distressing symptom, prevents people from going out for socialization and limits their normal life enjoyments.[13] In addition, the financial implication associated with the treatment is an added burden, which eventually affects the overall functioning of an individual.[14] Thus, chemotherapy treatment produces an enormous physical, psychological, and emotional trauma among cancer patients, influencing their overall QOL.

The effects of chemotherapy may vary among individuals based on several factors, such as age, gender, cancer site, and stage of the disease. The findings of an American study indicated that older adults (65 and older) demonstrated better coping and QOL scores in comparison with young adult cancer patients.[15]

In a cross-sectional study, it was found that being a female was significantly ($P = 0.009$) associated with psychological stress as compared to male gender.[16] Different cancer sites also adversely affect the QOL. A research study reported significant higher distress levels ($P \leq 0.001$) in breast and digestive tract cancer patients as compared to those suffering from other cancer sites.[17] In addition to this, disease stage is also found to be a predictor of QOL. A cross-sectional investigation was carried out among cervical cancer patients revealed a significant decline in all QOL domains in women having Stage IV tumors.[18] Moreover, support from family and health-care workers (HCWs) reported to have better QOL outcomes in cancer patients.[19,20]

Many of the recent cancer studies focus on the physical and psychological adverse effects of chemotherapy treatment or emphasize on certain specific cancer sites. However, studies examine the overall QOL components and its related factors are rare. Thus, this current study aimed to assess the QOL and its determinants in adult patients suffering from any type of cancer and undergoing chemotherapy treatment. The study aimed to answer the following questions:

1. What is the QOL of adult cancer patients undergoing chemotherapy treatment?
2. What are the determinants associated with the QOL of adult cancer patients undergoing chemotherapy treatment?

Methods

An analytical cross-sectional study design was used to answer the research questions.

Participants were recruited using consecutive sampling strategy from the Oncology Daycare Chemotherapy Unit of a Tertiary Care Hospital in Karachi, Pakistan. This chemotherapy bay caters multiple patients daily for the administration of different chemotherapeutic regimens. The patients who are admitted belong to different socioeconomic strata, ethnic background, and education level. Thus, it provides an opportunity to recruit population with diverse characteristics. Eligible participants were approached with the help of patient schedule list and patients' bedside nurses taking care of these patients. Researcher recruited the willing patients after explaining them the research purpose, procedure, and potential risks and benefits of the study. Participants were selected on the following

criteria: (a) patients aged 19 years and older, irrespective of the site of cancer, (b) patients who had received two or more cycles of chemotherapy as these patients can explicitly tell how chemotherapy affect their life in terms of symptoms, financial burden, societal reaction in relation to their disease, and many others, and (c) patients who could speak and understand Urdu or English language. Patients who were known cases of (a) diabetes, (b) heart disease, or (c) psychiatric illness, (d) not aware of their diagnosis, and (e) not willing to participate were excluded from the research study.

Among 200 cancer patients approached, only 150 patients were agreed to participate in the study. All the agreed individuals completed the study questionnaire. All recruited individuals were provided a written informed consent before starting the process. The study was approved by the Institutional Ethical Review Board of the Aga Khan University, Karachi, Pakistan.

A self-developed questionnaire was used to collect data regarding the sociodemographic and clinical characteristics of the study participants. This questionnaire was based on the information extracted from the existing literature. It has five main components inquiring personal and financial information, chemotherapy treatment and its related side effects, support system and level of socialization during treatment. This questionnaire was applied through the interview.

The tool Functional Assessment of Cancer Therapy-General was used to measure the QOL of the study participants. This tool was developed by a group, the Functional Assessment of Chronic Illness Therapy (FACIT) measurement system to measure the QOL of all types of cancer patients. It consists of 27 questions measured on a 5-point Likert scale (0 = not at all, 1 = a little bit, 2 = somewhat, 3 = quite a bit, 4 = very much). The tool comprises four common QOL domains: physical, social/family, emotional, and functional well-being. The higher the score, the better the QOL. The original tool is in English and its translation is also available in Urdu language. Permission was obtained from the administration of the FACIT system to use the tool.

The content validity index for the tool was 0.84 for both relevance and clarity. The value of the reliability coefficient (Cronbach's alpha) for the total scale was found to be 0.88, and for the subscales, it was ranged from 0.86 to 0.70, respectively.

