ADDISS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTEMENT OF GYNECOLOGY AND OBSTETRICS

POSTGRADUATE PROGRAM

TO DESCRIBE HEALTH RELATED QUALITY OF LIFE, AND ITS PREDICTIVE FACTORS ON CERVICAL CANCER PATIENTS IN TWO TEACHING HOSPITALS, ADDIS ABABA, ETHIOPIA, 2021.

PRINCIPAL INVESTIGATOR: DANIEL TEREFE (MD, FINAL YEAR RESIDENT IN THE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, SCHOOL OF MEDICINE, COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY**)**

AUG, 2021

ADDIS ABABA, ETHIOPIA

To Describe Health Related Quality of Life, and its predictive factors on cervical cancer patients in two teaching hospitals, Addis Ababa, Ethiopia, 2021.

Advisors:

-Shiferaw Negash (MD, Associate Professor of Obstetrics and Gynecology, Gynecology oncologist, department of obstetrics and gynecology ,school of medicine, college of health sciences, Addis Ababa University)

-Sofanit Haillu (MD, Assistant professor of Obstetrics and gynecology department of obstetrics and gynecology ,school of medicine, college of health sciences, Addis Ababa University)

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF SPECIALITY CERTIFICATE TO THE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE, ADDIS ABABA UNIVERSITY

AUG, 2021

ADDIS ABABA, ETHIOPIA

Approval Sheet
Addis Ababa University
School of Postgraduate Studies

I, Daniel Terefe(MD), hereby declare that this thesis entitled **"To Describe Health Related Quality of Life, and its predictive factors on cervical cancer patients in two teaching hospitals, Addis Ababa, Ethiopia, 2021''**in line with the requirement of graduate studies was fully undertaken by me under the guidance of my advisors and that I have, to the best of my knowledge and effort, avoided plagiarism or duplication of materials unless and otherwise cited and/or acknowledged and that it has not been so far submitted for any form of publication or consideration before the final approval.

Principal investigator	Signature	Date
Daniel Terefe (MD)	_____	_____

We hereby certify that we have read and evaluated this research thesis **To Describe Health Related Quality of Life, and its predictive factors on cervical cancer patients in two teaching hospitals, Addis Ababa, Ethiopia, 2021''**in under our guidance from its inception up to in its current format and that it can be submitted for final approval in partial fulfillment to Specialty certificate in Obstetrics and Gynecology.

1. Advisor	Signature	Date
_____	_____	_____
2. Advisor	Signature	Date
_____	_____	_____

As a member of DRPC, I certify that I have read and evaluated the thesis prepared by Daniel Terefe (MD), and examined the candidate. I recommend that the thesis be accepted as fulfilling the thesis requirements for the Degree of Specialty in Obstetrics and Gynecology.

Examiner	Signature	Date
_____	_____	_____

Acknowledgments

Above all I would like to thank our God for giving me the strength to pass through all this way. I would like to acknowledge Addis Ababa University School of medicine for sponsoring this research. I would also thank Saint Paul Hospital Millennium Medical College gynecology and obstetrics department for their permission for the additional samples taken. I would also like to thank TASH OB/GYN department for their continuous support. My special thanks also go to my advisors Dr.Shiferaw Negash and Dr. Sofanit Haile for the unreserved guidance and constructive suggestions for the completion of the research. My family and friends have served as anchor throughout out my journey. I am also thankful to all who gave hands by the times we were in need.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Acronyms

ADR	Adverse Drug Reactions
ASR	Age standardized rate
DRPC	Department of Research Publication Committee
EORTC QLQ-CX24	European Organization for Research and Treatment of Cancer Quality of life questionnaire- Cervical cancer Module
EORTC QLQ-C30	European Organization for Research and Treatment of Cancer Quality of life questionnaire- Core
FACT-G	Cancer specific Functional Assessment of Cancer Therapy-General
FACT-CX	Cancer specific Functional Assessment of Cancer Therapy-Cervical Cancer Specific
FIGO	International Federation of Gynecology and Obstetrics
GLOBCAN	Global Cancer Initiative
GQOL	Global Quality of Life
HADS	Cancer specific Hospital and Anxiety Depression Scale
HRQOL	Health Related Quality of Life
HIV	Human Immunodeficiency Virus
POMS	Generic Profile of Mood States
QALY	Quality Adjusted Life Year
QOL	Quality of Life
RGOPD	Regular Gynecology OPD
RSCL	Cancer specific Rotterdam Symptom Checklist
SF-36	Short Form 36
SPHMMC	Saint Paul Hospital Millennium medical college
TASH	Tikur Anbessa Specialized Hospital
UN	United Nations
VAS-C	Cancer specific Visual Analogue Scale-Cancer

Abstract

Background*: Cervical cancer is the second most prevalent malignancy in Ethiopia associated with high mortality and morbidity. Nonetheless, few efforts have been made to assess the patients' HRQOL, and its predictive factors in Ethiopia.*

Objective: *To describe Health Related Quality of Life, its predictive factors of cervical cancer patients in Tikur Anbessa Specialized Hospital and Saint Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia.*

Methods: *An institutional based cross-sectional study was conducted in Tikur Anbessa Specialized Hospital and Saint Paul's Hospital Millennium Medical College, from Feb to June, 2021G.C. A total of 264 cervical cancer patients were interviewed using the Amharic version of European Organization for Research and Treatment of Cancer module (EORTC QLQ-C30), and cervical cancer module (EORTC QLQ-CX24) .The Amharic versions of both instruments were previously validated .The data was analyzed using SPSS version 25 and Microsoft Office Excel 2010. ANOVA and stepwise binary and multivariable logistic regression were employed to determine mean difference and significant associations.*

Results*: The mean Global quality of life (GQOL) was (mean± SD =42.57± 23.31) and with the least affected function being physical functioning (mean± SD =76.39± 23.24) and highest social function (mean± SD =50.40± 32.19). For the symptom scales, the financial difficulty had the highest mean of (mean± SD =57.83 ±35.34) and with the exception of diarrhea (mean± SD= 20.08± 29.87) and dyspnea (mean± SD= 22.89± 29.87), all the other items indicated moderate to high symptoms. The EORTC QLQ-CX24 symptom scales the least affected score was on Lymph adenoma (mean± SD =27.71±37.11) and highest affected score was for sexual worry (mean± SD= 51.81+32.197). As stage increases there was a statistically significant reduction in GQOL (p = 0.005) .Age, educational status and monthly income has association with GQOL .Being in the age group <40years affects 2.12 times the GQOL compared to the other variables (AOR =2.12, 95%CI =0.23-18.90). The patients monthly income <600ETB affects the GQOL 1.7 times (AOR=1.74, 95% CI = 0.34-8.93). Participants affected body image and feeling of lymph adenoma was the only two variables which had significant association with GQOL. Once sense of body image affected 1.88 times (AOR=1.88, 95%CI=0.42-8.45) the GQOL and 1.39 times (AOR=1.39, 95%CI=0.51-3.81) if affected feeling of lymph adenoma.*

Conclusions*: GQOL, physical function, role function, cognitive functions, financial difficulties, insomnia and fatigue were the most affected however social function, dyspnea and diarrhea were less affected components of HRQOL of cervical cancer patients. Age , marital status, educational status, occupational status ,monthly income , stage of the disease ,time since diagnosis and planned type of treatment were some of the different socio demographic and medical factors which were associated with health related quality of life of cervical cancer patients.*

Key words: **Cervical cancer, Health related quality of life, HRQOL, EORTC QLQ-C30, EORTCQLQ-CX24, Ethiopia**

1. Introduction

1.1. Background

Cervical cancer is a disease in which the cells of the cervix start to grow uncontrollably forming tumors like most cancerous cells. This abnormal growth could be due to different risk factors such as multiple sexual partners, early onset of sexual intercourse, a male sexual partner who has had many sexual partners, family history of cancer, history of cigarette smoking and the principal one being human papilloma virus infection. This exposure through 5-10 years will transform the normal cells to dysplastic cells, which will then progress to the in-situ carcinoma followed by the development of clinical cervical cancer. (1)

The global incidence and mortality rates depend upon the presence of screening programs for cervical pre-cancer and human papillomavirus vaccination, which are most likely to be available in developed countries. Due to these interventions, there has been a 75 percent decrease in the incidence and mortality of cervical cancer over the past 50 years in developed countries. (2)

The main goal is to cure or prolong the life of cervical cancer patients and ensure the best possible quality of life for survivors. There were an estimated 527,600 new cervical cancer cases and 265,700 deaths worldwide in 2012. According to the World Health Organization (WHO), cervical cancer will kill more than 443,000 women a year worldwide by 2030. A study done on global burden of cancer indicates that women are highly affected by certain cancers than others (3). The American Cancer Society's estimates in the United States for 2020 are about 13,800 new cases of invasive cervical cancer and about 4,290 women will die from the disease. It is the second most commonly diagnosed cancer and third leading cause of cancer death among females in less-developed countries. Breast and cervical cancers are the leading cancers among women in developing countries, with estimated annual new cases of 882,900 and 444,500 respectively. More than 324,300 and 230,400 women die from these cancers every year respectively. Incidence rates are highest in sub-Saharan Africa. Nearly 90% of cervical cancer deaths occurred in developing parts of the world: 60,100 deaths in Africa, 28,600 in Latin America and the Caribbean, and 144,400 in Asia.

The most prevalent cancers in Ethiopia among the adult population are breast cancer (30.2%), cancer of the cervix (13.4%) and colorectal cancer (5.7%). About two-thirds of reported annual cancer deaths occur among women .According to the only oncology center in the country (Tikur

Anbessa Specialized Hospital), about 80% of reported cases of cervical cancer are diagnosed at advanced stages, when very little can be done to treat the disease. This is largely due to the low awareness of cancer signs and symptoms, inadequate screening and early detection and treatment services, inadequate diagnostic facilities and poorly structured referral. The country has very few oncologists which make it difficult for a great majority of the population to access cancer treatment services, which results in long waiting times and cause many potentially curable tumors to progress to incurable stages. The reason for this despondent situation is that the cancer-treatment infrastructure in Ethiopia is inadequate and some cancer-management options are not readily available, within the health care system. Effective cancer treatment requires surgical, radiotherapy and chemotherapy should be available in the same setting to avoid distant referral and delays in treatment administration. Currently, the Ethiopian Essential Medicines List does not include chemotherapy for cancer. Even the essential medicines for pain-management are rare to find in most public hospitals. (4) Currently in Ethiopia, cervical cancer screening is one measure being taken by the government in order to capture the disease at its earliest stage. However, with only one radiotherapy center, distribution of treatment is still imbalanced with the disease burden. (5)

Cervical cancer clinical staging is usually described in terms of a staging scheme developed by the International Federation of Gynecology and Obstetrics (FIGO) Stage I to IV with sub stages; Stage IV indicating the late stage of the disease(1). Mandatory tests such as Speculum, vaginal and rectal examination, Intravenous pyelogram (IVP) or abdominal ultrasound and some supplementary tests could be done like Cystoscopy, Proctoscopy, Cone biopsy, Endo-cervical curettage or smear, Chest X-ray, Skeletal X-ray or bone scan if bone pain is reported, blood tests, CT scan and renal and liver function tests are recommended by professionals. (2)

Main stay of treatment for cervical carcinoma is dependent on the clinical stage of the disease. Patient's willingness, economic and social responsibilities of the patient and family, will eventually affect the adherence to treatment. These treatment options should also be under the consultation of the right specialists such as the gyn-oncologists, oncologist and radio- therapist. International guidelines put surgery, radiotherapy and chemotherapy as main stay of treatment options for invasive carcinoma of the cervix, all of which have side effects ranging from minor discomforts to major morbidity and mortality .(2)

QOL is defined by the WHO as the way an individual perceives his or her own position in the context of culture and system of values in which he or she exists together with own aims, limitations, standards, and concerns; a wide conception comprehensively was influenced by individual's state of health, cognitive state, social relations, level of independence, and relation to the surrounding environment. Female cancer survivors are faced with physical, psychological and social distress in addition to fatigue, irritability, memory loss, decreased energy level, and recurring pain and decreased QOL. The symptom distress experienced by cancer survivors is a critical factor influencing their QOL.

Health Related Quality of Life (HRQOL) is a wellbeing that can be related to or affected by the presence of a disease or treatments (6). QOL is a new dimension of care which has received greater attention in the last three decades. Concern with quality of life (QOL) has grown as the life expectancy of cancer survivors has increased. Cervical cancer affects the HRQOL of women starting from the time of diagnosis to treatment. It was noted that cervical cancer affects the body image, sexual activity of patients in addition to the social and physical functioning (7). High levels of anxiety and depression are also observed in patients diagnosed with cervical cancer (8).

HRQOL can be measured by different validated tools that assess the functioning, symptoms, psychological wellbeing and social support. Different instruments to capture patient reported outcome are available. Using validated tools assures the reliability and validity of the measurement questionnaire to a specific community in their local language (9). Measurement of the HRQOL of patients allows clinicians to have a better understanding of patient's status and eventually make decisions that could lead to a better heath outcome for the patient (10).

However, there are very few or no information in regards to the HRQOL of the cervical cancer patients in Ethiopia. The main aim of this study was, therefore, to describe the HRQOL of cervical cancer patients using validated Amharic version questionnaires. It also endeavors to describe the predictive factors associated to the HRQOL providing a comprehensive understanding on the clinical status of cervical cancer patients attending Tikur Anbessa Specialized Hospital (TASH) and Saint Paul Hospital Millennium Medical College (SPHMMC). The availability of this data would help the decision making of heath care professionals and policy makers on the steps to take in order to bring cost effective and efficient treatment alternatives specific to this group of patients.

1.2 Statements of the problem

Cervical cancer is the second most prevalent cancer in women aged between 20 to 44 years worldwide (11). Cervical cancer was the most common cause of cancer deaths for women in 50 countries in the world and the most diagnosed cancer for women in 11 countries; Sub-Saharan countries including Ethiopia falling in this category . (3)

Compared with other gynecologic cancer, cervical cancer most often affects young women with a mean age at diagnosis of 49 years. It rarely develops in women younger than 20. Many of this women with early stage disease will be cured and have significant additional life expectancy following completion of treatment .Consequently they will face years of potential treatment related side effects. They may also have concern regarding fertility preservation finally given their younger age these women may have more family and work responsibility than women with other gynecologic cancers. Many older women do not realize that the risk of developing cervical cancer is still present as they age increases. More than 20% of cases of cervical cancer are found in women over 65. However, these cancers rarely occur in women who have been getting regular tests to screen for cervical cancer before they were 65. (1)

As a major public health problem in Ethiopia, the disease affects the country's vulnerable demographic i.e. those who have poor health care, those with minimal education, rural communities with low activities and knowledge of screening and those with acquired risk factors such as HIV. It is highly likely that one develops cervical cancer if not treated in its early precancerous stage (5). About 80% of reported cases of cancer are diagnosed at advanced stages, when very little can be done to treat the disease. Currently there are diligent efforts to promote early detection and screening (12). In Ethiopia, the treatment options and infrastructures are not adequate for the cases that come about. Management options are not always available within the health care system. The treatments options such as radiation are only available in one hospital, TASH, and the waiting period is more than six months (5). Only patients with the resources have the opportunity to seek early treatment abroad. These problems with access to health care adds to the patient's mental distress and also enables the progression of the disease as they wait for treatment(4).Cervical cancer has a major effect on a patient's health related quality of life which includes physiological and psychological impact. The anxiety, discomfort, insecurity and loss of sexual desire in cervical cancer patients have stood out more than others (13). Cervical cancer patients also tend to have issues involving their femininity, self-image, and changes in sexual

function in addition to the general distress that follows cancer treatment. (14). Determining HRQOL is associated with the survival benefit that a pharmacological treatment may provide (15). The assessment, will also allow a better decision making in terms of treatment alternatives and better outcome for patients. Thus, it is evident that the high prevalence of the disease in Ethiopia calls for special attentions to patients, demanding action and public health priority from health program managers, planners, policy designer and social workers. In Ethiopia, there are limited research's done associated with HRQOL of cancer patients and one research has been conducted few years back to evaluate HRQOL and estimate utility specific to cervical cancer patients. As the only radiotherapy and oncologic surgery referral hospital, TASH and Saint Paul Millennium Medical College were chosen as the study setting.

