Assessment of Breast Cancer Patients' Quality of Life under Chemotherapy treatment at Tikur Anbessa Specialized Hospital, in Addis Ababa, Ethiopia, 2018

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Acronyms

AAU	Addis Ababa university
ANOVA	Analysis of variance
ASMR	Age standardized mortality rate
BRAS	Arm symptom
BRBI	Body image
BRBS	Breast symptom
BRFU	Future perspective
BRHL	Hair loss
BRSEE	Sexual enjoyment
BRSEF	Sexual functioning
BRST	Systemic therapy side effects
CF	Cognitive functioning
EF	Emotional functioning
EORTC QLQ C30	European organization for research and treatment of cancer quality of life questionnaire core 30
EORTC QLQ BR23	European organization for research and treatment of cancer quality of life questionnaire breast 23
ER	Estrogen receptor
ETB	Ethiopian birr
FA	Fatigue
GHS	Global health status
HRQOL	Health related quality of life
NCD	Non communicable disease
PA	pain
PF	Physical functioning
PR	Progesterone receptor
QOL	Quality of life

RF	Role functioning
RS	Raw score
SF	Sexual functioning
TASH	Tikur Anbessa specialized hospital
USA	United states of America
WHO	World health organization

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Abstract

Background: Breast cancer is the most common cancer affecting women in Ethiopia with increasing burden, yet little research has been conducted on quality of life of breast cancer patients under chemotherapy treatment.

Objective: To assess the quality of life of breast cancer patients' under chemotherapy treatment at Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia, 2018.

Methods: Institution based cross-sectional study was conducted on 403 breast cancer patients who took at least one cycle of chemotherapy treatment at oncology unit of Tikur Anbessa specialized hospital day care center from February to April 2018. The validated Amharic version of European organization for research and treatment of cancer core 30 (EORTC QLQ-C30) and quality of life questionnaire specific to breast (QLQ-BR23) was used to measure quality of life. Simple descriptive statistics has been calculated. One way analysis of variance (ANOVA) was compared to see if there was a significant mean difference in quality of life between categories of socio-demographic and clinical variables. For purpose of interpretation quality of life score was dichotomized in to 2 using 50 as a cutoff point then, bivariate and multivariable logistic regression was used to describe association between dependent and independent variables. Hence patients who score above 50 for quality of life were considered to have better quality of life.

Result: Of the total sample, overall response rate was 99.77%. Mean age of participants was 44±11.78. Mean quality of life of breast cancer patients was 52.98 (25.61). The most affected functional scale was emotional functioning (mean 47.61± 25.83). Similarly, 79.2 % of participants had financial difficulties. Likewise, sexual functioning was the most affected functional scale in the disease specific tool with 86.8% of participants had affected sexual functioning. Similarly, patients score worse in breast symptoms where 90.1% had affected breast symptoms. Educational status, marital status, income, number of chemotherapy cycle, physical functioning, social functioning, fatigue, insomnia, financial difficulties and systemic therapy side effects had significant association with QOL.

Conclusion and recommendation: Quality of life of breast cancer patients under chemotherapy treatment was poor. Therefore quality of life assessment should be incorporated in patient's treatment protocol. And health advocates should demand financial support for the patients.

1. Introduction

1.1.Background of the study

Worldwide breast cancer is a major life threatening and the major public health problem of great concern. It is the second most common form of cancer following lung cancer worldwide and by far the most frequent cancer among women with an estimated 1.7 million new cancer cases diagnosed in 2012, which alone accounts for 25% of all cancer cases showing 20% increment from the previous year 2008 report (1, 2).

Breast cancer is the fifth cause of death from all cancers and the most common cause of cancer death among women with an estimated 220,000 deaths with standardized mortality rate of 12.9 per 100,000 have been recorded in 2012 accounting about 12% of all cancer deaths in both developing and developed countries. Among these more-developed countries account for about one-half of all breast cancer cases and 38% of the deaths (1, 3).

In developing countries more than 324,300 women die from this cancer every year, and in eastern, middle, and southern Africa it is the second leading cause of cancer deaths among women (27,000deaths), after cervical cancer (4). In Africa overall, the estimated number of new cases was 92,600 and total number of death was 50,100 in 2008 and 133, 900 in 2012 (3). Though incidence and overall mortality rates continue to be lower than in most developed countries, Case fatality rates from breast cancer are very high. These high case fatality rates are likely due to a lack of awareness of the benefits of detection and treatment and scarcity of adequate facilities for detection and diagnosis, as well as poor access to primary treatment (5). About two-thirds of the annual cancer mortality and more than 50% of all new cancers worldwide happen in low income and middle-income countries (6).

According to world health organization (WHO) 2015, annually around 60,000 new breast cancer cases are diagnosed in Ethiopia, and the major obstacles in the country are lack of trained health professionals and oncologists (7). A study conducted to assess the pattern of cancer in Tikur Anbessa Specialized Hospital Oncology Centre in Ethiopia from 1998-2010 showed that, breast cancer has been the second most common form of cancer following cervical cancer accounting 26% (8).

During the past four decades, Quality of life (QOL) has become an important outcome in medical and psychological research. Increasingly there has been a growing recognition that maintaining or improving the quality of life for cancer patients is an important treatment goal, since, it is well known that clinical data only show small correlations with patients' judgments (9, 10). Health-related quality of life (QOL) is a multidimensional construct dependent on clinical, socio demographic and psychological factors. And has been defined as "individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (11).

1.2. Statement of the problem

To increase the survival rates and reduce the risk of recurrence breast cancer patients face different types of treatment for the disease, such as surgeries and radiotherapy and chemotherapy treatments, frequently associated to adverse side effects (12). The majority of breast cancer patients in Ethiopia (83%) received chemotherapy treatment as a front-line therapy, as an adjuvant to surgery or radiotherapy and even in palliative care (13). Adjuvant and neo adjuvant chemotherapy is given for a total of 3 to 8 months depending on the drugs used. The length of treatment for advanced breast cancer is based on how well the drug is working and the side effects the patients have (14). Of all chemotherapy patients in Ethiopia, 83.7% received a full cycles of chemotherapy treatment (13).

Being diagnosed with breast cancer is a very stressful event and has tremendous consequences for most persons who experience it, affecting all aspects of life and the temporary side effects associated with the treatment may influence the patients' health related quality of life during treatment, In the case of breast cancer the initial treatment usually consists of surgery, and after the operation many patients are recommended one or more additional treatments including radiotherapy, chemotherapy, and hormonal treatment. All these factors may, of course, impact the patients' quality of life thus compromising the quality of life (15-17). Moreover the incurable nature of breast cancer along with its reoccurrence causes psychological distress to clients than the diagnosis of primary breast cancer that in turn affects the quality of life of these patients (18, 19).

Assessing quality of life of patients has numerous benefits including the ability to provide clinicians and patients with accurate expectations about the likely impact of treatments on well-being and functioning, the ability to identify common problems that will need to be addressed, and the ability to identify therapies and interventions effective in addressing these problems (9). In addition, findings suggest that QOL data may improve clinicians' ability to predict treatment response and survival time in certain contexts. Besides, numerous studies have found that a better quality of life measure is associated with longer survival of patients in different types of cancer (20, 21). Therefore assessing QOL status in cancer patients is important for several reasons, particularly because it provides supplementary information about the impact of the

disease and its treatment on cancer patients to aid physicians in selecting both antineoplastic and supportive-care therapy (22).

In Ethiopia, little research has been conducted to evaluate quality of life of cancer patients. Among these only one study is conducted to evaluate quality of life of breast cancer patients (23). The study encompasses all breast cancer patients under treatment and did not use the validated Amharic version of European Organization for Research and Treatment of cancer Quality of life questionnaire core 30 (EORTC QLQ C-30). Considering the increasing prevalence of breast cancer and its destructive effect on QOL and low local reports pertaining to QOL of breast cancer patients' under chemotherapy treatment, this study aims to evaluate the quality of life of breast cancer patients' under chemotherapy treatment using the validated questionnaire.

1.3. Significance of the study

Women may receive chemotherapy, and/ or radiation therapy plus systemic hormonal therapy for breast cancer treatment depending on stage and estrogen receptor status at diagnosis. Patients will face the long term consequence of cancer and cancer therapy. Therefore, it is critical for health care professionals to become familiar with the impact of a breast cancer diagnosis and its treatment on patients' QOL for enhancement of service provision.

Hence, the finding of this study is believed to provide for health care professionals and policy makers a foundation for interventions to improve QOL among breast cancer patients and help to include QOL assessment in the cancer treatment protocol and also to advise for resource allocation based on unmet needs. Besides it is believed to be a base line data for future studies.

1.4. Literature review

1.4.1. What is breast cancer?

Cancer is a group of diseases that cause cells in the body to change and grow out of control. Most types of cancer cells eventually form a lump or mass called a tumor, and are named after the part of the body where the tumor originates. Breast cancer is a disease which happens as a result of the erratic proliferation of cells that originate in the breast. It is typically detected either during a screening examination, before symptoms have developed, or after a woman notices a lump (24).

1.4.2. Burden of cancer

Globally in 2012, cancer was estimated the leading cause of mortality and morbidity, accounting for about 14 million new cases and was responsible for 8.8 million deaths in 2015. Among these approximately 70% of deaths from cancer occur in low- and middle-income countries. And the overall burden of cancer in the world is projected to continue to rise, particularly in developing countries. It is estimated that 21 million people will be diagnosed, and 13 million will die of cancer in the year 2030 (3, 25).

Current data suggest that cancer kills more people than HIV/AIDS, tuberculosis and malaria combined, but this overall picture hides significant variations in incidence in different parts of the world. Whereas cancer incidence is certainly rising in all developing countries, the poor control and persistence of old infectious diseases and emergence of new ones in Africa means that infections remain the major source of morbidity and mortality in this part of the world compared to Asia and Latin America, where the impact of non-communicable diseases has now become more predominant (26).

Despite this growing burden, cancer continues to receive low public health priority in Africa, largely because of limited resources and other pressing public health problems, including communicable diseases such as Acquired Immune Deficiency Syndrome (AIDS)/Human Immunodeficiency Virus (HIV) infection, malaria, and tuberculosis. It may also be in part due to a lack of awareness about the magnitude of the current and future cancer burden among policy makers, the general public, and international private or public health agencies (8) .

1.4.3. Epidemiology of breast cancer

In the twenty century a break through occurred in cancer systemic treatment, including hormonal therapy and chemotherapy treatments. It is believed that Chemotherapy after breast surgery (adjuvant chemotherapy) improves survival in women with breast cancer (27, 28). Eventually Over the past thirty years although the incidence of breast cancer has greatly increased by 2-3%, each year in numerous countries until the mid-2000, including Europe and North America the mortality rate is decreasing substantially and survival of patients is increasing (29).

A study conducted in United states of America (USA) by Steven a et al in 2015 using surveillance, epidemiology and end result database to estimate incidence rates, and survival from invasive breast cancer women from 1975 to 2010, showed a marked reduction in the mortality of breast cancer patients from 32 per 100,000 per year to 21 per 100,000 per year (34%). Moreover there has been increased in survival of patients by 28%. But the incidence rate has been increased by 62% (30). This observed decline in mortality and increased survival could be explained by the introduction of drugs that are introduced in 1970s and 1980s and treatment advancement in the late 1990s and the increasing proportion of cancers detected at an early stage due to the development of mammographic screening practices (31).

A prospective study by Rossi et al (2015), conducted in the institute of curie between 1981 and 2008 by including 32,502 women for assessing the impact of adjuvant chemotherapy on breast cancer survival on real world population showed an improvement in patient prognosis was observed as a result of the administration of adjuvant chemotherapy in a real world setting. There has been a 25% reduction in the risk of death among the patients treated with chemotherapy than the non-treated patients; the reduction resulted in absolute survival benefit of 4.5% at 5 years and 6.9% at 10 years. The result also showed that women who were treated with chemotherapy had 18% relative reduction in the risk of distant metastasis (30).

1.4.4. Risk factors of breast cancer

Although most women who develop breast cancer have no known risk factors, information about risk may be particularly useful when making decisions about screening. The risk factors for cancer can be broadly categorized into four types, namely personal risk factors,

biological/genetic risk factors and reproductive factors. Biological factors including, obesity, age of first menarche, having a child after the age of 30, sex of the individual and genetic/hereditary make up. Moreover, extremely dense breasts on mammography were associated with greater than two fold increases in the risk of breast cancer. Prior breast biopsy and heterogeneously dense breasts were associated with 1.5–2 fold increased risk of breast cancer (32).

Age is an important risk factor for breast cancer. The incidence of breast cancer starts to increase at about the age of 35 years and rises rapidly to about the age of 50 years, and by the age of 75 the incidence starts to decline (26). A research by Kakarala et al. indicated that Asian women particularly those under 40 years of age were more likely to be affected with estrogen receptor or progesterone receptor (ER/PR) negative invasive ductal and inflammatory cancer than their Caucasian counterparts. More over a family history of breast cancer in first-degree relatives, especially if the breast cancer was bilateral or diagnosed at an early age, strongly increases the risk of developing the disease (33). Study from United Kingdom showed women with a history of breast cancer in a first- relative is approximately two-fold higher risk than women without a family history (34). Similar study from Moroccan women also supports the finding that having a family history of first degree relative is a risk for women with breast cancer (OR=11.556) (35).

From reproductive factors, the influential risk factors for breast cancer are a woman's menstrual life and her childbirth history (36). A study from Australia reported that women who had their first menstrual period at age 12 or later have a slightly lower risk of breast cancer (10–25%) than women who had their first menstrual period earlier. while current oral contraceptive use was associated with 1.5 increased risk of breast cancer. With regard to childbirth history a study by Nelson et al. (2013) and Zahra et al (2016) showed that null parity and age ≥30 years at first birth were associated with 1.5 increased risk of breast cancer (32, 35).

