Journal of Pharmacoeconomics and Pharmaceutical Management

Journal homepage: http://jppm.tums.ac.ir

Assessment of Health-related Quality of Life in Cancer Patitients Receiving Chemotherapy in Specialist Hospital, Jalingo, North Eastern of Nigeria

Abdulganiyu Giwa[1], Carene Sabum[2], Halima Bukola Giwa[1], Muslim Olakunle Jamiu [1*]

1. Department of Clinical Pharmacy and Pharmacy Practice, School of Pharmaceutical Sciences, University of Ilorin, Ilorin, Nigeria.
2. Specialist Hospital, Jalingo, Nigeria.

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Citation Giwa A, Sabum C, Giwa HB, Jamiu MO. Assessment of Health-related Quality of Life in Cancer Patients Receiving Chemotherapy in Specialist Hospital, Jalingo, North Eastern of Nigeria. Journal of Pharmacoeconomics and Pharmaceutical Management. 2021; 7(3-4):100-112.

Running Title Quality of Life in Cancer Patients Under Chemotherapy

Article Type Research Paper

Article info:

Received: 17.04.2021

Revised: 19.06.2021

Accepted: 02.08.2021

Publisher

Tehran University of Medical Sciences

ABSTRACT

Background: This study aimed to assess Health-Related Quality of Life (HRQoL) in cancer patients receiving chemotherapy in Specialist Hospital, Jalingo, North-Eastern Nigeria, in 2015.

Methods: A cross-sectional study was conducted on 218 cancer patients selected by systematic random sampling method. The study data were collected using a modified European Organization for Research and Treatment of Cancer QoL Questionnaire (EORTC QLQ-C30 v. 3).

Results: Out of the 218 participants, 42(18.8%) had between 1 to 4 chemotherapy cycles, while 86(39.4%) had 5 to 8 cycles and the remaining 91(41.7%) had 9 to 12 chemotherapy cycles. There was a significant relationship between HRQoL and the number of chemotherapy cycles received.

Conclusion: Encouraging cancer patients to complete a chemotherapy course plays an essential role in the treatment outcome and the HRQoL in cancer patients undergoing chemotherapy.

Keywords: Anticancer, Quality of life, Cycles of chemotherapy, Nigeria

*** Corresponding Author:**
Muslim Olakunle Jamiu, PhD.
Address: *Department of Clinical Pharmacy and Pharmacy Practitice, School of Pharmaceutitical Sciences, University of Ilorin, Ilorin, Nigeria.*
E-mail: *amiu.mo@unilorin.edu.ng*

Introduction

Cancer is a public health problem affecting all groups of people and the second cause of death in developed countries and among the three leading causes of death in developing countries [1]. Approximately 70% of deaths from cancer occur in low- and middle-income countries. Cancer is the second leading cause of death globally and is responsible for about 10 million deaths per year. Globally, about 1 in 6 deaths is due to cancer [2]. In the US, cancer is second only to cardiovascular diseases as the leading cause of death [2].

Despite the threat that cancer poses to public health in Sub-Saharan Africa (SSA), few countries in this region have data on cancer incidence [3]. WHO reported that about 24.6 million people live with cancer worldwide. About 12.5% of all deaths are attributable to cancer, and if the trend continues, it is estimated that by 2020, 16 million new cases will be diagnosed per annum, out of which 70% will be in developing countries [4].

Quality of Life (QoL) is defined as an individual perception of life, values, objectives, standards, and interests in the framework of culture. QoL is increasingly being used as a primary outcome measure in studies to evaluate the effectiveness of treatment (WHO, 1998) [5]. An increasingly important issue in oncology is to assess health-related Quality of Life (HRQoL) in cancer patients [6].

The concept of HRQoL and its determinants have evolved since the 1980s to encompass those aspects that can clearly affect health either physically or mentally [7]. There have been many myths surrounding chemotherapy amongst cancer patients in the North-Eastern part of Nigeria, leading to non-completion of chemotherapy [8]. As reducing mortality and ensuring optimal health-related QoL are perhaps the main objectives of medical care, the study showed that improvement of QoL in cancer patients could be achieved using Chemotherapy (CT) [9].