1.3 Significance of the study

Considering the increasing prevalence of cervical cancer and its effects on HRQOL and low local reports pertaining to HRQOL of cancer patients, this study aimed to evaluate HRQOL of cervical cancer patients. This study also assessed the predictive factors associated with HRQOL which can be used to guide heath care professionals on the treatment protocols and steps to follow as improving HRQOL is a significant end-point in cancer patients. This will also enable health care providers to make decisions that will improve the Quality Adjusted Life Years (QALY) of patients. It is also used as a base line research for other researchers who want to study on the already treated patients.

2. Literature review

2.1. Burden of cervical cancer

Cancer is among the non-communicable diseases conditions that have captured the attention of the world. It is a global concern due to its increasing incidence worldwide. The incidence of cervical cancer varied widely among countries with world age-standardized rates (ASR) ranging from 4.4 to 75.9 per 100 000 population (32). The global disease burden study results showed that between 2005- 2015, there was a 33% increase in incidence and is expected to rise to 21.4 million in 2030 (2). In Africa non-communicable diseases and cancer are the leading cause of death. Cancer conditions that once were rare and considered the diseases of western countries, such as colon, breast, and lung cancers, are now frequently diagnosed in less developed countries and their rates are on the rise(1). About 85% of the cases and 88% of deaths due to cervical cancer occur in developing nations. Women in developing nations are at a 35% greater lifetime risk of developing cervical cancer than women in high-income countries. In 2015, Age standardized incidence rates are the highest in central Sub Saharan Africa (47.4), Southern Sub-Saharan Africa (46.8) (3)

Ethiopia is among the Sub-Saharan countries with a population size as of UN July 1, 2019; 112,078,727 with a female population of 54,918,576 and male population of 57,160, 151. Ethiopia is also among the countries that suffering through the consequences of cancer. Ethiopia has a total cancer cases of 67,573 population per year of which 47,954 deaths from that 9.3 %(6284) cases are cervical cancer and 10.2% (4891) died of cervical cancer (WHO 2020). Studies showed that approximately 60,000-125,000 cancer patients visit the number one hospital in the country, TASH oncology unit annually (TASH, 2018).

Currently, cervical cancer is the second most common cancer among women and the number one cause of death in the country. According to the 2009 WHO report, the age-adjusted incidence rate of cervical cancer in Ethiopia is 26.4 per 100,000 patients from 29.43 million Ethiopian women over the age of 15. It is found that there are 6228 annual number of new cases and 4891 deaths every year (WHO, 2018). Crude incidence rates of cervical cancer in Ethiopian women per 100 000 population per year are estimated to be 23. Even though facility-based cancer registries have been set up in five regional university hospitals, since most cervical cancer cases are diagnosed late, the probability for successful treatment is limited and very expensive to pay for. Consequently, the mortality rate is high among the affected patients. At present in Ethiopia,

radiotherapy services are only available at TASH (4). Patients come from everywhere in the county and majority of patients could not afford accommodations in big cities like Addis Ababa. (5)

Cervical cancer disrupts the patient's quality of life starting from the stage of diagnosis. With the addition of side effects coming from the treatment options provided to the patient such as surgery, chemotherapy and radiation therapy the impact is multidimensional (16). The Ethiopian standard treatment guideline also suggests a combination of pharmacological and non-pharmacological treatment strategies for treatment of carcinoma of the cervix. A non-pharmacologic treatment could be surgery, as the main stay treatment, radiotherapy: as treatment or palliation to arrest vaginal bleeding or alleviate pain and a combination of surgery and radiotherapy. As Neo-adjuvant chemotherapy, Cisplatin or carboplatin and paclitaxel are given weeks before surgery or radiotherapy. As supplementary treatments adequate nutrition, and correction of anemia and in advanced terminal cases, provided emotional psychological support (17). The side effects of the treatment modality such as chemotherapy could result in loss of hair, loss of sexual feeling, nausea and vomiting. This is also associated with femininity and sexual identity. Nausea and vomiting are among the treatment side effects most feared by patients undergoing chemotherapy or radiation therapy (9). That it could actually lead to refusal of continuation of treatment (18). These side effects of the treatments are not only just about hair loss and vomiting other bowl complications such as bleeding, perforations and fistulae could also manifest as a result of the treatment. Other urinary complications such as hematuria, vaginal atrophy and agglutination that is also associated with problems in sexual intercourse (17). From an emotional stability stand point gynecologic malignancies have challenges that can impair the quality of life. Associated with the organ that is affected in these cases the loss of sexual feeling and a result perceived loss of femininity could build a negative emotion. (18)

These problems could largely include anger, anxiety, guilt and depression (7). A study conducted in Berlin found that sexual functioning and depression had a negative relationship, to thus in women who have problems with sexual intercourse the depression was higher this could keep getting worse for months to years since diagnosis . (19)

Specifically, from the gynecological cancer patients, those affected by cervical cancer have been reported to show the worst scores in terms of emotional distress and QOL. (20)

It was also observed that the vaginal changes will still be reported two years after the radiotherapy. Physical and emotional problems, financial problems increased the negative impact on the quality of patients' lives significantly. (21)

A study done on general cancer patients in Ethiopia stated that there was no significant association between the quality of life of patients with cervical cancer and socio-demographic characteristic (13). However, another study indicts that even though there is no direct relationship, it could be hypothesized that patients experience changes in their marital status after the diagnosis of cervical cancer. The study found that 39% of the patients got divorced during the study period. (23)

There was one study done in Ethiopia that indicates the impact of quality of life of cancer patients in general. This study was done in TASH where there was low-level quality of life with a large number of unmet emotional, financial, pain management and patient care services. It is especially more challenging in Ethiopia as the access to radiotherapy and chemotherapy is largely scarce (13). However, there was also one study done assessing the HRQOL of patients specific to cervical cancer in the department of pharmacy few years back after taking patients admitted at oncology unit here in TASH .According to this study, social functioning and sexual activity scored the lowest mean from the functioning scales, while financial difficulty, pain and fatigue scored the highest mean from the symptom scales. Physical functioning, emotional functioning, pain and symptom experience had a strong association with the GQOL of patients. (28)

2.2. Health related quality of life of patients with cervical cancer

As the definition of health by WHO, health is "The state of complete mental and social wellbeing not merely the absence of disease" (WHO, 2008). Quality of Life (QOL) of a person is an indication of a person's wellbeing in ways of the ability to perform daily task, physical, emotional, cognitive, social, role and sexual functioning. An illness can affect the QOL of a patient in multiple ways and can be stated as a heath related quality of life (6). There are five categories to describe heath related quality of life. These categories are able to identify the patient's life in the sense of performing normal tasks in a manner that is comparable with healthy counterparts. As its key elements the quality of life composes of the physical wellbeing of individuals which represents presence or absence of symptoms of bleeding, pain, shortness of breath, fatigue and other physical expressions of illness. Also associated with that functional

well- being is the ability of patient to undergo simplest tasks independently. Social well-being is the ability to engage in activities with other people (6) (9). The other element is psychological well-being; this is to measure the presence of depression and anxiety.

Health and quality of life are constantly interlinked elements in patient care. HRQOL is a patient-reported outcome that is usually measured using carefully designed and validated instruments such as questionnaires and scheduled interviews. The questionnaire to be used in this study incorporates QOL questionnaires (QLQs) developed by the European Organization of Research and Treatment for Cancer (EORTC) as well as a self-designed questionnaire. The questionnaire was designed to elucidate the QOL of cancer survivors. HRQOL assessment include physical, psychosocial or emotional, functional or occupational domain. (6) The HRQOL of patients can be measured by using different tools to determine the level of psychometric properties (23). Studies have shown that in order to properly assess the psychometric properties, combination of a generic quality of life questionnaire and a specific questionnaire can be used (24). The EORTC QLQ C30 is a generic module that is validated and reliable to measure the quality of life of cancer patients in Ethiopia (25). The cervical cancer module (EORTC QLQ-CX24) was developed in a multicultural, multidisciplinary setting to supplement the EORTC QLQ-C30 core questionnaire. (9)

2.3. Approaches to measuring health related quality of life

There are multiple instruments that measure the QOL of a person. Most of the questionnaires have multiple item questions which could incorporate single global questions that could ask "how you have been feeling the past week" and / or group different items in to scales corresponding to different dimensions. The theory of multi-item tests is based on several measurement models that make assumption on the nature of items. (6)

One of the models for questionnaires is theory of parallel test, which indicates that items should reflect the level of underlying construct. This theory uses what is known as Likert scales to score items. Factor analysis is used to examine how underlying constructs influence the responses on a number of measured variables. Factor analysis could be used to explore the influence of items on constructs or confirm that items do reflect the construct as predicted. Researchers like Kiline (2014) stated that samples for analysis should be in the ratio of participants to variables (2:1) or extracted factors (20:1) and according to Hutcheson and Sofroniou (1999) the sample is sufficient for factor analysis if the number of subjects is between 150- 300.

Also, Tabachnick and Fidell (2011) recommended that in order to obtain a reliable number of estimates through multivariate analysis, the number of observations should be 5-10 times the number of variables in the model.

There are many instruments used to measure the HRQOL in oncology; Short Form 36 (SF-36), EORTC QLQ-C30, Cancer specific Functional Assessment of Cancer Therapy-General (FACT-G), Cancer Specific Visual Analogue Scale-Cancer (VAS-C), Cancer specific Hospital and Anxiety Depression Scale (HADS), Generic Profile of Mood States (POMS), Cancer specific Rotterdam Symptom Checklist (RSCL) (26). However, EORTC QLQ CX 24 and FACT-CX are the only cervical cancer specific tools. It is recommended to use the generic tools in conjunction with the cancer specific tools in order to measure the HRQOL of patients.

With the culturally and linguistically diverse global population the use of a valid and reliable instrument is needed to measure subjectively. The European Organization for Research and Treatment of Cancer EORTC QLQC30 is used globally as it is valid to measure QOL in different languages including Amharic. It is designed to be used together with its additional module, specific for patients with cervical cancer – the EORTC QLQ-CX24.

The EORTC QLQ-C30 is a 30-item cancer-specific questionnaire for measuring the general HRQOL of cancer patients. It incorporates 5 functioning domains (physical, role, cognitive, emotional, and social functioning), 3 symptom scales (fatigue, pain, and nausea and vomiting), global health, and overall QOL scales and 6 single items that assess additional symptoms commonly reported by cancer patients(dyspnea, appetite loss, sleep disturbance, constipation, and diarrhea) along with perceived financial difficulties. The EORTC QLQ-CX24 incorporates 3 multi-item scales (symptom experience scale, body image scale, and sexual/vaginal functioning scale) and 6 single-item scales. All scores on the EORTC QLQ-C30 and QLQ-CX24 were transformed to a 0- to 100-scale according to the EORTC QLQ scoring manual. For all missing data (one or more missing answers to items within the questionnaire), we used methods of missing imputations introduced in the manual. Higher scores represent better levels of functioning or worse levels of symptoms. The EORTCQLQ-CX24 was found to be acceptable with high compliance and low missing responses. The Cronbach's alpha ranged from 0.70–0.84, indicating the reliability of the scales. Convergent and discriminant validity in multi trait scaling analysis was adequate (30). The EORTC QLQ-C30 subscales and EORTC QLQ-CX24 subscales had a weak to strong correlation, indicating concurrent validity. The scales and single-item

measures were able to discriminate between subgroups of patients differing with regard to performance status, cancer stage and treatment status, indicating clinical validity and also it is validated in several European and African countries. EORTC QLQ-CX24 was also found to be valid and ready to use in China, Poland, Kenya and some other countries of Africa (29). The instrument was found to have good construct validity, convergent and discriminant validity and criterion validity which confirms that the items can measure the intended construct in the mentioned languages. (9)

3. Objectives

3.1. General objective

➢ To describe Health Related Quality of Life, and its predictive factors on cervical cancer patients in two teaching hospitals, Addis Ababa, Ethiopia.

3.2. Specific objectives

➢ To describe the HRQOL of women patients with cervical cancer in TASH and SPHMMC.

➢ To identify predictive factors associated with global QOL of cervical cancer patients in TASH and SPHMMC.

4. Methods and Materials

4.1. Ethical Consideration

The study was conducted after getting ethical clearance from institutional review board of AAU-SOM and DRPC. Permission was received from EORTC research group to use the questionnaires. Each study subjects/participants were informed about the purpose of the study and the importance of their participation to confirm willingness for participation. Patients were informed completed questionnaires were not stored in the patient's clinical notes and will remain confidential. To keep the privacy of patient's history, name of the patients were not included in the study; rather a registration number was used. Participants were also informed that they have a full right to refuse or discontinue/terminate participating at any point of the interview and this will not have any impact on their treatment or follow up. A private and comfortable environment was arranged for completing the questionnaire. Written consent was taken from the patients before the interview.

4.2. Study Setting

The study will be conducted in both outpatient and inpatient clinics of Gynecology/Obstetrics departments of TASH and SPHMMC. TASH is the largest teaching hospital under the administration of Addis Ababa University in Ethiopia. The hospital was established in 1972 and has more than 800 beds providing diagnostic and treatment service for about 370,000 to 400,000 patients per year. The oncology unit at TASH is the largest referral site for the country, providing service for over 60,000 patients annually. It is the sole oncology referral and radiotherapy center in the entire country.

Departments of Gynecology and Obstetrics though is not the sole institution, it is a place where most of gynecologic oncology surgeries are performed. Nearly 35-40% of patients evaluated at gynecology referral clinic are patients with cervical cancer. Both departments also give chemotherapy services for cervical cancer patients

The other study area was SPHMMC gynecology and obstetrics department and oncology unit which are located in Addis Ababa. SPHMMC was established through a decree of the Council of Ministers in 2010, although the medical school opened in 2007 and the hospital was established in 1968 by the late Emperor Haile Selassie. The College initiated Ethiopia's first integrated modular and hybrid problem-based curriculum for its undergraduate medical education. The

college has more than 2800 clinical, academic, and administrative and support staffs that provide: medical specialty services to patients who are referred from all over the country. The hospital has 800 beds and gives diagnostic and treatment services for about 370,000-400,000 patients per year. SPHMMC offers the lowest cost for these services. Around 800 cancer patients are served in the unit since its establishment SPHMMC Oncology Unit was established in August 1, 2018.It was the second hospital offering cancer treatment in the country next to TASH.

4.3. Study Period

The study was conducted from Feb 1st to May 30 2021 GC at TASH and SPHMMC department of Gynecology and Obstetrics and oncology unit.

4.4. Study Design

The study design was facility based cross sectional descriptive study. Quantitative data were collected using standard questionnaire which were already been validated in Amharic language from cervical cancer patients coming to outpatient clinics and medical oncology center of both TASH and SPHMMC during the study period.

4.5. Source and Study Population

The source population of the study was all patients with histological confirmed cervical cancer seeking care at outpatient clinics and inpatient ward of Gynecology and Obstetrics and medical oncology center of TASH and SPHMMC.

The study populations were all patients with histological confirmed cervical cancer seeking care at outpatient clinics and inpatient wards of gynecology and obstetrics and medical oncology departments at TASH and SPHMMC during the study period meeting the inclusion criteria and provide an informed consent to participate in the study.

4.6. Eligibility Criteria

4.6.1. Inclusion Criteria

- Patients with histological confirmed cervical cancer at age above or equal to 18 years and who are going to take oncologic treatment (chemotherapy, radiotherapy and/or surgery) for the first time.

4.6.2. Exclusion Criteria

- Patients who has got oncologic treatment (chemotherapy, radiotherapy and/or surgery) previously.
- Patients with psychiatric disorders, communication problems, severe medical condition or diagnosed coexisting malignancies.
- Patients who are known HIV positive.
- Patients who defer to participate in the study.

4.7. Sampling

4.7.1. Sample Size determination

The sample size (n) required for the study was calculated based on 5 to 10 patients per questionnaire item to generate stable reliability and validity estimates (Schwab DP. Construct validity in organization behavior. In: Staw BM, Cummings LL, editors. Research in Organizational Behavior. Greenwich: JAI Press, 1980:3–43.). The tool has 24 items making the maximum sample size 240.

By considering the 10% non-response rate the total sample size was 264 cervical cancer patients.

4.7.2. Sampling Procedure

All patients who fulfilled the inclusion criteria and came to outpatient clinics and admitted as inpatient of obstetrics and gynecology department and medical oncology unit in both teaching hospitals willing to participate in the study data during the study period were included. Due to limited number of patients in the study period, participants were recruited consecutively until the required sample size was reached.

4.8. Study Variables

4.8.1. Dependent Variables

Different parameters of QOL

4.8.2. Independent Variables

Socio- demographic and socio-economic characteristics such as age, region, religion, marital status, educational status, and average monthly household income.