1.4.5. What is quality of life?

According to the World Health Organization (WHO) Quality of Life is defined as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment (11).

1.4.6. Factors affecting quality of life of breast cancer patients

Breast cancer patients' quality of life is compromised in different ways associated with the disease related factor and side effects of the therapeutic agents.

1.4.6.1. Socio demographic factors affecting quality of life

The most important factor affecting quality of life is age. A population based survey in the United States among 1357 breast cancer patients to evaluate the relationship of treatment and socio demographic characteristics on quality of life found that, the impact of breast cancer on QOL is more profound in younger women. In four of nine QOL outcomes (emotional and social functioning, body image, and future perspective) younger women reported lower scores than women over 70 years of age (37). Another prospective study conducted in china Shanghai to evaluate QOL of breast cancer patients with association of social support, health insurance and clinical factors among 1160 patients shows that Age has significant relation with quality of life (P= 0.029) (38). Similar study from Taiwan and morocco also shows that younger patients had a significantly lower quality of life (39, 40).

Additional factor that affects quality of life of breast cancer patients is occupation. A cross sectional study conducted in Shiraz city south of Iran among 119 breast cancer patients to asses predictors of QOL revealed that occupation had significant relation with quality of life (p = 0.01) indicating patients who are employed in certain activities had better quality of life than patients who are unemployed (41). Similar findings have been found in different studies. Analytical cross sectional study conducted in Karachi Pakistan to evaluate the quality of life of cancer patients among 150 patients showed 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 ($\beta = -1.186$, $P = 0.04$) (42). This result is also supported by other similar study in Turkey in which Housewives had lower physical well-being and social wellbeing than patients who are engaged in different activities (43).

Additionally, financial status is another factor which can impair the quality of life of breast cancer patients. A cross sectional study conducted in Iran among 119 breast cancer patients to

asses predictors of QOL shows financial status is significantly associated with quality of life of breast cancer patients (p=0.019) (41). Another study from Ethiopia among 250 breast cancer patents show that those women who earn 320-700 Ethiopian birr (ETB) had lower QOL (23). Similar study from China and Nepal also support these finding (38, 44) .

Level of education of is another factor which can impair quality of life of breast cancer patients. A study from United States shows that Chemotherapy lowered QOL scores overall across four QOL dimensions (p values < 0.001), with a disproportionately greater impact on those with lower levels of education (37). Similar study in Kenya among 142 breast cancer patients showed that patients who have primary and secondary education had better quality of life than those patients with no education (OR=1.9 and 2.9 respectively) (45).

Moreover, marital status also affects quality of life of breast cancer patients. A descriptive study from Ankara among 526 patients found that Singles had worse psychological wellbeing and general well-being than married patients (t = 14.294, P = 0.0001; t = 13.783, P = 0.0001) (43). Similar study from turkey and Kenya also supports these findings (45, 46).

1.4.6.2. Disease and chemotherapy related factors

Beyond the socio demographic factors which can impair quality of life of breast cancer patients, clinical stage of the disease, tumor size, time since diagnosis, number of chemotherapy cycle, presence of comorbidity, nodal involvement and previous treatments are other factors which can affect QOL of breast cancer patients. In a cross sectional study conducted in Tehran Iran among 200 breast cancer patients to evaluate QOL of cancer patients at different chemotherapy cycles (CT), a strong correlation was found between QOL and number of chemotherapy cycles. Nevertheless, significant difference was found between the level of QOL in patients with < 2 chemotherapy cycles and/or with 3-5 cycles (p< 0.001). Patients who had completed 3 or more cycles of chemotherapy reported a fairly favorable or favorable level of QOL. This may show that QOL is directly related to cancer treatment procedure (47). A prospective, non-interventional, 4-month observational study in Malwa region of Punjab revealed global health status was significantly improved in patients receiving more than 4 chemotherapy cycle as compared to the patients receiving less than two cycles of chemotherapy, indicating that the patient rated their overall health/QOL improved and better as the chemotherapy session

progressed (48) Another study from Iran and Pakistan also indicates that those patients who took more than two cycles of chemotherapy had an improved quality of life than those patients who took less than 2 cycles of chemotherapy ($p< 0.001$) (49, 50).

However, this is not always true, in another prospective study conducted in china Shanghai among 1160 breast cancer patients revealed that, Women receiving chemotherapy for breast cancer had lower QOL (38). similar finding have been found in the study conducted in mahatma Gandhi hospital India to assess quality of life of cancer patients found that patients in the early phase of treatment (<2 cycles) had better quality of life than patients who took more than two cycles of treatment (51). Moreover a study done by Dangchee on 32 Malaysian breast cancer patients receiving chemotherapy found that patients on chemotherapy treatment had lower global health status ($p=0.001$) and increased symptom scales compared to patients at baseline before beginning of chemotherapy declining from 75 (22.9%) to 66.7 (8.3%) (52).

A study from Ethiopia revealed that patients in the second cycle of chemotherapy treatment ($P=0.04$) showed significant association with QOL, in which patients at the second cycle of chemotherapy had worse QOL. But no associations were noted with type of therapy, time since diagnosis, stage at diagnosis and presence of other co-morbidities (53). Another study in the same country among 148 cancer patients showed that patients who receive the first cycle of chemotherapy treatment had lower quality of life and stage of the disease has significant association with quality of life of cancer patients meaning as the stage of the disease is progressed the quality of life of cancer patients will be worsened (54). But a study from Nepal among 245 cancer patients during evaluation of quality of life during chemotherapy showed that cancer patients with stage 2 had higher global health/QOL status and lower symptom scores than stage 3 and 4 (55). The other factor that affects quality of life of breast cancer patients is time since diagnosis. A study conducted in Bahrain showed that breast cancer patients who were recently diagnosed were more worried about their future, complained of more symptoms and more upset by the loss of hair (56).

Cancer patients will face different types of side effects as result of the disease itself or treatment side effects. Health related quality of life (HRQOL) of breast cancer patients is largely affected by chemotherapy (16). Unlike other therapies, chemotherapy exhibits several systemic side

effects that are difficult to tolerate. Therapy-related side effects are well documented and include: chest pain, nausea/vomiting, stomatitis, diarrhea, constipation, fever, fatigue, anorexia, dyspnea, dermatitis, neurosensory or motor problems, bleeding, palmar-plantar syndrome, pain, bruising and extravasation, as well as other less common side effects. The presence of any or a combination of these side effects can have a detrimental effect on one's well-being, body image, and self-perception (57).

Based on the explanations leaved by patients in study done by Palmer (1980) on what extent the chemotherapy affect quality of life, some stated that "treatment was unbearable" or "never again" and some stated that the experience had been "most unpleasant" or they had "dreaded" the treatment "but would have it again if it were recommended for their health's sake." This showed that they experienced poor quality of life following chemotherapy (58).

Patients with cancer frequently experience pain as a result of their disease or treatment strategies. Pain is the most common symptoms in cancer patients' in which 50% of the patients with cancer experience pain (59). A cross sectional study from Iran among 142 cancer patients to compare depression and quality of life among Iranian cancer patients with and without pain found, those who experienced pain showed a significant lower degree of global quality of life ($p<0.0001$), physical ($p<0.0001$), emotional ($p<0.0014$), and role functioning ($p<0.0001$). Besides Pain consistency was significantly correlated with depression and global quality of life ($r=0.3$, $p=0.002$) (60).

Cancer treatments, especially chemotherapy create change in female body that may have an effect on emotional relations and psychological status, in addition to alteration in body image loss of sexual feeling and perceived loss of femininity also contribute to the list of negative emotional effects experienced in this patient population. In a French survey in which chemotherapy side effects were ranked by gender, women ranked "loss of hair" and "loss of sexual feeling" – two side effects that may be considered reflective of femininity and sexual identity – as second and fourth among the most severe side effects experienced (61).

A cross sectional study conducted in Brazil in the city of Ceara among 145 breast cancer patients by Samya et al, to assess QOL of breast cancer patients undergoing two or more cycles of chemotherapy, shows that the emotional function was the lowest score 61.3, compared with other

domains, indicating feelings of slight tension, anger, depression or worry. High score for Sexual Function (72.41), on its turn, revealed that the practice of sexual intercourse continues for most patients, however, the Sexual Satisfaction (average 50.50) was unsatisfactory or impaired (62). A cross sectional study conducted in Iran among 119 patients on assessing the quality of life of breast cancer patients undergoing chemotherapy treatment reveled that, insomnia, fatigue and loss of appetite are the highest symptom scores that affect the quality of life of breast cancer patients (41). Moreover there has been significant increase of certain symptoms of chemotherapy side effects which are nausea and vomiting ($p=0.000$), appetite loss ($p=0.028$), and diarrhea ($p=0.026$) among patients receiving chemotherapy than those patients who do not take the treatment (52).

2. Objective of the study

2.1.General objective

To assess the quality of life of female breast cancer patients under chemotherapy treatment at Tikur Anbessa specialized hospital (TASH), Addis Ababa, Ethiopia, 2018.

2.2. Specific objective

- To describe quality of life of female breast cancer patients under chemotherapy treatment at TASH, Addis Ababa Ethiopia, 2018.
- To asses factors associated with quality of life of female breast cancer patients under chemotherapy treatment at TASH, Addis Ababa, Ethiopia, 2018.

3. Methodology

3.1. Study area and period

The study was conducted at adult oncology unit of Tikur Anbessa specialized hospital (TASH) day care Centre. TASH is a large referral teaching Hospital, under the administration of Addis Ababa University, located in Addis Ababa, Ethiopia. TASH has divisions such as internal medicine, surgery, gynecology and obstetrics, pediatrics, radiotherapy, adult oncology, pediatric oncology /hematology, nuclear medicine, psychiatry, laboratory, orthopedics and pharmacy. There are 201 staff physicians, 627 nurses, 26 oncology nurses, more than 10 pathologists, 4 medical oncologists, 4 radiotherapists, 1 pediatric oncologist, and 2 specialized surgical oncologists. The hospital has more than 600 beds, and the bed reserved for oncology unit is 20 giving diagnostic, and treatment service for about 370,000-400,000 patients per year. The oncology unit of TASH is the only oncology unit for the country giving service for over 60,000 patients annually and has both an outpatient and inpatient departments. In 2014, the estimated number of cancer patients who get chemotherapy, radiation therapy and other supportive care and palliative care are greater than 24,000 without considering the repetition of client flow. In one month patients enrolled in chemotherapy, radiation therapy, follow up and complain therapy accounts for 2040 in number. The chemotherapy bay caters multiple patients daily for the administration of different chemotherapeutic regimens (63, 64). The study was conducted from February 15 to May 15, 2018.

3.2. Study design

Institution based cross sectional study design was conducted.

3.3. Population

3.3.1. Source population

The source population constitutes all female breast cancer patients who were under treatment at TASH.

3.3.2. Study population

All female breast cancer patients who were under chemotherapy treatment at outpatient department of TASH oncology unit.

3.3.3. Study unit

All female breast cancer patients who took at least one cycle of chemotherapy treatment at TASH day care Centre from February 15 to May 15, 2018 that fulfills the inclusion criteria of the study.

3.4. Inclusion and exclusion criteria

3.4.1. Inclusion criteria

- Female breast cancer patients who took at least one cycle of chemotherapy treatment at the oncology unit of day care Centre of TASH.
- Age greater than 18 years old.

3.4.2. Exclusion criteria

- Patients who were severely ill and unable to communicate during the study time.

3.5. Sample size and sampling procedure

All female breast cancer patients under chemotherapy treatment during the study period have been included based on the inclusion criteria. Therefore, 403 breast cancer patients who visited the day care Centre of TASH for chemotherapy treatment were included.

3.6. Data collection procedure

3.6.1. Quality of life questionnaire

The validated Amharic version of European organization for research and treatment of cancer quality of life questionnaire core 30 (EORTC QLQ C-30) was used to measure breast cancer patients' quality of life in addition to the socio demographic and clinical characteristics questionnaire. Besides, European organization for research and treatment of cancer quality of life

questionnaire specific for breast cancer (EORTC QLQ BR23) was used to assess specific factors of breast cancer patients' QOL.

The EORTC QLQ C-30 questionnaire is a multi-item questionnaire aimed to address the health related QOL of cancer patients in general. It has 30 questions, composed of five 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. Likewise, the QLQ- BR23, which assess the QOL of breast cancer patients has 23 items assessing disease symptoms, side effects of treatment, body image, sexual functioning and future perspective (65). Generally the 53 items from QLQ C-30 and QLQ -BR23 and the 15 questions of socio demographic and clinical characteristics add up to be 68 questions was used to assess QOL of breast cancer patients. The data was collected through face to face interview and variables on clinical characteristics were extracted from medical charts at the oncology unit.

3.6.2. Data collection process

The data was collected by two BSc nurses from oncology Centre that has experience in data collection. Training was given to the data collectors for one day on how to collect the data correctly by the principal investigator and supervision was also conducted by the principal investigator every day to monitor data collection procedure. Pretest was conducted on 10% of patients at Betezata hospital and TASH then modifications of the questionnaire were done based on the results of the pre-test.

3.6.3. Data quality control

The Validated Amharic version of EORTC QLQ C-30 was used. The questionnaire has a reliability with Cronbach's á coefficient of 0.81 (66). Moreover, the questionnaire was piloted on 10% of participants to identify clarity and applicability of the tools, and to provide feedback about the questionnaire.

3.7. Variables of the study

3.7.1. Independent variable

- Socio Demographic characteristics
  - age
  - income
  - level of education
  - occupation
  - marital status
  - religion
  - residence
- Clinical characteristics
  - Number of chemotherapy cycle
  - Previous exposure to breast cancer treatment
  - metastatic stage
  - Tumor size
  - Regional lymph node involvement
  - Comorbid diseases
  - Time since diagnosis

3.7.2. Dependent variable

- Global health status/QOL

3.8. Data analysis procedure

3.8.1. Scoring procedure

The QLQ-C30 is composed of both multi-item scales and single-item measures. These include five functional scales, three symptom scales, a global health status / QOL scale, and six single items. Each of the multi-item scales includes a different set of items and no item occurs in more than one scale.