Improving QoL is as important as the survival benefit that pharmacological treatment may provide. However, this may not always be the case. For example, QoL has been reported to be 87.5% lower in patients with leukemia than in the control group [10]. The difference may be due to various patients' population (sample size or patient age) or cancer types. The Tehran Hospital study selected patients (aged 18 years) with various solid tumors while Nemati et al. sampled 40 adolescent patients (aged <18 years) with leukemia.9 In a later study, most of the patients (68%) who had completed three or more cycles of CT reported a fairly favorable or favorable level of QoL. These findings imply that QoL is directly related to cancer treatment, i.e., CT. Likewise, except for a small group (13.3%) of the patients who reported that their sleep pattern was not favorable, the others had good QoL.

This issue implies that CT can lead to better sleep patterns in cancer patients. Similar studies also revealed that QoL in lung cancer patients during the fourth cycle of CT improved slightly over the baseline values, where patients perceived more sleep disturbances during the early cycles of CT [11]. Mystakido et al. found similar results in patients suffering from advanced cancer and breast cancer [12, 13]. In the reported findings, there was no correlation between QoL and age, gender, social status, marriage, and job. Similar results have been reported, but there was no correlation between the extent of the disease and QoL [14-16].

The total cost of care and chemotherapy has hindered many cancer patients from receiving chemotherapy and even completing the cycles for those who dare to start. This condition results in treatment failure, disease progression, relapse, drug resistance, and eventually death. There are also HRQoL issues that affect the psychosocial, physical burden, and economic status of these patients.

Cancer is a preventable disease that requires major lifestyle modifications [17]. More than one million Americans and more than ten million people worldwide are expected to be diagnosed with cancer this year, a disease commonly believed to be preventable [17]. Only 5%-10% of all cancers can be attributed to genetic defects, whereas the remaining 90%-95% have their roots in the environment and lifestyle [17]. The lifestyle factors include smoking, non-healthy diets (fried foods, red meat), alcohol use, sun exposure, environmental pollutants, infections, stress, obesity, and physical inactivity. The evidence indicates that 25%-30% of all cancer-related deaths are due to tobacco, while as many as 30%-35% are linked to diet, and about 15%-20% are due to infections, with the remaining percentage due to factors like radiation, stress and physical inactivity, and environmental pollutants.

Therefore, cancer prevention requires smoking cessation, increased ingestion of fruits and vegetables, moderate use of alcohol, calorie restriction, exercise, avoidance of exposure to direct sunlight, minimal meat consumption, use of whole grains and fibers, use of vaccination, and regular check-ups.

Materials and Methods

The study was conducted at Specialist Hospital, Jalingo, North Eastern of Nigeria, with a population of about two million. The hospital was established in 2007 and chosen because it is the only cancer center in Taraba State, North-Eastern Nigeria. Jalingo is the capital of Taraba State. Cancer cases were usually referred to Specialist Hospital Jalingo from different states in the North East. The bed compliments for the hospital are 370 and have eight cubicles for outpatient chemotherapy sessions. The oncology clinic is one of the specialist clinics and runs on Tuesdays and Thursdays. There are over 25 doctors and 15 consultants.

Ethical considerations

Ethical permission to carry out the research work in Specialist Hospital was obtained from the hospital's management through her Ethics & Research Committee. The study was performed following the Helsinki Declaration [18-22]. The purpose of the study was explained to the cancer patients, and they were told that they would be examined for research purposes. Their consent was sought and obtained at the Oncology Clinic before the interview and data collection.

Study design

This research was a prospective, cross-sectional study, through observational analyses within four months from February 2015 to May 2015 to assess patients' HRQoL and their physical/psychosocial symptom burden during their respective chemotherapy sessions.