For the purpose of data analysis, statistical package for social sciences (SPSS) version 19 was used. Mean and standard deviation (SD) were calculated for normally distributed continuous variables. For categorical variables, frequencies and proportions were reported. Multiple linear regression analysis was done to identify the factors associated with QOL of adult cancer patients undergoing chemotherapy treatment.

Results

Demographic and disease-related characteristics

Overall, 150 adult cancer patients participated in this study. Sixty-six percent of the participants were females. The mean age of the study participants was 48.23 years. In relation with the occupational status, 74.0% of the study participants were unemployed, and more than half of the participants (76.0%) had a single earning member in their families. Majority (60.7%) of the study participants or families belonged to lower middle-income group [Table 1]. 28.7% were breast cancer patients, followed by 19.3% with ovarian tumors; whereas, the remaining participants were

Table 1: Demographic profile of the adult cancer patients	
Characteristics	***n*=150 (%)**
Gender	
Male	51 (34.0)
Female	99 (66.0)
Age (years)	
19-35	30 (20.0)
36-50	52 (34.7)
51-65	56 (37.3)
>65	12 (8.0)
Marital status	
Married	124 (82.7)
Unmarried	24 (16.0)
Separated/divorced/widowed	2 (1.3)
Educational status	
Below primary	10 (6.7)
Primary	11 (7.3)
Matric	18 (12.0)
Intermediate	30 (30.0)
Graduation and above	81 (54.0)
Occupational status	
Employed	39 (26.0)
Unemployed	111 (74.0)
Earning members	
1	114 (76.0)
2	28 (18.7)
>2	7 (4.70)
Monthly income	
>20,000	11 (7.3)
21,000-50,000	91 (60.7)
51,000-100,000	41 (27.3)
>100,000	6 (4.0)
Financing of chemotherapy cost	
Self-financed	124 (82.7)
Sponsored	19 (12.7)
Donors	7 (4.7)
Values are *n* (%)	

diagnosed with other cancer sites. Study participants were receiving palliative (42.0%), adjuvant (31.3%), and (26.7%) neo-adjuvant chemotherapy treatment. With regard to side effects, most of the patients (42.0%) experienced chemotherapy-related symptoms, approximately for one week; however, for the management of these side effects, a few were hospitalized. Majority (89.0%) of the participants responded that they had received chemotherapy-related education before the initiation of the treatment [Table 2].

Quality of life and chemotherapy treatment

The overall QOL mean score was 57.37, with an SD of +13.11. With respect to individual domains, the participants scored best in social/family well-being with a mean of 22.33 (SD +3.42) whereas individuals had lower scores on emotional and physical well-being, that is, 10.32 (SD +4.95) and 10.41 (SD +5.32), respectively. The last domain, i.e., functional well-being, presented a mean of 14.31 (SD +4.22) [Table 3].

Determinants of quality of life

The statistical significance of the predictors with mean QOL was checked out through multiple linear regression analysis. The final model indicates that 34.1% of the variability in the mean QOL is explained by female gender ($\beta = -1.51$, $P = 0.012$), unemployment ($\beta = -1.34$, $P = 0.032$), parents as caretaker of the patients ($\beta = -1.62$, $P = 0.03$), and post-chemotherapy side effects more than a week ($\beta = -1.186$, $P = 0.04$), which were the factors that resulted in poor QOL of cancer patients. Moreover, patients who were avoiding socialization ($\beta = -2.25$, $P .20.001$) due to the stigma and discriminatory attitude by family/relative ($\beta = -8.53$, $P .50.001$) also reported a decline in their QOL, whereas no hospitalization due to the chemotherapy side effects ($\beta = 1.43$, $P = 0.01$) and no other significant changes in the life during the treatment phase ($\beta = 1.56$, $P = 0.01$) were the determinants contributed to better QOL [Table 4]. With respect to the Pakistani culture, the determinants which mainly affect these patients' QOL were being a female cancer patient, side effects of chemotherapy medicines, and reluctant to socialize due to stigmatization.