All of the scales and single-item measures range in score from 0 to 100. A high scale score represents a higher response level. Thus a high score for a functional scale represents a high/ healthy level of functioning; a high score for the global health status / QOL represents a high QOL, but a high score for a symptom scale / item represents a high level of symptomatology / problems (67).

The principle for scoring these scales is the same in all cases:

1. Estimate the average of the items that contribute to the scale; this is the raw score (RS)
2. Use 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, or a higher ("worse") level of symptoms

In practical terms, if items I1, I2….In are included in a scale, the procedure is as follows:

Raw score

Calculate the raw score

Raw score= RS = $(^{I1 + I2 + \cdots + In}/_{n})$

Linear transformation

Apply the linear transformation to 0-100 to obtain the score S,

Functional scale: S = $(1 - \frac{RS-1}{range}) \times 100$

Symptom scale: S = $(\frac{RS-1}{range}) \times 100$

Global health status /QOL: S = $(\frac{RS-1}{range}) \times 100$

Range is the difference between the maximum possible value of RS and the minimum possible value. The QLQ-C30 has been designed so that all items in any scale take the same range of values. Therefore, the range of RS equals the range of the item values. Most items are scored 1 to 4, giving range = 3. The exceptions are the items contributing to the global health status / QOL, which are 7-point questions with range = 6 (67). After transformation of the raw score, based on the recommendation leaved by Koller et al, (68) that a quality of life score of 50 points can be used to indicate clinically significant impairment in the EORTC questionnaire. Therefore using 50 as a cutoff point, it was dichotomized in to "affected QOL (worse)" and "not affected (better) QOL" in which a score below 50 for functional and global health status/QOL and a score above 50 for symptom scale indicates affected QOL.

Scoring of items in QLQ C-30 and QLQ - BR23 with their categories is given in Annex I and II.

3.8.2. Statistical analysis

Data was entered cleaned and coded into Epi-data 4.2 Software and then exported to Statistical Package for the Social Science (SPSS Version 20.0) for analysis. Simple descriptive statistics such as frequencies, mean, and standard deviation (SD) was calculated. The performance of the Amharic version of the EORTC QLQ C-30 and EORTC QLQ- BR23 was evaluated by examining feasibility and reliability. Feasibility of conducting quality of life interviews was evaluated by examining the presence of missing item responses, and the time and ease of administration. The internal consistency of the QLQ C-30 and QLQ-BR23 questionnaire was assessed with cronbach's alpha(α) value of the multi item scales based on the recommendation of ($\alpha > 0.7$). In addition inter scale correlation was checked to see whether each scale was distinct from other scale using Pearson correlation coefficient. Moreover, principal component analysis (PCA) was computed to see whether the scales were unidimensional or not.

Quality of life score was checked for its normality through P-P plot. Consequently, one way analysis of variance (ANOVA) was compared to see if there was a significant mean

difference in quality of life between the different groups of socio-demographic and clinical variables.

After mean difference has been observed, the QOL score was dichotomized in to two using 50 as a cutoff point. After dichotomization of the transformed score, bivariate and multivariable logistic regression was used to assess the association of QOL with socio demographic and clinical variables and functional and symptom scales of EORTC QLQ C-30 and QLQ BR 23. In addition, interaction has been checked among some independent variables using backward elimination method. As a result crude and adjusted odds ratio with 95% confidence interval was calculated. A p-value of less than or equal to 0.05 was considered significant.

3.9. Ethical consideration

Ethical clearance and approval letter was obtained from the ethical clearance committee of Addis Ababa University (AAU) College of health science, school of public health ethical review committee to conduct the research. An official letter of approval was written to TASH oncology unit. Informed verbal consent was obtained from the study participants after clearly introducing the purpose, the benefits and risks of the study. Moreover the participants assured that no harm occur to them by not participating in the study. Confidentiality was secured by avoiding writing the identification of the participant's name.

3.10. Dissemination of the result

Result of the study will be presented through AAU College of health science school of public health for the partial fulfillment of the degree of master of public health in epidemiology and biostatistics. And effort will be made to disseminate the results through publication in local or international journals, presentation on annual scientific meeting and copy of the result will be offered to TASH oncology unit.

4. Result

There were 404 eligible respondents during the study period. Of these, only 1 (0.25%) participant refused to participate and was excluded from the study giving a response rate of 99.75%.

4.1. Feasibility and reliability analysis

There was no missing response to the EORTC QLQ C-30 and EORTC QLQ BR 23 questionnaire. The questionnaire took approximately 25 minutes to complete and was well tolerated by the participants. The respondents had some difficulty of understanding questions and ratings stated in cognitive functioning like 'have you had difficulty of concentrating on things like reading and watching television and from the global health status scale 'how would you rate your overall QOL in the past week?'

All of the domains of EORTC QLQ C-30 had an acceptable internal consistency (The cronbache's Alpha value was > 0.7 for 7 out of 9 multi item scales) except cognitive functioning (α=0.57) and nausea and vomiting (α=0.65) domain. On the other hand, Global health status (QOL) had the highest internal consistency (α=0.93). Similarly 3 out of 5multi item scales for EORTC QLQ BR-23 had cronbach's Alpha value of >0.7 (acceptable internal consistency) which ranged from 0.59 for arm symptoms to 0.87 for body image functioning. Table 1

Table 1: Cronbache's Alpha value of EORTC QLQ C-30 and EORTC QLQ BR 23 for the 14 multi item scales Addis Ababa, 2018.

Scale name	Number of items	Cronbache's Alpha value
EORTC QLQ C-30		
Global health status (QOL)	2	0.93
Functional scale		
Physical functioning	5	0.77
Role functioning	2	0.86
Emotional functioning	4	0.88
Cognitive functioning	2	0.57

Social functioning	2	0.72
Symptom scale		
Fatigue	3	0.84
Nausea and vomiting	2	0.65
Pain	2	0.72
EORTC QLQ BR-23		
Functional scale		
Body image	4	0.87
Sexual functioning	2	0.77
Symptom scale		
Systemic therapy side effects	7	0.63
Breast symptoms	4	0.72
Arm symptoms	3	0.59

4.1.1. Correlation between scales

To evaluate how distinct each scale is from other scale in the same matrix, correlation among all scales was computed.

Table 2: Pearson correlation coefficient for inter scale association of EORTC QOL C-30 scales, Addis Ababa, Ethiopia, 2018.

Scale	GHS	PF	RF	EF	CF	SF	FA	NV	PA
GHS	1								
PF	.300**	1							
RF	.275**	.449**	1						
EF	.211**	.420**	.309**	1					
CF	.111*	.280**	.254**	.439**	1				
SF	.266**	.387**	.475**	.318**	.147**	1			
FA	-.267**	-.466**	-.405**	-.426**	-.340**	-.444**	1		
NV	-.285**	-.637**	-.546**	-.383**	-.322**	-.493**	.464**	1	

PA	-.308**	-.678**	-.476**	-.424**	-.358**	-.527**	.520**	.554**	1

**significant level at p<0.01

*significant level at p<0.05

As shown in table 2, all the scales of EORTC QLQ C-30 questionnaire have statistical significant correlation to each other, where all, except pain and N&V with PF scales had correlation coefficient value <0.56. This indicates that the scales are related to each other, and those with small correlations are relatively more distinct from others.

Table 3: Pearson correlation coefficient of EORTC QLQ BR23 scales, Addis Ababa, Ethiopia, 2018.

Scale	BRBI	BRSEF	BRST	BRBS	BRAS
BRBI	1				
BRSEF	.173*	1			
BRST	-.159**	.144**	1		
BRBS	-.023	.069	.265**	1	
BRAS	-.042	.131**	.313**	.526**	1

As shown in table 3, all scales had correlation coefficient value <056. This shows each scale is distinct from the other in the EORTC QLQ BR23.

4.1.2. Principal component analysis of EORTC QLQ C-30 and EORTC QLQ BR23 scales

Principal component analysis (PCA) had been performed to see whether each scale was unidimensional in the EORTC QLQ C-30 and EORTC QLQ BR23 questionnaire. Components with Eigenvalue greater than 1.0 had been retained in the analysis. (Table 4 & 5)

Table 4: Principal component analysis of EORTC QLQ C-30 scales, Addis Ababa, Ethiopia, 2018.

Scale	component	Initial Eigenvalues		
		Total	**% of variance**	**Cumulative %**
GHS	1	1.86	93.16	93.16
	2	0.14	6.84	100
PF	1	2.64	52.79	52.79
	2	0.88	17.57	70.36
	3	0.64	12.70	83.07
	4	0.56	11.15	94.22
	5	0.29	5.78	100
RF	1	1.76	87.82	87.82
	2	0.24	12.18	100
EF	1	2.92	73.07	73.06
	2	0.46	11.53	84.59
	3	0.37	9.27	93.86
	4	0.25	6.14	100
CF	1	1.27	63.32	63.32
	2	0.73	36.68	100
SF	1	1.56	78.21	78.21
	2	0.44	21.79	100
FA	1	2.26	75.44	75.44
	2	0.43	14.26	89.70
	3	0.31	10.30	100

NV	1	1.48	74.14	74.14
	2	0.52	25.86	100
PA	1	1.57	78.25	78.25
	2	0.44	21.75	100

The first principal component explains the maximum variance, and used as an index of unidimensionality. The larger the amount of variance explained by the first component, the closer the set of items is to being unidimensional. As shown in the above table, above 40 % of the total variance had been accounted by the first component for all scales of EORTC QLQ C-30 questionnaire. In addition, the ratio of the first to the second Eigen values of all scales was high. Therefore the scales are unidimensional.

Table 5: Principal component analysis of EORTC QLQ C-30 scales, Addis Ababa, Ethiopia, 2018.

Principal component analysis of EORTC QLQ BR23 scales, Addis Ababa, Ethiopia, 2018.

Scale	**component**	**Initial Eigenvalues**		
		Total	**% of variance**	**Cumulative %**
BRBI	1	2.848	71.20	71.20
	2	0.495	12.39	83.59
	3	0.370	9.25	92.83
	4	0.287	7.17	100
BRSEF	1	1.623	81.17	81.17
	2	0.38	18.83	100
BRST	1	2.18	31.18	31.18
	2	1.07	15.24	46.42
	3	1.01	14.31	60.73
	4	0.93	13.28	74.01
	5	0.71	10.11	84.11
	6	0.65	9.24	93.35

	7	0.47	6.65	100
BRBS	1	2.18	54.51	54.51
	2	0.76	19.05	73.56
	3	0.58	14.54	88.09
	4	0.48	11.90	100
BRAS	1	1.54	51.19	51.19
	2	0.81	26.97	78.16
	3	0.66	21.84	100

As shown in table 5, except for BRST scale, above 40 % of the variance had been accounted by the first component for all other scales of EORTC QLQ BR23 questionnaire. However, it had high Eigen value of the first to the second ratio for all scales. Therefore all the scales were unidimensional. This result indicates that because of the relationship between the variables (scales), as shown earlier, all of the scales may not contribute equally in explaining the QoL and can be condensed into a single axis (variable) by combining the scales through regression-like model, where each variable is weighted by a given coefficient. The size of the coefficient is an indicative of the relative contribution of each scale to explain QoL, large coefficients are indicative of better contribution (the coefficients, known as vectors, are given in appendix III). Having this result in mind, proposed methods of analysis were done as presented in the sections that follow.

4.2. Socio-Demographic characteristics of study participants

The mean age of the study participants was 44 ± 11.78 (Mean ± SD) in which majority 177 (43.9%) were within the age group of 36-50. One hundred and four (25.8%) of participants had completed secondary education, while 97 (24.1%) of participants were unable to read and write. More than half of the participants 248 (61.5%) were housewives followed by government employee 60 (14.9). Majority of participants 229 (56.8%) were married. Two hundred fifty six (63.5%) of participants had Christian faith followed by Muslim faith (24.6%). More than half of the participants 221(54.8%) came from outside of Addis Ababa. One hundred four (25.8%) participants had a household monthly income of 801-1800 Ethiopian birr. Table 6 shows the socio-demographic characteristics of the study participants.

Table 6: Socio-demographic characteristics of breast cancer patients under chemotherapy treatment, Addis Ababa, Ethiopia, 2018.

Variables	Category	Frequency (n)	Percent (%)
Age	<35	123	30.5
	35-50	177	43.9
	51-65	85	21.1
	66-80	18	4.5
Educational status	Unable to read and write	97	24.1
	Able to read and write	39	9.7
	Primary education	87	21.6
	Secondary education	104	2.8
	College and above	76	18.9
Occupation	Housewife	248	61.5
	Government employee	60	14.9
	Non-government employee	13	3.2
	Farmer	28	6.9
	Merchant	34	8.4
	Other	20	5
Marital status	Married	229	56.8

	Single	40	9.9
	Divorced	56	13.9
	Husband died	78	19.4
Religion	Orthodox Christian	256	63.5
	Muslim	99	24.6
	Protestant	45	11.2
	Other	3	0.7
Residence	Addis Ababa	182	45.2
	Out of Addis Ababa	221	54.8
Monthly income	<=800	102	25.3
	801 – 1800	104	25.8
	1801 - 4000	98	24.3
	>4000	99	24.6

4.3.Clinical characteristics of study participants

Among the study population 359 (89.1%) participants were diagnosed for the first time, while 44 (10.9%) participants had recurrent breast cancer (breast cancer that comes back after initial treatment). The mean length of time since diagnosis for the study participants was 29.81 month. Less than 12 months had been elapsed since diagnosis for 249 (61.8%) participants, while greater than 60 months had been elapsed since diagnosis for 80 (19.9%) participants. One hundred eighty three (45.4%) of study participants were stage 3 followed by stage 2 (36%) and stage 4 (14.6%) at the time of diagnosis. One hundred thirty six (33.7%) of participants had regional lymph node involvement of N1, followed by N2 (21.6%), and there was no documentation of regional lymph node involvement for 43 (10.7%) participants. One hundred forty five (36%) participants had a tumor size of T2 (tumor size between 2 cm – 5 cm) followed by T4 (any tumor size with direct extension to chest wall) and the tumor size was not assessed for 12 (3%) participants. Only 98 (18.9%) participants had comorbid diseases, among these 65.78 % of participants had hypertension followed by diabetes mellitus with 31.57 %. Concerning previous exposure to different breast cancer treatment modalities 338 (83.9%) participants had taken different breast cancer treatments. Among these majority, 261 (79.3%) had undergone surgery

alone, 56 (17.0%) had exposure to both surgery and radiotherapy. Regarding the current exposure to chemotherapy treatment, One hundred eighty eight (46.7%) participants were in their first three cycle of treatment, while 37.7 % of participants were in their second three cycle of chemotherapy treatment. Table 7 shows the clinical characteristics of the participants.