This study was carried out at the Oncology Centre using the validated modified questionnaires and patient case folders after taking their informed consent. The study data were collected using the European Organization for Research and Treatment of Cancer QoL Questionnaire-C30 (EORTC QLQ-C30) version 3 (modified). This questionnaire is a copyrighted instrument that has been translated and validated in 81 languages. It has been used in more than 3000 studies worldwide, and it is free of charge for research purposes only.

This questionnaire instrument was modified to suit the objectives of the study and validated for the study. The study was conducted after taking permission from the Institutional Research and Ethics committee. An oncology nurse assisted in the filling of the questionnaires after translation into the local Hausa language, and for those that can neither speak English nor Hausa, an interpreter or translator was used.

Study population

Cancer patients who were registered at Specialist Hospital Jalingo and attending chemotherapy sessions at the oncology clinic were the study respondents. These samples included both inpatients and outpatients.

Sample size determination

The number of cancer patients registered with the Oncology Clinic from the inception of the clinic in 2009 was obtained from the Medical Records Department and was used as the estimated population size of the serviced cancer patients. This number was 500.

Using the Fischer equation, the sample size was determined as:

$n_f=n/(1+n/N)$, where

n_f is the desired sample size when the population is <10000,

n refers to the desired sample size when the population is>10000, and

N is the estimated population size.

Then, also $n=Z^2pq/d^2$, where n is the desired sample size in population> 10000,

Z refers to the standard normal deviation 1.96 (=2), which corresponds to 95% confidence level, and P is the proportion of the target population estimated to have a particular characteristics (prevalence), for example, 50% i.e., 0.5. So q is found as 1-p, and d refer to the degree of accuracy (usually set at 0.05=5%)

Therefore,

n=(1.96x1.96x0.5x0.5)/(0.05x0.05)=384.1 ≈385.

nf=385/(1+385/500)=217.514≈218.

So the final sample size was 218.

Subject selection/sampling

A cross-sectional study of old and new cancer cases by systematic random sampling at the Oncology Clinic on working days using a sampling interval of 1, until a total of 218 patients that fall within the inclusion criteria were obtained. A retrospective review of their case notes was also carried out.

Inclusion criteria

i. Only patients confirmed to have cancer based on their histology reports and receiving chemotherapy in the Taraba State Specialist Hospital.

ii. Patients diagnosed with the Retroviral Disease (RVD) with Kaposi sarcoma and receiving chemotherapy for the center.

iii. Males and Females aged between 20 and 75 years.

iv. All eligible patients, both inpatients and outpatients receiving chemotherapy in the center were considered in the study.

Exclusion criteria

Patients with cancer but not receiving chemotherapy in the hospital, Cancer patients with a known mental problem or being treated with psychotropic drugs.

Questionnaire development

A set of 30 questions was prepared for the questionnaire. The EORTC QLQ questionnaire has already been translated into English and was validated and used for the study. It was developed to assess the quality of life of cancer patients. The modification was made to suit the objectives of the study. This questionnaire is interviewer-based and was completed by each patient with the aid of an oncology nurse and, when necessary, with the help of a translator. A personal interview was carried out with the patients or their relatives in cases where the patient was too ill to respond effectively to questions. A copy of the EORTC QLQ C-30 v.3 questionnaire was employed (Appendix 1).

Questionnaire revalidation process

The questionnaire is a copyrighted instrument that has been validated. To ensure its effectiveness, it was pretested by administering to cancer patients (n=22) attending the Oncology Clinic but not those included in the study sample. Appropriate corrections were made based on the analyses of the pretested questionnaire.

Data collection

An instrument (Appendix I) was used to obtain sociodemographic data, physical activities outcomes, patients' general conditions, social status, occupational functions, and HRQoL in the past months. The patients were selected from cancer patients on consecutive oncology clinic working days (Tuesdays-Thursdays) in systematic random sampling. The patients should have met the inclusion criteria until a total number of 218 patients were interviewed.

Data analysis

The collected data were analyzed using the SPSS v. 20. Data were presented as frequency distribution tables and figures. The Chi-square test was used to compare proportions and test hypotheses. $P<0.05$ was considered significant.