Discussion

Our study estimated an average mean score of QOL as 57.37 depicts poor QOL among adult cancer patients undergoing chemotherapy treatment. Compared with the other study conducted on gynecological cancer patients which reported a score of 62.1, this was considered as low QOL among patients undergoing chemotherapy treatment.[44]

Within all the constructs, emotional well-being appeared to be the most affected in our study participants, with

a score of 10.32. Consistent with the study carried out among Turkish cancer patients, a lower score of 9.07 was identified.[21] Similarly, a study carried out among breast cancer patients in Brazil also reported emotional well-being as the most negatively affected dimension of QOL.[45]

The findings of this study showed that poor physical health is associated with lower QOL. Lack of energy (that is fatigue) and nausea/vomiting were the most common side effects reported by the study participants. Concurrent with the previous studies, chemotherapy was

Table 2: Clinical characteristics and therapeutics of adult cancer patient

Characteristics	n=150 (%)
Cancer type	
Breast	43 (28.7)
Ovarian	29 (19.3)
Colon/rectum	23 (15.3)
Head and neck	6 (4.0)
Others	49 (32.7)
Disease stage	
I	1 (0.7)
II	17 (11.3)
III	63 (42.0)
IV	64 (42.7)
Type of chemotherapy	
Neo-adjuvant	40 (26.7)
Adjuvant	47 (31.3)
Palliative	63 (42.0)
Number of chemotherapy sessions received	
2-5	84 (56.0)
6-10	45 (30.0)
11-15	17 (11.3)
>15	4 (2.70)
Duration of postchemotherapy side effects	
2-3 days	47 (31.3)
1 week	63 (42.0)
>1 week	40 (26.7)
Hospitalization	
Yes	34 (22.7)
No	116 (77.3)
Information received	
Yes	134 (89.3)
No	16 (10.7)

Values are n (%)

Table 3: Quality of life scores in all four domains of the functional assessment of cancer therapy-general tool

Domains	n	Minimum	Maximum	Mean	SD
Physical well-being	150	2	24	10.41	5.321
Social/family well-being	150	11	27	22.33	3.422
Emotional well-being	150	2	23	10.32	4.954
Functional well-being	150	5	25	14.31	4.227
Overall QOL	150	29	92	57.37	13.11

P=0.05 is significant, QOL: Quality of life, SD: Standard deviation

Table 4: Multivariable analysis of determinants associated with quality of life			
Characteristics	β (SE [β])	95% CI	*P*
Female	−1.51 (0.594)	−2.69-−0.34	0.012
Unemployed	−1.34 (0.619)	−2.56-−0.11	0.032
Chemotherapy side effects (>1 week)	−1.186 (0.589)	−2.3-−0.020	0.046
No hospitalization	1.435 (0.548)	0.340-2.52	0.010
Parents (as caretaker)	−1.620 (0.742)	−3.08-−0.15	0.031
No significant change	1.56 (0.619)	0.342-2.79	0.013
No socialization	−2.256 (0.523)	−3.29-−1.22	<0.001
Discrimination by family/relatives	−8.535 (1.984)	−12.45-4.61	0.000

FACT-G: Functional assessment of cancer therapy-general, QOL: Quality of life, CI: Confidence interval, SE: Standard error

highly associated with severe fatigue and nausea among cancer patients which affected their ability for self and family care.[11,22]

Similar to the existing literature, the current study also showed that the female gender was significantly associated with the poor QOL. Generally, females are identified with efficiency in household work and childbearing and rearing. Women adapt these behaviors happily as a cultural norm. Moreover, this perception is a bigger reality for the traditional Pakistani society. Disturbance in these practices, due to the disease and its treatment, will greatly influence their QOL.[23,24]

It is well-recognized that patients who experienced economic hardships are at the higher risk for developing distress. Our study has found a negative significant association between the financial status and QOL. These results are consistent with some of the previous investigations.[25-28] This finding is not surprising because chemotherapy is a prolonged and expensive treatment which creates financial burden among the cancer patients. In the developing country like Pakistan, this is even worse as majority of the population belonged to lower-middle class families and had one earning member who solely responsible for all family expenditure.

This situation poses an additional financial burden, along with the usual household expenses, on cancer patients and their families.