Medical characteristics such as medical service status, presence of other disease, time since diagnosis, current cancer stage and current planned type of treatment**.**

4.9. Data Handling

4.9.1. Data Collection Instrument

An Amharic version of EORTC-QLQ-C30 and EORTC-QLQ- Cx24 were adopted and included in the study with the approval of the EORTC and Euro Qol Research Foundations. A questionnaire was developed to collect the socio-demographic, socio-economic and medical characteristics of patients. The questionnaire included questions about age, religion, and marital status, level of education, occupation and average monthly household income. In addition, data on medical characteristics of patients through chart review (patient status, time since diagnosis, stage of cancer, current planned type of treatment and comorbid conditions) were filled through chart review by data collectors.

EORTC-QLQ-C30

EORTC QLQ-C30 a globally used and validated Amharic generic questionnaire was used to describe the HRQOL of patients. It contains a total of 30 questions measuring five functional scales (Physical, Role, Emotional, Cognitive and Social), nine symptom scales (Fatigue, Nausea and vomiting, Pain, Dyspnea, Insomnia, Loss of appetite, Constipation, Diarrhea and Financial difficulties) and global health status scale. Each item were scored 1("not at all") to 4 ("very much") with the exception of the global health status and global QOL which was scored 1("Extremely poor") to 7("excellent") (Fayers et al., 2008).

EORTC-QLQ- CX24

EORTC-QLQ- CX24 is a globally used and validated Amharic generic questionnaire for a cervical cancer specific module that contains 24 questions used to describe the HRQOL of patients. It contains four functional scales (body Image, sexual activity, sexual enjoyment and sexual/vaginal functioning) and five symptom scales (symptom experience, menopausal symptoms, peripheral neuropathy, lymph adenoma and sexual worry). All of the questions use four-point Likert scale. Scores range from 0 to 100, with higher scores indicating better functioning and better state of health (Fayers et al, 2008)

4.9.2. Data Collection Process

Data were collected by the nurses from the departments of gynecology/obstetrics and medical oncology unit in both TASH and SPHMMC. For patients intimacy all interviews were conducted by female nurses. Data collectors were trained on data collection techniques for two days and collected the data under the close supervision of the principal investigators.

4.9.3. Data Quality Assurance

The questionnaire pre-test was done to assess for its clarity, understandability and completeness in 26 cervical cancer patients in a patients which were not included in the main study. The reliability was assessed by measuring the internal consistency of EORTCQLQ-CX24 using Cronbach's α coefficient for each domain where $\alpha \geq 0.7$ indicated adequate scale reliability of the tool (Cronbach, 1951). During the pre-test problems on the order, response option and difficult sentence constructions were noted. Based on the finding of the pre-test, rearrangement of sequence and change of wording of questions were made as needed.

Data was collected by using a pre-tested structured interview questionnaire by trained health care providers. Two nurses from gynecology OPD and two nurses working at oncology unit with the qualification of BSc were recruited as data collectors in each teaching hospital. Two day training was given to the data collectors on data collection technique, relevance of the study and confidentiality of information gathered from the study group.

The principal investigators supervised the data collection activity every day. The data were checked.

4.9.4. Data Scoring

EORTC QLQ C-30 and EORTC QLQ-CX24

The collected responses were coded, entered and cleaned. The raw scores for both EORTC QLQ C-30 and EORTC QLQ-CX24 were computed to scores ranging from 0 to 100, with higher scores indicating better functioning and better state of health. The scoring of the QOL of the patients was based on the scoring manual provided by the quality of life coordinator at the European Quality Of Life data Center

Linear transformation to 0-100 to obtain the score S, was done by using the formula below (Aaronson, 1993). Items representing one sub-scale were coded in to their respective multi-item scales.

• Functional scales for EORTC QLQ- C30; Physical functioning (questions no: 1-5), emotional functioning (questions no: 21-24), cognitive functioning (question no: 20&25) and social functioning (questions no: 26&27).

• Symptom scales EORTC QLQ-C30: Fatigue (questions no; 10, 12&18), Nausea and vomiting (questions no: 14&15), Pain (questions no; 9&19), dyspnea (questions; 8), insomnia (question no: 11), and loss of appetite (questions 13), constipation (questions no: 16), diarrhea (questions no: 17) and financial difficulty (questions no: 28).

• Functional scales for EORTC QLQ-CX24: body image (questions; 45-47), sexual activity (question no: 11), sexual enjoyment (question no: 54) and sexual/vaginal functioning

• Symptom scales for EORTC QLQCX24: Symptom experience (questions no; 31-37, 39, 41-43), lymph adenoma (question no:38), peripheral neuropathy (question no:40), menopausal symptoms (question no:44) and sexual worry (question no:48)

Linear transformation

Principle for scoring

1) Raw score

For each multi-item scale, calculate the average of the corresponding items.

Raw score (RS) = (I1 + I2 +...+ In)/ n

For each single-item measure, the score of the concerning item corresponds to the raw score.

There are no reverse scoring items.

2) Linear Transformation

To obtain the Score S, standardize the raw score to a 0 – 100 range following the transformation:

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

For the symptom and the functional scales / single items.

Range is the difference between the maximum possible value of RS and the minimum possible value. The EORTC QLQ-C30 and EORTC QLQ-CX24 were designed so that all items in any scale take the same range of values; Most items are scored 1 to 4, (Range = 3). The exceptions were the items contributing to the global health status / QOL, which are 7-point questions with

range of 6. Therefore, the range of RS equals the range of the item values. High mean scores represent better functioning in the functioning scales and global health status, but a high level of difficulty for symptom scales and single symptom items (Aaronson, 1993).

Since there were no hard scoring guides of the EORTC QLQ-C30 and EORTC QLQ-CX24 that translate to mean significant impairment. After computing, the domains were dichotomized to "affected" and "not affected". The score below 75 was taken for an affected functional and GQOL scales while above 25 were taken as an affected symptom scale, for completeness, clarity and consistency by the principal investigators.

4.9.5. Statistical Analysis

Data were checked for completeness, inconsistencies, cleaned, coded and then entered to SPSS version 25 for windows. (SPSS, Inc. Chicago, USA)

Descriptive statistics (mean, standard deviation, minimum, maximum, and median) and frequency distribution were used for presenting patient and treatment characteristics.

The internal consistency of the questionnaire was measured by the Cronbach's α coefficient for each domain. The Cronbach's α value higher than 0.7 is generally considered to be satisfactory (Bland and Altman 1997). The acceptability of the questionnaire was assessed by estimating the rate of missing items.

Bivariate analyses (t test and one way Anova) were used to determine the association between the quality of life and predictor variables.

Multivariable linear regression model was fitted for those variables which were found statistically significant in the bivariate analysis to assess the independent association (confounder free) between quality of life and independent variables.

The strength of association was measured by adjusted odds ratios and 95% confidence intervals. Statistical significance was declared at $P<0.05$.

4.10. Operational Definitions

Coexisting malignancy – presence of malignancy arising from more than one anatomic site.

Severe medical condition – a medical condition severe enough to affect patient's usual life.

Psychiatric disorders – a condition which affects patients understanding, communication and orientation.

Early stage - stage I-IIA

Advanced cervical cancer – stage IIB and above

Functional scales: physical, emotional, role, cognitive, social, sexual functioning, future perspective, body image, and sexual enjoyment.

Symptom scales; fatigue, nausea/vomiting and pain, dyspnea, insomnia, appetite loss, constipation, diarrhea and financial difficulties, Symptom experience, lymph adenoma, peripheral neuropathy, menopausal symptoms and sexual worry.

Affected functional and symptom scales: Scoring for functional scales < 75% and > 25% for symptom scales.

Affected Global health status/QOL: Scoring < 75% or below the cut of point of 75.

4.11. Dissemination of Results

The finding of this study was communicated to the concerned bodies and further efforts were made to publish the findings on national and international peer reviewed journal.

5. Results

5.1. Results for HRQOL of cervical cancer patients

5.1.1. Socio-demographic, socio-economic and clinical characteristics of the study participants

A total of 264 patients were participated in the study. Of which 154 participants were recruited from TASH and 110 of the participants were from SPHMMC. The mean age was found to be 51.83±11.032 years; ranged from 25– 81 years. Majority 89 (33.7%) of the participants were in the age category of 50-59 years and 143 (54.2%) of the participant were married. About half 132 (50%) of the patient were Orthodox Christianity religion followers; and majority 91(34.5 %) and 67(25.4%) of the participants came from the Oromia and Amhara region respectively. No participant was from Gambella region. The educational background of the participants indicated that the majority 117 (44.3%) of them had no formal education. Most participant's occupations were Housewives 129 (48.9%) and Farmers 47(17.8%). The average monthly household income for the majority 157 (59.5%) of the participants were above poverty line, an income of more than 600 ETB.

Table 1: Socio-demographic and socio-economic characteristics of the study participants

Variables	Category	Frequency	Percent
Age	<40	44	16.7
	40-49	57	21.6
	50-59	89	33.7
	60-69	55	20.8
	>70	19	7.2
Region	Tigray	11	4.2
	Afar	8	3.0
	Amhara	67	25.4
	Oromia	91	34.5
	Somalia	6	2.3
	Benshangul	2	0.8
	SNNPR	34	12.9
	Harrarie	1	0.4

	Addis Ababa	39	14.8
	Dire Dawa	5	1.9
Religion	Orthodox	132	50.0
	Muslim	79	29.9
	Protestant	53	20.1
Educational status	Illiterate	117	44.3
	Can read and write	48	18.2
	Informal education	33	12.5
	Primary	21	8.0
	Secondary	6	2.3
	Collage and above	39	14.8
Marital Status	Single	14	5.3
	Married	143	54.2
	Divorced	40	15.2
	Widowed	67	25.4
Occupational Status	Government employee	34	12.9
	Private employee	21	8.0
	Merchant	26	9.8
	Retired	5	1.9
	Farmer	47	17.8
	Housewife	129	48.9
	Unemployed	2	0.8
Monthly Income	<600 ETB	107	40.5
	≥600ETB	157	59.5

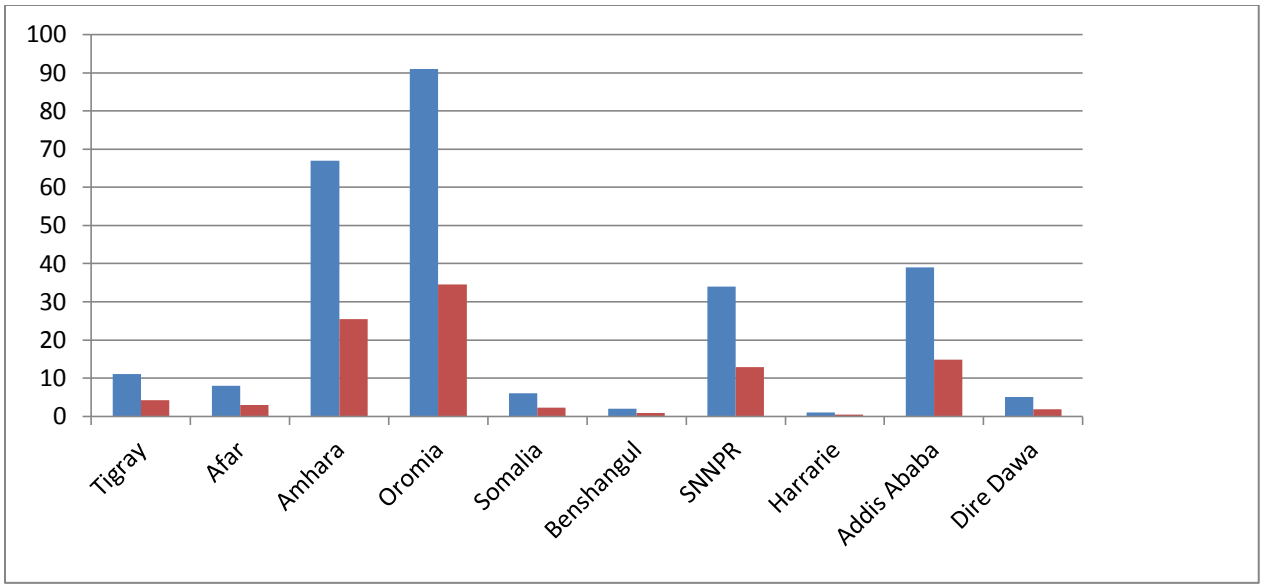

Figure 1: Frequency distribution of region with percentage

Participants visiting the out-patient department were 208(78.8%) and those on a follow up schedule were 56 (21.2%). Patients diagnosed with FIGO stage III cervical cancer constituted the highest proportion accounting 103 (39%) of participants. Majority 239 (90.5%) of the participants were diagnosed within less than one year of the data collection period. Majority 136 (51.5%) of the participants were planned to have chemo radiation followed by surgery accounting 92(34.8%). The majority 223(84.5%) of the patients did not have comorbid conditions. Of those who had comorbid conditions, highest 21(8.0 %,) were registered hypertensive followed by DM 11(4.2%).

Table 2: Clinical characteristics of study participants

Variables	Category	Frequency	Percent
Patient status	New patient	208	78.8
	On follow up	56	21.2
stage of cancer	stage I	41	15.5
	stage II	92	34.8
	stage III	103	39.0
	stage IV	28	10.6
Time since dx	<1yr	239	90.5
	1-5yrs	24	9.1

	>5yrs	1	0.4
Current treatment plan	Surgery	92	34.8
	Chemotherapy	27	10.2
	Radiation therapy	2	0.8
	Chemo-radiation	136	51.5
	Chemotherapy then surgery	7	2.7
Comorbidity condition	None	223	84.5
	HTN	21	8.0
	DM	11	4.2
	Cardiac	2	0.8
	Renal	1	0.4
	Others	6	2.3

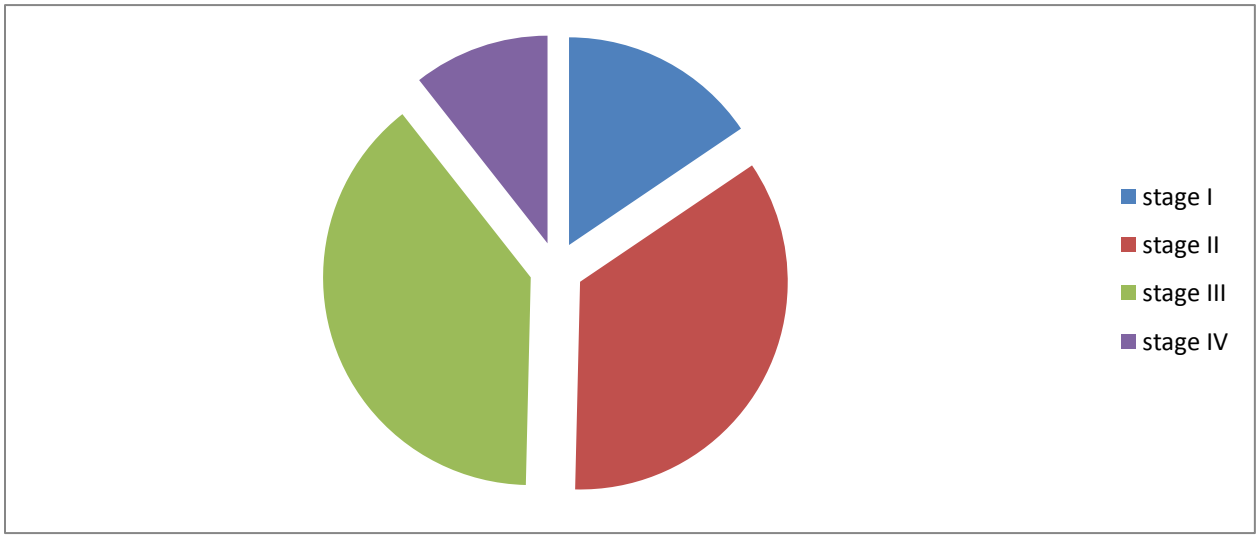

Figure 2: Frequency distribution of FIGO stage of cervical cancer with percentage

5.1. 2. Global quality of life among cervical cancer patients

The global health status/QOL mean score was found to be 42.57± 23.31. The EORTC QLQ-C30 multiple and single item scales were also evaluated and the functional scales ranged from 50.40±32.19 to 76.39± 23.241 with the least affected function being physical functioning and highest social function. For the symptom scales, the financial difficulty had the highest mean of 57.83 ±35.34 and with the exception of diarrhea 20.08± 29.87 and dyspnea 22.89± 29.87, all the other items indicated moderate to high symptoms. The EORTC QLQ-CX24 items exhibited a range of mean scores from 24.5±28.07 for the sexual enjoyment to 49.4±24.06 sexual activity. On the symptom scales the least affected score was on Lymph adenoma 27.71±37.11 and highest affected score was sexual worry 51.81+32.197.