Figures 1 and 2 were obtained by merging responses for Q1 to Q7 as physical activities, Q8 to Q19 as patients' general conditions, and Q20 to Q28 as social status and occupational function. Only responses for very much trouble (Score 4 of 4) were considered. In Figures 3 and 4, only responses for very poor (Score 1 of 7) were considered.

Results

Young, married, employed, and literate cancer patients are more likely to be in a better state of physical, mental, emotional, and social well-being with consequent better HRQoL in line with WHO (2012) definition of health.

Similarly, based on the responses, age, gender, marital status, occupational status, and literacy level revealed a significant causal relationship with overall patients' health and quality of life in the past months. In other words, the young, married, employed, and literate cancer patients had better o health and QoL in the past months (Tables 1 & 2).

Distribution of respondents according to cancer type

The distributions of cancer type were as follows: breast cancer 72(33%), prostate cancer 10(4.6%), colorectal cancer 19(8.7%), lung cancer 6(2.8%), Kaposi sarcoma 89(40.8), and others 22(10.1%). So, breast cancer is the most common type of cancer, seen in 72 respondents (33.0%) in the study area (Table 3).

Table 1. Demographic characteristics of respondents

Characteristics	All Respondents	No.(%)
Gender (sex)	Male	38(17.4)
	Female	180(82.6)
Marital status	Married	172(78.9)
	Single	46(21.1)
Occupational status	Employed	62(28.4)
	Unemployed	156(71.6)
Literacy status	Literate	140(64.2)
	Illiterate	78(35.8)

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Distribution of respondents according to current chemotherapy cycle

Out of the 218 respondents, 41(19%) received between 1 and 4 cycles of chemotherapy, 86(39%) received between 5 and 8 cycles of chemotherapy, while the remaining 91(42%) received 9 to 12 cycles of chemotherapy as shown in Tables 4-8.

The implication is that majority of the respondents had up to 9-12 cycles representing 91(42%) in the study area. There was a statistically significant and causal relationship between CT cycles and QoL regarding physical activities, patients' general conditions, social status, and occupational functions. Cancer patients with poor and excellent overall health and QoL significantly differ in their number of current CT cycles.

The relationship between patients' socio-demographic relationship and health related quality of life assessed patients' characteristics with domains of quality of life which were physical activities, general condition and social status and occupational function (Figure 1). As presented in Figure 2, retrospective assessment of patients' quality of life in the last 3 months was done and the results as presented. Figure 3 assessed the relationship between number of current CT cycles and HRQoL responses and three cycles of 1-4, 5-8 and 9-12 of chemotherapy medication in relation to patients' general health and social status and occupational condition. The relationship between number of current CT cycles and overall health and quality of life in the past months responses in the chemotherapy cycles were assessed and the results were as presented (Figure 4).

Distribution of respondents according to physical activities, general patient conditions, social status, and occupational function

Respondents had very much trouble as their responses to questions were grouped under physical activities as 530 (34.7%) out of 1526 responses, patients' general conditions as 997 (38.1%) out of 2616, and social status/occupational function as 849 (43.3%) out of 1962 responses. There was a statistically significant difference in responses to questions in all HRQoL domains (Table 9).

Table 2. Age distribution of respondents

Age Range (y)	No.(%)
20-30	6(2.8)
31-40	18(8.3)
41-50	88(40.4)
51-60	63(28.8)
61-70	28(12.8)
71-80	15(6.9)
Total	218(100)

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Table 3. Distribution of respondents according to cancer type

Category	No.(%)
Breast cancer	72(33.0)
Prostate cancer	10(4.6)
Colorectal	19(8.7)
Lung cancer	6(2.8)
Others	2(10.1)
Total	218(100)

Table 4. Distribution of respondents according to current chemotherapy cycle

Category	No.(%)
1-4 cycles	41(19)
5-8 cycles	86(39)
9-12 cycles	91(42)
Total	218(100)

Discussion

The present study revealed significant relationships between sociodemographic factors and quality of life regarding physical activities, patient's general conditions, social status, and occupational functions. These findings are inconsistent with the results of Dehkordi (2009), who reported no correlations between QoL and variables such as age, gender, marital status, occupational status, and level of literacy [9].