Although it is apparent that cancer itself affects the physical functioning of a person, with the effects of chemotherapy treatment, it becomes worse. This study revealed that longer duration of post chemotherapy side effects (more than a week) impacts negatively on the QOL; these findings were also in line with the existing literature.[29-32] Several other researches indicate frequent hospitalization due to chemotherapy adverse effects.[33-35] On the contrary, in the current study, although a majority of the study participants faced severe side effects for a week or more, a few hospitalizations were reported by them. The low number of hospitalization in the present study could be explained by the findings that the majority of the patients were educated by the HCWs about the management of chemotherapy side effects, before starting the actual therapy. This received knowledge may have facilitated them in handling their side effects effectively at home.

Participants who experienced any significant change (i.e., loss of a loved one), along with the disease, showed poor QOL. Any major life event with the course of treatment could enhance stress and negative thinking in cancer patients. This, ultimately, affects patients, both physically and emotionally, which further worsens their well-being. Another finding of our study was that a majority of patients were avoiding socialization which adversely affects their QOL, which is also substantiating by other studies.[36-39] The findings also indicated that most of the patients avoided going out because of alopecia. Patients avoid socialization as they do not appreciate the starring and sympathizing looks of strangers.[13]

Parents are among the caretakers who are extremely vital in obtaining favorable results of the patients' treatment. However, in this study, it was seen that those patients who were taken care by their parents exhibited a poor QOL. One of the probable explanations for this could be that the cancer patients considered themselves as a burden for their families, which subsequently affected their QOL.[40] In the Pakistani culture, parents have a unique status and they are treated with great respect. In addition, adult children are supposed to look after their parents' needs and finances in their older ages.[41] However, when a son or daughter is diagnosed with cancer, the responsibilities shift toward the parents, which become an additional source of burden during their older age.[36] The sense of self-guilt and nonfulfillment of responsibilities toward their parents may create frustration in cancer patients and affecting their emotional well-being.

Religion has a special place in an individual's life. The study findings showed that a majority of the patients found religious help as their priority coping mechanism, which is consistent with the findings of a previous study done in Pakistan.[7] The regular recitation of prayers and other rituals helps in coping with an illness and is considered as a hope for the future; hence, they develop a positive effect on QOL in cancer patients.[42-43]

In Pakistan, very limited studies were conducted to address the QOL concerns of adult cancer patients; therefore, the findings of this study will potentially facilitate health policymakers and researchers for planning further investigations and patients care plans.

Limitations

The current study has certain limitations which need to be considered. Patients were recruited from single private health-care setting, therefore; the findings of the study

have limited generalizability and are applicable only to the similar settings. In our study, the ratio of female to male participants was greater which may have affected the findings of this study. Keeping in mind the time limitation for this project, only a quantitative design was employed in this study. However, a mixed method approach could have given a better understanding of the concept of QOL in cancer patients receiving chemotherapy.

Conclusion and Recommendation

The findings of the current study indicate poor QOL among adult cancer patients undergoing chemotherapy treatment in Karachi. Moreover, the study results identify emotional and physical wellbeing as severely affected domains of QOL. Gender, occupational status, post chemotherapy side effects, lack of socialization, and discrimination, and a few other factors were the significant determinants of QOL. It is vital to initiate certain strategies for cancer patients to alleviate their physical and psychological sufferings and subsequently improving QOL.

This study recommends the following:
1. Strategies such as cancer support groups and psychological screening in the regular assessments can potentially help lessen emotional distress in cancer patients undergoing chemotherapy
2. Educate patients and their families regarding the management of chemotherapy treatment, this minimizes frequent hospitalizations and helps in obtaining better patients health outcomes
3. Public awareness campaigns about the disease and its effects need to be organized, which may help in eliminating the stigma and misconceptions regarding cancer and its treatment
4. A multidisciplinary team needs to be on board to resolve cancer patients' issues without any wastage of time.

Cancer is a major public health concern which not only affects patients' physical health but also influences their overall QOL. Considering the severity of this disease and its effects, it is necessary to identify factors associated with the betterment or deteriorating the patient's QOL. Our study found few of those factors which potentially help in making patients care plans and further initiate certain strategies which will contribute toward better QOL outcomes. Moreover, further studies were recommended to identify determinants that have not been investigated in the current study. Longitudinal studies are required to establish causal relationship between the variables.

Conflicts of interest

There are no conflicts of interest.

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