EORTC QLQ –C30

Table 3: Global quality of life among cervical cancer patients

Variables	Item numbers	Mean	Std. Deviation(SD)
Global QOL	29,30	42.57	23.31
Functional scales			
Physical function	1-5	76.39	23.241
Role function	6,7	72.49	27.600
Emotional function	21-24	63.86	23.400
Cognitive function	20,25	72.49	25.025
Social function	26,27	50.40	32.194
Symptom scales			
Dyspnea	8	22.89	29.872
Insomnia	11	42.17	28.075
Nausea and vomiting	14,15	30.52	31.323
Fatigue	10,12,18	40.70	23.810
Pain	9,19	36.75	23.679
Loss of appetite	13	40.16	34.437
Constipation	16	32.13	37.339
Diarrhea	17	20.08	29.878
Financial difficulty	28	57.83	35.340

EORTC QLQ -CX24

Variables	Item numbers	Mean	SD
Functional scales			
Body image	45-47	45.65	28.933
Sexual activity	49	49.40	24.060
Sexual and vaginal	50-53	38.96	20.746
Sexual enjoyment	54	24.50	28.075
Symptom scales			
Symptom experience	31-34,39,41-43	35.01	22.254
Lymph adenoma	38	27.71	37.111
Peripheral neuropathy	40	32.53	37.531
Menopausal symptoms	44	30.52	36.886
Sexual worry	48	51.81	32.197

5.1.2.1. Mean differences of EORTCQLQ-C30 functional scales with socio-demographic, Socio-economic characteristics

All categories other than marital status showed significant mean difference in all functional scales with the exception of emotional and social functioning. Those patients who learnt up to college and above had more affected GQOL and role functions. Those participants who were unemployed and their family monthly income <600ETB had affected GQOL than other counter parts.

Table 4: Mean differences of EORTCQLQ-C30 functional scales with socio-demographic, Socio-economic characteristics

Variables	Category	GQOL	PF	RF	EF	CF	SF
Age	<40	40.34±23.08	82.88±19.41	79.92±27.74	66.29±22.51	79.17±24.14	50.76±29.84
	40-49	44.30±24.45	74.62±22.65	66.37±30.45	65.50±23.7	73.68±24.38	48.25±31.76
	50-59	40.82±23.70	77.00±21.24	69.29±33.13	62.83±20.5	74.91±26.84	43.26±29.70
	60-69	41.36±23.56	64.61±25	63.03±34.05	59.24±23.0	66.67±29.04	36.67±30.66
	>70	25.88±17.76	55.09±22.53	57.02±31.58	54.39±19.3	61.40±29.42	36.84±31.22
	p-value	0.221	0.000*	0.000*	0.193	0.051*	0.114
Marital status	Single	50.60±27.04	82.38±15.15	84.52±23.98	72.02±20.8	80.95±17.11	64.29±32.59

	Married	39.98±22.80	73.15±24.43	70.28±32.14	62.82±22.2	73.43±26.84	44.06±29.89
	Divorced	41.88±25.7	75.50±23.06	64.58±32.28	62.37±22.2	69.58±27.70	47.50±31.24
	Widowed	38.81±23.23	70.45±22.36	62.69±32.70	59.2±21.81	71.14±28.06	36.57±29.90
	p-value	0.376	0.325	0.82	0.223	0.536	0.014
Educational status	Illiterate	33.26±20.89	72.31±23.53	68.66±32.02	61.68±22.77	74.50±27.38	38.75±29.83
	Can read and write	35.76±21.87	73.47±22.66	72.92±27.42	61.81±20.4	74.65±24.30	46.87±29.90
	Informal education	41.16±21.74	82.63±17.71	79.29±23.21	58.33±22.14	75.25±24.33	45.96±36.33
	Primary	52.38±16.69	73.97±26.06	72.22±30.88	69.84±20.15	75.40±23.34	47.62±28.03
	Secondary	70.83±29.69	74.44±25.79	58.33±41.83	70.83±22.82	77.78±27.21	66.67±40.82
	Collage and above	56.62±24.27	67.69±25.06	51.28±38.30	64.96±23.11	60.26±30.01	47.44±27.45
	p-value	0.000*	0.169	0.005*	0.417	0.077	0.154
Occupational status	Government	53.68±25.72	70.98±25.84	59.31±39.60	61.76±22.01	63.73±27.63	47.06±31.64
	Private	44.05±24.74	78.41±16.85	74.60±28.68	71.43±19.28	73.81±27.67	65.08±25.22
	Merchant	53.85±22.14	72.82±26.79	63.46±35.90	63.14±22.75	75.00±21.21	46.15±30.29
	Retired	45.00±21.73	66.67±21.08	46.67±38.00	53.33±27.38	46.67±36.13	40.00±30.27
	Farmer	31.91±21.01	74.61±23.20	71.99±32.98	63.12±23.87	74.11±28.40	44.33±27.20
	Housewife	36.82±21.91	72.56±23.16	69.64±28.97	61.18±21.66	74.81±26.19	39.02±31.62
	Unemployed	37.50±17.67	100±000	91.67±11.78	83.33±000	75.00±35.35	33.33±000
	p-value	0.000*	0.594	0.224	0.362	0.138	0.027
Monthly income	<600ETB	33.02±21.56	75.20±21.55	73.83±28.96	66.2±20.63	80.84±22.17	40.34±31.89
	≥600ETB	45.65±23.61	72.02±24.48	64.44±33.76	60.19±22.85	67.09±23.36	46.34±29.72
	p-value	0.000*	0.277	0.020	0.030	0.000*	0.137

PF=Physical functioning, EF=Emotional functioning, RF=Role functioning, CF=Cognitive functioning, SF= Social functioning *p<0.05

5.1.2.2. Mean differences of EORTC QLQ-C30 functional scale with clinical characteristics of patients with cervical cancer

In terms of functional scales and clinical characteristics of the participants, it was found that there was no significant mean difference across the functional scales and comorbid conditions. However, participants with FIGO stage I cervical cancer scored a significantly higher mean in GQOL and all functional scales. All functional scales of patients with FIGO stage IV cervical cancer was found to have the lowest means. Stage of cervical cancer and current planned type of treatment had significant mean difference in all functional scales. The more the stage of cervical cancer advanced, the more the GQOL affected. Patients diagnosed with in 1 year of the data collection exhibited a significantly higher score on all other functional items except GQOL and social functioning scales. Patients whose current plan of radiotherapy showed the least mean for GQOL (Mean ±SD =16.67±.00) and role functioning (Mean ±SD =16.67±23.57) while patients who were planned to have surgery as current planned type of treatment showed the highest mean for all functional scale except GQOL of which chemotherapy followed by surgery accounts the highest mean difference (Mean ±SD =50.00±17.34).

Table 5 : Mean differences of EORTC QLQ-C30 functional scale with clinical characteristics of patients with cervical cancer

Variables	Category	GQOL	PF	RF	EF	CF	SF
Patient status	New	40.02±23	75.48±23.1	73.00±28.91	64.02±21.3	75.24±25.21	45.03±31.28
	Follow up	42.41±25	65.24±22.3	50.60±37.4	57.44±24.3	63.10±30.6	38.99±28.11
	p-value	0.503	0.003*	0.000*	0.048	0.003*	0.191
Time since dx	<1yr	40.55±23.1	74.76±22.9	71.27±30.7	63.74±21.8	75.03±26.0	44.70±30.63
	1-5yrs	41.32±28.	60.56±23.0	40.97±31.46	53.13±21.9	51.39±23.52	34.72±31.05
	>5yrs	16.67±0	33.33±00	.00	25.00±00	16.67±00	33.33±00
	p-value	0.593	0.004*	0.000*	0.019	0.000*	0.299
Stage of cancer	Stage I	53.66±25.2	85.53±21.1	85.37±22.4	70.33±20.5	82.52±20.0	62.20±28.63

	Stage II	43.03±20.7	81.23±19.6	78.44±25.6	68.30±21.8	81.34±24.0	51.45±29.61
	Stage III	37.22±23.7	68.09±20.4	64.08±30.1	58.74±20.6	67.96±25.7	33.50±27.95
	Stage IV	25.30±18.1	48.57±24.2	25.00±29.91	47.02±20.31	47.02±28.34	29.17±26.69
	P-value	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Treatment plan	Surgery	49.46±23.5	84.20±19.2	83.33±21.5	69.20±20.3	82.97±20.5	55.98±30.32
	Chemo	41.05±20.2	67.65±21.6	65.43±30.2	62.65±27.4	67.90±29.2	42.59±31.80
	Rad	16.67±.00	60.00±9.42	16.67±23.5	66.67±35.3	66.67±.00	33.33±.00
	Chemo-rad	34.25±22.5	66.57±23.9	58.70±34.8	57.60±21.0	65.81±28.4	36.03±28.41
	Chemo surgery	50.00±17.3	86.67±10.8	80.95±14.99	72.62±19.07	90.48±8.90	40.48±33.13
	p-value	0.000*	0.000*	0.000*	0.002*	0.000*	0.000*
Comorbid conditions	None	41.63±24.15	73.99±23.7	68.61±32.63	63.12±21.73	73.02±26.90	45.37±30.60
	HTN	38.49±23.78	69.84±20.1	67.46±29.09	69.44±23.61	73.02±25.53	42.06±33.17
	DM	32.58±6.92	64.85±24.0	66.67±28.86	55.30±19.46	69.70±27.70	33.33±29.81
	Cardiac	41.67±11.78	63.33±32.9	66.67±47.14	62.50±29.46	66.67±23.57	25.00±11.78
	Renal	16.67	66.67	.00	41.67	66.67	33.33
	*others	25.00±19.72	80.00±15.77	72.22±27.21	37.50±21.57	66.67±38.00	16.67±18.25
	p-value	0.358	0.698	0.461	0.034	0.987	0.187

*others: anemia, epilepsy, peptic ulcer disease…*p-value<0.005

5.1.2.3. Mean differences in EORTCQLQ-C30 symptom scale with socio-demographic and socio-economic characteristics

As shown in Table 6; the mean difference of all symptom scales was significant across all age groups except financial difficulty. The mean symptom scales of constipation and financial difficulty the EORTC QLQ-C30 showed significant differences with marital status. Similarly, the mean scales of fatigue, constipation and financial difficulty showed the highest mean difference in the widowed groups. The education status resulted in a significant mean difference in constipation scales in patients with cervical cancer at TASH. In connection with this, those who are illiterate had higher mean scores with respect to fatigue and financial difficulty as compared to other educational status categories. Those who are unemployed have the lowest mean difference scores in all symptom scales except financial difficulty.

Table 6 : Mean differences in EORTCQLQ-C30 symptom scale with socio-demographic and socio-economic characteristics

Variables	Category	FA	NV	PA	DY	SL	AP	C0	DI	FI
Age	<40	37.88 ±24.1	22.35 ±26.4	31.06± 27.37	17.42± 28.29	41.67 ±28.8	29.55± 27.10	24.24 ±31.6	13.64 ±23.0	53.79 ±37.50
	40-49	44.64 ±28.2	26.90 ±31.3	42.41± 25.14	20.47± 27.28	40.94 ±30.2	43.86± 37.35	35.09 ±34.7	16.96 ±28.9	60.82 ±36.25
	50-59	50.06 ±26.9	25.09 ±32.7	43.45± 25.57	18.73± 29.71	43.45 ±30.7	43.82± 28.69	50.19 ±42.3	12.36 ±27.2	68.91 ±32.48
	60-69	56.36 ±24.0	28.79 ±28.4	54.85± 27.34	30.30± 36.44	51.52 ±30.6	50.30± 31.99	59.39 ±37.7	10.91 ±24.8	73.33± 32.96
	>70	59.06 ±21.2	43.81 ±34.3	61.40± 22.94	29.82± 36.67	57.89 ±29.0	61.40± 27.80	61.40 ±37.2	22.81 ±31.5	71.93± 37.29
	p-value	0.002*	0.126	0.000*	0.128	0.102	0.002*	0.000*	0.434	0.037
Marital status	Single	28.57 ±27.4	14.29 ±26.5	32.14± 31.66	14.29± 21.54	33.33 ±32.0	23.81± 33.15	16.67 ±25.3	14.29 ±21.5	38.10 ±36.64
	Married	48.25 ±26.1	26.57 ±30.7	42.66± 25.45	21.91± 30.92	45.45 ±30.7	42.89± 31.05	39.86 ±39.4	16.78 ±28.4	62.00 ±34.62
	Divorced	51.67 ±31.3	33.75 ±34.0	47.08± 31.09	25.00± 35.20	45.00 ±30.7	47.50± 36.11	50.83 ±41.3	9.17± 23.85	66.67 ±36.20

	Widowed	52.57 ±22.0	27.11 ±29.7	51.24± 26.16	22.39± 31.45	47.76 ±29.1	48.76± 29.14	59.70 ±36.4	10.95 ±25.5	79.10 ±30.05
	p-value	0.017	0.231	0.045	0.748	0.457	0.051	0.000*	0.296	0.000*
Educational status	Illiterate	51.00 ±25.6	29.91 ±32.5	47.86± 28.32	24.22± 33.51	46.72 ±31.2	47.86± 30.75	57.83 ±39.2	15.38 ±28.8	72.65 ±31.44
	Can read and write	46.30 ±26.3	29.86 ±30.9	40.63± 23.29	18.75± 29.09	39.58 ±29.7	38.89± 31.76	43.06 ±36.3	20.83 ±31.2	54.17 ±35.48
	Informal education	39.73 ±20.9	19.19 ±27.0	33.33± 19.09	14.14± 27.67	47.47 ±25.0	38.38± 32.40	25.25 ±32.3	13.13 ±23.4	62.63 ±37.96
	Primary	46.56 ±30.9	17.46 ±26.6	42.06± 26.67	19.05± 30.86	46.03 ±26.8	36.51± 33.17	23.81 ±38.2	1.59± 7.27	50.79 ±38.90
	Secondary	48.15 ±35.6	16.67 ±27.8	44.44± 34.42	16.67± 27.88	33.33 ±42.1	44.44± 40.36	33.33 ±36.5	5.56± 13.60	61.11 ±49.06
	Collage and above	54.42 ±28.7	29.06 ±30.5	52.99± 30.07	29.06± 29.79	47.86 ±33.1	47.86± 33.15	41.03 ±40.0	10.26 ±23.1	70.94 ±33.49
	p-value	0.220	0.270	0.030	0.354	0.651	0.340	0.000*	0.096	0.010
Occupational status	Governmental	53.27 ±30.3	23.53 ±27.2	50.49± 30.56	26.47± 29.33	50.98 ±33.0	45.10± 31.65	38.24 ±39.4	8.82± 18.90	70.59 ±34.58
	Private	34.92 ±25.1	26.98 ±29.0	34.13± 30.49	22.22± 26.52	34.92 ±24.6	23.81± 23.90	22.22 ±28.5	12.70 ±24.6	46.03 ±35.70
	Merchant	48.72 ±27.4	17.95 ±27.0	42.31± 27.17	16.67± 28.67	44.87 ±24.8	46.15± 32.76	25.64 ±34.3	8.97± 22.22	60.26 ±37.73
	Retired	53.33 ±14.4	40.00 ±27.8	46.67± 34.15	40.00± 27.88	46.67 ±44.7	46.67± 44.72	53.33 ±38.0	13.33 ±18.2	53.33 ±50.53
	Farmer	47.28 ±21.7	32.98 ±33.0	43.26± 27.06	27.66± 32.83	40.43 ±30.2	43.26± 31.78	57.45 ±37.8	21.28 ±33.6	64.54 ±35.71
	Housewife	50.90 ±26.7	27.78 ±32.0	46.64± 25.37	19.64± 32.43	47.55 ±31.1	47.55± 31.67	50.90 ±40.1	14.21 ±27.2	69.51 ±33.08
	Unemployed	11.11 ±15.7	.00	25.00± 11.78	.00	33.33 +.00	.00	.00	.00	83.33 ±23.57

	p-value	0.062	0.331	0.343	0.384	0.441	0.028	0.000*	0.3999	0.100
Monthly income	<600ETB	45.69 ±25.1	26.95 ±31.4	42.68± 26.42	18.07± 29.41	45.17 ±29.0	42.37± 30.90	49.84 ±39.7	15.58 ±29.4	67.91 ±34.54
	≥600ETB	50.96 ±27.2	27.28 ±30.6	46.50± 27.60	24.84± 32.22	45.44 ±31.3	45.22± 32.68	42.25 ±39.4	12.95 ±24.9	64.33 ±35.42
	p-value	0.113	0.931	0.263	0.084	0.945	0.477	0.127	0.436	0.416

FA:fatigue ,NV:nausea and vomiting, PA:pain, DY:dyspnea, SL:insomnia, AP:appetite loss, CO:constipation, DI:diharea, FI:financial difficulty, ETB:Ethiopian birr

5.1.2.4. Mean differences in EORTC QLQ-C30 symptom scale with clinical characteristics of patients with cervical cancer

On the clinical characteristics of patients; all symptom scales except diarrhea showed significant mean differences across FIGO stages. Stage IV showing the highest symptoms while stage I had the least. Patients whose diagnosis was longer than 5 years showed a significantly high mean difference in all symptom scales .On the current planned type of treatment options all of the symptom scales exhibited a significant mean difference among groups. Least symptom score was reported with patients who are planned to have surgery.