Table 7: Clinical characteristics of breast cancer patients under chemotherapy at TASH oncology unit, Addis Ababa, Ethiopia, 2018.

Variables	Category	Frequency (n)	Percent (%)
Time since diagnosis	< 12 months	249	61.8
	12-24 months	31	7.7
	25-36 months	20	5
	37-48 months	15	3.7
	49-60 months	8	2
	> 60 months	80	19.9
Stage at diagnosis	Stage I	16	4
	Stage II A	53	13.2
	Stage IIB	92	22.8
	Stage IIIA (T3,N1,M0)	23	5.7
	Stage III *	160	39.7
	Stage IV	59	14.6
Regional lymph node	N0	63	15.6
involvement (Node)	N1	136	33.7
	N2	87	21.6
	N3	74	18.4
	N4	43	10.7
Tumor size	Tx (Not assessed)	12	3
	T1 (< 2 cm)	47	11.7
	T2 (2 cm-5 cm)	145	36
	T3 (> 5 cm)	94	23.3
	T4 (Any size with extension to chest wall)	105	26.1

Comorbid disease	Hypertension	50	65.78
	Diabetes mellitus	24	31.57
	HIV AIDS	8	10.52
	Asthma	12	15.78
	Cardiac disease	4	5.26
Previous exposure to breast cancer treatment	Surgery alone	261	79.3
	Surgery and radiotherapy	56	17.0
	Surgery and Chemotherapy	13	4.0
	Surgery, Radiotherapy and Chemotherapy	21	6.4
Sequence of chemotherapy cycle	2nd cycle	100	24.8
	3rd cycle	88	21.8
	4th cycle	50	12.4
	5th cycle	58	14.4
	6th cycle	44	10.9
	7th cycle	38	9.4
	8th cycle	25	6.2

*stage III other than T3,N1,M0

4.4. Quality of life scores

4.4.1. Global health status/QOL

The interpretation of QOL score was based on the review by koller et al (68) which recommended that a quality of life score of 50 points can be used to indicate clinically significant impairment in the EORTC questionnaire. As a result, it had been dichotomized in to two using 50 as a point of reference between worse (affected) and better (not affected) quality of life scores.

The mean global health status of the study participants was 52.98 with standard deviation of 25.61. Two hundred nineteen (54.3%) participants had scored less than 50 and had worse (affected) global health status/ quality of life; While 184 (45.7%) participants had scored greater than or equal to 50 hence had better (not affected) quality of life.

Table 8: Global health status score of breast cancer patients under chemotherapy at TASH oncology unit, Addis Ababa, Ethiopia, 2018.

	Frequency (n)	Percent (%)
Affected QOL (<50)	219	54.3
Not affected QOL (>=50)	184	45.7

4.4.2. Functional and symptom scale scores of EORTC QLQ C-30

In the EORTC QLQ C-30, The functional scale of study participants ranged from a mean of 47.61 ± 25.83 for emotional functioning to a mean of 80.06 ± 22.89 for cognitive functioning. The most affected functional scale was emotional functioning followed by social functioning with 288 (71.5%) and 239 (59.3%) particpants had scored < 50 respectively. Whereas the cognitive functioning state of the participants was the least affected functional scale with only 70 (17.4%) of partipants had affeted cognitive functioning.

On the other hand, the most affected symptom scale was financial difficulties with a mean of 74.19 (34.01) followed by fatigue (53.9±26.98) and constipation 49.96 ±34.82). Three hundred nineteen (79.2%) participants had faced financial difficulties (scored >50). While only 84 (20.8%) participants didn't have a financial difficulties. Majority (57.3%) and 216 (53.6%) participants suffered from fatigue and constipation respectively. On the contrary nausea and vomiting was the least affected symptom scale with 266 (66%) participants didn't experience this symptom. The following table illustrates the functional and symptom scores of EORTC QLQ C-30 questionnaire.

Table 9: EORTC QLQ C-30 Functional and symptom scale score of breast cancer patients under chemotherapy at TASH oncology unit, Addis Ababa, Ethiopia 2018.

	Mean (SD)	**Affected Frequency n (%)**	**Not affected Frequency n (%)**
Functional scales			
Physical functioning	63.46 (22.78)	113 (28.0)	290 (72.0)
Role functioning	60.92 (33.12)	177 (43.9)	226 (56.1)
Emotional functioning	47.61 (25.83)	288 (71.5)	115 (28.5)

Cognitive functioning	80.06 (22.89)	70 (17.4)	333 (2.6)
Social functioning	49.71 (32.25)	239 (59.3)	164 (40.7)
Symptom scales			
Fatigue	53.90 (26.98)	231 (57.3)	172 (42.7)
Nausea and vomiting	43.67 (29.31)	137 (34.0)	266 (66.0)
Pain	43.55 (30.08)	144 (35.7)	259 (64.3)
Dyspnea	37.97 (34.96)	165 (40.9)	238 (59.1)
Insomnia	37.79 (35.69)	165 (40.9)	238 (59.1)
Appetite loss	49.05 (35.13)	211 (52.4)	192 (47.6)
Constipation	49.96 (34.82)	216 (53.6)	187 (46.4)
Financial difficulties	74.19 (34.01)	319 (79.2)	84 (20.8)

4.4.3. Functional and symptom scale scores of EORTC QLQ BR23

The EORTC QLQ B-23 functional scale ranged from a mean of 55 (38.48%) for future perspective to a mean of 89 (21.10) for sexual functioning. The most affected functional scale was sexual functioning in which 350 (85.8%) had affected sexual functioning; whereas body image was the least affected in which only 67 (16.6%) participants had affected body image.

On the other hand the most unbearable symptom was breast symptom followed by systemic therapy side effects with mean of 78.15 (31.96) and 54.97 (28.90) respectively. 363 (90.1) Three hundred sixty three (90.1%) participants had suffered with breast symptoms, while 271(67.2%) participants suffered from systemic therapy side effects. Table 10 illustrates functional and symptom scales score of the participants.

Table 10: EORTC QLQ BR23 Functional and symptom scale score of breast cancer patients under chemotherapy at TASH oncology unit, Addis Ababa, Ethiopia 2018.

EORTC QLQ BR23 Functional and symptom scale score of female breast cancer patients under chemotherapy at TASH oncology unit, Addis Ababa, Ethiopia 2018.

	Mean (SD)	**Affected Frequency n (%)**	**Not affected Frequency n (%)**
Functional scale			
Body image	81.0 (26.03)	67 (16.6)	336 (83.4)
Sexual functioning	89.29 (21.10)	350 (86.8)	53 (13.2)
Sexual enjoyment*	68.44 (25.64)	61 (15.1)	14 (3.5)
Future perspective	55.0 (38.48)	205 (50.9)	198 (49.1)
Symptom scale			
Systemic therapy side effects	54.97 (28.90)	271 (67.2)	132 (32.8)
Breast symptoms	78.15 (31.96)	363 (90.1)	40 (9.9)
Arm symptoms	28.26 (22.06)	68 (16.9)	335 (83.1)
Upset by hair loss*	73.63 (36.42)	92 (25.6)	267 (74.4)

*sexual enjoyment percentage was calculated for those who were sexually active (75 patients were sexually active)

*upset by hair loss was calculated for those who had hair loss (359 patients had hair loss)

4.5. Mean difference in global health status (QOL) across categories of socio-demographic and clinical variables

Mean difference in QOL across categories of socio-demographic and clinical variables had been calculated before it had been dichotomized in to two.

Before mean difference in QOL across categories of socio-demographic and clinical variables had been calculated, whether to use parametric or non-parametric method the assumption of

normality was checked using P-P plots.

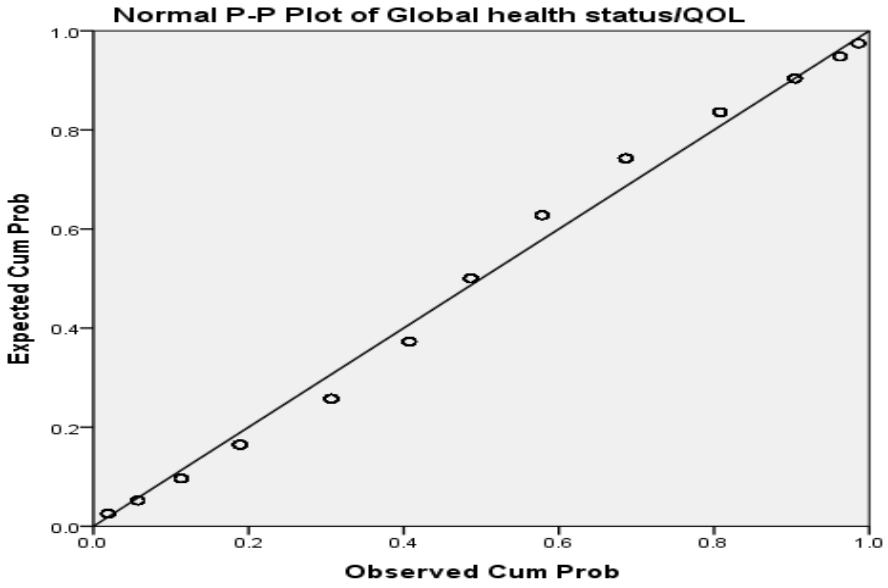

Figure 1: Normal P-P plot of global health status (QOL) of female breast cancer patients under chemotherapy, Addis Ababa, Ethiopia, 2018.

As shown in figure 1, P-P plot of global health status score looks normal, indicating a normally distributed score of global health status (QOL). As a result, mean difference had been compared using a parametric method of one way analysis of variance (ANOVA).

4.5.1. Mean difference in global health status (QOL) across categories of socio-demographic variables

There was a significant mean difference in quality of life across educational status, marital status, occupation, residence and income. According to post hoc tukey's HSD test the mean difference in QOL across the age group was between those in the age group of <35, and 66-80 ($p<0.020$) and between 36-50 and 66-80 ($p<0.022$) where the largest mean score was observed in the young age group . In addition educational status had shown significant mean difference between those who were unable to read and write, and between unable to read and write and college and above ($p < 0.007$), where the lowest mean score had been scored by those who were unable to read and write 44.4 (22.8). Mean difference in QOL had also been noted between married and divorced and married with single ($P < 0.012$ for both) where those who were divorced had highest mean

score of 53.7 (25.0) than other categories. The mean difference in QOL across occupation was between those who were housewife with government employee and, housewife with merchant (P= 0.015 and 0.009 respectively). Moreover, mean difference in QOL was observed between those who earned < =800 and 801-1800, 1801-4000 and >4000 (P=0.000 for all). Table 11 illustrates the mean difference in QOL among SDC categories.

Table 11: Mean difference in global health status among categories of socio-demographic variables of breast cancer patients under chemotherapy at TASH oncology unit, Addis Ababa, Ethiopia, 2018.

Variable	**Mean**	**SD**
Age category		
< 35	51.9	25.3
36-50	51.4	26.1
51-65	47.6	24.7
66-80	33.3	21.6
P value	**0.022***	
Educational status		
Unable to read & write	44.4	22.8
Can read &write	49.4	25.3
Primary education	46.2	24.7
Secondary education	53.1	25.1
College & above	57.6	28.8
P value	**0.005***	
Occupation		
Housewife	47.6	25.6
Gov't employee	56.5	25.5
Non gov't employee	42.3	26.9
Farmer	44.0	22.4
Merchant	59.8	21.9
Other	56.3	29.1

P value	**0.01***	
Marital status		
Single	43.3	26.4
Married	48.2	25.0
Divorced	53.7	26.6
Husband died	43.6	24.5
P value	**0.005***	
Residence		
Addis Ababa	53.9	25.4
Out of Addis Ababa	46.8	25.4
P value	**0.005***	
Monthly income		
<= 800	35.7	20.3
801 - 1800	44.6	22.9
1801 - 4000	53.6	26.7
4001+	66.8	21.6
P value	**0.000***	

P values indicate: the statistical significant mean difference across categories of SDC

4.5.2. Mean difference in global health status (QOL) among categories of clinical variables

There was no statistically significant mean difference in QOL across the categories of time since diagnosis, previous exposure to different treatment modalities, and type of comorbid disease. Significant mean difference was observed in QOL across the sequence of chemotherapy cycle (between 2^{nd} and the 4^{th} ($P< 0.03$), and between 2^{nd} and 5^{th} through 8^{th} cycle of treatment ($P < 0.000$)). Those who were under the second cycle of chemotherapy had scored lowest mean of 38.0 (21.6) than others. Another categories of clinical variables in which significant mean difference in QOL was observed is, stage of the disease at diagnosis (between stage IIB and stage IV ($P< 0.001$) where those who were stage IV had lowest mean score of 41.2 (23.8) than others). In addition regional lymph node involvement had shown significant mean difference in QOL (between N0 and N3 ($P < 0.015$) and N1 and N3 ($P< 0.012$)). Moreover, significant mean difference in QOL had been noted among categories of tumor size (between T1 and T4 (P<

0.004) in which those who had a tumor size of T4 had lowest mean score of 43.9 (25.4) than others). The following table illustrates the mean difference between clinical variables and global health status.