Table 5. Relationship between sociodemographic status and hrqol responses

Factors	Physical Activities	Patients General Condition	Social Status and Occupational Function
Age <40 y	115	110	105
Age >40 y	527	900	850
Males	114	117	115
Females	527	800	750
Married	317	464	484
Single	210	529	366
Literates	189	192	275
Illiterates	338	801	575
Employed	155	150	145
Unemployed	422	893	744

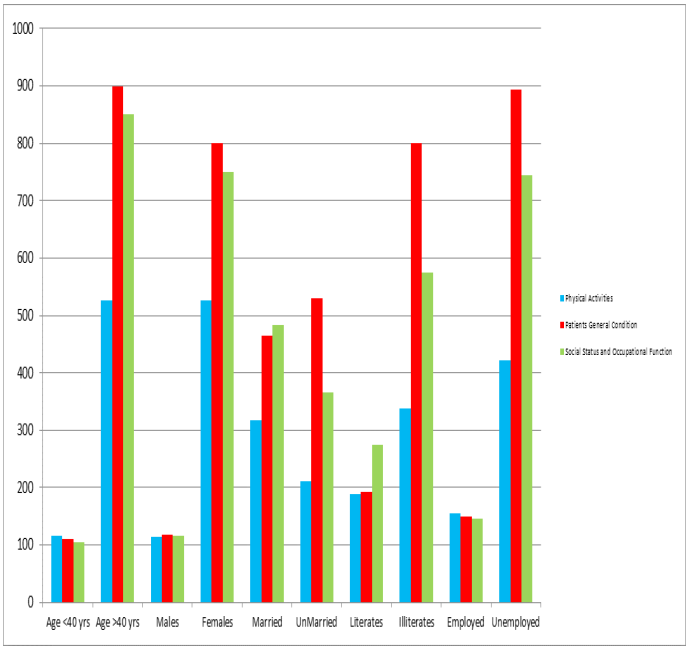

Figure 1. Relationship between sociodemographic status and hrqol responses

These findings are significant because it has policy implications for human capital investment in education to promote cancer awareness, job creation, and responsible social/married life.

Several studies support the positive influence of cancer chemotherapy on QoL. For instance, Nematollahi et al. showed that in patients suffering from lymphatic tumors, there was a positive correlation between CT and QoL. Likewise, the QoL of African American women with breast cancer was relatively high; cancer recurrence and metastasis to the lymphatic glands significantly affected the QoL [14]. It has also been shown that CT had a measurable adverse impact on QoL in women with node-positive operable breast cancer [23]. There was an indication that CT may improve the QoL in cancer [23]. Currently, QoL has been introduced as an endpoint for treatment comparisons in many cancers, particularly in advanced stages [24]. As reducing mortality and ensuring optimal health-related QoL are the main objectives of medical