Table 7: Mean differences in EORTC QLQ-C30 symptom scale with clinical characteristics of patients with cervical cancer

Variables	Category	FA	NV	PA	DY	SL	AP	CO	DI	FI
Patient status	New	45.89 ±24.8	25.64± 30.11	41.59± 25.16	19.55 ±29.1	44.23 ±29.1	43.59± 30.76	43.1±3 9.12	13.62 ±25.8	62.34 ±35.09
	Follow up	59.72 ±29.7	32.74± 33.32	57.44± 30.63	31.55 ±36.7	49.40 ±34.8	45.83± +36.27	53.57± +41.03	15.48 ±30.4	78.57 ±32.05
	p-value	0.000*	0.127	0.000*	0.010	0.259	0.642	0.080	0.647	0.002*
Time since dx	<1yr	46.82 ±25.7	24.62± 29.61	42.68± +26.52	20.64 ±30.2	43.51 ±29.9	41.98± 31.15	44.07± 39.85	13.25 ±26.2	64.85 ±35.25
	1-5yrs	66.67 ±26.0	50.00± 32.96	65.28± 23.00	33.33 ±35.4	61.11 ±28.9	62.50± 33.06	58.33± 37.10	22.22 ±32.1	73.61 ±32.57
	>5yrs	100.0	83.33	100.00	100.0	100.0	100.00	33.33	.00	100.00
	p-value	0.000*	0.000*	0.000*	0.007	0.005*	0.002*	0.234	0.258	0.315
Stage of cancer	Stage I	30.62 ±24.4	21.14± 29.58	26.02± 19.73	14.63 ±26.9	33.33 ±27.8	26.83± 30.93	26.83± 31.81	8.94+ 16.70	43.09 ±34.35
	Stage II	40.58 ±22.7	18.30± 26.38	33.88± 22.29	16.30 ±27.2	37.68 ±28.4	36.96± 29.42	31.88± 36.61	12.68 ±25.6	56.88 ±34.42

	Stage III	56.63 ±23.5	30.74± +32.23	55.02± 24.45	19.74 ±29.6	51.13 ±29.0	50.16± 29.84	56.31± 39.06	16.18 ±29.6	77.99 ±29.72
	Stage IV	73.81 ±22.2	51.79± 26.96	72.02± 23.59	60.71 ±28.7	66.67 ±30.0	70.24± 27.72	76.19± 31.23	17.86 ±30.7	83.33 ±30.76
	P-value	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.403	0.000*
Treatment plan	Surgery	34.54 ±22.6	21.38± 29.37	29.17± 20.01	13.77 ±24.2	34.78 ±28.3	33.70± 32.59	30.07± 34.96	9.42± 17.34	50.00 ±35.46
	Chemo	55.97 ±23.7	19.75± +19.63	54.32± 24.71	32.10 ±31.3	46.91 ±26.5	39.51± 32.07	29.63± 37.36	18.52 ±33.7	67.90 ±31.32
	Rad	72.22 ±39.2	66.67± 47.14	66.67± 47.14	66.67 ±.000	50.00 ±23.5	66.67± 47.14	66.67± 47.14	83.33 ±23.5	83.33 ±23.57
	Chemo-rad	57.11 ±25.8	33.09± 32.58	54.17± 27.04	26.23 ±34.2	51.23 ±31.4	52.21± 29.73	60.29± 37.95	15.93 ±29.5	76.47 ±31.46
	Chemo-surgery	41.27 ±8.39	4.76±1 2.59	30.95± 14.99	.00	61.90 ±12.5	33.33± 19.24	9.52±1 6.26	.00	52.38 ±37.79
	p-value	0.000*	0.002*	0.000*	0.001*	0.000*	0.000*	0.000*	0.001*	0.000*
Comorbid conditions	None	27.03 6±27	25.71± 30.90	44.02± 27.01	20.78 ±30.7	43.80 ±30.6	44.10± 32.47	44.69± 40.52	12.41 ±25.5	65.62 ±34.57
	HTN	21.9± 21.98	37.30± 25.76	50.79± 29.09	31.75 ±34.1	44.44 ±28.5	36.51± 27.69	46.03± 35.70	22.22 ±32.2	57.14 ±41.01
	DM	16.68± 16.68	28.79± 32.56	48.48± 22.91	27.27 ±32.7	60.61 ±13.4	42.42± 26.20	39.39± 35.95	24.24 ±33.6	69.70 ±34.61
	Cardiac	15.71± 15.71	25.00± 33.35	25.00± 11.78	16.67± 23.57	50.00± 23.57	50.00±2 3.57	66.67± 47.14	16.67± 23.57	100.00
	Renal		100.00	100.00	66.67	66.67	100.00	100.00	100.0	100.00
	Others	32.71± 32.71	30.56± 34.02	50.00± 29.81	22.22± 40.36	72.22± 38.96	61.11± 32.77	61.11± 25.09	11.11± 17.21	77.78 ±34.42
	p-value	0.301	0.133	0.234	0.443	0.125	0.303	0.592	0.011	0.421

FA:fatigue ,NV:nausea and vomiting, PA:pain, DY:dyspnea, SL:insomnia, AP:appetite loss, CO:constipation, DI:diharea, FI:financial difficulty

5.1.2.5. Mean differences in EORTCQLQ-CX24 functional scale with Socio-demographic and Socio-economic characteristics

The results in Table 8 showed from the functioning scales a significant mean difference was found in the body image and sexual activity .Of those falling under the age category of 60-69 years old have the highest mean scores in all functional scales as compared to other age groups. Sexual activity score had significant mean difference across marital status. Body image had statistically significant mean difference across educational and occupational status categories.

The highest mean score was reported in those learnt up to college and above groups (mean ± SD =52.99±25.294). Average monthly household income did not exhibit a significant difference in the scales except in body image scale. Even though sexual enjoyment and vaginal function fall under this category, there was no significant mean difference observed among those who were able to respond to the questions.

Table 8: Mean differences in EORTCQLQ-CX24 functional scale with Socio-demographic and Socio-economic characteristics

Variables	Category	Sexual/vaginal function	Body Image	Sexual enjoyment	Sexual activity
Age	<40	39.24±19.57	40.91±29.32	26.39±31.05	24.24±26.28
	40-49	39.17± 22.96	42.50± 31.99	21.11±28.34	26.32±30.69
	50-59	35.19± 17.51	35.83±30..51	22.22±22.86	10.49± 24.41
	60-69	56.67± 27.25	35.56± 26.91	33.33±25.57	4.24± 14.42
	>70	33.33± 13.94	44.44±30.76	33.33± 36.51	19.30±33.91
	p-value	0.713	0.012	0.854	0.000*
Marital status	Single	31.67±13.693	42.06±34.08	20.00±29.814	11.90±16.575
	Married	39.02±22.641	41.10±29.839	23.28±29.105	22.61±30.283
	Divorced	38.33±11.180	36.11±27.419	40.00±14.907	5.00±14.222
	Widowed	42.50±14.407	34.33±30.627	26.67±26.294	7.46±20.777
	p-value	0.828	0.420	0.616	0.000*
Education	Illiterate	36.94±21.518	32.76±29.027	27.78±23.298	14.81±29.506
	Can read and write	36.76±21.053	28.70±24.775	21.57±26.197	15.28±23.778
	Informal education	41.11±22.596	52.86±33.682	26.67±40.237	21.21±26.112
	Primary	38.10±22.493	45.50±29.587	23.81±37.090	17.46±27.119
	Secondary	38.89±12.729	38.89±34.960	11.11±19.245	27.78±38.968

	Collage and above	45.45±18.769	52.99±25.294	21.21±22.473	10.26±17.361
	p-value	0.893	0.000*	0.917	0.482
Occupation	Government	40.38±16.613	51.31±27.897	23.08±31.578	14.81±29.506
	Private	37.88±19.848	38.62±32.322	21.21±22.473	15.28±23.778
	Merchant	50.93±16.375	50.85±26.699	22.22±23.570	21.21±26.112
	Retired	41.67±14.434	44.44±17.568	44.44±50.918	17.46±27.119
	Farmer	40.28±31.603	30.73±27.336	20.37±25.918	27.78±38.968
	Housewife	33.91±15.094	35.06±30.412	27.59±29.639	10.26±17.361
	Unemployed	0	72.22±23.570	0	14.81±29.506
	P-value	0.433	0.005*	0.787	0.169
Monthly income	<600	32.69±21.464	30.43±29.012	30.77±28.163	13.71±28.208
	≥600	41.81±19.951	44.30±29.289	21.64±27.811	16.77±25.493
	p-value	0.063	0.000*	0.171	0.359

5.1.2.5. Mean differences in EORTC QLQ-CX24 functional scales with clinical characteristics

It can be observed on table that patient status, treatment plan and comorbid conditions didn't have any statistically significant mean difference across all functional scales of EORTC QLQ-CX24, and Body image is the only functional scale which showed statistical significant mean difference across time since diagnosis and stage of cervical cancer. Patients whose time of diagnosis was 5 years and above scored a good body image (Mean± SD =100±0.00). Stage IV has the highest mean score in sexual and vaginal function (Mean± SD =60.42±22.160). Patients whose plan of treatment was to take radiation therapy had the highest body image (Mean± SD =61.11±39.284) as compared to the other planned type of treatment.

Table 9: Mean differences in EORTC QLQ-CX24 functional scales with clinical characteristics

Variables	Category	Sexual/vaginal function	Body Image	Sexual enjoyment	Sexual activity
Patient status	New	38.77±20.611	36.49±28.981	24.07±27.534	16.99±27.215
	Follow up	40.15±22.613	46.83±32.113	27.27±32.722	10.12±23.715
	P-value	0.839	0.021	0.727	0.087
Time since diagnosis	<1yr	38.40±20.947	36.17±29.445	24.47±28.599	16.32±26.963
	1-5yrs	50.00±13.608	61.11±22.462	25.00±16.667	8.33±22.522
	>5yrs	.00 . .	100.00 .	.00	.00 .
	p-value	0.278	0.000*	0.971	0.317
Stage of cervical ca	Stage I	35.83±14.332	30.89±29.660	20.00±19.941	23.58±29.101
	Stage II	38.28±18.314	31.28±28.999	28.13±32.911	15.22±24.417
	Stage III	35.14±24.613	43.58±29.136	24.64±28.810	12.30±25.984
	Stage IV	60.42±22.160	56.35±26.001	20.83±24.801	16.67±30.765
	p-value	0.017	0.000*	0.763	0.149
Treatment plan	Surgery	36.11±17.660	30.92±29.181	23.93±27.518	21.01±29.117
	Chemo	52.78±26.352	37.86±37.141	25.93±36.430	13.58±21.202
	Rad	33.33	61.11±39.284	33.33	16.67±23.570

	Chemo-rad	37.50±21.895	43.71±27.789	26.04±27.740	12.50±25.959
	Chemo- surgery	58.33±11.785	39.68±31.983	.00	9.52±16.265
	p-value	0.150	0.023	0.789	0.186
Comorbid Conditions	None	39.34±21.828	37.77±28.838	22.55±26.667	15.25±26.785
	HTN	35.42±16.332	40.74±35.890	30.56±30.011	26.98±29.096
	DM	33.33	45.45±37.003	33.33	3.03±10.050
	Cardiac	.0	27.78±39.284	00	33.33±47.140
	Renal	50.00 .	33.33	0	.00 .
	Others	50.00 .	57.41±36.118	100.00 .	5.56±13.608
	p-value	0.913	0.624	0.057	0.134

5.1.2.6. Socio-demographic and socio-economic characteristics with EORTC QLQ-CX24 symptom scales of patients with cervical cancer

On the analysis of the score of symptom scales of the EORTC QLQ-CX24 with the age category and marital status, the symptom experience, lymph adenoma and sexual worry scale showed a significant mean difference. Participants falling in the age group of 70 years old and above showed the highest mean difference in all symptom scales from the rest of the age category. Those who are widowed score highest mean difference across symptom experience and menopausal symptoms (mean+ SD =40.03±16.761 and 43.28±41.037) respectively. Symptom experience ,menopausal symptoms, and sexual worry showed significant mean difference across educational status .Those who are learnt up to college and above had the highest mean score in the menopausal symptom scales (mean+ SD=58.12±41.688) .Symptom experience and lymph adenoma had significant mean difference across occupational status. Those who were retired from job had highest mean difference across lymph adenoma scales (mean+ SD = 86.67

±29.814). Monthly income category of patients indicated a significant mean difference across lymph adenoma and menopausal symptom groups.

Table 10: Socio-demographic and socio-economic characteristics with EORTC QLQ-CX24 symptom scales of patients with cervical cancer

Variables	Category	SE	LY	PN	MS	SXW
Age	<40	24.65±16.25	21.21±32.22	19.70±30.76	29.55±35.37	37.12± 38.18
	40-49	35.03±18.82	23.98±34.93	31.58±36.41	33.33±35.07	43.27± 32.71
	50-59	35.85± 17.22	19.10±30.93	22.47±29.63	38.95±38.34	25.09± 35.63
	60-69	36.80± 14.85	27.88±33.10	26.67±31.69	46.06± 41.81	17.58± 32.61
	>70	48.48± 17.69	49.12±44.95	47.37±40.54	35.09± 39.24	29.82±36.67
	p-value	0.000*	0.000*	0.078	0.215	0.000*
Marital status	Single	18.18±12.466	14.29±31.254	16.67±31.351	14.29±21.540	35.71±35.720
	Married	34.44±18.392	21.91±32.164	27.27±33.248	37.30±37.213	35.20±37.898
	Divorced	33.94±15.131	30.00±37.591	23.33±31.306	35.83±38.776	27.50±32.806
	Widowed	40.03±16.761	28.86±36.651	29.35±34.584	43.28±41.037	18.41±30.860
	p-value	0.000*	0.243	0.541	0.077	0.014
Education status	Illiterate	38.49±17.500	21.65±33.424	29.91±35.661	36.75±35.120	20.23±30.936
	Can read and write	34.22±18.138	26.39±32.947	29.86±32.427	33.33±38.897	23.61±32.947
	Informal education	27.55±16.587	19.19±28.904	19.19±28.904	28.28±36.440	53.54±38.133
	Primary	25.54±17.211	22.22±38.490	25.40±36.370	22.22±33.884	52.38±40.237
	Secondary	36.36±16.817	27.78±44.305	22.22±40.369	50.00±45.947	38.89±38.968
	Collage and above	36.13±16.949	35.90±37.762	20.51±26.063	58.12±41.688	32.48±35.448
	p-value	0.005*	0.286	0.453	0.003*	0.000*
Occupational status	Government	33.24±17.865	31.37±36.645	18.63±27.452	49.02±40.398	39.22±38.024

	Private	25.97±17.606	20.63±35.709	23.81±31.873	34.9±38.696	41.27±34.809
	Merchant	29.49±17.472	15.38±28.645	14.10±26.954	34.62±44.702	39.74±37.735
	Retired	49.09±19.685	86.67±29.814	53.33±38.006	40.00±54.772	20.00±18.257
	Farmer	41.01±21.796	21.28±32.172	34.75±39.292	38.30±33.318	17.73±27.672
	Housewife	35.54±15.003	24.29±33.269	28.17±32.396	35.40±37.210	27.39±36.669
	Unemployed	9.09±4.285	.00	.00	.00	83.33±23.570
	P-value	0.001*	0.001*	0.034	0.459	0.008
Monthly income	<600	34.64±17.253	17.13±29.802	22.74±31.255	32.09±36.608	23.05±33.462
	≥600	35.11±18.205	29.51±36.195	29.30±34.250	40.98±38.835	34.39±36.868
	p-value	0.833	0.004*	0.115	0.003*	0.011

SE=symptom experience, LY=Lymph adenoma ,PN=Peripheral neuropathy, MS=Menopausal symptoms, SXW=Sexual worry

5.1.2.7. Mean differences in EORTC QLQ-CX24 Symptom scales with clinical characteristics

Symptom experience, lymph adenoma and peripheral menopausal symptoms resulted in a significant mean difference of the participants' patient status and time since diagnosis. All symptom scales had significant mean scores across stage of cervical cancer except sexual worry. Those diagnosed to have stage IV cervical cancer scored the highest mean score in all symptom scales. All symptom scales had significant mean difference across planned type of treatment except sexual worry. Those planned treatment type was radiation have the highest mean scores in all symptom scales. Peripheral neuropathy showed significant mean difference across comorbid conditions. Those participants who had cardiac problem concomitant with cervical cancer showed the highest mean difference in the peripheral neuropathy scale (mean ± SD = 83.33±23.570).