Table 12: Mean difference in global health status (QOL) among categories of clinical variables of breast cancer patients under chemotherapy at TASH oncology unit, Addis Ababa, Ethiopia, 2018.

Variables	**Mean**	**SD**
Chemotherapy cycle		
Second cycle	38.0	21.6
Third cycle	38.5	23.8
Fourth cycle	50.5	20.6
Fifth cycle	63.2	18.5
Sixth cycle	62.1	23.9
Seventh cycle	64.0	28.7
Eighth cycle	63.7	27.5
P value	**<0.0001***	
Stage of the disease at diagnosis		
Stage I	55.7	25.2
Stage IIA	51.6	27.6
Stage IIB	57.9	26.1
Stage IIIA (T3,NI,Mo)	42.8	24.7
Stage IIIA,B,C	48.6	24.3
Stage IV	41.2	23.8
P value	**0.002***	
Regional lymph node involvement		
N0	55.8	24.9
N1	53.9	25.3
N2	49.5	25.1
N3	42.2	26.4

Unknown	43.0	23.2
P value	**0.002***	
Tumor size		
Tx	49.3	24.2
T1	59.6	24.7
T2	51.5	26.9
T3	49.7	22.9
T4	43.9	25.4
P value	**0.010***	
Time since diagnosis		
<12 months	49.4	24.9
13-24 months	59.4	24.4
25-36 months	54.2	25.7
37-48 months	51.1	29.3
49-60 months	43.8	28.8
>60 months	47.6	26.9
P value	**0.300**	

4.6. Association between independent and dependent variables

Bivariate and multivariable logistic regression analysis had been performed to assess the association, control confounding variables and to identify the strength of association between the outcome variable QOL with significant socio-demographic, clinical variables and as well as functional and symptom scales of EORTC QLQ C-30 and EORTC QLQ BR23. Those variables with P<0.05 in the bivariate association had been included in the model. Before computing the multivariable logistic regression analysis, interaction terms had been checked for some independent variables in the socio-demographic and clinical variables, and EORTC QLQ C-30 questionnaire using backward elimination method.

4.5.1. Association of socio-demographic and clinical variables with QOL

In the bivariate analysis, age, educational status, marital status, and monthly income from socio-demographic variables and sequence of chemotherapy from clinical variables were significantly associated with QOL.

Interaction of income by stage of the disease at diagnosis, and stage of disease by tumor size was checked using backward elimination method. As a result there was no statistical significant interaction of income by stage of disease (p<0.862), and stage of the disease by tumor size (p<0.416).

In the multivariable analysis, association of age and stage at diagnosis with QOL turned non-significant, while educational status, marital status, income, and, sequence of chemotherapy cycle had significant association with QOL. Breast cancer patients with educational status of college and above had 1.6 times better QOL than patients with no formal education (OR=1.6, P<0.041). Besides, Divorced mothers were more likely to have better (unaffected) QOL than singles (OR=1.6, P<0.021), similarly, in comparison with those breast cancer patients who earned <=800 ETB, those breast cancer patients who had an income between 1801-4000 and greater than 4000 had 3 fold times better QOL (OR=3.8, p <0.002) (OR=7.9, p<0.000) respectively. Quality of life also significantly got better with chemotherapy cycle. Breast cancer patients who took greater than 3 cycles of chemotherapy treatment had 2.4 times better QOL than those who took less than or equal to 3 cycles of chemotherapy treatment (OR=2.4, p<0.005). Table 13 and 14

Table 13: Binary and multivariable logistic regression of socio-demographic variables with global health status (QOL) of breast cancer patients under chemotherapy at TASH Addis Ababa, Ethiopia, 2018.

Variable category	Affected QOL N (%)	Not affected QOL N (%)	COR (95 %CI)	AOR (95 % CI)	P value
Age					
<35	63 (28.8)	60 (32.6)	1	1	
36-50	92 (42.0)	85 (46.2)	0.9 (0.61-1.53)	1.4 (0.76-2.42)	0.310
51-65	49 (22.4)	36 (19.6)	0.8(0.44-1.35)	1.5 (0.67-3.18)	0.304
>66	15 (6.8)	3 (1.6)	0.2 (0.06-0.76)	0.5 (0.11-2.42)	0.401
Educational status					
Unable to read & write	65 (29.7)	32 (17.4)	1	1	
able to read &write	21 (9.6)	18 (9.8)	1.7 (0.81-3.72)	1.5 (0.55-3.89)	0.446
Primary education	51 (23.3)	36 (19.6)	1.4 (0.78-2.62)	0.8 (0.36-1.64)	0.497
Secondary education	51 (23.3)	53 (28.8)	2.1 (1.19-3.74)	0.96 (0.44-2.09)	0.927
College and above	31 (14.2)	45 (24.4)	2.9 (1.58-5.49)	1.6 (1.01-3.03)	0.041*
Occupation					
Housewife	144 (65.8)	104 (56.5)	1	/	
Gov't employee	27 (12.3)	33 (17.9)	1.7 (0.95-2.99)	/	
Non gov't employee	9 (4.1)	4 (2.2)	0.6 (0.18-2.05)	/	
Farmer	20 (9.1)	8 (4.3)	0.5 (0.23-1.31)	/	
Merchant	12 (5.5)	22 (12.0)	2.5 (0.90-5.36)	/	
Other	7 (3.2)	13 (7.1)	2.57 (0.99-6.67)	/	
Residence					
Addis Ababa	90 (41.1)	92 (50.0)	1	/	
Out of Addis Ababa	129 (58.9)	92 (50.0)	0.7 (0.47-1.04)	/	
Marital status					
Single	24 (11.0)	16 (8.7)	1	1	
Married	112 (51.1)	117 (63.6)	1.6 (1.12-3.10)	1.6 (0.68-3.70)	0.277
Divorced	31 (14.2)	25 (13.6)	1.2 (0.53-2.75)	1.6 (1.12-5.54)	0.021*

Husband died	52 (23.7)	26 (14.1)	0.7 (0.34-1.65)	1.5 (0.52-4.30)	0.463
Income					
<=800	84 (38.4)	18 (9.8)	1	1	
801-1800	67 (30.6)	37 (20.1)	2.6 (1.35-4.93)	1.9 (0.89-4.09)	0.009
1801-4000	45 (20.5)	53 (28.8)	5.5 (2.88-10.48)	3.8 (1.63-8.91)	0.002*
>4000	23 (10.5)	76 (41.3)	15.4 (7.74-30.7)	7.9 (3.13-20.02)	0.000*

/ indicates: not included in the model

Table 14: bivariate and multivariable logistic regression of clinical variables with global health status (QOL) of breast cancer patients under chemotherapy at TASH Addis Ababa Ethiopia, 2018.

Variable category	Affected QOL N (%)	Not affected QOL N (%)	COR (CI)	AOR (95% CI)	P value
Privies exposure to breast cancer treatment					
Yes	180 (82.2)	158 (85.9)	1.3 (0.77-2.26)	/	
No	39 (17.8)	26 (14.1)	1	/	
Chemotherapy sequence					
<=3 cycles	142 (64.8)	46 (25.0)	1		
>3 cycles	77 (35.2)	138 (75.0)	5.5 (3.58-8.54)	2.4 (1.29-4.41)	0.005*
Stage of the disease					
Early stage	32 (18.1)	37 (22.2)	1	/	
Late stage	145 (81.9)	130 (77.8)	0.8 (0.46-1.34)	/	
Regional lymph node involvement					
N0	28 (12.8)	35 (19.0)	1	/	
N1	61 (27.9)	75 (40.8)	0.9 (0.54-1.79)	/	
N2	49 (22.4)	38 (20.7)	0.6 (0.32-1.19)	/	
N3	52 (23.7)	22 (12.0)	0.3 (0.17-0.68)	/	
Unknown	29 (13.2)	14 (7.6)	0.4 (0.17-1.87)	/	
Time since diagnosis					
<12 months	138 (63.0)	111 (60.3)	1	/	

13-24 months	12 (5.5)	19 (10.3)	1.9 (0.91-4.22)	/	
25-36 months	11 (5.0)	9 (4.9)	1.0 (0.41-2.54)	/	
37-48 months	7 (3.2)	8 (4.3)	1.4 (0.50-4.04)	/	
>48 months	51 (23.3)	37 (20.1)	0.9 (0.55-1.47)	/	

/ indicates: not included in the model

4.5.2. Association of EORTC QLQ C-30 functional and symptom scales with QOL

In the association of EORTC QLQ C-30 functional and symptom scales with QOL, bivariate analysis showed that, except cognitive functioning from functional scale and, dyspnea, appetite loss and diarrhea from symptom scales, other functional and symptom scales had significant association with QOL.

Before adjusting for confounding variables, interaction terms for physical by role by social functioning had been checked. There was no statistically significant interaction of physical by role by social functioning (P<0.078). Moreover significant interaction was not observed for physical by role functioning (P<0.136), physical by social functioning (p<0.186), and role by social functioning (p<0.147). Likewise, Interaction terms had also been checked for physical functioning by role functioning by fatigue symptom, and significant interaction was not observed for physical functioning by role functioning by fatigue symptom (p<0.829), similarly, there was no statistically significant interaction of physical functioning by fatigue symptom (p<0.377), and role functioning by fatigue symptom (p<0.614).

In the multivariable analysis only physical functioning, social functioning, fatigue, insomnia and, financial difficulties kept their association. Those breast cancer patients who had better (not affected) physical functioning had 1.6 times better QOL than those patients who had affected physical functioning (OR=1.6, p<0.001), similarly those patients who had better (not affected) social functioning had about 50 % more times better (not affected) QOL than those patients whose social functioning was worse (affected) (OR=1.5, p<0.024).

Regarding the symptom scale, those who were classified as less (unaffected) fatigue symptom had 90% more likely to have good QOL than those patients who were classified as affected fatigue symptom (OR=1.9, P<0.017). Likewise compared with those patients who had high (affected) financial difficulties, those patients who had less (not affected) financial difficulty had

more than 3 fold times more likely to have good QOL (OR=3.5, p<0.001). Moreover breast cancer patients who had sleeping disturbance had 8.3 times better QOL than those with better sleeping status (OR=8.3, P<0.043). The following table illustrates these results.

Table 15: Bivariate and multivariable logistic regression of EORTC QLQ C-30 functional and symptom scales with global health status (QOL) of breast cancer patients under chemotherapy at TASH Addis Ababa Ethiopia, 2018.

Variables		Affected QOL N (%)	Not affected QOL N (%)	COR (95% CI)	AOR (95% CI)	P value
Functional scale						
Physical functioning	Affected	77 (35.2)	36 (19.6)	1	1	
	Not affected	142 (64.8)	148 (80.4)	2.2 (1.41-3.52)	1.6 (1.08-5.06)	0.001*
Role functioning	Affected	115 (52.5)	62 (33.7)	1	1	
	Not affected	104 (47.5)	122 (66.3)	2.2 (1.45-3.26)	1.3 (0.69-2.26)	0.422
Emotional functioning	Affected	73 (33.3)	42 (22.8)	1	1	
	Not affected	146 (66.7)	142 (77.2)	1.7 (1.08-2.64)	0.9 (0.54-1.78)	0.956
Cognitive functioning	Affected	43 (19.6)	27 (14.7)	1	/	
	Not affected	176 (80.4)	157 (85.3)	1.4 (0.84-2.41)	/	
Social functioning	Affected	141 (64.4)	98 (53.3)	1	1	
	Not affected	78 (35.6)	86 (46.7)	1.6 (1.06-2.37)	1.5 (1.09-45)	0.024*
Symptom scale						
Fatigue	Affected	146 (66.7)	85 (46.2)	1	1	
	Not affected	73 (33.3)	99 (53.8)	2.3 (1.56-3.49)	1.9 (1.17-5.09)	0.007*
Nausea	Affected	88 (40.2)	49 (26.6)	1	1	1

&vomiting	Not affected	131 (59.8)	135 (73.4)	1.9 (1.21-2.83)	0.5 (0.14-1.91)	0.143
Pain	Affected	96 (43.8)	48 (26.1)	1	1	1
	Not affected	123 (56.2)	136 (73.9)	2.2 (1.45-3.38)	1.4 (0.34-5.52)	0.653
Dyspnea	Affected	108 (49.3)	57 (31.0)	1	/	
	Not affected	111 (50.7)	127 (69.0)	2.2 (0.43-3.26)	/	
Insomnia	Affected	111 (50.7)	54 (29.3)	1	1	
	Not affected	108 (49.3)	130 (70.7)	2.5 (1.63-3.74)	8.3 (1.06-15.11)	0.043*
Appetite loss	Affected	127 (58.0)	84 (45.7)	1	/	
	Not affected	92 (42.0)	100 (54.3)	1.6 (0.10-2.44)	/	
Constipation	Affected	131 (59.8)	85 (46.2)	1	1	
	Not affected	88 (40.2)	99 (53.8)	1.7 (1.17-2.58)	4.7 (0.65-34.46)	0.126
Diarrhea	Affected	16 (7.3)	8 (4.3)	1	/	
	Not affected	203 (92.7)	176 (95.7)	1.7 (0.72-4.14)	/	
Financial difficulties	Affected	184 (84.0)	135 (73.4)	1	1	
	Not affected	35 (16.0)	49 (26.6)	1.9 (1.17-3.11)	3.5 (1.63-7.57)	0.001*

*significant at P<0.05

/ indicates not included in the model.