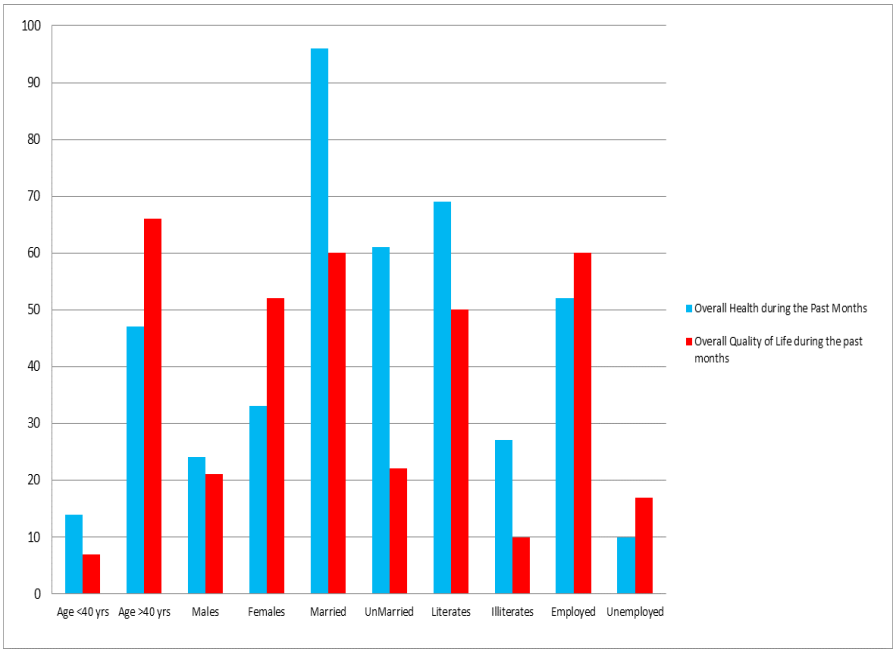

Figure 2. Relationship between sociodemographic status and overall health and quality of life in the past months

Table 6. Relationship between sociodemographic status and overall health and quality of life in the past months

Factors	Overall Health During the Past Months	Overall Quality of Life During the Past Months
Age <40 y	14	7
Age >40 y	47	66
Males	24	21
Females	33	52
Married	96	60
Single	61	22
Literates	69	50
Illiterates	27	10
Employed	52	60
Unemployed	10	17

Table 7. Relationship between the number of Current Chemotherapy (ct) cycles and health-related quality of life responses

Factors	1 to 4 CT Cycles	5 to 8 CT Cycles	9 to 12 CT Cycles
Physical activities	390	137	60
Patients general conditions	866	127	50
Social status and occupational functions	640	210	35

care, this study showed that improvement of QoL in cancer patients could be achieved with chemotherapy [25]. In fact, improving QoL is as important as the survival benefit that pharmacological treatment may provide. However, this issue may not always be the case. For example, QoL in patients with leukemia is 87.5% lower than that in the control group [10]. The differences may be due to different study groups (sample size or patient age) or cancer types. The Tehran Hospital study selected patients (aged 18 years) with various solid tumors while Nemati et al. recruited 40 adolescent patients (aged <18 years) with leukemia [10]. In another study, the majority of the patients (68%) who had completed 3 or more cycles of CT reported a fairly favorable or favorable level of QoL. These findings imply that QoL is directly related to cancer treatment, i.e., CT. However, a small group (13.3%) of the patients reported that their sleep pattern was unfavorable, but the others had good QoL.

This finding implies that CT can lead to better sleep patterns in cancer patients. Similar studies also revealed that QoL in lung cancer patients during the fourth cycle of CT improved slightly over the baseline values, where patients perceived more sleep disturbances during the early cycles of CT [9]. Mystakido et al. found similar results in patients suffering from advanced cancer and

Table 8. Relationship between the number of Current Chemotherapy (ct) cycles and health-related quality of life responses in the past months

Factors	1 to 4 CT Cycles	5 to 8 CT Cycles	9 to 12 CT Cycles
Overall health during the past months	128	71	19
Overall quality of life during the past months	121	91	6

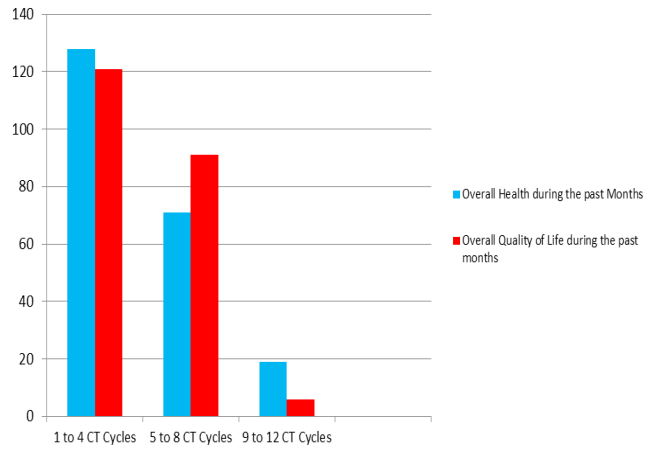

Figure 3. Relationship between the number of current chemotherapy (ct) cycles and health-related quality of life responses in the past months