Table 11: Mean differences in EORTC QLQ-CX24 Symptom scales with clinical characteristics

Variables	Category	SE	LY	PN	MS	SXW
Patient status	New	33.28±18.12	20.99±32.311	26.28±34.105	30.29±35.23	31.09±35.822
	Follow up	41.02±15.16	37.50±38.172	27.98±29.663	63.69±37.21	25.00±36.098
	P-value	0.004*	0.001*	0.735	0.000*	0.261
Time since diagnosis	<1yr	33.68±17.42	21.90±32.616	25.10±32.369	34.31±36.97	29.43±35.682
	1-5yrs	45.71±16.69	47.22±39.215	40.28±38.043	66.67±38.069	30.56±36.669
	>5yrs	72.73 .	100.00 .	66.67 .	66.67 .	100.00 .
	p-value	0.001*	0.000*	0.049	0.000*	0.145
Stage of cervical ca	Stage I	18.70±10.20	13.01±26.748	18.70±26.925	16.26±28.98	30.89±36.048
	Stage II	29.31±15.07	15.94±29.434	20.29±29.632	29.71±33.31	30.80±36.055
	Stage III	40.54±14.290	26.54±32.459	27.51±33.797	43.37±38.72	26.54±34.729
	Stage IV	56.39±16.949	61.90±39.246	55.95±35.199	71.43±35.96	36.90±39.896
	p-value	0.000*	0.000*	0.000*	0.000*	0.563
Treatment plan	Surgery	22.99±12.71	11.96±27.328	15.94±26.830	21.01±31.14	32.25±36.129
	Chemo	38.27±13.29	16.05±26.747	18.52±26.688	28.40+34.22	32.10±36.376
	Rad	48.48±4.285	83.33±23.570	83.33±23.570	83.33±23.570	16.67±23.570

	Chemo-Rad	42.71±17.221	34.80±36.485	35.78±35.517	50.49±38.27	26.47±34.929
	Chemo - Surgery	23.38±12.581	4.76±12.599	4.76±12.599	19.05±37.79	57.14±46.004
	p-value	0.000*	0.000*	0.000*	0.000*	0.196
Comorbid conditions	None	34.05+17.84	22.42+32.964	23.32+30.582	36.32+37.44	28.85+35.086
	HTN	40.55±19.43	38.10±38.421	50.79±40.303	47.62±38.832	31.75±35.709
	DM	40.50±15.820	21.21±34.230	27.27±35.957	18.18±31.140	39.3±46.710
	Cardiac	45.45±12.856	66.67±47.140	83.33±23.570	50.00±70.711	33.33±47.140
	Renal	45.45	100.00	66.67	100.00	.00
	others	31.82±2.384	33.33±42.164	38.89±49.065	61.11±49.06	44.44±50.185
	p-value	0.425	0.027	0.000*	0.082	0.748

5.2. Predictive factors of Global Quality of life

Age, educational status and monthly income have association with GQOL. Being in the age group <40years affects 2.12 times the GQOL compared to the other variables (AOR =2.12, 95%CI =0.23-18.90). The patients monthly income <600ETB affects the GQOL 1.7 times (AOR=1.74, 95% CI = 0.34-8.93).

Table 12: Binary and multivariable logistic regression analysis to observe association between (socio-demographic, medical characteristics) variables and global QOL of patients with cervical cancer.

Variables	Category	GQOL		Odds Ratio(95% CI)	
		Affected	Not affected	COR	AOR
Age	<40	42 (17.3%)	2 (9.5%)	3.12(0.44-27.9)	2.12(0.23-18.90)
	40-49	52(21.4)	5(23.8%)	4.39(0.53-36.4)	3.74(0.41-33.61)
	50-59	80(32.9%)	9(42.9%)	1	

	60-69	50(20.6%)	5(23.8%)	1	
	>70	19(7.8%)	0	1	
Education status	Illiterate	113(46.5%	4(4.8%)	0.118(0.034-0.41)	0.79(0.01-0.65)
	Can read and write	46 (18.9%)	2 (9.5%)	0.145(0.029-0.71)	0.91(0.01-0.845)
	Informal education	33 (13.6%)	0	0	0
	Primary	18(7.4%)	3(14.3%)	0.556(0.133-2.32)	0.453(0.80-2.57)
	Secondary	3(1.2%)	3(14.3%)	3.33(0.571-19.47)	2.78(0.39-19.83)
	Collage and above	30(12.3%)	9(42.9%)	1	
Occupational Status	Government employee	27(11.1%)	7(33.3%)	1	
	Private	19(7.8%)	2(9.5%)	0.406(0.076-2.17)	
	Merchant	22(9.1%)	4(19.0%)	0.701 (0.182-2.709)	
	Retired	5(2.1%)	0	.000	
	Farmer	47(19.3%)	0	.000	
	Housewife	121(49.8%	8(38.1%)	0.255 (0.085-0.764)	
	Unemployed	2(0.8%)	0	.000	
Monthly income	<600	101(41.6%)	6(28.6%)	0.562 (0.211-1.499)	1.74(0.34-8.93)
	≥600	142(58.4%)	15(71.4%)	1	

The association between the GQOL and medical characteristics resulted in a significant association in the time since diagnosis. If it was diagnosed with in 1-5years, it will affects the GQOL 3.01times (AOR =3.01, 95%CI = 0.53-16.91).However, in the multi-variable associations there was no significant association between medical characteristics of patient and GQOL.

Table 13: Binary and multivariate logistic regression analysis between clinical variables and GQOL of patients with cervical cancer

Variables	Category	GQOL		Odds Ratio(95%CI)	
		Affected	Not affected	COR	AOR
Time since diagnosis	<1yr	220(90.5%)	19(90.5%)	1	1
	1-5yrs	22 (9.1%)	2(9.5%)	1.05(0.23-4.82)	3.01(0.53-16.91)
	>5yrs	1(0.4%)	0	0	1.44(0.00)
Stage of cervical ca	Stage I	33(13.6%)	8(38.1%)	1	1
	Stage II	84(34.6%)	8(38.1%)	0.393(0.13-0.03)	0.43(0.13-1.41)
	Stage III	98(40.3%)	5(23.8%)	0.21(0.06-0.16)	0.35(0.04-2.67)
	Stage IV	28(11.5%)	0	0	0
Treatment plan	Surgery	79(32.5%)	13(61.9%)	0.98(0.11-8.88)	0.59(0.05-6.23)
	Chemo	25(10.3%)	2(9.5%)	0.48(0.037-6.21)	0.46(0.03-6.07)
	Rad	2(0.8%)	0	0	0
	Chemo-rad	131(53.9%)	5(23.8%)	0.229(0.023-2.27)	0.258(0.021-3.19)
	Chemo surgery	6(2.5%)	1(4.8%)	1	1

During the bivariate analysis, all variables with p-value < 0.25 were included for the multivariable logistic regression. On the multi-variable analysis, only three of the variables showed association with the GQOL. Accordingly role functioning (AOR=2.16, 95%CI=0.71-6.56), fatigue (AOR= 1.09, 95%CI=0.32-3.7) and dyspnea (AOR=1.21, 95%CI= 0.35-4.17) had shown a significant association with GQOL. In other words, patients who had an affected role functioning are 2.16 times more likely to affect the GQOL, such as the difficulty to walk is likely result in an affected GQOL. The feeling of fatigue has 1.09 times likely chance of affecting the GQOL as well as dyspnea which has a 1.21 times risk of affecting the GQOL.

Table 14: Binary and multivariate logistic regression analysis between EORTC QLQ-C30 scales of patients with cervical cancer

Variables	Category	Outcome	GQOL		Odds Ratio(95%CI)	
			Affected	Not affected	COR(95%CI)	AOR(95%CI)
Functional scales	Physical	Affected	117(48.1%)	5(23.8%)	0.33(0.12-0.64)	0.208(0.052-0.835)
		Not affected	126(51.9%)	16(76.2%)	1	1
	Role	Affected	126(51.9%)	10(47.6%)	0.84(0.34-2.06)	2.16(0.71-6.56)
		Not affected	117(48.1%)	11(52.4%)	1	1
	Cognitive	Affected	114(46.9%)	7(33.3%)	0.56(0.22-1.45)	0.96(0.28-3.22)
		Not affected	129(53.1%)	14(66.7%)	1	1
Symptom scales	Fatigue	Affected	180(74.1%)	13(61.9%)	0.56(0.22-1.43)	1.09(0.32-3.7)
		Not affected	63(25.9%)	8(38.1%)	1	1
	Nausea &vomiting	Affected	114(46.9%)	6(28.6%)	0.45(0.17-1.20)	0.74(0.21-2.62)
		Not affected	129(53.1%)	15(71.4%)	1	1
	Pain	Affected	177(72.8%)	10(70.8%)	0.339(0.138-0.83)	0.60(0.16-2.27)
		Not affected	66(27.2%)	11(52.4%)	1	1
	Dyspnea	Affected	99(40.7%)	7(33.3%)	0.72(0.28-1.86)	1.21(0.35-4.17)
		Not affected	144(59.3%)	14(66.7%)	1	1
	Appetite	Affected	195(80.2%)	11(52.4%)	0.27(0.10-0.67)	0.52(0.16-1.64)
		Not affected	48(19.8%)	10(47.6%)	1	1
	Constipation	Affected	162(66.7%)	11(52.4%)	0.55(0.22-1.34)	0.95(0.34-2.62)
		Not affected	81(33.3%)	10(47.6%)	1	1
	Diarrhea	Affected	66(27.2%)	4(19%)	0.63(0.20-1.94)	0.70(0.17-2.81)
		Not affected	177(72.8%)	17(81%)	1	1
	Financial	Affected	218(89.7%)	12(57.1%)	0.15(0.05-0.39)	0.21(0.07-0.59)
		Not affected	25(10.3%)	9(42.9%)	1	1

Participants affected body image and feeling of lymph adenoma was the only two variables which had significant association with GQO. Once sense of body image affected 1.88 times (AOR=1.88, 95%CI=0.42-8.45) the GQOL and 1.39 times (AOR=1.39, 95%CI=0.51-3.81)if affected feeling of lymph adenoma.

Table 15: Binary and multivariate logistic regression analysis to association of GQOL and EORTC QLQ CX 24 scales of patients with cervical cancer

Variables	Category	Outcome	GQOL		Odds Ratio(95%CI)	
			Affected	Not affected	COR	AOR
Functional scales	Body image	Affected	203(83.5%)	19(90.5%)	1.87(0.41-8.35)	1.88(0.42-8.45)
		Not affected	40(16.5%)	2(9.5%)	1	1
	Sexual activity	Affected	233(95.9%)	20(95.2%)	0.85(0.10-7.05)	0.80(0.09-6.66)
		Not affected	10(4.1%)	1(4.8%)	1	1
Symptom scales	Symptom experience	Affected	165(67.9%)	9(42.9%	0.35(0.14-0.87)	0.36(0.12-1.03)
		Not affected	78(32.1%)	12(57.1%)	1	1
	lymph adenoma	Affected	98(40.3%)	8(38.1%)	0.91(0.36-2.27)	1.39(0.51-3.81)
		Not affected	145(59.7%)	13(61.9%)	1	1
	Sexual worry	Affected	118(48.6%)	8(38.1%)	0.65(0.26-1.62)	0.60(0.23-1.53)
		Not affected	125(51.4%)	13(61.9%)	1	1
	Menopausal symptoms	Affected	145(59.7%)	9(42.9%)	0.50(0.20-1.24)	0.66(0.24-1.80)
		Not affected	98(40.3%	12(57.1%)	1	1

6. Discussion

The main purpose of this study was to describe the HRQOL, and predictive factors of cervical cancer patients in TASH & SPHMMC. For the assessment of the HRQOL of patients, we have used the already validated EORTC QLQ-CX24 disease-specific module which was performed to establish the psychometric properties of the tool in the Ethiopian patients. The validation study indicated that the EORTC QLQ-CX24 has the acceptability and is a psychometrically robust tool to measure HRQOL specifically in cervical patients. The results of the validation showed that the EORTC QLQ-CX24 tool was easily understood with 100% compliance. None of the patients refused to fill the questionnaire with no missing responses. (28)

As the major finding of the study the mean score for GQOL of cervical cancer patients was low which is similar to studies done in Iran and China (38, 26) but lower than Indian and Brazilian cervical cancer patients (Dallabri et al. 2013). It was also very lower than the EORTC QLQ reference value manual for cervical cancer patients (60.0 $\pm$25.2) indicating poor QOL. The differences could be due to patients' cultural influence; most of the participants were from country side which results in less perception of their illness and diagnosis at late stage. These factors were found to affect in patient outcome (20). It could also be that patient's assumption of an exaggerated symptom report will entail more attention from the health care professional. Among symptom scale, financial difficulty was the worst affected QOL dimension. Studies conducted in other developing countries, Tanzania and Indonesia showed that financial difficulty is one of the most affected domains among the symptom scale. We found that pain and fatigue was the second and the third highly scored domains whereas a Turkish and Malaysian studies showed that either of the two are the most affected domains. This may be due to the fact of inaccessibility of the oncology service and lack of health insurance in the Ethiopian settings. This makes patients to travel over a long distance to get oncologic service which could be the cause of fatigue and pain.

Educational status has also shown a significant correlation with health related quality of life components. Those patients who had never gone to school scored lower in GQOL, physical function, and social function and had higher score in fatigue, dyspnea and financial difficulties. A study done in Turkey showed education status was associated with physical function in the same way as ours but in contrary to ours with fatigue. This can be justified by the fact that a

lower level of education is associated with poor health seeking behavior. This study also found that those patients who are house wife had a lower score in social function. There was a similar finding from Sudan which showed higher QOL of scores for patients when they are employed in medium skill/high skill occupation. The functioning domain of EORTCQLQ 30 and EORTCQLQ CX 24 resulted in a score lower than the reference value except role functioning. All the symptom scales were all higher than the reference values placed by the EORTC group (Scott et al., 2008). Social and sexual functioning was found to have a minimum result among the scales which mirrors to previous findings where patients with cervical cancer found it difficult to interact with their community and engage in sexual activity due to the illness and treatment. This study found 31.4% of the participants were sexually active with different frequency mostly in a little way. This is higher than previous study done here in TASH accounting 10.1% of the participants. It was also higher to a study done in Poland where the majority participants were not sexually active (29). This is unexpected as sexual activity is among the least reported functioning item in most groups of patients' previous studies. In this study better because most of the participants were in the age group between <40 years by which most sexual activity were undertaken and also most of the participants were married. These things could increase sexual exposure (45). Similar to the finding in India (Kumar et al., 2007), diarrhea was among the least reported symptoms. However, a study done in UK found diarrhea and fatigue as the most frequently reported symptom (Bjelic-Radisic. et al, 2012). The difference between the two groups' lies in the fact that none of the patients in this study did receive any treatment. Diarrhea is a symptom associated with the treatment side effect. The present study indicates that GQOL, role functioning, social functioning, sexual activity, fatigue, pain, loss of appetite and symptom experience showed significance differences with the patients educational background. This is similar to the finding of a study done to evaluate the GQOL of cancer patients where educational level was found to be associated with certain domains of GQOL (Pinar, 2003, Quercioli etal, 2009 and König et al., 2009).