4.5.3. Association of QLQ BR23 functional and symptom scales with quality of life

Statistical significant association was observed between QOL and Sexual functioning, future perspective, systemic therapy side effects, and arm symptom in the bivariate analysis of the EORTC QLQ BR23 functional and symptom scale with QOL. But in the multivariable logistic

regression analysis only systemic therapy side effects maintained its association. Those breast cancer patients who did not experienced worse systemic therapy side effects had 1.5 times better QOL than breast cancer patients who experienced worse therapy side effects. Though not statistically significant, breast cancer patients who had better future perspective had 60 % times better QOL than those who had worse future perspective. See the next table

Table 16: Bivariate and multivariable logistic regression of EORTC QLQ BR23 functional and symptom scales with global health status (QOL) of female breast cancer patients under chemotherapy at TASH Addis Ababa Ethiopia, 2018.

Variables		Affected QOL N (%)	Not affected QOL N (%)	COR (95% CI)	AOR (95% CI)	P value
Functional scale						
Body image	Affected	30 (13.7)	37 (20.1)	1	/	
	Not affected	189 (86.3)	147 (79.9)	0.6 (0.37-1.06)	/	
Sexual functioning	Affected	194 (88.6)	156 (84.8)	1	1	
	Not affected	25 (11.4)	28 (15.2)	1.4 (1.04-2.48)	0.7 (0.36-1.65)	0.504
Sexual enjoyment	Affected	4 (11.1)	10 (25.6)	1	/	
	Not affected	32 (88.9)	29 (74.4)	0.4 (0.10-1.28)	/	
Future perspective	Affected	122 (55.7)	83 (45.1)	1	1	
	Not affected	97 (44.3)	101 (54.9)	1.5 (1.03-2.27)	1.6 (0.95-2.64)	0.077
Symptom scale						
Systemic therapy side effects	Affected	139 (63.5)	132 (71.7)	1	1	
	Not affected	80 (36.5)	52 (28.3)	0.68 (0.45-0.98)	1.5 (1.03-7.56)	0.048*
Breast	Affected	193 (88.1)	170 (92.4)	1	/	

symptoms	Not affected	26 (11.9)	14 (7.6)	0.6 (0.31-1.21)	/	
Arm symptoms	Affected	47 (21.5)	21 (11.4)	1	1	
	Not affected	172 (78.5)	163 (88.6)	2.1 (1.22-3.70)	0.9 (0.46-1.96)	0.906
Upset by hair loss	Affected	54 (27.8)	38 (23.0)	1	/	
	Not affected	140 (72.2)	127 (77.0)	1.2 (0.79-2.08)	/	

/ indicates: not included in the model

5. Discussion

This study assessed QOL of life of breast cancer patients under chemotherapy treatment at TASH. The study showed that the QOL of breast cancer patients under chemotherapy treatment was marginally above average (52.98). Participants had worse emotional, social and sexual functioning. And most patients had been affected by financial difficulties and breast symptoms. Educational status, marital status, income level, and number of chemotherapy cycle, have been associated with QOL of breast cancer patients. Moreover, physical functioning and social functioning of QOL dimensions and symptoms of fatigue, insomnia, financial difficulties, and systemic therapy side effects are associated with QOL of breast cancer patients.

The mean QOL score of the study participants obtained in this study was consistent with previous studies done in Ethiopia, Morroco, Nigeria, and Nepalese breast cancer patients (23, 40, 44, 69). However, it was lower than the EORTC QLQ reference value manual for breast cancer patients (61.8 ± 24.6) indicating poor QOL (70). The reference value manual is based on pretreatment QOL data only. Therefore the reason for lower QOL might be due to the different treatment side effects that most patients had been taking including surgery, radiotherapy, and chemotherapy. The mean score of QOL of breast cancer patients was also lower than studies done in Iran, Sweden, Bahrain, India, Australia, Brazil, and Kenya (18, 41, 45, 56, 62, 71, 72). The discrepancy for this result might be due to the difference in socio-demographic characteristics of study participants and different study designs employed. Unlike some studies mentioned here, this study did not compare the QOL of breast cancer patients at different time intervals but assessed at a point in time. Besides patients recruitment method can explain the difference, in which some other studies enrolled breast cancer patients undergoing different forms of treatment, but this study only assessed patients under chemotherapy.

Moreover most of the patients in this study are at stage III and above which might put the patients on frequent visit to the hospital which in turn lead to poor QOL. Besides, majority of the patients in this study come from outside of Addis Ababa traveling long distance to the hospital and wait for longer periods of time to get appropriate treatment due to long queue of patients waiting for treatment at the hospital. This in turn may cause psychological and economic stress leading to poor QOL.

The mean score for physical, role and social functioning was lower than the EORTC QLQ reference value manual for breast cancer but similar in other functional scales in the EORTC QLQ C-30 questionnaire (70). Similar to studies conducted in Bahrain, Brazil, Sweden, Iran, and India, (41, 56, 62, 71, 72) emotional functioning was the most affected functional scale; While Physical and role functioning was the least affected functional scales. The reduced emotional functioning might be due to the role of women in Ethiopia is to take care of the family, so when they get sick, they perceive disruption in their usual role and worry more about their family. In addition they have much concern for their children's future, resulting in poor emotional functioning.

Despite government subsidization program for those patients who are unable to pay for their chemotherapy treatment expenses, patients scored worse in financial difficulties. This is contrary to other studies in Sweden, Brazil, and Iran (41, 62, 71). This finding is not surprising because chemotherapy is a prolonged and expensive treatment which creates financial burden among the breast cancer patients. Besides, in countries like Ethiopia, this is even worse as there is only limited number of facility available for chemotherapy treatment causing all the patients to travel long distance to get the treatment adding to the already elevated financial burden on the patients. Similarly, patients scored worse in fatigue, constipation, and appetite loss. This is consistent with studies conducted in Bahrain and Ethiopia (23, 56). In the same category patients scored better in nausea and vomiting. This might be because symptoms of nausea and vomiting are experienced within a week period of taking chemotherapy treatment. However the patients have been asked about the symptoms they have experienced in the last week. As a result, when they come for the next visit the symptoms might already been alleviated.

Regarding the EORTC QLQ BR23scores, patients scored worse in sexual functioning. This is in consistent with previous studies conducted in Australia, Bahrain, Nepal, and Sweden (18, 44, 56, 71). The reason for lower sexual functioning might be due to the effect of the disease (being late stage) and its treatments on psychological and physical aspects of sexuality. The breast is an organ of sexuality and fertility and loss of one breast may be loss of all these. In addition, patients wrongly believe that having sexual intercourse during chemotherapy treatment might worsen the disease progression. As a result they won't be engaged in the sexual activities leading to poor sexual functioning. Moreover as this topic is sensitive, patients may perceive it improper

to express their sexual desire. In the same category, future perspective was better than studies conducted in Brazil and Sweden (62, 71). This might be because Ethiopian societies may get strong social support from the families, friends, relatives, and neighbors. And it is believed that social support has a potential to play a protective role by buffering the impact of life stress on patients and enhance QOL of breast cancer patients (44). In addition patients have a strong religious belief, and have a great hope of cure if they get the treatment properly. As a result they do have less worry for their future.

Contrary to studies conducted in Morocco and Nepal (40, 44), the patients scored worse in breast symptoms. This might be because majority of the patients in this study are under the second and third cycle of adjuvant chemotherapy following surgery. As a result, the breast symptoms might be due to the unresolved surgery side effects.

In the analysis of mean difference in QOL across categories of socio-demographic variables, better QOL has been observed among literates, divorced and high socio-economic status. This is in consistent with the findings in Bahrain, Ethiopia, and China (23, 38, 56). However a study conducted in California and Nepalese breast cancer patients revealed that better quality of life was observed among older patients and housewives (37, 44). This finding is inconsistent with the present study where better QOL has been observed among younger age and those who are merchants. This inconsistency might be due to the different health care system among countries in which some countries might have free medical service and social support for the elderly and economically disadvantaged women.

It is found that college education is associated with better QOL. This is consistent with previous studies conducted in China, Nepal, Iran, and Kenya (38, 41, 44, 45). This might be because educated persons might get better opportunity for different salaried employment positions, more access to economic resource, interaction with other people and sense of self control.

Similar to studies conducted in Iran, Pakistan, and India (41, 49, 72) patients who take more than 3 cycle of chemotherapy cycle have better quality of life. But this is in contrary to studies conducted in Turkey and Malaysia(43, 52). The discrepancy of this result might be due to the study design and the instrument used to measure the outcome variable. Unlike the present study, a study conducted in Turkey has used nightingale symptom assessment scale N-SAS to measure

the QOL of patients. In addition a study conducted in Malaysia assessed QOL of the patients at different time intervals (before chemotherapy, then after third cycle of chemotherapy). Another reason might be because participants in this study had difficulty of understanding the meaning of QOL and consequently responded the question positively.

Quality of life was significantly associated with physical and social functioning in which those who have better physical and social functioning have better QOL. This in line with the previous studies conducted in Ethiopia, Nigeria, and Pakistan (23, 49, 69) . Similar to studies in Iran, Pakistan, Nigeria, and Ethiopia (23, 41, 49, 69) patients with symptoms of high fatigue, sleep disturbance, and financial difficulty have worse QOL. Fatigue has been well reported to have significant impact on patient's QOL. It has been said that many patients regard the treatment of fatigue as more important than the treatment of pain in contrast to the opinion of many physicians (73, 74). Contrary to study conducted in Sweden financial difficulty is associated with QOL. This might be due to the difference in economic status of the two countries. On the other hand insomnia is associated with a number of adverse medical, social, and psychological consequences leading to QOL impairment (75).

6. Limitation of the study

The study uses a cross sectional study design as a result it would be difficult to see the progress of the quality of life of breast cancer patients at different time intervals, and would be difficult to see the cause effect relationship between the quality of life and independent factors. Second, for the sake of interpretation the outcome variable has been dichotomized in to two. This might result in underestimating the extent of variation in the outcome between groups, such as the association of some events, and considerable variability may be subsumed within each group. Therefore the results of this study should be taken in caution.

7. Conclusion and recommendation

7.1. Conclusion

This study showed that overall quality of life of breast cancer patients under chemotherapy treatment is above average and is lower when compared to other studies. Participants had worse emotional, social and sexual functioning. And most participants had been affected by financial difficulties and breast symptoms. Educational status, marital status, income level, and number of chemotherapy cycle, have been associated with QOL of breast cancer patients. Moreover, physical functioning and social functioning of QOL dimensions and symptoms of fatigue, insomnia, financial difficulties, and systemic therapy side effects are associated with QOL of breast cancer patients.

7.2. Recommendation

- Emphasis should be given to empowering women through education, as it is a key tool for avoiding unemployment and tackling the psychological impact of breast cancer
- Breast cancer patients should be encouraged and supported, in groups or individually, to involve in economic activities and capacity building programs , and health advocates should demand financial support for breast cancer patients
- Policy makers should include quality of life assessment in the patients' treatment protocol which can address the patients' functional and symptom scales.
- Health care providers should encourage patients to explain their feelings, problems and concerns about emotional as well as sexual issues.
- Health care providers should also focus on addressing side effects of therapy
- Lastly, further research with strong study design should be implemented to assess the QOL of breast cancer patients at different time intervals.

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Annexes I: scoring of items in EORTC QLQ C30 with their analysis category

Analysis category	**scale**	**Number of items**	**Item range***	**Question numbers analyzed together**
Global health status/QOL	QOL	2	6	29, 30
Functional scales				
Physical functioning	PF	5	3	1 to 5
Role functioning	RF	2	3	6, 7
Emotional functioning	EF	4	3	21, 24
Cognitive functioning	CF	2	3	20, 25
Social functioning	SF	3	3	26, 27
Symptom scales				
Fatigue	FA	3	3	10, 12 and 18
Nausea and vomiting	NV	2	3	14, 15
Pain	PA	2	3	9, 19
Dyspnea	DY	1	3	8
Insomnia	SL	1	3	11
Appetite loss	AP	1	3	13
Constipation	CO	1	3	16
Diarrhea	DI	1	3	17

Financial difficulties	FI	1	3	28

* Item range is the difference between the possible maximum and the minimum response to individual items; most items take values from 1 to 4, giving range = 3

Annex II: scoring of items in EORTC QLQ BR23 with their analysis category.

	Scale name	**Number of items**	**Item range**	**Question number analyzed together**
Functional scales				
Body image	BRBI	4	3	9-12
Sexual functioning ☥	BRSF	2	3	14, 15
Sexual enjoyment ☥	BRSE	1	3	16
Future perspective	BRFP	1	3	13
Symptom scales				
Systemic therapy side effects	BRST	7	3	1-4, 6, 7, 8
Breast symptoms	BRBS	4	3	20-23
Arm symptoms	BRAS	3	3	17, 18, 19
Upset by hair loss	BRHL	1	3	5

Remarks

1. Sexual enjoyment (BRSEE) is not applicable if item 15 is scored “not at all.”

2. Upset by hair loss (BRHL) is not applicable if item 4 is “not at all.”

* “Item range” is the difference between the possible maximum and the minimum response to individual items.

† Items for the scales marked † are scored positively (i.e. “very much” is best) and therefore use the same algebraic equation as for symptom scales; however, the Body Image scale uses the algebraic equation for functioning scales.