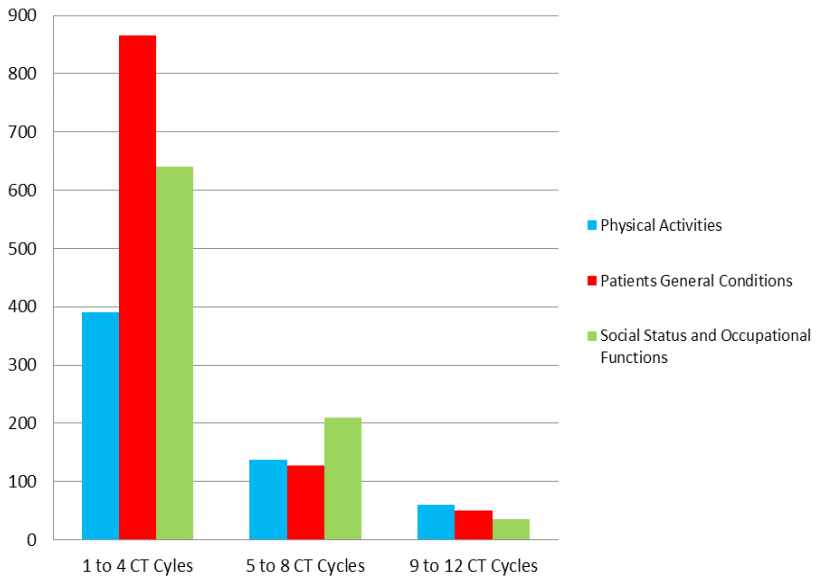

Figure 4. Relationship between the number of Current Chemotherapy (ct) cycles and health-related quality of life responses

Table 9. Distribution of respondents according to physical activities, general patient conditions, social status, and occupational function

Responses	No.(%)					The Chi-square Test
	Not at All	A Little	Quite a Bit	Very Much	Total (n)	
Physical activities (Q1-7)	369(24.2)	358(24)	269(17.6)	530(34.7)	1526	χ^2=7.99 df=3 P=0.046
Patients general conditions (Q8-19)	57(2.2)	799(30.5)	763(29.2)	997(38.1)	2616	χ^2=40 df=3 P=0.00
Social status & occupational function (Q20-28)	129(6.6)	324(16.5)	660(33.6)	849(43.3)	1962	χ^2=42 df=3 P=0.00

df: Degrees of freedom; P: 0.046 (<0.05) significant difference; χ^2: The chi-square; n: total responses.

breast cancer [12]. In the reported findings, there was no correlation between QoL and age, gender, social status, marriage, and job. Similar results have been reported, but there was no correlation between the extent of the disease and QoL [14-16].

The prevalence of breast cancer in females (72, 33%) was also noted. Various earlier studies support the fact that breast cancer is the most prevalent cancer in females [11] while prostate cancer (10, 4.6%) and colorectal cancer (19, 8.7%) dominate the male cancers in this part of Nigeria. Interestingly, there is a high proportion of skin cancer (Kaposi sarcoma with 89 cases or 40.83%) in this study. This finding is related to the high incidence of Anti-Retroviral Disease (ARV) in this part of the country. Those patients that received more than 5 cycles of CT appeared to have a better QoL. Though other factors such as the stage of the disease, side effects of the medication also affect the QoL, which is beyond the scope of this study.

Conclusion

Cancer is an important health issue influencing QoL. An appropriate treatment that may provide care to the cancer patient is chemotherapy. The obtained results indicate a strong correlation between QoL and the number of CT cycles in cancer patients. Since CT is socially stigmatized in some countries such as Iran, encouraging patients to complete a CT course may play an essential role in the treatment outcome and the QoL of cancer patients. HRQOL issues are of interest in cancer because effective treatment and detection methods have led to an increase in long-term survivors.