The results can be indicative that patients who are educated hence, with a better understanding of their condition, could have a different perception on their role and emotional functioning which will allow them to be able to interact better in their social life. On the contrary to the finding of the current study, one study done in Ethiopia found no significant relationship between every socio-demographic character including, marital status, income and educational status the patient

(13) and (Vrettos et al., 2012). This difference could have been due to the difference of measurement tools, difference of study populations. The factors that had an association with better HRQOL in women with cervical cancer were having a current occupation, a longer time since the diagnosis which had a similar result to the study done at Brazil 2019. (46)

Most of the participants were at advanced stage of cervical cancer during the study period. Patients who were on FIGO stage I of cervical cancer reported significantly high mean in functional domains and low symptom scales which is similar result in the other studies done but one study done few years back in all oncologic patients in TASH most of the patients were at stage II cervical cancer(25). Even though some literatures did not show the similar results (Vistad, 2006 and Sowa et al.2014), the present study and a study by Xie et al. (2013) confirmed higher scores for physical and role functioning with patients that are on earlier stages of cervical cancer. The ability to interact with their community and participate in household tasks declines due to the prevalence of symptoms and lower functionality scores. This can be reflected directly on the role and social functioning of the patients who are on FIGO stage IV. Stage of the disease and the planned type of treatment were associated with quality of life of cervical cancer patients. Advanced stage of diseases and radiation treatment found associated with the worst side. A study done in Texas has described cervical cancer survivors treated with radiotherapy to report more QOL impairments than survivors treated with other approaches. Self-esteem was reported to have a significant role in psychological distress and quality of life thus; the researcher's recommended psychological support for this group. In our study, it was shown that the global quality of life was found to have a strong association with role function. This was not true in the previous study of which physical function had strong association with GQOL. Physical function is an often neglected but integral part of the HRQOL of patients (Kirchheiner, 2013). In Ethiopia, where women play a big role in the household, the physically function ability might have a great impact on the self-satisfaction and HRQOL of patients. (45)

Fatigue and dyspnea in the EORTC QLQ-C30 scale and lymph adenoma from the EORTCQLQ-CX24 were found as predictive factors for GQOL. Studies found a different result and emphasized that the degree of pain and symptom experience directly affected the GQOL of patients with cervical cancer (13, 30).While other studies indicated that symptom experience had a relevant degree of affecting the GQOL of a patient as well.

In light of the significance of pain and symptom experience TASH and SPHMMC could benefit patient by providing continuous supply of pain and symptom management and designing a method appropriate for all demographic groups. In our study emotional functioning had no significant association with GQOL .Other studies have emphasized that emotional distress is a strong factor behind the battle with cervical cancer and patients reported a higher amount of anxiety and depression (Wenzel et al., 2003). The assessment of HRQOL by Herzog and Wright (2007) found that anxiety, distress, and concern are high in women with cervical cancer. The cultural inhibitions and the image of an illness could exaggerate the impact on the HRQOL of the patients. (23, 33)

In addition to the factors mentioned above other studies have discussed that social support and sexual functioning only were predictive of the GQOL of patients (Gotay et al. 2008). Contrary to (Prasongvejet al., 2017, Torkzahrani, 2013), the current study did not find sexual activity predictive of GQOL of patients. This may not have been predictive due to the values that are given to sexual activity in comparison to the illness. However, studies confirm that ability to sexually function had a positive relationship with the physical, social and functional wellbeing thus with a positive GQOL. (7, 34)

7. Strengths and limitations

The strength of the study is the relatively large sample size and the use of validated measurement tools. Despite the sample heterogeneity, the results indicate that the two QOL assessment tools were able to discriminate between groups of cervical cancer patients. The study also tried to include different varieties of patients from the whole country with different cultures and belief towards a disease. The study is very specific that it only tried to understand HRQOL of cervical patients before the initiation of any sort of treatment to describe how much the disease burdened the quality of life.

The study was conducted using Amharic version of EORTC QLQ-C30 and EORTC QLQ CX24 despite the fact that all study participants were not Amharic native speakers. The study was inherent to cross-sectional design.

8. Recommendations

Based on the findings of the study, the following recommendations have been made.

- Emphasis should be given to empowering women through education, as it is a key tool for avoiding unemployment and tackling the psychological impact of cervical cancer and financial aids may significantly improve the health of cervical cancer patients.
- Follow up studies should be done to determine the HRQOL of patients and changes due to different factors.
- Qualitative studies should be incorporated in order to better understand the patients spiritual and emotional connection

9. Conclusion

GQOL, physical function, role function, cognitive functions, financial difficulties, insomnia and fatigue were the most affected however social function, dyspnea and diarrhea were less affected components of HRQOL of cervical cancer patients. Age , marital status, educational status, occupational status ,monthly income , stage of the disease ,time since diagnosis and planned type of treatment were some of the different socio demographic and medical factors which were associated with health related quality of life of cervical cancer patients.

10. References

Garcia, M., Jemal, A., Ward, E.M., Center, M.M., Hao, Y., Siegel, R.L. and Thun, M.J., 2007. Global cancer facts & figures 2017. Atlanta, GA: American cancer society, 1(3), p.52.

WHO. Latest global trends of cancer in five continents. Switzerland. 2018.

Farley, J.,. GLOBOCAN 2018 v2. 0, Cancer incidence and mortality worldwide: 2010, IARC Cancer Base No. 10.http://globocan. iarc. fr.

Federal Ministry of Health, National Cancer Control and Implementation Plan, 2016-2020

Federal Ministry of Health, Combating Cervical Cancer in Ethiopia, 2015.

Fayers, P.M. and Machin, D.Quality of life: The assessment, analysis and reporting of patient-reported outcomes. John Wiley & Sons 2015.

Bae, H. and Park, H. Sexual function, depression, and quality of life in patients with cervical cancer. Supportive Care in Cancer, 2016, 24(3), pp.1277-1283.

Herzog, T.J. and Wright, J.D., The impact of cervical cancer on quality of life—the components and means for management. Gynecologic oncology, 2007. 107(3), pp.572-577.

Greimel, E.R., Winter, R., Kapp, K.S. and Haas, J., Quality of life and sexual functioning after cervical cancer treatment: A long-term follow-up study. Psycho-Oncolog 2009. y, 18(5), pp.476-482

Whitehead, S.J., Ali, S.. Health outcomes in economic evaluation: The QALY and utilities. British Medical Bulletin. 2010, doi:10.1093/bmb/ldq033 WHO/ICO.:

Human papilloma virus and related cancers in Ethiopia. In Summary report. Switzerland 2009

Ferrandina, G., Margariti, P.A., Smaniotto, D.A.N.I.E.L.A., Petrillo, M., Salerno, M.G., Fagotti, A.N.N.A., Macchia, G., Morganti, A.G., Cellini, N. and Scambia, G.,. Long-term analysis of clinical outcome and complications in locally advanced cervical cancer patients administered concomitant chemoradiation followed by radical surgery. Gynecologic oncology, 2010, 119(3), pp.404-410.

Tadele, N.,. Evaluation of quality of life of adult cancer patients attending Tikur Anbessa specialized referral hospital, Addis Ababa Ethiopia. Ethiopian journal of health sciences, 2015, 25(1), pp.53-62

Uma Singh, Manju Lata Verma, Zakia Rahman, Sabuhi Qureshi,Kirti Srivastava1Factors affecting quality of life of cervical cancer patients: A multivariate analysis. Journal of Cancer Research and Therapeutics 2019.

Abate, S.M. Trends of cervical cancer in Ethiopia. Obstetrics & Gynecology, 2015, 5(103), pp.2161-0932

Du Toit, G.C. and Kidd, M. Prospective quality of life study of South African women undergoing treatment for advanced-stage cervical cancer. Clinical therapeutics, 2015, 37(10), pp.2324-2331

Food, Medicine and Health Care Administration and Control Authority of Ethiopia, Standard Treatment Guideline for General Hospitals, 2014

Ebrahim, S. Clinical and public health perspectives and applications of health-related quality of life measurement. Social Science & Medicine, 1995, 41(10), pp.1383-1394.

Nchebe sindaza chitashi., Quality of life in zambian cervical cancer women post chemo-radiotherapy, University of Johannesburg, 2013, 1-126

Distefano, M., Riccardi, S., Capelli, G., Costantini, B., Petrillo, M., Ricci, C., Scambia, G. and Ferrandina, G. Quality of life and psychological distress in locally advanced cervical cancer patients administered pre-operative chemoradiotherapy. Gynecologic oncology, 2008, 111(1), pp.144-150.

S. Vaccarella , M. Laversanne, J. Ferlay and F. Bray . Cervical cancer in Africa, Latin America and the Caribbean and Asia: Regional inequalities and changing trends. International Journal of Cancer 1997–2001 (2017) VC 2017 141, IARC/WHO.

Khalil, J., Bellefqih, S., Sahli, N., Afif, M., Elkacemi, H., Elmajjaoui, S., Kebdani, T. and Benjaafar, N., Impact of cervical cancer on quality of life: beyond the short term (Results from a single institution). Gynecologic oncology research and practice, 2015. 2(1),

Xie, Y., Zhao, F.H., Lu, S.H., Huang, H., Pan, X.F., Yang, C.X. and Qiao, Y.L. Assessment of quality of life for the patients with cervical cancer at different clinical stages. Chinese Journal of cancer, 2013,32(5), p.275.

Jemal, A., Bray, F., Forman, D., O'brien, M., Ferlay, J., Center, M. and Parkin, D.M., Cancer burden in Africa and opportunities for prevention. Cancer, 2012. 118(18), pp.4372-4384.

Ayana, B.A., Negash, S., Yusuf, L., Tigeneh, W. and Haile. Reliability and validity of Amharic version of EORTC QLQ-C 30 questionnaire among gynecological cancer patients in Ethiopia. Public library of science, 2016, 11(6)

Tabachnick, B.G. and Fidell, L.S. Using multivariate statistics. Allyn & Bacon/Pearson Education, 2011.

Kamau, R.K., Osoti, A.O. and Njuguna, E.M.,. Effect of diagnosis and treatment of inoperable cervical cancer on quality of life among women receiving radiotherapy at Kenyatta National Hospital. East African medical journal, 2007, 84(1), pp.24-30.

Liya Teklu Araya, Gebremedhin Beedemariam Gebretekle, Girma Tekle Gebremariam and Teferi Gedif Fenta . Reliability and validity of the Amharic version of European Organization for Research and Treatment of cervical Cancer module for the assessment of health related quality of life in women with cervical cancer in Addis Ababa, Ethiopia.BMC journal,2018,pp 33-40.

Paradowska, D., Tomaszewski, K.A., Bałajewicz-Nowak, M., Bereza, K., Tomaszewska, I.M., Paradowski, J., Pityński, K., Skotnicki, P., Greimel, E.R. and Bottomley, A., Validation of the Polish version of the EORTC QLQ-CX24 module for the assessment of health-related quality of life in women with cervical cancer. European journal of cancer care, 2014, 23(2), pp.214-220.

Korfage IJ, Essink-Bot ML, Mols F, van de Poll-Franse L, Kruitwagen R, van Ballegooijen M. Health-related quality of life in cervical cancer survivors: a population-based survey, 2009.

Ljuca, D. and Marosevic, G., Quality of life in patients with cervical cancer FIGO IIb stage after concomitant chemoradiotherapy. Radiology and Oncology, 2009. 43(4), pp.293-298. 70

Nwabichie Chinemerem Cecilia, Rosliza A.M. , Suriani I. GLOBAL BURDEN OF CERVICAL CANCER: A LITERATURE REVIEW International Journal of Public Health and Clinical Sciences e-ISSN : March/April 2017 , 2289-7577. Vol. 4:No. 2

Park, S.Y., Bae, D.S., Nam, J.H., Park, C.T., Cho, C.H., Lee, J.M., Lee, M.K., Kim, S.H., Park, S.M. and Yun, Y.H., Quality of life and sexual problems in disease-free survivors of cervical cancer compared with the general population. Cancer, 2007. 110(12), pp.2716-2725.

Plotti, F., Sansone, M., Di Donato, V., Antonelli, E., Altavilla, T., Angioli, R. and Panici, P.B., Quality of life and sexual function after type C2/type III radical hysterectomy for locally advanced cervical cancer: a prospective study. The journal of sexual medicine, 2011. 8(3), pp.894-904.

Prasongvej, P., Nanthakomon, T., Jaisin, K., Chanthasenanont, A., Lertvutivivat, S., Tanprasertkul, C., Bhamarapravatana, K. and Suwannarurk, K., Quality of Life in Cervical Cancer Survivors and Healthy Women: Thai Urban Population Study. Asian Pacific journal of cancer prevention, 2017. 18(2), p.385.

Quercioli, C., Messina, G., Barbini, E., Carriero, G., Fanì, M. and Nante, N., Importance of sociodemographic and morbidity aspects in measuring health related quality of life: performances of three tools. The European Journal of Health Economics, 2009. 10(4), pp.389-397.

Neha Dahiya1, Anita S Acharya1, Damodar Bachani1*, DN Sharma2, Subhash Gupta2, KP Haresh2, GK Rath2 . Quality of Life of Patients with Advanced Cervical Cancer before and after Chemo-radiotherapy . Asian Pac J Cancer Prev, 2016,17 (7), 3095-3099

Torkzahrani, S., Rastegari, L., Khodakarami, N., Akbarzadeh-Baghian, A., Alizadeh, K., Quality of life and its related factors among Iranian cervical cancer survivors. Iranian Red Crescent medical journal 2013. 15, 320–323. doi:10.5812/ircmj.4410 72

Tang F, Wang J, Tang Z, Kang M, Deng Q, Yu J, Quality of Life and Its Association with Physical Activity among Different Types of Cancer Survivors. PLoS ONE 11(11): e0164971. doi:10.1371/journal.2016,pone.0164971

Stephanie Klügel, Caroline Lücke1 ,Aurora Meta, Meike Schild-Suhren, Eduard Malik, Alexandra Philipsen, Helge HO Müller . Concomitant psychiatric symptoms and impaired quality of life in women with cervical cancer: a critical review Department of Psychiatry and Psychotherapy. Department of Gynecology and Obstetrics, Carl von Ossietzky University Oldenburg, International Journal of Women's Health,2017, Germany

A. O ´ Ce´illeachair J. F. O'Mahon, M. O'Connor, J. O'Leary,C. Normand,C. Martin L. Sharp.Health-related quality of life as measured by the EQ-5D in the prevention, screening and management of cervical disease: A systematic review. Springer International Publishing AG ,2017

Elham Shirali, Fariba Yarandi, Marjan Ghaemi, Ali Montazeri.Quality of Life in Patients with Gynecological Cancers: A Web-Based Study. Asian Pac J Cancer Prev, **21 (7)**, 1969-1975,Iran.

Dwi E,Arthorn R,Muntharat T,Nairan P,Evaluation of HRQOL among patients with cervical cancer .Asian pac.J. cancer prevention ,2015,Indonsia.

Wanjuan Z,Xiangchea Y, Quinu wu,Gang Yin.survey of cervical cancer suvivors regarding quality of life and sexual function .J cancer Res Ther 2016 12(2).938-44,China.

Ana clara L,Rosario B,Martin S,Marta P. Contribution of sociodemographic ,clinical and psychological variables to quality of life in women with cervical cancer in the follow up phase .Journal of clinical psychology in medical setting ,603-614(2020),Portugal .