Annex III: Component score coefficient matrix for the EORTC QLQ C-30 questionnaire

Questions	components				
	1	2	3	4	5
Physical functioning					
Do you have any trouble in doing strenuous activities?	.310	-.348	-.280	.493	-1.255
Do you have any trouble taking a long walk?	.313	-.396	-.244	.259	1.353
Do you have any trouble taking a short walk outside of the house?	.284	.033	-.150	-1.167	-.199
Do you need to stay in bed or a chair during the day?	.260	.185	1.108	.146	-.001
Do you need help with eating, dressing, washing yourself or using the toilet?	.191	.909	-.433	.314	.117
Role functioning					
Were you limited in doing either your work or other daily activities?	.534	-1.432			
Were you limited in pursuing your hobbies or other leisure time activities?	.534	1.432			
Emotional functioning					
Did you feel tense?	.299	-.717	.195	1.408	
Did you worry?	.301	-.576	.491	-1.416	
Did you feel irritable?	.279	1.120	.703	.218	
Did you feel depressed?	.290	.263	-1.387	-.192	
Cognitive functioning					
Have you had difficulty in concentrating on things, like reading a newspaper or watching	.628	-.826			

television?					
Have you had difficulty remembering things?	.628	.826			
Social functioning					
Has your physical condition or medical treatment interfered with your family life?	.565	-1.071			
Has your physical condition or medical treatment interfered with your social activities?	.565	1.071			
Fatigue					
Were you tired?	.390	-.581	-1.285		
Have you felt weak?	.390	-.626	1.258		
Did you need to rest?	.371	1.268	.031		
Nausea and vomiting					
Have you felt nauseated?	.581	-.983			
Have you vomited?	.581	.983			
Pain					
Have you had pain?	.565	-1.072			
Did pain interfere with your daily activities?	.565	1.072			

Annex IV: Component score coefficient matrix for the EORTC QLQ BR23 questionnaire

Questions	Components						
	1	2	3	4	5	6	7
Systemic therapy side effects							
How would you rate your overall health during the past week?	.272	-.349	-.398	.165	.600	-.411	.587
Did food and drink taste different than usual?	.309	.121	-.540	.060	-.236	-.012	-.973
Were your eyes painful, irritated or watery?	.217	-.131	.313	.734	-.595	-.097	.224
Have you lost any hair?	.168	.644	.290	.315	.652	.142	-.117
Did you feel ill or unwell?	.295	.365	-.150	-.402	-.400	.338	.814
Did you have hot flushes?	.251	-.485	.306	-.156	.237	.812	-.251
Did you have headache?	.251	-.032	.500	-.471	-.048	-.758	-.260
Body image							
Have you felt physically less attractive as a result of your disease or treatment?	.282	1.063	.759	.069			
Have you been feeling less feminine a result of your disease or treatment?	.299	.247	-1.345	.405			
Did you find it difficult to look at yourself naked?	.296	-.790	.561	1.065			
Have you been	.308	-.452	.071	-1.479			

dissatisfied with your body?							
Sexual functioning							
To what extent were you interested in sex?	.555	-1.152					
To what extent were you sexually active? (with or without intercourse)	.555	1.152					
Breast symptoms							
Have you had any pain in the area of your affected breast?	.338	-.667	.238	.893			
Was the area of your affected breast swollen?	.338	.396	-1.022	.221			
Was the area of your affected breast oversensitive?	.363	-.393	.054	-1.116			
Have you had skin problems on or in the area of your affected breast (e.g, itchy, dry, and flaky)?	.313	.745	.785	.093			
Arm symptoms							
Did you have any pain in your arm or shoulder?	.501	-.196	-.943				
Did you have a swollen arm or shoulder?	.423	.909	.293				
Was it difficult to raise your arm or to move it sideways?	.470	-.609	.742				

Annex V: Information sheet for the participants (English version)

Addis Ababa University College of Health Sciences School of Public Health

Assessment of breast cancer patient's quality of life during chemotherapy session at Tikur Anbessa specialized hospital oncology unit Addis Ababa Ethiopia.

Introduction

Greeting, My Name is ----------; I am working in ----------. I am working as data collector in a study conducted by the research team member of Addis Ababa University College of Health Sciences School of public Health. I would like to inform you that I would have a short interview concerning this study. Before we go to our discussion, I will ask you to listen carefully to what I am going to tell you about the purpose and general condition of the study and tell me whether you agree or disagree to participate in this study.

The objective of this study is to assess the quality of life of breast cancer patients under chemotherapy treatment session. You are selected to be one of the participants in this study. The study will be conducted through interview.

Apart from the time you are going to use during the interview, there will not be any risk acquired by participating in the study.

Benefits of the study: Taking part in the study helps;

- ✓ To improve the knowledge about quality of life of breast cancer patients during chemotherapy treatment session
- ✓ To provide basic information for health policy makers, administrators, researchers and for patients who are suffering from breast cancer.

Personal information you are going to give during the data collection will be confidential. Your name will not be written in the questionnaire and once the data is entered into a computer, it will be coded and becomes unidentifiable. Information in the computer will be password protected. Hard copy (paper) documents such as consent and information forms will be kept in a secured locked cabinet

You will be recruited based on your willingness and without obligation to participate in the study. You have the right to withdraw from participating in the study whenever you want to (before completing the study). Participation in the study will have no implications for your relation and treatment at the hospital.

Are you willing to participate in the study? 1. Yes 2. No

Thank you!

Annex VI: Informed consent form (English version)

I understand all the information provided to me by the data collector, and I am willing to participate in the interview.

Signature ---------- Date ----------

Annex VII: English version of the Questionnaire

1. Socio demographic data		
	Variables	Response
1.1	Age	------- years
1.2	Educational status	A. Illiterate B. Read and write C. Primary education D. Secondary education E. College and above
1.3	occupation	A. Housewife B. Governmental C. Non-governmental D. Private
1.4	Religion	A. Orthodox Christian B. Muslim C. Protestant D. Catholic E. Other -----
1.5	Residence	A. Addis Ababa B. Out of Addis Ababa
1.6	Marital status	A. Married B. Single C. Divorced D. Other
1.7	Monthly income	----------

2. Clinical data extracted from patients' medical chart		
2.1	How many cycles of chemotherapy treatment have you taken	A. Two B. three C. four D. five E. six F. seven
2.2	Have you taken cancer treatment before?	A. Yes B. No
2.3	If yes, for question number 2.2, what type of treatment have you taken?	A. Surgery B. Radiotherapy C. Chemotherapy D. Hormonal therapy
2.4	Stage of tumor	A. Stage I B. Stage II A C. Stage IIB D. Stage IIIA (T3,N1,M0) E. Stage III F. Stage IV
2.5	Tumor size	A. T1 B. T2 C. T3 D. T4 E. Tx
2.6	Regional lymph node involvement	A. N0 B. N1 C. N2 D. N3

		E. N4
2.6	Do you have Comorbid diseases	A. Yes B. No
2.7	If yes what is the disease type?	A. Hypertension B. Diabetes mellitus C. Heart disease D. Asthma E. Other

EORTC QLQ C-30 (English version)

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.

Please fill in your initials …….

Code number ……..

Date ……..

1. Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

2. Do you have any trouble taking a long walk?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

3. Do you have any trouble taking a short walk outside of the house?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

4. Do you need to stay in bed or a chair during the day?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

5. Do you need help with eating, dressing, washing yourself or using the toilet?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

During the past week

6. Were you limited in doing either your work or other daily activities?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

7. Were you limited in pursuing your hobbies or other leisure time activities?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

8. Were you short of breath?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

9. Have you had pain?

   1. Not at all 2. A little 3. Quite a bit 4. Very much

10. Did you need to rest?

1. Not at all 2. A little 3. Quite a bit 4. Very much

11. Have you had trouble sleeping?

1. Not at all 2. A little 3. Quite a bit 4. Very much

12. Have you felt weak?

1. Not at all 2. A little 3. Quite a bit 4. Very much

13. Have you lacked appetite?

1. Not at all 2. A little 3. Quite a bit 4. Very much

14. Have you felt nauseated?

1. Not at all 2. A little 3. Quite a bit 4. Very much

15. Have you vomited?

1. Not at all 2. A little 3. Quite a bit 4. Very much

16. Have you been constipated?

1. Not at all 2. A little 3. Quite a bit 4. Very much

17. Have you had diarrhea?

1. Not at all 2. A little 3. Quite a bit 4. Very much

18. Were you tired?

1. Not at all 2. A little 3. Quite a bit 4. Very much

19. Did pain interfere with your daily activities?

1. Not at all 2. A little 3. Quite a bit 4. Very much

20. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?

1. Not at all 2. A little 3. Quite a bit 4. Very much

21. Did you feel tense?

1. Not at all 2. A little 3. Quite a bit 4. Very much

22. Did you worry?

1. Not at all 2. A little 3. Quite a bit 4. Very much

23. Did you feel irritable?

1. Not at all 2. A little 3. Quite a bit 4. Very much

24. Did you feel depressed?

1. Not at all 2. A little 3. Quite a bit 4. Very much

25. Have you had difficulty remembering things?

1. Not at all 2. A little 3. Quite a bit 4. Very much

26. Has your physical condition or medical treatment interfered with your family life?

1. Not at all 2. A little 3. Quite a bit 4. Very much

27. Has your physical condition or medical treatment interfered with your social activities?

1. Not at all 2. A little 3. Quite a bit 4. Very much

28. Has your physical condition or medical treatment caused you financial difficulties?

1. Not at all 2. A little 3. Quite a bit 4. Very much

For the following questions please circle the number between 1 and 7 that best applies to you

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

1 2 3 4 5 6 7

very poor **excellent**

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

1 2 3 4 5 6 7

very poor **excellent**

EORTC QLQ -BR23 (English version)

Patients sometimes report that they have the following symptoms or problems. Please indicate the extent to which you have experienced these symptoms or problems during the past week.

During the past week

1. Did you have dry mouth
   1. Not at all 2. A little 3. Quite a bit 4. Very much
2. Did food and drink taste different than usual?
   1. Not at all 2. A little 3. Quite a bit 4. Very much
3. Were your eyes painful, irritated or watery?
   1. Not at all 2. A little 3. Quite a bit 4. Very much
4. Have you lost any hair?
   1. Not at all 2. A little 3. Quite a bit 4. Very much
5. Answer this question only if you had any hair loss. were you upset by the loss of your hair?
   1. Not at all 2. A little 3. Quite a bit 4. Very much
6. Did you feel ill or unwell?
   1. Not at all 2. A little 3. Quite a bit 4. Very much
7. Did you have hot flushes?
   1. Not at all 2. A little 3. Quite a bit 4. Very much
8. Did you have headache?
   1. Not at all 2. A little 3. Quite a bit 4. Very much
9. Have you felt physically less attractive as a result of your disease or treatment?
   1. Not at all 2. A little 3. Quite a bit 4. Very much
10. Have you been feeling less feminine a result of your disease or treatment?
    1. Not at all 2. A little 3. Quite a bit 4. Very much
11. Did you find it difficult to look at yourself naked?
    1. Not at all 2. A little 3. Quite a bit 4. Very much
12. Have you been dissatisfied with your body?
    1. Not at all 2. A little 3. Quite a bit 4. Very much

13. Were you worried about your health in the future?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

During the past four weeks

14. To what extent were you interested in sex?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

15. To what extent were you sexually active? (with or without intercourse)

    1. Not at all 2. A little 3. Quite a bit 4. Very much

16. Answer this question only if you have been sexually active. To what extent was sex enjoyable for you?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

17. Did you have any pain in your arm or shoulder?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

18. Did you have a swollen arm or shoulder?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

19. Was it difficult to raise your arm or to move it sideways?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

20. Have you had any pain in the area of your affected breast?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

21. Was the area of your affected breast swollen?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

22. Was the area of your affected breast oversensitive?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

23. Have you had skin problems on or in the area of your affected breast (e.g, itchy, dry, flaky)?

    1. Not at all 2. A little 3. Quite a bit 4. Very much

Annex VIII: Information sheet (Amharic version)

አድሲ አበባ ዩኒቨርሲቲ ህክመናና ጤና ሳይንስ ኮሌጅ የማህበረሰብ ትምህርት ክፍል

የተሳታፊዎች መረጃ ቅፅ

ጤና ይስጥልኝ፣ ስሜ…….ይባላል. የምስራዉ……..ነዉ. በአዲስ አበባ ዩኒቨርሲቲ ህክምናና ጤና ሳይንስ ኮሌጅ የጥናት ቡድን አባላት በተዘጋጀዉ ጥናት ላይ መረጃ ሰብሳቢ ሁኜ እየሰራሁ ነዉ.ይህን ጥናት በተመለከተ አጭር ቃለመጠይቅ ከርስዎ ጋር ይኑረኛል። ከቃለ ምልልሱ በፊት ግን ስለዚህ ጥናት አላማ በአጭሩ እገልጽሎታለው። ይህ ጥናት በአ.አ.ዩ ህክምናና ጤና ሳይንስ ኮሌጅ የ ማስተርስ ፕሮግራም መመረቂያ ፅሁፍ ነዉ። የዚህ ጥናት አላማ በጥቁር አንበሳ ስፔሻላይዝድ ሆስፒታል የጡት ካንሰር ላለባቸውና በኬሞ ቴራፒ ህክምና ላይ ላሎ ህመምተኞች በህይወት የመኖር ጣዕም ላይ የሚያተኩር ነው። እርሶም በዚህ ጥናት ላይ እንዲሳተፉ ተጋብዘዋል።አሁን የመናደርገው ቃለ ምልልስ ምክንያት ጊዜዎን ከመሻማት ውጪ በአካሉ ላይ የሚደረግ ምንም አይነት የለም ።

የዚህ ጥናት ጥቅም

- የጡት ካንሰር ያለባቸውና ኬሞ ቴራፒ ህክምና ላይ ላሎ ህመምተኞች በህይወት የመኖር ጣዕም እዉቀት ይጨምራል።
- የዚህ ጥናት ውጤት ሌሎች ጤናን በተመለከተ መተዳደሪያ ደንብ ለሚያወጡ ግለሰቦች አስተዳደሮች ጥናትን ለሚያከናውኑ ግለሰቦች በጡት ካንሰር ለሚሰቃዩ ህሙማን መረጃ ይሰጣል።

ይህ የሚሰጡን ግላዊ መረጃ ሚስጥራዊነቱ የተጠበቀ ነው ። ይህ መረጃ በኮምፒውተር በሚስጥር ከተመዘገበ በኃላ ስምዎት አይጠቀስም እናም በምንም አይት ምነገድ ሊታወቅ አይችልም። በኮምፒውተር ውስጥ ያለው መረጃ በሚስጥር ኮድ ታስሮ ይቀመጣል።

ይህን መረጃ የሚሰጡን ያለምንም ግዴታ በሙሉ ፍቃደኝነት ነው ከተጀመረ በኃላ በማንኛውም ግዜ ተሳትፎሁን የማቁረጥ ሙሉ መብት ይኖሮታል። እርሶዎ በጥናቱ በመሳተፎ ከሆስፒታል ካልዎት ግንኙነት ጋር ተፅእኖ የለውም

በጥናቱ ላይ ለመሳተፍ ፍቃደኛ ነዎት?