Cancer patients in stable condition and with psychosocial support can expect to enjoy a good QoL with treatment. The findings provide an evidence base for the country's cancer care program to boost national health education about prognosis in cancer. It should also be noted that increased awareness will increase the number of new cases; thus, training and re-training of health personnel concerned with a cancer diagnosis and management cannot be over-emphasized.

This study had the following limitations: unavailability of unpublished data, difficulty in obtaining information by face-to-face interview approach from the respondents, inability to reach some cancer patients who received chemotherapy neither by phone nor by direct contact and inability to communicate effectively with illiterate subjects who could not even communicate in the local Hausa dialect. When information could not be obtained from these patients, we used the caregivers, which might affect the accuracy of the information.

Ethical Considerations

Compliance with ethical guidelines

Ethical permission to carry out the research work in Specialist Hospital was obtained from the hospital's management through the Ethics & Research Committee. The study was performed following the Helsinki Declaration.

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

We appreciate the support of the management and staff of Specialist Hospital, Jalingo, in carrying out this research in the health facility.

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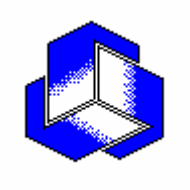
Appendix 1: Questionnaire on Quality of life assessment



EORTC QLQ-C30 (version 3) Modified.

Assessment of Quality of Life in cancer patients receiving chemotherapy using the European Organization for Research and Treatment of Cancer- Quality of Life Questionnaire.

We are interested in some things about you and your health. Please answer all of the questions yourself by circling the number that best applies to you. There are no "right" or "wrong" answers. The information that you provide will remain strictly Confidential and for research purposes only.

Please fill in.

Today's Date ----------

Your Initials ----------

Your Age ----------

Your Gender ----------

Your Cancer Type ----------

Marital Status ----------

Educational Status ----------

Current Chemotherapy cycle ----------

Employed/ Unemployed ----------

Key: 1=Not at all, 2= A little, 3= Quite a bit, 4= Very much.

s/n	Questions	Not at All	A Little	Quite a bit	Very much
1	Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?				
2	Do you have any trouble taking a long walk?				
3	Do you have any trouble taking a short walk outside of the house?				
4	Do you need to stay in bed or a chair during the day?				
5	Do you need help with eating, dressing, washing yourself or using the toilet?				
6	Were you limited in doing either your work or other daily activities?				
7	Were you limited in doing either your work or other leisure time activities?				
8	Were you short of breath?				

s/n	Questions	Not at All	A Little	Quite a bit	Very much
9	Have you had pain?				
10	Did you need to rest?				
11	Have you had trouble sleeping?				
12	Have you felt weak?				
13	Have you lacked appetite?				
14	Have you felt nauseated?				
15	Have you vomited?				
16	Have you been constipated?				
17	Have you had diarrhea?				
18	Were you tired?				
19	Did pain interfere with your daily activities?				
20	Have you had difficulties in concentrating on things like reading or watching the television?				
21	Did you feel tense?				
22	Did you worry?				
23	Did you feel irritable?				
24	Did you feel depressed?				
25	Have you had difficulties in remembering things?				
26	Has your physical condition or medical treatment interfered with your family life?				
27	Has your physical condition or medical treatment interfered with your social life activities?				
28	Has your physical condition or medical treatment caused you financial difficulties?				

For the following questions please circle the number between 1 and seven

that best apply to you.

29. How would rate your overall health during the past months?

1 2 3 4 5 6 7

Very poor Excellent

30. How would you rate your overall quality of life during the past months?

1 2 3 4 5 6 7

Very poor Excellent.

Using the Likert Scale for measurement of attitudes, the various levels of QoL were assessed.

1= Very Poor

2=Poor

3=Average

4=Satisfactory

5=Good

6=Very Good

7=Excellent