Larissa Nascimento Dos Santos [1], Luciana Castaneda [1], Suzana Sales de Aguiar [2], Luiz Claudio Santos Thuler [2], Rosalina Jorge Koifman [3], Anke Bergmann. Health-related Quality of Life in Women with Cervical Cancer. Rev Bras Ginecol Obstet 2019 Apr;41(4):242-248.Brazil

Yumi Lee, RN, Myong Cheol Lim, Se Ik Kim, Jungnam Joo, Dong Ock Lee, Sang-Yoon Park, Comparison of Quality of Life and Sexuality between Cervical Cancer Survivors and Healthy Women Cancer Res Treat. 2016;48(4):1321-1329Goyang, Korea

Annex

አዲስ አበባ ዩኒቨርሲቲ

ህክምና ትምህርት ቤት

ጥቁር አንበሳ ስፔሻላይዝድ ሆስፒታል ውስጥ በመታከም ላይ በሚገኙ የማህጸን ጫፍ ካንሰር ታማሚዎች ስለህመማቸው ሁኔታ መረጃ ለመሰብሰብ የተዘጋጀ መጠይቅ፣2013ዓ.ም

ተሳታፉዎች በጥናቱ ለመሳተፍ ፈቃደኝነታቸዉን የሚገልፁበት ቅጽ

ጤና ይስጥልኝ እኔ _____ እባላለሁ በአዲስ አበባ ዩኒቨርሲቲ፣ ህክምና ትምህርት ቤት ተማሪ ስሆን፣ ይህ ጥናት የማህጸን ጫፍ ካንሰር ላይ የሚሰራ ጥናት ወረቀት ነው:: በመሰራት ላይ ያለው ጥናት አላማ ስለ እርስዎ ጤንነትና ስለሚደረግልዎት ህክምና ለማጥናት ነው:: መጠይቁ ከጊዜዎ ቢበዛ 15 ደቂቃ የሚወስድ ሲሆን በዚህ ጥናት ውስጥ የእርስዎ ተሳታፊነት ሙሉ በሙሉ በእርስዎ ፈቃደኝነት ላይ የተመሰረተ ነዉ፡፡ በዚህ ጥናት ውስጥ ለመሳተፍም ሆነ ላለመሳተፍ መወሰንዎ በሆስፒታሉ ውስጥ በሚያገኙት አገልግሎት ላይ ምንም አይነት ተጽእኖ የማይኖረው ሲሆን ቃለ መጠይቁን በማንኛውም ሰዓት ማቋረጥ ወይም ጥያቄዎችን አለመመለስ ይችላሉ፡፡ በጥናቱ ውስጥ ለተነሱት ጥያቄዎች የሚሰጧቸው መልሶች ሙሉ በሙሉ በምስጢር የሚጠበቁ ሲሆን የእርስዎም ስም በማንኛዉም መልኩ በጥናቱ ውስጥ አይገለጽም፤ እንዲሁም የሚሰጡት ምላሽ ከእርስዎ ማንነት ጋር በማንኛውም መልኩ አይያያዝም፡፡ በዚህ መጠይቅ ውስጥ ለቀረቡት ማንኛውም ጥያቄዎች ትክክለኛ ወይም የተሳሳቱ የሚባሉ ምላሾች የሉም:: ዋናው የሚፈለገው በእነዚህ ጥያቄዎች ወይም አረፍተ ነገሮች ዙሪያ ያልሆዎት ምላሽ ነው::

በጥናቱ ለመሳተፍ ፈቃደኛ ነዎት?

አዎ □ አይደለሁም □

• ፈቃደኛ መሆናቸውን ካረጋገጡ ቃለ መጠይቁን ይጀምሩ

• ፈቃደኛ ካልሆኑ ወደ ሚቀጥለው ተገልጋይ ይሸጋገሩ

ክፍል አንድ

1. እርስዎን በተመለከተ አጠቃላይ መጠይቅ	መልስ
1.1. እድሜ	_____አመት
1.2. ክልል	_____
1.3.ሀይማኖት	_____
1.4. የጋብቻ ሁኔታ	ያላገባች □ ባለትዳር □
	አግብተውየፈቱ □ የትዳርጓደኛንበሞትያጡ □
1.5. የትምህርትደረጃ	ማንበብናመፃፍ አልችልም □
	ማንበብናመፃፍ እችላለሁ □
	መደበኛያሌሆነትምህርት/የሃይማኖትትምህርት □
	አንደኛደረጃትምህርት (ከ 1ኛ-8ኛክፍል) □
	ሁለተኛደረጃ/መሰናዶትምህርት (ከ 9ኛ-12ኛክፍሌ) □
	ከፍተኛትምህርት(ሰርተፍኬት፣ዲፕልማ፣የመጀመሪያ ዲግሪና ከዚያ በላይ) □
1.6. የስራ ቅጥር ሁኔታ	የመንግስት ሰራተኛ □
	የግሌመሥሪያ ቤትተቀጣሪ □
	ነጋዴ □
	ጡረተኛ/ በጡረታ ከሥራ የተገለሉ □
	አርሶአደር □
	የቤት እመቤት □
	ሥራ አጥ □
	ሌሎች፣ ይግለፁ_____
1.7.ወርሃአማካኝየቤተሰብ ገቢ በብር	

Section 2: Medical Characteristics (to be filled through chart review by data collectors)

2.1 Patient status	New patient □ Follow up □
2.2 Time since diagnosis	
2.3 Stage of cancer	Stage I □ Stage II □ Stage III □ Stage IV □ If Not mentioned, please write the card number _____
2.4 Current planned type of anticancer treatment (within the period of the data collection) (more than one answer possible)	Surgery □ Chemotherapy □ Radiation □
2.5 Please specify known comorbid condition	

Section 3: EORTC QLQ –C30

እርስዎን እና ጤንነትዎን የሚመለከቱ ጉዳዩት ትኩረታችንን ስበውታል፡፡ የሚጠቅሙ ነገሮች ላይ ተማርከናል፡፡ እባክዎ ከተሰጡት አማራጮች መካከል ስለራስዎ ትክክለኛ ነው ብለው የሚያስቡትን በማክበብ ሁሉንም ጥያቄዎች ይመልሱ፡፡ ከተሰጡት አማራጮች መካከል ትክክለኛ ወይም ስህተት የሆነ መልስ የለም፡፡ የሚሰጡት መረጃ ሁሉ በጥብቅ ምስጢር የሚጠበቅ እንጂ ለማንም ተላልፎ አይሰጥም፡፡

	በጭራሽ	በመጠኑ	በጥቂቱ	በጣም
1.አድካሚ ሥራዎችን ለምሳሌ ከባድ ጆንያዎችን መሸከምና ሻንጣዎችን እንደመሸከም ያሉ ከባድ ስራዎችን ይሠራሉ?	1	2	3	4
2.በእግርዎ ረዥም ጉዞ መጓዝ ይቸገራሉ?	1	2	3	4
3.በእግርዎ ከቤትውጭ አጭር ጉዞ መጓዝ ይቸገራሉ?	1	2	3	4
4. ቀን ቀን ተኝተው ወይም ወንበር ላይ ተቀምጠው ማሳለፍ ይገደዳሉ?	1	2	3	4
5. ሲመገቡ፣ ሲለብሱ፣ ሲታጠቡወይም መጽዳጃ ቤት ሲሄዱ እግዛ ያስፈልግዎታል	1	2	3	4

ባለፈው ሳምንት:	በጭራሽ	በመጠኑ	በጥቂቱ	በጣም
6. ሥራዎን ወይም ሌሎችን የዕለት ከዕለት ተግባራት መከወን ላይ ብቻ ተገድበው ነበር?	1	2	3	4
7. በትርፍ ጊዚየሚከናወኑ ሰራዎችን ና የመዝናኛ ጊዚዎቸን ለማሳለፈ ገድቦት ነበር	1	2	3	4
8. ትንፋሽ ያጥርዎት/ መተነፈስ ያቅትዎት ነበር?	1	2	3	4
9. ህመም/ ስቃይ ይሰማዎት ነበር?	1	2	3	4
10. ማረፍ አሰኝቶዎች ነበር?	1	2	3	4
11. እንቅልፍ አለወስድዎት እያለ ተቸግረው ነበር?	1	2	3	4
12. የድካም ስሜት ይሰማዎት ነበር?	1	2	3	4
13. የምግብ ፍላጎት አልነበረዎትም?	1	2	3	4
14. ያቅለሸልሸዎት ነበር?	1	2	3	4
15. አስታውኮዎት ነበር?	1	2	3	4

16. ድርቀት አጋጥሞዎት ነር? 1 2 3 4

17. ያስቀምጥዎት ነበር? 1 2 3 4

18. ይደክምዎት ነበር? 1 2 3 4

19. ህመም እየተሰማዎ የዕለት ከዕለት ሥራዎን ያቋርጡ ነበር? 1 2 3 4

20. ጋዜጣ እንደማንበብና ቴሌቪዥን እንደማየት ያሉ ነገሮችን ሲከውኑ

በትኩረት ለመከታተል ይቸገሩ ነበር? 1 2 3 4

21. የመወጣተር ስሜት ይሰማዎት ነበር? 1 2 3 4

22. ይጨነቁ ነበር? 1 2 3 4

23. ይበሳጩ ነበር? 1 2 3 4

24. ይደብርዎት ነበር? 1 2 3 4

25. ነገሮችን የማስታወስ ችግር ገጥሞዎት ነበር? 1 2 3 4

26. አካላዊ ሁኔታዎ ወይም የህክምና ክትትልዎ ቤተሰባዊ ህይወትዎን

ይረብሸዎት ነበር? 1 2 3 4

27. አካላዊ ሁኔታዎ ወይም የህክምና ክትትልዎ ማኅበራዊ ህይወትዎን

ይረብሸዎት ነበር?? 1 2 3 4

28. በአካላዊ ሁኔታዎ ወይም በህክምና ክትትልዎ ምክንያት

ለገንዘብ ችግር ተጋልጠው ነበር? 1 2 3 4

ለሚቀጥሉት ጥያቄዎች ከ1 እስከ 7 ከቀረቡት አማራጮች ስለራስዎ የበለጠ ትክክል ነው የሚሉትን መርጠው በማከበብ ይመልሱ፡፡

29. አጠቃላይ የጤንነትዎን ሁኔታ (እጅግ በጣም መጥፎ እስከ እጅግ በጣም ጥሩ ባሉ ነጥቦች) በደረጃያስቀምጡት ቢባሉ ምን ያህል ይሆናል?

1 2 3 4 5 6 7

እጅግ በጣም መጥፎ እጅግ በጣም ጥሩ

30. ባለፈው ሳምንት የነበርዎትን አጠቃላይየህይወት ሥምረት (ግላዊ፣ ማህበራዊ፣ ኢኮኖሚያዊና መንፈሳዊ ደህንነት)በደረጃ ያስቀምጡት ቢባሉስ ምን ያህል ያደርጉታል?

1 2 3 4 5 6 7

እጅግ በጣም መጥፎ እጅግ በጣም

Section 4: EORTC QLQ – CX24

አንዳንዴ ታካሚዎቻችን የተለያዩ ምልክቶችና ስሜቶች እንደሚሰማቸው፡፡

እባክዎን ከስር የተጠቀሱትን ስሜዎች በምን ያህል ሁኔታ እንደተሰማዎት ይግለፁልኝ፡፡

ባለፉት ሳምንታት

	በጭራሽ	በትንሹ	በመጠኑ	በጣም በብዛት
31. የሆድቁርጠትስሜትተሰምቶታል	1	2	3	4
32. የአንጀት እንቅስቃሴ መቆጣጠር ችግር አለ	1	2	3	4
33. ሰገራዎላይደምአይተውያውቃሉ	1	2	3	4
34. ቶሎቶሎይሸናሉ	1	2	3	4
35. በሚሸኑጊዜየህመምስሜትአለው	1	2	3	4
36. የሽንትውሃአምልጥዎትያውቃል	1	2	3	4
37.ሙለበሙሉከፍኛዎየሽንትውሃንማስወገድያስቸግሮታል	1	2	3	4
38.አንደኛውወይምሁለቱእግርላይእብጠትአይተዋል	1	2	3	4
39. የወገብ ህመም ተሰምቶትየውቃል	1	2	3	4
40.እግርዎላይየመቆጥቆጥወይምየስሜትማጣትነገርአይተውያውቃሉ	1	2	3	4
41. በማህፀንዎአካባቢየማቃጠልስሜትተሰምቶትያውቃል	1	2	3	4

42. ከማህፀንዎፈሳሽነገርይዋጣልነበር 1 2 3 4

43. ከማህፀንዎያልተለመደ ደምመድማትአጋጥሞታል 1 2 3 4

44.የሰውነትሙቀትመጨመርወይምስብያጋጥሞታል 1 2 3 4

45.በህመምምክንያትስለሰውነትአካላትዎውበትየቀነሰስሜትይሰማዎታል 1 2 3 4

46.በህመምምክንያትየሴትነትስሜትዎቀንሷል 1 2 3 4

47.ስለ አካላዊሁኔታዎ ያለ መርካት ስሜትያጋጥሞታል 1 2 3 4

ባለፉት 4 ሳምንታት

48.የግብረስጋግንኙነትየህመምስሜትያመጣብኛልብለውአስበውያውቃሉ 1 2 3 4

49. የግብረስጋግንኙነትአርገውያውቃሉ 1 2 3 4

የሚከተሉትንጥያቄዎችየሚመልሱትላለፉት 4 ሳምንታት የግብረስጋግንኙነትካደረጉብቻነው፡፡

በጭራሽ በትንሹ በመጠኑ በጣም በብዛት

50.በግንኙነትጊዜማህፀንዎየመድረቅስሜትነበረው 1 2 3 4

51. ማህፀንዎ ያጠረ መስሎ ተሰምቶታል 1 2 3 4

52. ማህፀንዎ የጠበበ መስልዎታል 1 2 3 4

53.በግንኙነትጊዜወይምካለ ግብረ ስጋ ግንኙነት) በግንኙነተሁኔታላይህመምተሰምቶታል 1 2 3 4

54.ይህግንኙነትአዝናንቶታል 1 2 3 4

ENGLISH

EORTC QLQ-C30 (version 3)

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:

Your birthdate (Day, Month, Year):

Today's date (Day, Month, Year):

	Not at all	**A Little**	**Quite a bit**	**Very much**
1. Do you have any trouble doing strenuous activities like carrying a heavy shopping bag or a suitcase?	1	2	3	4
2. Do you have any trouble taking a long walk?	1	2	3	4
3. Do you have any trouble taking a short walk outside of the house?	1	2	3	4
4. Do you need to stay in bed or a chair during the day?	1	2	3	4
5. Do you need help with eating, dressing, washing Yourself or using the toilet?	1	2	3	4

During the past week:

6. Were you limited in doing either your work or other daily activities?	1	2	3	4
7. Were you limited in pursuing your hobbies or other Leisure time activities?	1	2	3	4
8. Were you short of breath?	1	2	3	4
9. Have you had pain?	1	2	3	4
10. Did you need to rest?	1	2	3	4
11. Have you had trouble sleeping?	1	2	3	4
12. Have you felt weak?	1	2	3	4
13. Have you lacked appetite?	1	2	3	4
14. Have you felt nauseated?	1	2	3	4
15. Have you vomited?	1	2	3	4
16. Have you been constipated?	1	2	3	4

During the past week:	**Not at all**	**A Little**	**Quite a bit**	**Very much**
17. Have you had diarrhea?	1	2	3	4
18. Were you tired?	1	2	3	4
19. Did pain interfere with your daily activities?	1	2	3	4
20. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?	1	2	3	4
21. Did you feel tense?	1	2	3	4
22. Did you worry?	1	2	3	4
23. Did you feel irritable?	1	2	3	4
24. Did you feel depressed?	1	2	3	4
25. Have you had difficulty remembering things?	1	2	3	4
26. Has your physical condition or medical treatment Interfered with your family life?	1	2	3	4
27. Has your physical condition or medical treatment interfered with your social activities?	1	2	3	4
28. Has your physical condition or medical treatment caused you financial difficulties?	1	2	3	4

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 – CX24

Patients sometimes report that they have the following symptoms or problems. Please indicate the extent to which you have experienced these symptoms or problems, please answer by circling the number that best applies to you.

During the past week	**Not at all**	**A Little**	**Quite a bit**	**Very much**
31. Have you had cramps in your abdomen?	1	2	3	4
32. Have you had difficulty in controlling your bowels?	1	2	3	4
33. Have you had blood in your stools (motions)?	1	2	3	4
34. Did you pass water/urine frequently?	1	2	3	4
35. Have you had pain or a burning feeling when passing water/urinating?	1	2	3	4
36. Have you had leaking of urine?	1	2	3	4
37. Have you had difficulty emptying your bladder?	1	2	3	4
38. Have you had swelling in one or both legs?	1	2	3	4
39. Have you had pain in your lower back?	1	2	3	4
40. Have you had tingling or numbness in your hands or feet?	1	2	3	4
41. Have you had irritation or soreness in your vagina or vulva?	1	2	3	4
42. Have you had discharge from your vagina?	1	2	3	4
43. Have you had abnormal bleeding from your vagina?	1	2	3	4
44. Have you had hot flushes and/or sweats?	1	2	3	4
45. Have you felt physically less attractive as a result of your disease or treatment?	1	2	3	4

46. Have you felt less feminine as a result of your disease or treatment?	1	2	3	4
47. Have you felt dissatisfied with your body?	1	2	3	4

During the past 4 weeks:	**Not at all**	**A Little**	**Quite a bit**	**Very much**
48. Have you worried that sex would be painful?	1	2	3	4
49. Have you been sexually active?	1	2	3	4

Answer these questions only if you have been sexually active during the past 4 weeks:

50. Has your vagina felt dry during sexual activity?	1	2	3	4
51. Has your vagina felt short?	1	2	3	4
52. Has your vagina felt tight?	1	2	3	4
53. Have you had pain during sexual intercourse or other sexual activity?	1	2	3	4
54. Was sexual activity enjoyable for you?	1	2	3	4