1. አዎ 2. አይደለውም

አመሰግናለው!!

Annex IX: Informed consent form (Amharic version)

ፈቃደኝነትን የሚያረጋግጥ ቅፅ

በመረጃ ሰብሳቢዋ መሰረት የተነገረኝን መረጃ በሙሉ ተረድቻለሁ። አናም በዚህ ቃለመጠይቅ ላይ ለመሳተፍ ፈቃደኛ ነኝ።

የምላሽ ሰጪ ፊርማ .....

ቀን…….

የጠያቂ ፊርማ …….

Annex X: Amharic version of the questionnaire

1. ማንነትን የሚመለከት ጥያቄዎች

1.1 ዕድሜ ……

1.2 የትምህርት ደረጃ ……ሀ/ አልተማርኩም

ለ/ ማንብብ መፃፍ እችላለሁ

ሐ/አንደኛ ደረጃ ያጠናቀኩ

መ/ ሁለተኛ ደረጃ ያጠናቀኩ

ሠ/ ኮሌጅ እና ከዚያ በላይ

ረ/ሌላ ካለ

1.3 ስራ ሀ/ የቤት እመቤት

ለ/ የመንግስት ሠራተኛ

ሐ/ መንግስታዊ ያልሆነ ድርጅት ሠራተኛ

መ/ ግል

1.4 ሀይማኖት……ሀ/ ኦርቶዶክስ ክርስቲያን

ለ/ሙስሊም

ሐ/ፖሮቴስታንት

መ/ካቶሊክ

ሠ/ ሌላ ካለ

1.5 የመኖሪያ ቦታ……..

1.6 የጋብቻ ሁኔታ ……ሀ/በትዳር ላይ ያሉ

ለ/ ያላገባች

ሐ/የፈታች

መ/ሌላ ካለ

1.7 የወር ገቢ……

2. የሕክምና መረጃ/ ከበሽተኛ ካርድ የሚወሰድ

2.1. ለስንተኛ ዙር ነው ይህን መድሀኒት የሚወስዱት

ሀ/ለሁለተኛ ጊዜ

መ/ ለአምተኝ ጊዜ

ለ/ለሶስተኛ ጊዜ

ሠ/ለስድስተኛ ጊዜ

ሐ/ ለአራተኛ ጊዜ

ረ/ ለሰባተኛ ጊዜ

ሰ/ ለስምተኛ ጊዜ

2.2. ከዚህ ህክምና በፊት ሌላ የካንሰር ህክምና ወስደዋል?

ሀ/ አዎ ወስደዋል

ለ/ አልወስዱም

2.3. ለ2 .2 መልስም አዎ ከሆነ ምን አይነተ ህክምና ነው የወሰዱት ?

ሀ/ ቀዶ ህክምና

ለ/የጨረር ህክምና

2.4. የዕጢው ደረጃ ሀ/ ደረጃ አንድ

ለ/ ደረጃ ሁለት

ሐ/ደረጃ ሶሰት

መ/ደረጃ አራት

2.5. የዕጢዉ መጠን ……

2.6. ተጉዋዳኝ በሺታ ዐለብዎት ሀ/የደም ግፊት

ለ/የስኪረ በሺታ

ሐ/የልብ በሺታ

መ/ሌላ

EORTC QLQ C-30 (Amharic version)

የእኛው ቡድን ስለከእርሶዎ ስለጤንነትዎ ልዩ ትኩረት መስጠት ነው።

እባክዎትን የሚከተሉትን ጥያቄዎች በሙሉ እርሶዎ ትክከለኛ ብለው ያመኑበትን በማክበብ ይመልሱ ።

ትክክለኛ መልስ ወይም የተሳሰተ መልስ የሚባል የለም። የሚሰጡት መረጃ ሁሉ ሚስጠራዊነቱ በደንብ የተጠበቀ ይሆናል።

እባካዎን የእርሶዎንና የአያትዎን የስም መጀመሪያ ፊደል ይንገሩኝ.....

መለያቁጥር.....

ቀን፡.....

		በጭራሽ	በትንሹ	በመጠኑ	በብዛት
3.1	ከባድ ስራ ወይም እንቅስቃሴ ለመስራት ችግር አለብዎ (ለምሳሌ፤ዘንቢል ለመሸከም)	1	2	3	4
3.2	ረጅም የእግር ጉዞ ለማድረግ ችግር አለብዎ	1	2	3	4
3.3	አጭር የእግር ጉዞ ለማድረግ ችግር አለብዎ(ከቤትዎ ውጪ)	1	2	3	4
3.4	በህመምዎ የተነሳ በቀን አልጋ ላይ ወይም ወንበር ላይ ሁነው ረዘም ላለ ሰዓት ያሳልፍሉ?	1	2	3	4
3.5	የዕለት ተዕለት እንቅስቃሴዎን ለማከናውን ረዳት ወይም አጋዥ ይፈልጋሉ ?ለምሳሌ መመገብ መልበስ	1	2	3	4
3.6	ስራዎትን ወይም የዕለት ተዕለት እንቅስቃሴዎን ለማከናወወን አግድዎት ነበር	1	2	3	4
3.7	በትርፍ ጊዜ የሚከናወን ስራ ወይንም ዝነንባሌዎን ለማሳካት ወይም ሌሎች የመዝናኛ ጊዜዎች ለማሳለፍ	1	2	3	4

	አግዶዎታለ?				
3.8	ሲተነፍሱ ትንፋሽ ማጠር አጋትጥመዎት ነበር?	1	2	3	4
3.9	የህመም ስሜት ነበረብዎ?	1	2	3	4
3.10	ከወትሮዎ የተለየ ዕረፍት አስፈልጎዎት ነበር?	1	2	3	4
3.11	የእንቅልፍ ችግር ነበረብዎ?	1	2	3	4
3.12	አቅም ያንስዎት ነበር?	1	2	3	4
3.13	የምግብ ፍላጎትዎ ቀንሷል?	1	2	3	4
3.14	የማቅለሽለሽ ስሜት ነበረበዎ?	1	2	3	4
3.15	አስመልስዎት ነበር ?	1	2	3	4
3.16	የሰገራ ድርቀት ነበረብዎ ?	1	2	3	4
3.17	ተቅማጥ ነበረብዎ?	1	2	3	4
3.18	የድካም ስሜት ነበረብዎት ?	1	2	3	4
3.19	ህመሙ ዕለት ተዕለት እንቅስቃሴዎን ያውክብዎ ነበረ ?	1	2	3	4
3.20	አንዳንድ ነገሮች ትኩረት ስጥተው ለመስራት? ያዉክዎት ነበር? (ለምሳሌ፤ ጋዜጣ ለማንበብ፤ ራዲዩ በማዳመጥ)	1	2	3	4
3.21	የውጥረት ስሜት ነበረብዎ ?	1	2	3	4
3.22	የመጨነቅ ስሜት ነበረብዎ ?	1	2	3	4

3.23	የመነጫነጭ ስሜት ነበረብዎ?	1	2	3	4
3.24	የመደበር ስሜት ነበረብዎ ?	1	2	3	4

ባለፈው ሳምንት ውስጥ

		በጭራሽ	በትንሹ	በመጠኑ	በብዛት
3.25	ነገሮችን የማስታወስ ችግር ነበረብዎ ?	1	2	3	4
3.26	የጤናዎ ሁኔታ ወይም የሚከታተሉት ህክምና ኑሮ ላይ ያሳደረው ተፅዕኖ አለ	1	2	3	4
3.27	የጤናዎ ሁኔታ ወይም የሚከታተሉት ህክምና በማህበራዊ ህይወትዎ፤ በሚያደርጉት እንቅስቃሴ ላይ ያሳደረው ተፅእኖ አለው ?	1	2	3	4
3.28	የጤናዎ ሁኔታ ወይም የሚከታተሉት ህክምና ገንዘብ እንዲያጥርዎ /እንደቸገርዎ አድርጓል ?	1	2	3	4

		በጣም መጥፎ						እጅግ በጣም ጥሩ
3.29	ባለፈዉ ሳምንት በአጠቃላይ የጤንነት ሁኔታዎን እንዴት ይመዝኑታል?	1	2	3	4	5	6	7
3.30	ባለፈዉ ሳምንት የርስዎን የሂወት የመኖር ጣዕም ዕንዴት ይመዝኑታል?	1	2	3	4	5	6	7

EORTC QLQ BR-23 (Amharic version)

		በጭራሽ	በትንሹ	በመጠኑ	በብዛት
4.1	የአፍ ድርቀት ነበረብዎ ?	1	2	3	4
4.2	ምግብና መጠጥ ከወትሮ የተለያ ጣዕም ተለዉቶብዎ ነበር?	1	2	3	4
4.3	አይንዎን የህምም የመቆርቆር ወይም ውሀ የማዘል ስሜት ነበረብዎ ?	1	2	3	4
4.4	ፀጉርዎ ሳስቶ ፤ ተነቅሉ ነበር?	1	2	3	4
4.5	ለጥያቄ ቁጥር 4.4 መልስዎአዎ ከሆነ ወይም ከ ምርጫ ቁጥር 1 ውጪ ከሆነ ፀጉራ በመነቀሉ ተናደው ነበር?	1	2	3	4
4.6	የህምም ስሜት ነበረብዎ?	1	2	3	4
4.7	ፊትዎ አካባቢ የሙቀት፤ የማቃተል ስሜት ነበርብዎ?	1	2	3	4
4.8	ራስ ምታት ነበረብዎ ?	1	2	3	4
4.9	በጤናዎ ሁኔታ ወይም በሚከታተሉት ህክምና ምክንያት አይን የማይስቡ ሰዉ እንደሆኑ ተሰምቶዎት ነበር ?	1	2	3	4
4.10	በጤናዎ ሁኔታ ወይም በሚከታተሉት ህክምና ምክንያት ሴትነትዎ ተሰምቶዎት ነበር?	1	2	3	4
4.11	እርቃንዎን ሁነው ራስዎን መመልከት ከብደዎት ነበር?	1	2	3	4

4.12	በአካልዎ ወይም በሰውነትዎ አቋም ያለመርካትና ያለመደሰት ስሜት ተሠምቶዎት ነበር?	1	2	3	4
4.13	ስለወደፊት ጤንነትዎ ተጨንቀው ነበር?	1	2	3	4

ባለፈት አራት ሳምንት ውስጥ

		በጭራሽ	በትንሹ	በመጠኑ	በብዛት
4.14	ለፅታዊ ግንኙነት ምን ያህል ፍላጉት ነበርዎት ?	1	2	3	4
4.15	ፅታዊ ግንኙነት ላይ ምን ያህል ተሳታፊ ነበሩ? (በግብረ ስጋ ግንኙነት ወይም ከግንኙነት ውጭ)?	1	2	3	4
4.16	ለጥያቄ ቁጥር 4፣15 መልስዎ ከ 1 ወጪ ከሆነ (ግብረ ስጋ ግንኙነቱ ምን ያህል አስደሳች ነበር?	1	2	3	4
4.17	ክንድዎ ላይ ወይም ትከሻዎ ላይ ህመም ተስምቶዎት ነበር ?	1	2	3	4
4.18	የክንድ ወይም ትከሻ እብጠት ነበረብዎት?	1	2	3	4
4.19	ክንድዎን ለማነሳት ወይም ወደ ጉን ለማንቀሳቀስ	1	2	3	4

ተቸግረው ነበር?

4.20	በበሽታ የተጠቃዉ ጡትዎ አካባቢ የህምም ስሜት ነበረብዎ?	1	2	3	4
4.21	በበሽታ የተጠቃዉ ጡትዎ አካባቢ እብጠት ነበረብዎ ?	1	2	3	4
4.22	በበሽታ የተጠቃዉ ጡትዎ አካባቢ በትንሹ ሲነካ ከባድ የህመም ስሜት ነበረብዎ?	1	2	3	4
4.23	በበሽታ የተጠቃዉ ጡትዎ አካባቢ የቆዳ ችግር ነበረብዎ?	1	2	3	4

Curriculum Vite

1. **Personal data**

1.1 Name	Anissa Mohammed Hassen
1.2 Permanent Address	Addis Ababa
1.3 E-Mail Address	anisa.moh26@gmail.com
1.4 Gender	Female
1.5 Nationality	Ethiopian
1.6 Date of Birth	November 24, 1986 E.C
1.7 Place of Birth	South Wello, Kombolcha
1.8 Tel.	+251921257471

2. **Educational background**

   2.1 From grade 1-8 Kombolcha Junier Primary School.

   2.2 From grade 9_10 Kombolcha Millennium Secondary school.

   2.3 From grade 11-12 Kombolcha secondary and preparatory School.

   2.4 Higher Education in university of Gondar Health Science College .

3. **Qualifications**

   - BCS Degree in Public Health Officer from University of Gondar in 2007 EC.

4. **Work experience**

   * worked for a year as a graduate assistance in Wello university.

5. **Language skill**

   - Excellent Speaking ,Reading , Writing and Listing In Amharic and good in English

6. **Other skills**

   - Basic ADULT And Pediatric ART Care Training

7. **Reference**

   - Available Up on request

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical and technical Conduct of the research project and for provision of required progress reports as Per terms and conditions of the Research Publications Office in effect at the time of Grant is forwarded as the result of this application.

Name of the student: _____

Date._____ Signature _____

Approval of the primary Advisor

Name of the primary advisor:_____

Date._____ Signature _____